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AUTHOR	Nakayama, Shuichi, Ed.; Griek, Lyckle, Ed.
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ABSTRACT

The International Seminar on Teacher Education for the 21st Century in Hiroshima explores innovative strategies to enhance the quality of teacher education in the Asia-Pacific Region. The goal of the seminar is to identify problems and issues related to teacher competencies at rural as well as urban schools in the region; the focus of the 1997 seminar is on the similarities and differences in the region concerning issues and problems of teacher competencies, especially in the context of educational media literacy. Four parts make up this report. In the first part, Dr. Rupert Maclean, Chief of Asian Pacific Centre of Educational Innovation and Development, describes the current activities and aims of the Asian Pacific Program for Educational Innovation and Development and the Center that is in charge of running the program. The second part consists of "Country Reports." The third part contains the "Action Plans" that each participant was asked to draw up; this part also includes synthesized Action Plans for Japan, to point out what role Japan might be able to play in terms of Overseas Development Assistance and international cooperation. The final part of the report summarizes the results of the follow-up meeting held in January, 1998. Experts give their assessment of the "Country Reports" and "Action Plans." (AEF)

1997

Innovation and Reform in Teacher Education for the 21st Century in the Asia-Pacific Region:

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Contents

Contents

Contents

Action Plans

Seminar Evaluation

Preface

We are very pleased to publish the combined report of the 1997 UNESCO-APEID Hiroshima International Seminar and its Follow-up Meeting. The 1997 UNESCO-APEID Hiroshima International Seminar on Teacher Education for the Effective Use of New Information Media in Schools was held in Hiroshima, Japan from September 23 to October 3, 1997. This seminar was outlined on the basis of the guidelines for the Sixth Programming Cycle of APEID Activities (1997- 2001) adopted by the First Asia and Pacific Inter-governmental Regional Committee on Education in the Asia and Pacific (EDCOM, June 1996). The common theme of the series of Hiroshima seminars for the next five years in the Sixth Programming Cycle will be "Innovation and Reform in Teacher Education for the 21st Century in the Asia-Pacific Region".

For the first time in the history of the Hiroshima APEID Associate Center a Follow-up Meeting was held from January 29 to February 1, 1998 on the campus of Hiroshima University in order to discuss the strategies and requests proposed by the participants of the International Seminar in the previous year. The participants to the Follow-up Meeting held very intensive discussions to shape up the strategies for the use of new information media in order to improve the classroom conditions through pre- and in-service teacher education.

On behalf of the 1997 Hiroshima University APEID Project Committee, we, as Director of the Committee and editors, would like to express our sincere gratitude to all the participants of the seminar, and participants to the Follow-up Meeting. We are confident that their contributions to this seminar and its follow-up meeting will provide many valuable ideas, hints and contributions to improve teaching in classrooms in the Asia-Pacific Region.

Shuichi Nakayama
Editor and Director of the Seminar

Lyckle Griek
Co-Editor and Junior Lecturer

Introduction

1. Objectives of the Seminar

As we move towards the 21st century, people all over the world feel there is a need to re-design teacher education programs that promote teacher competencies in a changing classroom. Teachers will have to acquire knowledge, skills and attitudes to live in the global village by

(a) learning to live together in order to promote interdependence among people of various nations;

(b) learning to know about current dynamic changes in the society;

(c) learning to do, such as to make plans, implement and evaluate more effective teaching activities; and

(d) learning to be a person who possesses the responsible citizenship.

The International Seminar on Teacher Education for the 21st Century in Hiroshima aims to explore innovative strategies to enhance the quality of teacher education in the Asia-Pacific Region. The goal of this seminar is to identify problems and issues related to teacher competencies at rural as well as urban schools in the region. The focus of this year's Seminar is on the similarities and differences in the region concerning issues and problems of teacher competencies, especially in the context of educational media literacy.

The 1997 Hiroshima International Seminar has the following objectives:

1. To identify and exchange key experiences about problem areas and issues related to teacher's knowledge, skills and attitudes that are vital for the enhancement of the effective use of educational media ;
2. To explore innovative methods and approaches presently employed for enhancing key teacher competencies for the effective use of educational media; and
3. To design national and international cooperative frameworks and action plans for the enhancement of teacher competencies in support of improving effective use of educational media.

2. Expected Outcomes

The teacher is seen as the key resource in the reform, redirection, and renewal of education for the 21st century. UNESCO-APEID recommends that action for the upgrading and renewal of education through enhancement of knowledge, skills and attitudes of teachers should focus on the following:

1. Achievement of education for all, through both formal and non-formal education including the

enhancement of achievement in all subject areas;

2. Implementation of action-programs to meet the needs of disadvantaged population groups, particularly women and girls and those in rural and inner-city areas;
3. Improvement of "quality of life education" with particular reference to environmental education, preventive education, value education, cultural education, and education for international understanding; and
4. Enhancement of teacher education for all, including mathematics and technology education and the use of information processing education which involves learning about information technology, the use of computer technology and learning with computers. Teacher competencies in secondary education should be geared toward the enhancement of knowledge, skills, and attitudes in the above-cited areas.

3. This Report

This year's report consists of four parts. In the first part, Dr. Rupert Maclean, Chief of Asian Pacific Centre of Educational Innovation and Development (ACEID), describes the current activities and aims of the Asian Pacific Programme for Educational Innovation and Development (APEID) and the Centre that is in charge of running the Programme.

The second part consists of the country reports submitted by participants of each country, which were presented at the 1997 Seminar.

The third part contains the "Action Plans" that each participant was asked to draw up after the presentation and discussion of the Country Reports had finished. This part also includes synthesized Action Plans for Japan, to point out what role Japan might be able to play in terms of Overseas Development Assistance and international cooperation.

The fourth and final part of the Report summarizes the results of the Follow-up Meeting held in January 1998. Here, experts have given their assessment of the Country Reports and Action Plans produced by the Seminar-participants. Although not all country-reports were discussed, the general viewpoints expressed at this Meeting will be of great value for all Seminar participants, both those who have attended the Seminar in the past and those who will in the future.

4. Organizers and Participants

The Seminar was organized by the Hiroshima University APEID Committee at the APEID Associated Center, Hiroshima University under the auspices of the Japanese National Commission for UNESCO, in collaboration with ACEID at the UNESCO Principal Regional

Office for Asia and the Pacific (PROAP), Bangkok.

At this years 1997 Seminar there were 20 participants from 10 countries and institutions namely; China, Bangladesh, India, Indonesia, Japan, Malaysia, Nepal, Pakistan, Philippines, Thailand, and UNESCO-PROAP. (For list of participants see Appendix A.)

Address: An Overview of APEID Activities and Modalities of Operation during the Sixth Programming Cycle (1997-2001) and our Plans for the Future

Rupert Maclean

Chief of the Asia-Pacific Centre of Educational Innovation for Development, UNESCO-PROAP, Bangkok

1. APEID Overview: Meeting the Educational Challenges of the Present and the Future

UNESCO's Asia-Pacific Centre of Educational Innovation for Development (ACEID) was established in 1973 in response to the expressed wishes of Member States in the Asia-Pacific region. Thus, ACEID, and the (APEID) programme it is responsible for implementing, is now in its 24th year of service.

Many developments have occurred within countries in this dynamic region over the past two decades, with regard to rapid rates of economic growth, and social, political and technological change. As a result, the region is poised to become the economic powerhouse of the 21st century.

Although such rapid change impact on raising living standards, development-related problems, such as environmental degradation, cultural pollution and major between countries.

Perhaps more than ever before, education and schooling are seen as being essential contributors to economic development and key sources of influence in helping overcome development related problems. However, while there is a strong belief amongst countries about the value of education, there is, at the same time, some widespread dissatisfaction with the quality and effectiveness of what currently occurs in education systems. Thus, countries continue to seek assistance in finding creative solutions to prevailing education problems, partly through learning from each other through the sharing of experience.

In keeping up with the various development-related changes that have occurred (and still occur) within the Asia-Pacific region, countries continue to place great emphasis on the importance of *educational innovation for development.* As a result, the purposes of UNESCO's Asia-Pacific Programme of Educational Innovation for Development (APEID) remain just as fresh, important and relevant today as they were when the programme was founded 23 years ago.

APEID aims to help Member States strengthen their capabilities and self-reliance, at the

national, sub-national and grassroots levels, for the creation and use of educational innovations to solve educational problems for the realisation of national development goals. The programmes developed to achieve this purpose are based upon the sharing of experience between countries to help achieve educational innovation for the economic, social and cultural development of the countries in the region.

In order to achieve this purpose, APEID has four key objectives:

- To promote an awareness of the need for innovation and the possibilities for change;
- To stimulate an understanding of the process and practices of innovation, and to identify and stimulate innovative activities and co-operative action amongst Member States, with a view to encouraging the systematic experimentation and adoption of educational innovations in response to the problems associated with development;
- To assist the Member States in strengthening on-going national programmes which are developing innovative, indigenous techniques for dealing with one or more aspects of development-orientated education in terms of personnel, techniques and management capacity; and,
- To encourage the inter-country transfer of experience and technical cooperation, particularly through exchange activities, advisory services and dissemination of information.

Many of ACEID's activities are developed and implemented through utilising a network of 199 co-operating Associated Centres (AC's) located in 29 member countries throughout the large and diverse Asia and Pacific region, which is home to 63 per cent of the world's population. Although the idea of sharing knowledge and experience through networks has now become commonplace, this was a new and highly innovative idea when APEID established its regional networks of Associated Centres in 1973.

During the 24 years of its operation, APEID has succeeded in helping to develop high-level commitment to educational change, in providing a model of institutional collaboration, an opportunity for individuals from different countries to meet and share their knowledge and experience and in generating significant innovative processes within countries. There are visible indicators that national authorities are committed to educational innovations for development, and numerous APEID publications also report on national innovations arising as a result of APEID's initial support, in terms of technical backstopping.

In the words of Professor Stacey Churchill from the University of Toronto, who undertook an independent evaluation of APEID:

> *'APEID has had a major impact in its (Asia Pacific) region and, through other networks, in other parts of the world. This impact has been the stimulus for changes in laws and educational structures, curricula, curriculum materials, administrative procedures and*

almost every imaginable aspect of educational practice.

Funds for the programme activities and personnel working in ACEID continue to be mainly provided by the Regular Programme of UNESCO adopted by each session of the UNESCO General Conference. Considerable support has also been provided by participating Member States; through contributing services in kind, regarding the organisation of Programme activities and by providing the help of specialists. Support has been extended in the form of voluntary contributions in cash and through funds-in-trust, most recently by Japan, China and the Republic of Korea. Due to current financial constraints being experienced by UNESCO, extra budgetary funding, including voluntary contributions from Member States, is taking on an increasingly important role in funding APEID's activities.

It is clear from such meetings that countries are keen to enhance the role of education as a dynamic force for change and improvement as they confront the threshold of the 21st century. As always, APEID remains dedicated to being responsive to the wishes of Member States as they seek to obtain reliable technical assistance and backstopping in order to help promote effective educational innovation for development.

Despite the continuing success of APEID activities, these are increasingly difficult times in which to operate, due to funding cutbacks and staffing shortages. Thus there is a need to explore more cost effective and innovative ways to achieve our aims. There is also a need to seek outside funding from other sources, such as government departments and private enterprise, and to sell our consultancy services to other multi-lateral and bilateral aid agencies.

At a time of reduced funding, we must critically assess our modes of operation to ensure that maximum benefits are obtained from resources and that the most effective services are being provided to our Member Countries. Thus, APEID itself needs to find new, more creative ways to achieve its mandate to assist Member Countries further develop their education and schooling systems.

In the future, change and development will continue to define both the trends and the tasks facing APEID. This means that preparing for a future that is being shaped by change is an essential element of the strategy for educational development. Many new aspects are very much now in all the settings - classrooms or work places - where education and training take place. The implications for reorienting the Asia-Pacific Programme of Educational Innovation for Development (APEID) include the following:

- APEID should be visionary in orientation;
- APEID should sensitively reflect the development context and the imperative of regional cooperation in order to keep its work relevant, and
- APEID's modes of action should be flexible in order to respond to change.

It is only through such a reorientation of activities that, as we fast approach the dawn of the

21st century, APEID can look forward to the reinforcement of its *leitmotif*. To achieve this, APEID cannot be complacent about what it has been doing, but must search for appropriate solutions to the problems arising in a rapidly changing region, and seek guidance from what has worked in the past.

APEID continues to subscribe to the view that if education is to contribute to national development and to the personal enrichment of individuals, it must be both creative and innovative. Through creativity, novel ideas may be transformed into useful programmes that help overcome obstacles

2. APEID Mission Statement

The fundamental mission of the Asia-Pacific Programme of Educational Innovation for Development (APEID), and its Secretariat, the Asia-Pacific Centre of Educational Innovation for Development (ACEID), as part of the UNESCO Principal Regional Office which serves 43 Member States in Asia and the Pacific, is:

> *To contribute to sustainable human development (underpinned by tolerance, human rights and a culture of peace) through the design and implementation of education programmes and projects, mainly at the post primary level of education, which stress 'educational innovation for development.'*

APEID will mount these programmes and projects in close consultation and collaboration with Member States in the region within the framework of the UNESCO Medium Term Plan and under the umbrella of UNESCO PROAP's overall mission in the Asia-Pacific region. In pursuing its mission. APEID will lay special stress on:

- Fostering educational innovation and research in support of development, in its widest sense;
- Forging effective partnerships in education with particular reference to the establishment and servicing of networks between and within countries (and across regions) which facilitate the free and open flow of information between those involved;
- Performing proactive and anticipatory roles in undertaking its various Programme activities; '
- Providing visionary and futuristic orientation.

In addition to working closely with Member States, within the overall education programme and framework of UNESCO PROAP, APEID will work closely with other UNESCO Offices, other UN agencies and NGO's.

3. Modes of Action and Institutional Framework for the Implementation of APEID Programme Activities

(3-A) Modes of Action

APEID in the last four programme cycles has adopted a range of 'modalities' in the development and implementation of programmes' activities. Indeed the Asia-Pacific Centre of Educational Innovation for Development (ACEID) has deservedly earned high professional respect for the skilful and imaginative ways it has used modes of action in service of the programmes being implemented. Much experience of success, as well as of shortfalls, has been gained.

These modalities are not static, but are modified and evolve over time to meet changing needs. In addition, new modalities are added to the repertoire of those already available. For example, from 1995 ACEID has organising an annual international conference on education, in cooperation with other agencies, such as UNICEF, UNDP and the Government of Thailand.

Modalities are not ends in themselves, but are chosen as appropriate methods to carry out particular programme activities or projects. They require the careful selection of people to implement them, and should be subjected to regular evaluation for effectiveness on the conclusion of a particular activity or sequence of activities.

(3-A-1) Inter-country exchange and sharing of experience and expertise within the framework of regional cooperation

Inter-country/inter-project transfer of experience and expertise in order to contribute to the strengthening of national capabilities and technical resources is at the core of APEID, defining the modes of action and their priorities. This is achieved through means such as:

- *Clusters of 'Research and Innovation Resource Institutions'* which singly, as 'lead institutions', or more often, with other selected institutions, form 'network teams', will assume responsibility for a programme area. (See under 'Institutional Framework');
- *Field operational seminars*, such as study visits by teams of project staff from different countries, culminating in a seminar;
- *Training programmes.* These are specifically aimed at building or strengthening national institutional capacities. These programmes (which have been regularly used in previous cycles) have comprised 'attachments', for training; study visits; and, Mobile Training Teams (MTT's) under Japanese Funds-in-Trust.

The training modalities adopted need careful planning and adequate lead-time to be effective in their outcomes, which should feed directly into a national institution's activities. Improved

identification of the 'focus area' of a training programme, greater concentration of available resources and the immediate evaluation of each activity as it concludes, will further strengthen the training mode which has proved its worth.

The *Mobile Training Team* programme warrants special emphasis and explanation since it is a particularly important and influential modality for encouraging EID in Asia-Pacific countries.

The Mobile Training Team (MTT) programme, funded through Japanese Funds-in-Trust, has been operating for almost 25 years (since 1972) within the framework of APEID. Over this period a total of 94 MTT's have been awarded to UNESCO Member States in the Asia-Pacific region, the estimated total funding for these completed MTT's being US$2.2 million.

Although there have been some adjustment to the modality and content of the MTT over time, the programme has remained largely unchanged since its inception. Currently there are five Mobile Training Teams per year, one in each of the content areas of: educational technology; technical and vocational education; curriculum development; science education; and special education. The cost of the MTT's is US$32,260 each, the total cost per year being US$161,300.

Each Mobile Training Team currently consists of three phases:

1) Inter-county study visits to 2-3 other countries by 2-3 national officials who are fully involved in the subject area covered by the MTT;
2) Organisation by the beneficiary institution of an in-country training workshop with the national officials who went abroad serving as core persons and with the assistance of one or two international consultants and an ACEID programme specialist; and
3) Provision of equipment for use during the in-country training workshop and/or for follow-up activities.

At the request of the Japanese authorities, ACEID organised an evaluation of the MTT programme in June 1996. In view of this evaluation there will be some flexibility in the education topics nominated, the modality adopted and financial allocations within the maximum allotments for any given MTT, in accordance with the basic framework arranged by ACEID and agreed to by Japan. The detailed operational plan of each MTT will be worked out through discussion and negotiation between the individual country to be awarded a particular MTT and ACEID.

(3-A-2) Programme Development Support and Implementation

The basic principle is that programme development is a joint and participating activity among and with the Member States and their institutions governs the modes of action. This can take various forms:

- *Studies.* More attention is to be given to 'studies' and 'research' in programme development. If 'innovation for development' is more than the innovation in place at the micro level, studies

and research are the means for the anticipatory and proactive functions of innovation to come into play. Studies can range from 'think pieces' by specialists to in-depth analytic studies of the major problems of reform and reappraisals. Also essential are in-depth studies (start-up studies) in preparation for co-operative action in a major programme area (e.g. quality-based education and training). Since UNESCO is an intellectual organisation, the professional staff in ACEID will themselves be personally involved in writing related to their professional areas of responsibility. This will be augmented by contributions from researchers and academics invited to work in ACEID during their sabbatical leave.

- *Technical groups, workshops and seminars.* The present mechanism for regional consultation for programme development having been merged with overall advisory functions, it is necessary to have theme-based technical groups (with specialist membership) to join in programme development processes. Workshops and seminars will be carefully planned as integral steps in the implementation of a programme.
- *Support Panels.* For a programme of growing complexity such as APEID to adequately reflect the growing complexity of development in the region, it is highly advisable for ACEID, as the central co-ordinating mechanism, and for co-operating clusters of institutions (when they become operational), to have on call the technical cooperation and assistance of standing Support Panels of Resource Persons, impaneled in their personal capacities. A panel is by definition small and compact.
- *National Action.* The follow-up or spin-off of an inter-country programme in some form of national-level activity is a criterion of the effectiveness of the inter-county programme. This ultimate modality is innovative, has long-term and multiplier impact, and has 'visibility' effects. These national-level activities may take the form of the follow-up of a training programme or the establishment of an experimental or pilot project.

From all accounts, ACEID's Joint Innovation Projects (JIP) is an exemplary illustration. A project (JIP) in the *Gansu Province of China*, which started as an experimental project in one province, has now been expanded to other provinces. The 'networking' of innovative schools and other programmes at the national level and highlighting their work calls for their innovations to have priority attention.

(3-A-3) Information Generation and Dissemination (Innovations, Reforms and New Developments)

The modalities in this group include research-development (R&D) and case studies. and information from international sources on new and significant developments in areas of APEID.

Examples include:

- the production and dissemination of various publications including the ACEID Newsletter;
- experimental materials (such as curricular, training . packages, etc.); and
- a database about experts and specialist institutions.

Publications continue to be the bedrock of the information dissemination process. Their value, however, lies in how well they are written and presented. Reports intended for publication are subjected to a process of rigorous review and editing and will have more targeted mechanisms for wide distribution. Research findings will be shared in the form of:

- translations or summaries of research studies of direct interest to the practitioners, e.g. SET type materials;
- annotated bibliographies of relevant research studies that relate to the programme areas within the strategic themes proposed earlier;
- A useful method of strengthening the information resource base is to commission highly qualified persons to prepare theme papers on specific issues or new areas of innovation, which can then be published as monographs or occasional papers.

Summing up, it should be stressed that the major share of the responsibility for these modalities falls on ACEID. Unless ACEID is reasonably staffed and equipped, it is difficult imagine how this special responsibility can be adequately discharged.

(3-B) Institutional Framework

The institutional framework refers to the mechanisms by which the aims and objectives of APEID and the programmes conceived therein are sought to be realised. In the light of the experiences of previous cycles, particularly because of the significantly diversified development of institutional structures of education in the Member States, suitable changes and a reorientation in APEID's institutional framework needs to occur.

(3-B-1) Asia-Pacific Centre of Educational Innovation for Development (ACEID)

ACEID is an integral part of the UNESCO Principal Regional Office for Asia and the Pacific (Bangkok) and functions as an interdisciplinary and multi-disciplinary task force for APEID. The main objectives of ACEID are:

- to facilitate, co-ordinate and support educational innovation and research programme development and implementation in close association with the national institutions and entities designated for the purpose;
- to stimulate and promote educational innovations and research for development in the

countries of the region, identifying growth points and futuristic trends;

- to promote and support inter-country and regional cooperation, and to this end stimulate active participation of the national institutions and programmes in programmes of mutual benefit;
- to develop and operate in cooperation with the appropriate institutions of the countries information and dissemination services relating to educational innovations and research. educational reforms and reappraisals;
- to stimulate and promote in the education systems and amongst educational workers at the grassroots level an awareness of the possibilities of change and innovation.

(3-B-2) Associated Centres (AC's)

The term 'Associated Centre', at present in use, is a general one and covers a variety of institutions with a wide range of functions. There are Associated Centres in each participating country which were specifically brought into association for their participation (as host or beneficiary) in the regional or inter-county activities.

The network of 199 Associated Centres in 28 Member States, especially the large countries, are intended to be elements of the concerned county's internal and national-level organisations, and the basis for networks at the national level that can involve others working in the normal structure of the education departments. They receive publications and other materials from the regional sources but clearly are intended only to be assessed or judged, as far as ACEID is concerned, in terms of their direct participation or otherwise in regional and national activities.

(3-B-3) National Development Groups (NDG's)

National Development Groups are national-level entities, which are intended to be active in promoting and stimulating educational innovations (including educational research for development) in the countries concerned. They can be Inks with the grassroots organisations in education.

ACEID is making systematic efforts to stimulate the formulation and strengthening by the Member States of their National Development Groups. Group meetings of NDG's at the regional level and ' seed' funds for stand-up activities will be a part of the revitalisation process by which the NDG's can play their due role in making widespread awareness of educational innovation possible.

4. Networks

APEID is not only itself an exemplar network (Churchill 1988, Hughes 1995), but it also spawns

and sustains other networks to achieve its mandate. Some networks have their origins in APEID: others are UNESCO-wide, with ACEID being responsible for their operation in the Asia-Pacific region.

1. APEID Network of Associated Centres (AC's)
2. UNESCO International Network on Technical and Vocational Education (UNEVOC)
3. Asia-Pacific Network for International Education and Values Education (APNIEVE)
4. The Associated Schools Project Network (ASP)
5. Special Education Network

5. Consultation to Develop Programme Activities

The Asia-Pacific Programme of Educational Innovation for Development (APEID is reviewed by the participating Member States on a regular basis to assess past performances and identify emerging issues and problems which ' educational innovation for development' can help solve.

APEID's programme areas are determined in consultation with UNESCO Member States. This consultation occurs in two main ways: first, through the General Conference of Member States at UNESCO Headquarters, Paris, every two years (1991, 1993, 1995 etc.); and, more specifically for those in the Asia-Pacific region, through the regular consultation meetings that occur with Member States in the region, such as at meetings between UNESCO and the Ministers for Education and those Responsible for Economic Planning in Asia-Pacific countries (e.g. MINEDAP VI, 1993), Regional Consultation Meetings on APEID, and the recently established Intergovernmental Regional Committee on Education in Asia and the Pacific (EDCOM).

When a new programming cycle of APEID begins, a Work Plan of APEID for the next five-years is prepared based on this consultation process with Member States.

The Delors Report, with its emphasis on meeting the educational challenges of the present and the future, provides a conceptual framework which has guided the formulation of the Work Plan of APEID for the Sixth Programming Cycle (1997-2001).

6. Work Plan: Major Programme Areas

(6-A) Overall Considerations

The APEID programme activities that will occur for each of the nine major programme areas presented below will be implemented utilising the *institutional framework* (e.g. ACEID; Associated Centre and other networks; National Development Groups; etc.) and *modes of action* (e.g. Mobile Training Teams; technical groups, workshops and seminars; international, regional

and sub-regional conferences; publications, etc.) outlined earlier.

It should be noted that although some modes of action may be specific to particular programme areas, there are other modes, which may touch upon all Major Programme Areas of work at the same time. A particular case in point are the annual UNESCO-ACEID International Conferences on Education, which were inaugurated in 1995, and are conducted in cooperation with various partners such as Thailand's Ministry of Education, UNICEF, UNDP, ESCAP and UNEP.

The themes chosen for each ACEID international conference are selected to be both of specific relevance to the region and of interest and concern worldwide. Two such conferences have already been held. these being :

- International Conference on Partnerships in Teacher Development for a New Asia: December 1995
- International Conference on Re-engineering Education for Change: Educational Innovations for Development: December 1996

These conferences have attracted a large clientele of international researchers, policy makers, and education practitioners in various areas of education to contribute papers and research findings on the topic in question. These inputs have done much to help revive ACEID's programmes and activities to suit the best interests of its Member states.

In 1996, 400 individuals from 36 countries participated in the ACEID International Conference on Education. Many individuals from UNESCO National Commissions and APEID's 198 Associated Centres in the Asia-Pacific region have participated in these conferences.

ACEID is planning to organise a major International Conference on Education in each year of the Sixth Cycle of Programme Activities. In 1997 the topic of the International Conference will be 'Educational Innovation for Sustainable Development' (in partnership with APPEAL) while in 1998 the International Conference will be on the 'Universalization of Secondary Education: Issues, Prospects and Priorities'. The topics for the ACEID International Conferences to be held in the years 1999, 2000 and 2001 will be determined by ACEID, in consultation with the Member States, taking into account emerging education issues in the Asia-Pacific region.

The major outcomes of these International Conferences are:

- Identification of key issues for strengthening and upgrading the areas of education examined;
- An analysis of policy trends and issues in the development of the field of education examined; and
- Recommendations regarding policy directions and education practices to strengthen and upgrade various aspects of education in the region.

The major APEID programme areas specified below have been formulated to address the issues and concerns expressed to UNESCO by Member States at various consultation meetings in the Asia-Pacific region, such as MINEDAP VI (1993) and EDCOM (1996).

(6-B) Strategic Themes

To enable APEID to focus specifically and sharply on major programme areas of work, which offer the best possibilities for innovative action to support educational innovation to foster development, programme areas, activities and modalities of action during the Sixth Programming Cycle will be delineated by four strategic themes.

There are three specific, and one overarching, strategic themes. These have been framed by ACEID in the light of consultations that have occurred with Member States in regional consultation meetings such as MINEDAP VI (1993), EDCOM (1996), and following the recommendations of a high level consultative group (1994).

APEID's strategic themes during the Sixth Programming Cycle will be:

- Enhancing the quality and relevance of education;
- Increasing access to effective education; and
- Enhancing education's contribution to the quality of life.

Overarching these three themes and helping set the programme objectives will be the additional theme: Enhancing educational capacities for coping with change.

With regard to this overarching theme, the first meeting of the Inter-governmental Regional Committee on Education in Asia and the Pacific (EDCOM. 1996). while discussing 'The Challenge of Preparing for a Changing Future' in the context of the report of the International Commission on Education for the Twenty-first Century (Delors Report), recommended that:

- Programme activities related to the challenge of preparing for a changing future (and to other issues, concerns and priorities arising from the Delors report), be implemented by UNESCO PROAP; and
- Action needs to be taken to help forge close 'partnerships in education' involving all participants in the education enterprise such as governments, teachers and their associations, parents, and other members of the regional community, such as Non-Government Organisations, in order to help ensure the relevance and effectiveness of education in coping with change.

It should be noted that each of these themes are not separate, water-tight compartments. Rather, a close inter-relationship exists between each of the themes.

These four strategic themes should be considered with regard to the development context, issues and priorities in the Asia-Pacific region, as outlined in the first section of this report. These stress the importance of

- Education for sustainable development;
- Education for poverty. eradication; and

- Education for greater equity.

(6-C) Major Programme Areas of Work

The programme areas of APEID refer to the broad fields of educational action in which the participating Member States will be associated to co-operatively realise the envisioned aims and objectives referred to above. They are defined by the developmental context and the needs of the region, as identified by the last Ministerial Conference on Education, (MINEDAP VI, 1993) and endorsed by the Inter-governmental Regional Committee in Education in Asia and the Pacific (EDCOM) at its first meeting held in June 1996. Furthermore, an attempt has been made to align these programme areas in accordance with UNESCO's Medium Term Strategy for the period 1996-2001. Special attention, during implementation, will be paid to the changing context of change, which is the energising force for the renovation of education systems in the region.

For each major programme area one or more programme actions, which will be the hub of operational or project activities to be developed and implemented by ACEID (and the co-operating national APEID Associated Centres), are broadly identified.

APEID programme activities during the Sixth Cycle (1997-2001) will address the following nine Major Programme Areas, these areas not being presented in any hierarchy of importance:

- Secondary education;
- Teacher education;
- Higher education;
- Technical and vocational education, and enterprise education;
- International, moral • and value education;
- Educational technology and science education;
- Research and innovation;
- Education of girls and other disadvantaged groups. including special education for those with learning disabilities;
- Environmental Education.

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Keynote Address: Strengthening the Role of Teachers and Teacher Education in a Technologically Changing World: An Asia-Pacific Perspective

Rupert Maclean

Chief of the Asia-Pacific Centre of Educational Innovation for Development
UNESCO PROAP, Bangkok.

1. Introduction

Worldwide, teachers are facing major problems that threaten the effectiveness and quality of education systems.

Many variables influence the effectiveness of a nation's school system, adequate school buildings and classrooms, a relevant curriculum, high quality and affordable teaching and learning materials such as textbooks, writing materials and laboratory equipment and an accurate system for monitoring education outcomes are all important. However, the bottom line is that the quality of any education system ultimately depends on the knowledge, skills and understandings of teachers.

It is therefore essential that the most capable and appropriate people are recruited into the occupation, and provided with career-long professional development to ensure they continuously update their capability to do the very best job possible in the school and classroom.

The teacher is the cornerstone of educational development, yet it is becoming increasingly difficult to recruit the most capable and suitable people into the occupation, in the numbers required.

A main reason for this situation is that there are so many competing areas of employment that provide higher salaries and better promotion opportunities than does teaching. Another is that there has been a gradual decline in the status of teachers over the past few years, so that amongst many members of the community teachers no longer attract the same high level of respect and admiration they used to. There has also been an erosion of the working conditions and salary levels of the world's 50 million teachers - relative to other comparable occupations - over the past two decades.

As a result many parents do not encourage their sons or daughters to become teachers, with some recruits regarding teaching as a second or third choice occupation.

There is currently, considerable worldwide apprehension about both the present and future

situation regarding the place of teachers in a changing world. At a time when the expectations for teachers have never been greater, in terms of the increasingly diverse nature of the teachers' role, the economic and social status of teachers in many parts of the world is in severe decline.

Yet even more will be expected of teachers in the future in providing pupils with ethical training, training for tolerance, citizenship, creative thinking and the ability to manage uncertainty. This means that the personal qualities of the teacher will become increasingly considered, particularly at the point of recruitment.

To attract and then keep the most able people in the teaching service requires great attention to finding ways to increase the status of teachers improve their working conditions and provide appropriate salary levels. These should reflect the important role teachers play in social, economic, cultural and technological development.

It is now widely recognised by most governments in our Asia-Pacific region that if our children are to have the high quality education, which they and our countries deserve. Teachers must receive greater attention. Teachers have a major role to play in the process of educational reform and educational change.

At present there are estimated to be 625 million illiterates in the Asia-Pacific region, which is 71 per cent of the world's total illiterates. Of all the illiterates in Asia-Pacific, 64 per cent are girls and women.

In addition, it is estimated that in the year 2000 there will be 74 million out-of-school children in the 6 to 11 year old age group in developing countries throughout the Asia-Pacific region.

If the educational reforms initiated by governments to achieve 'education for all', and to confront the challenges of the future, are to be effective they must reach the school and classroom. Awareness of this fact means that the teacher plays the key role in the process of transforming education. It is not possible effectively to reform education systems without taking teachers into greater consideration.

2. Overview of Regional Issues

The 45th Session of the International Conference on Education (ICE) was held at the International Bureau of Education (IBE), UNESCO, Geneva, 30 September - 5 October 1996. The theme of the Conference was 'Strengthening the Role of Teachers in a Changing World'.

IBE commissioned the Asia-Pacific Centre of Educational innovation for Development (ACEID), UNESCO, Bangkok, to prepare an Asia-Pacific Regional paper on the theme of the ICE, and provided an agenda of themes and issues.

In keeping with this request, UNESCO-ACEID organised, in cooperation with UNICEF and the Ministry of Education, Thailand, a Regional Conference on 'Partnerships in Teacher Education

for a New Asia', attended by 32 countries. On the basis of the proceedings of that conference, and on the basis of replies received from countries in the Asia-Pacific region to the 1995 IBE Survey, a regional working document for presentation to the ICE was prepared, also in keeping with the framework provided by the IBE.

The following main propositions were identified as arising from countries in the Asia-Pacific region that are particularly relevant to the ICE theme 'Enhancing the Role of Teachers in a Changing World'.

(1) The Changing Context

Proposition: Any meaningful enhancement of the role of teachers in a changing world has two necessary conditions:

a) The recognition of a changing world and the identification of present and likely future change agents ; and

b) The re-engineering of education in terms of the curriculum, pedagogy, teacher education including the recruitment of teachers), partnership in education and the organisational context of teaching.

(2) The New Professional Profile of Teachers

Proposition: Governments should; in the context of multi-sectoral consultation be pro-active in the determination of a new profile for teachers in terms of teaching competencies, management skills and the professional management of teachers, professional duties and responsibilities, personal attributes, and quality control.

(3) The Status of Teachers

Proposition: With the declared intention of enhancing the status of teachers, governments should, in the context of multi-sectoral consultation, commission working parties, representative stakeholders in education:

a) To identify factors determining the status of teachers ('status' to be viewed broadly in personal, professional and social terms);

b) To formulate proposals and devise strategies to enhance the status of teachers ;

c) To prioritise and cost the proposals; and

d) To propose a programme for implementation of the proposals, the better to address the policies, needs and interests of Member States.

(4) Pre-service and In-service Training of Teachers

Proposition: Governments should monitor teacher education programmes with a view to:

a) Targeting teachers as prime candidates for continuing education from recruitment to retirement;

b) Re-designing the shape and content of pre-service education for teachers in a changing world and ensuing articulation between pre- and in-service education;

c) Ensuring that teachers are provided with lifelong education adequate to meet the demands placed on them for teaching in a changing society;

d) Ensuring that teacher education providers and programmes fully accord with the new paradigms for the new profiling of teachers. Enhancement of their status and other critical matters discussed in this paper, especially in terms of lifelong (in-service) education.

(5) Participation of Teachers in the Management of Educational Change

Proposition: As custodians of education as a public good. the policy and resourcing of education rests ultimately with government as does the direction of educational change for a changing world. But the management of that change is fast becoming more decentralised and participatory and; hence, should involve teachers committed to educational change. Equally, all with interests in educational change should be involved in partnerships as participative change agents. Critical to this process is the commitment to decentralisation in its fullest sense and hence to democratisation.

(6) Educational Reform

Proposition: That vocational education policies be developed by governments in consultation with industry to ensure that technical and vocational education systems and, thus the teachers and the teaching within them become more dynamic and responsive to the ever-changing world of work.

(7) Special Aspects

Proposition: Teachers' roles should adapt to and support government shifts to exercise positive discrimination in favour of populations in extreme poverty, women in traditional societies, minorities and refugees within their jurisdictions, given the quantum leap in terms of the social change and hence, the educational change such populations undergo.

Proposition: That governments ensure the development of an inclusive education system which recognises differences of various kinds including ethnicity, gender, giftedness and special needs, thus reinforcing the principle of inclusion for children with special needs in ordinary schools.

(8) The Role of UNESCO

Proposition: UNESCO and other international agencies working in the field of education should be the catalyst in promoting Member States' desire to engage in enhancing the role of teachers in a changing world on an in-country basis and support Member States' efforts at educational re-engineering.

A proposition that gained special attention is that which relates to the impact of the *new information technologies* on the role and functions of teachers and on the content and approach of teacher education, which is the topic of this APEID meeting at Hiroshima University. I will therefore pay particular attention to this topic.

3. New Information Technologies and the Role and Function of Teachers and Teacher Education

A key proposition arising from the survey referred to earlier relates to the fact that given the benefits and burdens that new Information technologies bring to the role and functions of teachers, it is in the interest of governments - as and when new information technologies become available:

a) To ensure that teachers became computer literate;
b) To provide teachers with the most user-friendly technological resources (and appropriate support services) for teaching purposes; and
c) To assess the efficiency (pedagogically and economically) of technology as a means for delivering educational services.

New information technology as a genus is not new to the Asia-Pacific region, although it is new to some teachers in developed and developing countries in this region both in terms of a technology and/or the more recent developments in the technology. Associated with the advent of new information have come warnings as to it s benefits and burdens.

'In its best known form as multi-media distance education, NIT has provided benefits to governments, administrators and teachers as a faster mode of delivery of educational services and has enabled them to meet the goals brought about by population expansion and educational demand.' In this quantitative context Zhou Yanjun (ACEID, 1995, p.165) cites examples of teacher education by distance education in China reducing the time to train teachers in the established manner.

The benefits of using new information also extend beyond teachers to students in such a way as to threaten the traditional notion of 'teacher' unless teachers adapt to the advantages of NIT,

and also to challenge administrators to allow teachers to 'teach: in quite different ways. As Baker (ACEID, 1995, p.152) observes.

> *'Current views of teacher development needs and trends are complemented by newer technologies in distance education. These technologies are distinctive in their capacity to enable communication not just from 'teacher to learner' but also among learners. Consistent with the characteristics of open learning described above, the technologies enable teachers to move freely around information and contact networks, often at their own pace, and following their own agendas rather than one which is externally prescribed. The range of available technologies includes: audiographics; audio and interactive video conferencing and teaching; networked computer based teaching and learning; personal computers; computer conferencing; CD-ROM databases, electronic mail; and access to information through communications satellites. These technologies are being 'packaged' in ways which give teachers access from their workplace.*
>
> *For some teachers this panoply of technologies can only be overwhelming, even before the technologies arrive. It is, therefore, of importance to administrators of teachers, that the latter are enabled to become computer literate, preferably in advance of their students. Likewise, it should be ensured that the hardware and software should be as amenable to the teacher-learner context as is possible.'*

Caution in the expectations of and the use of new information technologies has been widely advocated. Clements and Ellerton warn:

> *'There is a danger that the education policy makers of some nations dazzled by the apparent power of modern technology, will allow hi-tech distance education programmes to be designed and implemented which are unsuited to the economic and technological stages of development of those nations Consultants from more developed nations need to be wary of the temptation to recommend to less developed nations that they move immediately to develop hi-tech distance education programmes, when these are not what are needed at the present time.' (ACEID, 1995, P. 67)*

On a different tack the same authors declare (at p. 63): 'Our main message is this: embodied in current hi-tech. multi-media approaches to education are assumptions and values which are inconsistent with the vision of an internationalised, mobile teacher workforce. If teacher educators wish to establish effective networks which maximise the potential of flexible forms of education, then they will need to recognise that no matter how much communication is possible

through hi-tech developments, teacher education programmes are not, never can be, and should not be culture-free or "neutral'. Furthermore, those responsible for developing teacher education curricula will need to be wary of subtle forces which push education administrators and curriculum developers towards adopting hi-tech yet culturally inappropriate curricula and practices.

Baker quoting Ljosa (ACEID. 1995. p. 153) cautions 'every time we introduce a new technology in a distance education system, we run the risk of introducing a new barrier to participation and learning.'

Despite these warnings and the qualifications of others such as Torres (ACEID. 1995. pp. 30ff.) distance education has 'distinct advantages' according to some such as S.K. Ghande (ACEID. 1995. pp. 159-160) who described the benefits to teacher education in the following terms:

1. It is possible to maintain a very high quality of the Self-Instruction Material (SIM). Since distance education is essentially backed by an institutional framework, it is possible to involve scholars and subject experts in developing SIM for the teacher-trainees. The basic materials prepared by these subject-experts can be examined with a view to adjusting the curricula best suited to the distance mode. Experts well qualified in distance education per se can recast these materials into the mode peculiar to the distance education system. This would mean casting the material in such a way that the distance learner can easily comprehend it without any face-to-face tuition.
2. A large number of teachers can be simultaneously catered for. Distance education has no constraints of time and place. Learners can study in their own place and at their own pace with the help of well-prepared self-instruction material. Of course, practical schoolwork is an essential part of teacher-training. This can be arranged by the distance education institutions with the help of the conventional system or through periodic contact programmes.
3. The distance education mode has the unique potential for education to take p lace without taking teachers away from their work, thus emerging as a better means of transferring knowledge, understanding and skills to them in their day-to-day practice.
4. It is possible to organise courses on a continuous basis in the career of a teacher. The subject-knowledge and the delivery system based on information technology are growing so fast that almost in all professions, but particularly in teaching, there is the need to update knowledge continuously.
5. Distance education is particularly suitable for ... disadvantaged sections of society who have been denied opportunities of education due to various social, economic, historical, cultural and, to some extent, religious factors.
6. Another important advantage of distance education is its cost effectiveness. Some of the recent cost comparative studies reveal that the per student cost for a degree using distance

education is as low as 30 per cent compared to that of the conventional system. With the growing numbers of students, economies of scale come into operation and further reduce the cost.

The status of distance education as the focus of teacher-utilised resources has been widely discussed in the Asia-Pacific region and no more recently so than at the ACEID conference. The report on these discussions showed that there was a general consensus that distance education was relevant for teacher development in a number of different ways. For E9 countries, distance education represents a means of achieving mass education, for updating the skills of the very large number of under-qualified practising teachers, and for the training of new teachers. In some countries, the earlier boom in educational access means that in the near future, many teachers will begin to retire with the consequence that a future shortage must be averted. A detailed description of these issues and their implementation in a number of countries is not presented here: instead, a summary is provided of the main issues and identified concerns.

The issue of quality control was identified by a number of speakers and other participants. It was considered that the admission and retention policies of distance education were sufficiently different from other more traditional forms of educational delivery that specific mechanisms were needed. However, the ways in which quality might be evaluated would likely differ across various countries since the objectives and aims: of distance education were different. One speaker described a situation where materials were provided at the national level with global transmission of lessons but where the evaluation and assessment of students was carried out at the local level. It is not a simple matter to measure the success of distance education. One method is to count the number of graduates with certificates of some kind. However, in E9 countries with large populations, mass education via distance education may be a factor in a general increase in standards of living. Thus, increases in per capita income may be an appropriate indicator of success.

In a number of countries, students faced specific problems in coping with education via the distance mode. Tine constraints were very often a problem while self-discipline and a willingness to put in the extra effort required made learning more difficult. It may be that students who undertake distance education need certain pre-requisite skills in order to cope more effectively with this mode of learning. One of the specific constraints typical of teacher development via the distance mode is the issue of the practical component, particularly in the supervision of this part of the programme.

Discussion of distance education often implies one methodology whereas the reality is of a system which has been evolving and changing over the last few decades. Distance education began as 'external studies' and was in reality correspondence teaching. Internal materials were

written for students and posted to those who could not attend the institution and evaluation was similar if not identical to that used for internal students. External studies evolved into 'distance education' and became a distinctive activity. High quality materials were developed using radio and television as supplements to printed materials. More recently, 'open learning' is the term used to describe these activities. This term implies a greater flexibility for enrolments and structure and usually is more focused on the needs of students rather than on the needs of the institution. As a result, evaluation is usually not carried out in reference to other groups but has its own mechanisms. It is also often associated with the use of the new information and communications technologies.

What is important in these distinctions is that policy and practice may sometimes come from different phases. It is also possible that certain educational objectives may be better served by one of these phases rather than another. This suggests a diversity of approaches rather than an assumption of more recent, bigger and better approaches. Each approach has a different aim and each has its own technology Therefore, a contextual needs analysis is required to determine which approach is most appropriate. It is also the case that each approach has a different cost. Open learning is generally considered to rely on the use of new information and communications technologies and is therefore complex and relatively expensive. However, there are instants where simpler solutions can be used to achieve the educational objectives identified.

In general, people think of higher education when distance education is mentioned. However, the question of distance education being the preserve of higher education has been raised. There are differences of opinion concerning the use of distance education for primary and secondary level education. Some believe that the human teacher is indispensable at these levels while others see that distance education is not limited to teacher development but could be used directly to teach students at lower levels. The importance of face-to-face interaction and peer-group support are underlined. It may be that, in the future, a different type of 'teacher' assists students to learn using distance education methods. Thus, a combination of methods may be an outcome that would have important implications for how we train this new type of 'teacher'.

There are also different opinions as to the efficacy of distance education in initial teacher-training, although there is consensus in its use for in-service training. These differences arise from different aims and objectives as well as different situational needs. Indeed it is important in all of these matters to remember the wide range of situations represented by the countries of Asia and the Pacific.

The fact that many countries of Asia-Pacific are examining and investing in distance education for teacher development suggests that some savings might be made through greater cooperation. Technically, it is relatively simple for all distance education institutions to be linked

via telecommunication and computers. There are differences of cultures and values but there is much in common. Such a linkage would suggest that a global and/or regional clearinghouse of distance education materials for teacher development might be established. Again there was a range of opinions on the desirability and feasibility of establishing such a clearinghouse.

The issue of the cost-effectiveness of distance education for teacher development is identified as requiring more analysis. The cost of distance education is considerable with high initial costs relative to recurrent budgets. For small countries, these initial costs can be formidable. While there has been much rhetoric about the potential of distance education for teacher development, there is relatively little in the way of accurate studies of its cost-effectiveness. There are many 'hidden costs' in developing distance education, both in supporting quality outcomes and in making it practical to implement.

There is an urgent need to undertake a study of the cost-effectiveness of different approaches to distance education and it was recommended that such a study be carried out as soon as is practicable. Such a study should examine distance education in more than just large population countries and should analyse various approaches in different situations.

It is agreed that Education for All is an inalienable human right. The training of more teachers is a necessary step in achieving this objective. In some countries, this will only be achieved through the greater use of distance education. Thus, the continued and increased support for further development of distance education approaches to teacher development is recommended.

There is scope for further regional cooperation in the sharing of ideas and materials concerning distance education approaches to teacher development. While there are limitations imposed by differences of histories, cultures and values, it is recommended that are as where cooperation can effectively take place be identified and developed for implementation Regional cooperation is already in evidence. Mellor (ACEID, 1995, p.212) notes the establishment by UNESCO of a Regional Informatics Network for South and Central Asia using the service of India's satellite communications. Further expansion of such cooperation is advocated but the concerns expressed above need to be accommodated.

The debates as to the use of new information technology in pre-service teacher education will continue in the region. Some countries advocate its use without exception: others forbid its use in training teachers. The question is on the interactive, practical aspects of initial teacher education. Resolution may come as it is realised this is not an either or debate. Those uses of technology efficiently beneficial to teacher education programmes should be utilised: those disadvantageous should be dispensed with. Other media may well do the job better. Any dilution in the preparation of pre-service teachers per force of any modality is to be strenuously resisted.

4. Conclusion

Over the years, there have been some who have believed that with the advent of increasingly sophisticated technology, machines can replace the teacher. Teaching machines were all the rage in some countries back in the 1960's, the view being that students could most effectively be taught by machines rather than teachers, the teacher becoming a technician who programmes the machines.

With the advent of computers, and their increasingly widespread use in classrooms, there has been further speculation that the computer may eventually replace the teacher.

Despite such futuristic speculations about the use of machines in classrooms, evidence suggests that while technology will have an increasingly important role to play in schooling, it is unlikely to replace the teacher. Rather, the teacher will draw upon a wider repertoire of technology when going about her or his work., but maintain a central role as facilitator and co-ordinator of the education environment.

Teachers need to learn how to use the new information technologies in order to utilise these technologies to improve the effectiveness of their own teaching. They should also train their students in the use of these new technologies.

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Country Reports

Teacher Education in Bangladesh

Gholam Rasul Miah

Director, Secondary and Higher Education
Ministry of Education
Shikkha Bhaban, Dacca, Bangladesh

Summary

The national education system of Bangladesh consists of five years of primary, three years of junior secondary, two years of secondary and two years of Higher Secondary Education. Compulsory Primary Education until class five was introduced in the country in 1992 and to achieve the goal of Education For All (EFA) the Food for Education policy has been introduced. The present government is going to declare a National Education Policy for the first time since the independence of the country, which highlights the extension of compulsory primary education up to class 8 and the restructuring of the education system of the country.

Due to the introduction of compulsory primary education, a rapid increase in the enrollment of students in secondary schools and a subsequent increase in the number of schools and teachers have taken place. There are about 12.000 secondary schools and 140.661 teachers, of which 317 are national secondary schools and nearly 8.000 national schools teachers. The remainder is non-governmental schools, however the Government pays 80% of the basic salaries of non-governmental i.e. private schools teachers.

Along with the quantitative expansion, the following new initiatives were taken to improve the quality of secondary education:

a) The curriculum of secondary schools for classes 6 to 10 have been modified and updated and new textbooks in different subjects have been prepared and introduced for all classes of secondary schools. In this new secondary school curriculum computer education is introduced from grade nine.

b) Before introduction, the secondary school teachers were given orientation into the new curriculum through a crash programme, known as the Curriculum Dissemination Programme.

c) To increase female enrollment in secondary schools and to retain them until the completion of the secondary school course, financial assistance and counseling services are provided to female students through four development projects.

Teachers are the most important factor in any system of education, and no system of education

is better than its teachers. If the teachers involved in the system are not properly trained and equipped, the goals of education cannot be achieved. Although teacher education in Bangladesh did not receive due importance in the past, it is give more importance at present. For the training of secondary school teachers there are 10 Teachers Training Colleges (TTC's) run by the Government. This number is insufficient, in comparison to the number of secondary school teachers. There are nearly 68.000 teachers working in secondary schools who do not have professional training. This number is nearly half of the total number of secondary school teachers. This situation is really deplorable and discouraging. The goals of secondary education can not be achieved, as long as this huge number of professionally untrained teachers exist. Provision of professional training to this huge backlog of untrained teachers and preparation of newly recruited teachers with the necessary knowledge and skills through training, are not possible without increasing the number of TTC's. The problem can be partially solved by opening the Teacher Education Department in some selected Government General Colleges.

We are moving towards the 21st century. New scientific and technological developments are rapidly changing the society. The rapid technological advances and educational reforms call for better and more motivated teachers. The present 10-months B.Ed. course is a very short time to prepare teachers with necessary knowledge and skills. The duration of the B.Ed. course should be extended to at least 12 months. The introduction of a 3-years integrated honors course after the B.Ed. is really an appropriate step taken in proper time. The success of the course depends on providing physical facilities. There is an acute shortage of necessary apparatus and equipment such as chemicals, audio and video materials, computers, projectors etc. Also there is lack of reference books, journals and magazines on education. The teaching posts in TTC's are quite inadequate and more 50% of the sanctioned posts remain vacant. Necessary measures should be taken to fill the vacant posts and to create subject-wise senior teaching posts.

As can be seen in Table 6, there are so many elective and optional subjects included in the secondary schools curriculum. However, the present B.Ed. Curriculum contains very few school subjects. Computer Education is included in the secondary school course, but this is not included the present B.Ed Curriculum. The integrated honors-course in Bachelor of Education curriculum contains computer education as an elective subject. However, there is neither any specialist teacher who can teach this subject effectively nor an adequate number of computers for the use of the Trainees. It is expected that the issues raised in this report will be properly looked on in the reformation and modernization of teacher education curriculum to prepare teachers with adequate knowledge, skills and attitudes who will be able to enhance the NIM literacy in the country.

1. Background

After the emergence of Bangladesh as an independent and sovereign country, education has received the highest attention in the national development programmes. A National Commission was set up in 1972 by Bangabandhu Sheikh Mujibur Rahman to recommend educational policies with feasible implementation strategies in the light of the national needs, ideals and resources. The Commission submitted its report in 1974 with recommendations for the overall improvement of education at all levels including professional, vocational and technical education of the country. But with the killing of Bangabandhu in 1975, the national development programmes were hindered for the time being. The present democratic government soon after its came into power has given top priority to the education sector. The Government has decided to frame a National Education Policy based on the Bangladesh National Education Commission Report 1974 popularly known as the *Quadarat-E-Khoda Commission Report*. For this purpose, a high powered National Education Committee has been appointed with eminent scholars, educationists and teachers from different levels of education. It is expected that the National Education Committee will be able to formulate a sound and suitable education policy for the country, highlighting the national goals of education in the global and international perspective in conformity with the new trends and challenges of the 21st century.

Strengthening of the role of teachers in a changing world and the impact of new information technologies on teaching and teachers are the new trends of teacher education throughout the world. The theme of the 45th session of the International Conference on Education (ICE) held between 30 September and 5 October 1990 in Geneva was 'Strengthening the Role of Teachers in a Changing World: Issues, Prospects and Priorities.' One of the main reasons for selecting this issue is that: ' good education requires a good teacher'. At this International Conference on Education the following four major thematic issues were discussed:

- The new professional profile of teaching staff and improvement of their social status;
- Pre-service and in-service training of teachers and other educational personnel;
- New information technologies and the role and function of teachers ;
- The participation of teachers in the management of educational changes, partnership with other social actors.

In this context, the 1997 APEID International Seminar on Innovation and Reform in Teacher Education for the 21st Century in the Asia Pacific Region on the Theme 'Teacher Education for the Effective Use of New Information media in Schools' jointly organized by the Hiroshima University APEID Committee and the Japanese National Commission for UNESCO and UNESCO PROAP, Bangkok, is very timely and appropriate.

2. Overview of the Bangladesh Education System:

The Bangladeshi national education system has its roots in our long traditional culture. It consists of five years of primary education, three years of junior secondary, two years of secondary (general, technical and vocational) and two years of higher secondary education. In addition to the types of education mentioned above, there is also an Islamic system of education known as *Madrasah* education. They are *Ibtidaiyah* (Primary), *Dakhil* (Secondary), *Alim* (Higher Secondary) and *Kamil* corresponding to higher education. Apart from the levels of education mentioned above, pre-school nursery and kindergarten education is also provided to children age between 0-6 years old.

The National Education Commission of 1974 recommended the introduction of compulsory primary education extending to class VIII. According to this report, primary education until class V was made compulsory from 1992. The present government is seriously considering extending compulsory primary education until class VIII, and restructuring the education system in the following way:

Primary education	-	8 years
Secondary Education	-	4 years
Higher Education	-	4 years

It is expected that the National Education Committee formed by the Government will soon submit its report highlighting the above educational-restructuring policy.

3. Overview of Education Development

The development of education was given the top priority in national development. Education is the crucial factor in accelerating the evolution of the economic and labor force structure. Education-expansion programmes increase the proportion of the labor force with higher education and reduce the proportion of the labor force with low education. Therefore, human resource development is an important factor in the national development process.

The Constitution of Bangladesh stipulates that 'Every citizen has the right to obtain education'. In order to implement the above Article, compulsory primary education was introduced in the country starting 1992. To achieve the goal of compulsory primary education and Education for All (EFA) the Food for Education-policy was introduced.

Table 1: Number of Junior Secondary Schools, Teachers and Students 1991-1995

Year	Number of Institutions	Number of Teachers		Number of Students	
		Total	Female	Total	Female
1991	2.000	16.989	1.176	212.646	75.231
1992	1.962	12.819	1.287	284.806	121.174
1993	1.905(435)	12.435	1.323	341.975	183.498
1994	2.136(496)	13.581	1.491	446.060	227.239
1995	2.349(549)	15.109	1.684	494.692	266.811

Notes: There is no government-administered Junior High School at present.
Figures between ( ) indicate the number of Girls' Junior High Schools.

Table 2: Number of Secondary Schools by Type of Administration

Type of Administration / Year	Government	Non-government	Total
1991	302(141)	8.413(1089)	8.715(1230)
1992	316(147)	8.722(1154)	9.038(1301)
1993	317(147)	8.873(1189)	9.190(1136)
1994	317(147)	9.035(1235)	9.352(1382)
1995	317(147)	9.346(1392)	9.663(1439)

Note: Figures between ( ) indicate the number of Girls' Secondary Schools

Table 3: Number of Teachers in Secondary Schools by Sex and Type of Administration, 1991-1995

Type of Administration / Year	Government		Non-government		Total	
	Total	Female	Total	Female	Total	Female
1991	6.442	2.119	106.185	9.416	112.627	11.535
1992	6.889	2.308	106.510	10.863	113.399	13.171
1993	7.106	2.573	107.153	12.601	114.259	15.174
1994	7.239	2.630	114.357	14.671	121.596	17.201
1995	7.631	2.781	117.319	14.971	124.950	17.752

Table 4: Enrolment in Secondary Schools by Sex and Type of Administration, 1991-1995

Type of Administration / Year	Government		Non-government		Total	
	Total	Girls	Total	Girls	Total	Girls
1991	198.805	88.898	2.744.668	906.049	2.943.473	994.947
1992	210.673	90.679	3.252.563	1.387.352	3.463.236	1.478.031
1993	214.915	94.319	3.594.600	1.585.709	3.809.515	1.680.028
1994	217.715	103.924	3.871.027	1.754.298	4.088.742	1.858.222
1995	246.799	109.453	4.373.970	2.026.520	4.620.769	2.135.973

Table 5: Secondary Schools Enrolment by Grade and Sex, 1991-1995

	Grades											
	VI		VII		VIII		IX		X		Total	
Year	Total	Girls	Total	Girls	Total	Girls	Total	Girls	Total	Girls	Total	Girls
1991	844.151	312.491	750.381	261.726	651.003	216.228	498.502	154589	412.082	125.144	3.156.119	1.070.178
1992	1.002.470	461.566	891.113	383.335	773.097	323.220	591.995	238.230	489.367	192.854	3.748.042	1.599.205
1993	1.146.535	545.896	970.245	449.076	828.616	378.321	666.961	274.634	529.655	209.295	4.141.612	1.857.222
1994	1.256.719	613.021	1.062.665	504.748	909.396	421.501	712.972	303.235	582.944	236.548	4.524.696	2.079.053
1995	1.426.399	699.939	1.209.619	591.840	1.009.321	475.374	782.371	341.361	630.899	264.328	5.058.610	2.372.842

The Specific objectives of this policy are:

i) to increase pupil enrollment ;

ii) to reduce drop-out rates and repetition; and

iii) to improve the quality of instruction.

With the introduction of compulsory primary education, literacy rates have increased to 43.44%, and have led to a decrease in illiteracy and the population growth-rate and reduced the dropout rates. The introduction of compulsory primary education has significantly influenced secondary and higher education, as well as on technical, vocational and professional education of the country. To cope with the increasing pressure of primary school graduates for admission into secondary schools, double shifts were established at urban secondary schools and many new schools have been established in the country. The number of secondary schools, enrollment of students and number of teacher have shown a steady growth as can be seen in Tables 1 through 5.

At present, there are about 140.661 secondary school teachers of nearly which 8.000 are government-administered and the remainder is working as non-governmental secondary school teachers. However, the non-governmental secondary school teachers get 80% of their salaries from the government.

4. Renovation and Modification of Secondary School Curriculum:

As was mentioned above, there has been a quantitative expansion in secondary education in terms of number of institutions, enrollment of students and number of teachers. Accompanying these quantitative gains, a growing emphasis on efforts to ensure the quality of education is necessary. Without an educational content relevant to current needs, without preparation in learning skills and new knowledge required for the future and without efforts to improve learning achievements, access may neither serve the purpose intended for nor provide benefits expected. Keeping this in mind, the Secondary School Curriculum was recently renovated, modified and updated, and new textbooks for different subjects were prepared and introduced in the classes VI to X.

The new curriculum of Secondary School has the following general objectives:

- To enable students to acquire new knowledge and skills,
- To illuminate them with religious, moral, cultural and social values,
- To enable them to acquire skills in vocational education, to become able for self-employment irrespective of the level of education,
- To develop a scientific attitude among the students and enable them to use modern science and technology in everyday life,
- To enable them to acquire skills and knowledge necessary for higher education and to develop life-oriented and positive outwork.

Table 6: Structure of Study Programme of Modified Secondary School Curriculum

Subject Matter	Marks	Subject Matter	Marks	Subject Matter	Marks
Social Science Group		*Science Group*		*Business Education Group*	
A. Core Subjects		*A. Core Subjects*		*A. Core Subjects*	
Bengali (Mother Tongue)	200	Bengali (Mother Tongue)	200	Bengali (Mother Tongue)	200
English	200	English	200	English	200
Mathematics	100	Mathematics	100	Mathematics	100
B. Other Compulsory subjects		*B. Other Compulsory subjects*		B. *Other Compulsory subjects*	
Religion Education	100	Religion Education	100	Religion Education	100
Agriculture/Home-Economics	100	Agriculture/Home-Economics	100	Agriculture/Home-Economics	100
Social Science/Science	100	Social Science/Science	100	Social Science/Science	100
	800		800		800
C. *Elective Subjects (any three)*		C. *Elective Subjects (any three)*		C. *Elective Subjects (any three)*	
History	100	Physics	100	Introductory Business	100
Geography	100	Chemistry	100	Accounting	100
Civics/Economics	100	Biology/Higher Mathematics	100	Business Efforts/ Commercial Geography	100
D. *Optional Subjects (any one)*	100	D. *Optional Subjects (any one)*	100	D. *Optional Subjects (any one)*	100
Economics/Civics		Higher Mathematics		Commercial Geography	
Higher Bengali		Biology		Business Effort	
Higher English		Geography		Economics	
Higher Mathematics		Computer Ed.		Computer Ed.	
Arabic/Sanskrit/Pali		Work-oriented Ed.		Higher Mathematics	
Computer Education		Basic Trade		Work-oriented Ed.	
Work-oriented Ed.		Accounting		Basic Trade	
Basic Trade		Arabic/Sanskrit/Pali		Arabic/ Sanskrit/Pali	
Arts and Crafts		Physical Ed. and Sports			
Accounting					
Physical Ed. and Sports					

This modified curriculum also identified the following objectives that were to be achieved by its implementation:

- To raise the standard of the curriculum equivalent to international levels, especially to the

level of the education systems of the region,

- To reorganize curriculum in a way that helps students for self-employment.
- To emphasize the development of social and moral values of the students.

The general secondary school curriculum consists of three channels. These are

(a) Social Science Group

(b) Science Group

(c) Business Education Group

The structure of the study programme of this modified secondary school curriculum is given in Table 6.

Before putting the modified curriculum into practice, the secondary school teachers of various subjects have been provided orientation through a crash programme, known as the *Curriculum Dissemination Programme*. This programme has been able to create greater awareness about the curriculum objectives, new topics and teaching techniques among the teachers. Table 7 shows the number of teachers of different subjects who have received training through this programme.

Table 7: Curriculum Dissemination Program: Number of Subject-wise Trained Teacher, who have received the orientation program.

Subject		Master Trainer	Core Trainer	Field Level Trainer	Classroom Teacher
01.	Bangla	6	221	934	14.020
02.	English	5	211	953	14.767
03.	Mathematics	5	208	952	12.720
04.	Science	5	181	904	6.612
05.	Social Science	5	196	927	8.951
06.	Physics	5	213	924	3.857
07.	Chemistry	4	215	897	3.456
08.	Botany	4	164	903	3.006
09.	Zoology	4	180	910	2.621
10.	Islamic Studies	5	202	942	9.298
11.	Geography	4	203	934	6.903
12.	Agriculture	6	190	915	6.722
13.	Home Economics	4	176	927	4.764
14.	Economics	5	200	883	7.394
15.	Civics	6	206	945	7.481
16.	Business Management	4	215	916	5.035
17.	Computer Science	6			224
	Total	83	3.181	14.766	117.831
				Trained in total	135.861

5. New Initiatives in Education

In order to make further progress and development and also to improve the quality of education, the government has undertaken 62 projects in secondary and higher education, including technical and vocational education in the Annual Development Programme for the year 1997-98. The main features and characteristics of some of these projects are listed below:

(5-1) Secondary Education Development Project (SEDP)

The project started in 1994 and will be completed in December 1999. The main objectives of the project are:

i) Improvement of the quality of secondary education,
ii) Expansion of access to secondary education opportunities on a selective basis,
iii) Strengthening of management and planning capacity through institutional development,
iv) Effective mobilization and utilization of resources allocated for secondary level of education,
v) Increase female participation in secondary education to reduce gender disparity in education in general and secondary education in particular.

To achieve the aforementioned objectives:

a) The curriculum of secondary schools from grade VI -X was modernized and updated and new textbooks were prepared and introduced accordingly.
b) Before introduction of the new textbooks, secondary school teachers of all subjects were offered an orientation in the new curriculum under the Curriculum Dissemination Programme throughout the county.
c) Selected secondary schools and *Dakhil Madrashas* were provided with one multipurpose science laboratory and two classrooms, furniture, scientific equipment, chemical, wall charts and books.
d) Teachers are the most important factor in any system of education and it has rightly been said that no system of education is better than its teachers. The best system of education may produce the poorest results if teachers, who are involved in the system, are not trained, equipped and imaginative enough to understand and appreciate the goals the educational system looks for. The Teacher Training Programme is of particular importance in the SEDP. Teacher training curriculum was reformed and additional teachers were recruited and posted in TTC's. Furthermore, second shifts were introduced in all TTC's to increase capacity. In addition, a new TTC will be established at Barisal as part of this project.

2) Female Stipend Program:

The Govt. of Bangladesh has laid special emphasis on female education. The Stipend Programme undertaken by the four educational projects (Female Secondary Education Stipend Project (FSESP), Female Secondary Schools Assistance Project (FSSAP), Secondary Education Development Project (SEDP) and the Female Secondary Stipends Project (FSSP) for development of female education by giving financial and counseling support to secondary school girls is a pioneering work in Southeast Asia. The objectives of the programme are:

i) To increase female enrollment and retain them in the secondary stage and there by reduce dropout and promote female education,

ii) To reduce population growth by motivating the stipend clientele group to refrain from marriage until after the completion of secondary school certificate exam, or until the attainment of 18 years of age,

iii) To increase involvement of women in socio-economic development activities ,

iv) To increase women's self -employment for poverty alleviation and

v) To assist in improving the status of women in society.

These projects have contributed to an

a) increase in the demand for secondary education among primary and secondary school age-girls,

b) increase the proportion of female secondary school graduates and decrease the average number of years of schooling to produce one girl secondary graduate,

c) instillment of a sense of confidence among girls through an increase in mobility within the community and interaction with the banking system, an

d) increase of the access of girls to productive work; and

e) the creation of an impact on fertility-rates as girls who complete secondary education are most likely to delay their marriage and thereby contribute to the accelerated fertility decline in Bangladesh.

The Teacher Enhancement Program, Occupational Skills Development Program, Water Supply and Sanitation Program, Female Education Awareness Program, Institutional Development Program are some of the Programs which closely related to these Projects.

Another important project is the Higher Secondary Education Development Project. Through this Project five Higher Secondary Teacher Training Institutes (HSTTI) have been set up and Higher Secondary Teachers are receiving training through this project. It is also providing management training to educational administrators, supervisors and inspectors for the development of management skills.

6. Technical and Vocational Education:

Technological backwardness and low per capita income constitute two major constraints that warrant intervention in vocational education and training on a substantial scale in Bangladesh. The Bangladesh National Education Commission in 1974 recommended making vocational education an integral part of the education system. It added that at the secondary level the main purpose of vocational education is to train students as employable skilled workers. The present government is sincerely and honestly implementing the above-mentioned recommendations and aims to train the students as skilled human resources.

The secondary education in Bangladesh consists of three sub- systems viz.:

- General Education
- Vocational Education
- Madrasha Education

Through integration of general and vocational education, an integrated vocational education sub-system was developed, thereby restructuring the secondary education system of the country. The vocational education sub-system consists of:

- S. S. C (Vocational)
- H. S. C (Vocational)
- H. S. C. (Business Management)
- Diploma in Agriculture

These are some of the new initiatives and strategies that the government has undertaken for quantitative expansion and qualitative improvement of education in Bangladesh. There is a need to enhance the capacities of teachers, through adequate teacher-training and provision of logistic support. Teacher education should not only limit teachers to teaching the basics but also empower them to participate actively in defining learning needs and let them think how to meet these. Teacher training should prepare teachers to move away from rote learning towards active and creative learning methods.

7. Teacher Education

The largest single enterprise in any country is education and a very prominent component of the educational system is the teacher. That means in any system of education the teacher is the most important factor and it has been rightly said that no system of education is better than its teachers. The actual delivery of the educational programmes rests squarely on the shoulders of the teacher. Success in education for a nation or the individual is made or marred by the quality

of the teaching force. The best system of education may produce the poorest result if the teachers involved in the system are not properly and adequately trained, equipped, oriented and imaginative enough to understand and appreciate the goals of the system looks for. No infrastructure or adequate financing would ensure success when the teacher fails at the delivery level.

The quality of teachers and their effectiveness are in turn a reflection of the teacher education programme that produced them. The pace of development of a nation depends on education and the development of education depends on teacher education.

The evolution of the system of teacher education, which took place with gradual development of the education system in Bangladesh, suffered from stagnation and slow growth as its importance was never fully realized. The attempts to expand and re-orient the educational system after the independence of the country have brought the importance teacher education to the forefront.

8. The Present Teacher Training Course in Bangladesh

At present, the following pre-service and in-service teacher-training courses are provided to primary and secondary school teachers:

i) The Certificate in Education (C. in-Ed.) course is offered by 54 Primary Training Institutes (PTI's) for certification of primary schools teachers,

ii) The Higher Certificate in Education (HC. in-Ed.) course in offered by 4 PTI's for certification of senior primary school teachers,

iii) The Bachelor of Education (B.Ed) course is offered by 10 Government and 2 private Teachers Training Colleges (TTC's) for certification of secondary school teachers,

iv) A two-year Bachelor of Education (B.Ed.) course is offered by the Bangladesh Open University through Distance Education,

v) A three-year Honors in Bachelor of Education (B. Ed. Hon.) course is offered by TTC Dhaka, and by the Institute of Education and Research (I.E.R.) University of Dhaka.

vi) The Master of Education (M.Ed.) course is offered by four Government TTC's and by Institute of Education and Research (I.E.R) University of Dhaka.

vii) Secondary Education and Science Development Centers (SESDC's), now merged with nine TTC's, offer in-service training courses in different subjects for secondary school teachers.

viii) The National Academy for Educational Management (NAEM) provides in-service training to school Headmasters and Principals.

ix) A 56-days in-service training courses has been developed and organized by the Higher

Secondary Education Project (HSEP) for higher secondary teachers of Intermediate classes of the colleges. For this purpose, five Higher Secondary Teacher Training Institutes (H.S.T.T.I) will be established. This will be the first attempt to train teachers of higher secondary classes in Bangladesh.

All of the above-mentioned teacher-training courses are institution-based, except the B.Ed. training course of the Bangladesh Open University. The B. Ed. curriculum of Teaching Training Colleges consists of the following courses, as listed in Table 8.

9. Innovations in Teacher Training

As was mentioned earlier, the Government has undertaken many development programmes for the quantitative expansion and qualitative improvement of secondary and higher education in the country. The Secondary Education Development Project (SEDP) is one such project. This project placers special emphasis on the following:

1. Curriculum Reforms,
2. Instructional Material Management,
3. Teacher Training and Education,
4. Capability Building

Table 8: B. Ed. Curriculum of Teaching Training Colleges

Subjects/Courses	*Marks*
A. *Core-Course*	
1. Principles of Education	100
2. Educational Psychology	100
3. History of Education	100
4. Measurement of Education and Counseling & Guidance	100
5. Education and National Development	100
B. *School Subjects (Elective) Any two* 1. Bengali (Mother Language) 2. English (Foreign Language) 3. Mathematics 4. General science 5. History 6. Social Studies 7. Geography	200
C. *Optional Subjects* 1. Educational Research 2. Art & Craft 3. Islamiat 4. Library Science 5. Educational Administration 6. Home-Economics	100
D. *Practice Teaching* (8 weeks) in two school subjects	300
E. *Viva-Voce (at the end of the course)* For overall assessment of the trainees	100
Total marks	1.200

Concerning teacher-training and education, the following innovative activities were implemented by the project:

1) *Introduction of Double-Shift in TTC's:*

According to the most recent statistics, there are 140.661 secondary school teachers working in junior secondary and secondary schools. However, no detailed information is available about the percentage of *trained* teachers at the secondary school-level in the country. A recent UNDP-GOB survey of 170 schools came up with the estimate as stated in table 10.

Table 9: Number of Teacher-Training Centers (TTC): Teachers and Students, 1991-1997

Year	Number of Colleges		Number of Teachers		Number of Students	
	Government	Non-government	Government	Non-government	Government	Non-government
1991	10	-	160		4.053	-
1992	10	-	160		4.472	-
1993	10	-	160		4.729	-
1994	10	1	197	10	4.938	400
1995	11	2	193	10	5.961	400
1996	12	2	176	20	6.160	560
1997	12	2	176	20	6.255	600

Table 10: Rates of trained secondary school teachers (UNDP-GOB survey)

Total Number of Teachers in Secondary Schools	140.661
Percentage of Trained teachers at secondary school level	*51.61%*

Table 11: Breakdown of Different Categories of Teachers in Five *Thanas*

Thana	Trained Graduates	Untrained Graduates	Non-Graduates	Total
Burichang	122	82	90	294
Dumuria	249	93	102	444
Gouranadi	127	66	57	250
Kotwali (Mymensingh)	490	184	211	885
Sherpur	73	54	56	183
Total	1061	479	516	2.056
%	*51.61*	*23.30*	*25.09*	*100*

It showed that 51.6% of the teachers working in secondary schools are professionally trained graduates. This means that 48.4% or approximately 68.000 teachers have no professional training at all. Even among the teachers, who have received training, many are considered to be too insufficiently trained to cater for the growing needs created by the technological development of the society.

The 10 TTC's administered by the government had a total admission-capacity of nearly

5.000 student-teachers in 1994. To cope with the demand and growing need for more professionally trained teachers, double shifts were introduced at 10 TTC's under SEDP starting July 1995. In 1997, the enrollment capacity has increased to 6.300 student-teachers. For such a large number of student-teachers, classrooms, hostel accommodation, laboratory- and library facilities are not available in sufficient amounts. Furthermore, much of the furniture and teaching aids are inadequate. SEDP supports measures to meet these inadequacies.

2) *Appointment of New Teaching staff or the TTC's*

Each Teacher-training College has only three Senior posts, e.g. a principal, a vice-principal and an associate professor. Consequently, experienced assistant professors, when promoted, usually are appointed at General Colleges, resulting in a lost of valuable experience for the TTC. Reorganization of sanctioned posts may solve this problem very easily. Ten Government-administered Teachers Training Colleges have 308 regular teaching posts, however more than 50% of the posts remain vacant (Table 9).

A breakdown of the sanctioned posts of teaching staff of Teachers Training Colleges is shown in Table 12. To meet the needs of double shift teachers-trainees an additional 100 teachers, 60 lecturers and 40 Assistant Professors, have been appointed at the TTC's by the SEDP.

Table 12: Sanctioned Posts of Teaching Staff of Teachers Training Colleges

Name College	Principal	Vice-Principal	Associate Professor	Assistant Professor	Lecturer	Total
Chittagong	1	1	1	13	14	30
Comilla	1	1	1	13	14	30
Dhaka	1	1	1	14	15	32
Feni	1	1	1	13	14	30
Jessore	1	1	1	13	14	30
Khulna	1	1	1	13	14	30
Mymensingh (M)	1	1	1	14	15	32
Mymensingh (W)	1	1	1	14	15	32
Rajshahi	1	1	1	14	15	32
Rangpur	1	1	1	13	14	30
Total	10	10	10	134	144	308

3) *Introduction of 3- year Integrated Honors in Bachelor of Education Course in TTC Dhaka*

The 10-month B.Ed.-Course was introduced in the country in 1909. Ten months of training is a very short time. Many countries in the world have a three to four year teacher-training programmes. Longer teacher-training programmes contribute to prepare better academic and professionally qualified teachers who contribute to raising the standard in education. A 3-year integrated Honors course in Bachelor of Education Course has been introduced at the Institute of Education and Research (I.E.R) of the University Dhaka in 1995

and at the TTC Dhaka in 1996.

4) *Development and refinement of the B.Ed. Curriculum*

The current B.Ed Curriculum was introduced in the country 15 years ago. It has become obsolete and outdated. With the reform and modernization of secondary school curriculum and textbooks, it has become imperative to review the teacher-training curriculum. The SEDP project has undertaken the task to review and develop the teacher-training curriculum. The project has organized several workshops to exchange ideas and views between the teacher-trainers and curriculum specialists and a draft curriculum has already been prepared. However, before finalizing this new teacher-training curriculum, the following important points ought to be taken in to account:

a) *Technological Revolution*

The present technological, scientific and information revolutions have far-reaching effects on both school curriculum and teaching methods. These have become the essential changing agents of society. Teachers require adequate knowledge, skills and understanding of the new technological developments in information and communication to make them effective in their work. Teaching methodologies need to emphasize inquiry, dialogue and student participation in developing knowledge, skills and learning to learn.

A future teacher will need a new kind of motivation and specialized training if they are to comply with the requirements of new technological developments. Teachers of 21st century are expected to be actively involved in these changes: - to be critical in their thinking and evaluation to generate new ideas, and participate actively in educational management.

b) New professional profile

The new professional profile of teachers as mentioned in ICE document of the 45th session states that the teacher should be at ease in carrying out the following functions :

- To promote values and attitudes that would lead to the development of the community,
- To be a role model for the teaching profession in the community,
- To display expertise knowledge and skills in their teaching,
- To assist learners on the acquisition of skills, attitudes and knowledge through the use of choices and variety of teaching methods and media
- To guide learners to self-actualization
- To be able to access information and achieve versatility in knowledge
- To be scientifically (and technologically) literate
- To participate in the uplifting of the teaching profession
- To participate in national issues and affairs.

c) *Teachers' role*

Regarding teachers role at the current time the ICE conference expects teachers to:

- promote skills and competency in literacy and numeracy, sensitivity to the environment and harmony between the school and its community,
- help the growth of basic skills and attitudes for proper and continued development of cognitive, social, moral and emotional development,
- transmit culture and knowledge, and help students become aware of the world community,
- nourish creative and critical abilities,
- encourage adaptability in a dynamic and ever-changing society,
- help each individual achieve full self-actualization to become a fully functional member of society,
- provide the students and the community with an admirable role model as professional teacher,
- ensure students' physical well-being,
- be accountable to the community and its parents.

d) *In order to undertake these teachers need to :*

- ensure their continuing personal development, including the upgrading of knowledge and teaching skills,
- be aware of the values and attitudes which lead to a healthy human society,
- be involved actively in the affairs of the local community and society,
- provide effective management of the learning environment and resources,
- be skilled in counseling individual children and the management of groups of children,
- be skilled in the use and choice of a variety of teaching methods,
- be skilled in working with parents and other members of the community,
- be skilled in a variety of appropriate research methodologies.

These should be reflected in the new curriculum of teacher education in the country.

e) *Initial or Pre-service teacher education programmes should include:*

- courses leading to in-depth knowledge of a specific subject or discipline,
- background studies into the psychology, philosophy, management, history and sociology of education,
- acquisition of skills in the use of educational methods and NIM, and
- practical exposure in school and supervision.

f) *Pre-service teacher education curriculum should be sufficiently broad-based to allow for versatility of knowledge.* The trainee-teachers should take specified elective courses in areas that expose them to modern scientific and technological knowledge, especially to a working knowledge of computers and other information technologies.

g) *Emphasis should be placed on the acquisition of pedagogical skills.* The practice teaching component should not be taken lightly. The students must be thoroughly supervised. A teacher must acquire adequate teaching skills before certification.

h) *A trained teacher should distinguish him/herself in the classroom by competence in:*

- classroom management,
- preparation and use of instructional materials, which, where available, should include modern technological aids; e.g. computers tele-conferencing etc.
- the application of various instructional methods and strategies,
- identifying and using resources outside the school, and
- using appropriate evaluation techniques.

These are some of the important points that need to be emphasized in the modernization and reform of teacher education curriculum to prepare teachers for the 21st century.

10. Some Problems of Teacher Education:

I. Nearly 50% of the secondary school teachers are still professionally untrained. Thus, the continuous presence of untrained teachers in the school system reinforces the impression that teaching can be handled by anyone with subject matter knowledge. Even more so both trained and untrained teachers are perpetually searching for job openings outside the school system. Training does not guarantee job satisfaction when other crucial factors are lacking. The teachers' working environment in schools is very poor. This affects the teaching in school.

II. Modern information technologies such as computers, television- and radio-sets are scare commodities in the school. Some rural schools do not yet have electricity to begin with. The lone chalkboard in a classroom is very often the only tool at the teachers' disposal. In the absence of technologies and even the minimum facilities necessary to provide good teaching, how can we expect our teachers to play effective role in a changing situation?

III. Teacher Training Colleges too do not have modern facilities. Consequently, teacher education programmes do not allow for sufficient training in the production of instructional

materials for pre-service and in-service training. TTC's are not provided with the necessary funds for the production of materials they need. Where the training is adequate, its effectiveness is limited due to the environment described above. This creates a wide gap between the teachers' intentions and their achievements. The crowded training programme content usually does not prepare the teachers sufficiently for co-curricular activities.

11. Recommendations

1. The most important component of the educational system is the teacher: - 'Good education requires good teachers'. Therefore, policy guidelines should be established emphasizing the following, that
   a) The most capable and appropriate people are recruited into the teaching profession,
   b) they should be provided with a high quality pre-service programme of teacher education,
   c) continuous in-service training is provided to upgrade knowledge and skills over the full length of a teacher's professional career.
2. The goals of expansion of secondary education opportunities and improvement of quality of secondary education can only be achieved through the improvement of teacher-training programme.
3. The training status and motivation of teachers should be at the very core of educational concern.
4. The efficient and effective use of available resources should be given priority.
5. New initiatives must be taken to improve the quality and relevance of learning at all levels.
6. To train the learner as employable skilled workers, vocational education at the secondary level should be given more importance.
7. Technology is a key changing agent new technological development. It should be incorporated in the revised teacher-training curriculum. The development of attitudes and qualities of teachers necessary to participate in a techno-cultural environment is needed.
8. Computer Education should be introduced in TTC-course to make sure that all secondary school teachers can efficiently utilize computers in their work.
9. TTC's should be equipped with modern facilities such as computers.

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Report on China's Utilization of New Information Media in Teacher Education

Gao Anmin

Professor & President of Shaanxi Institute of Education, China

Summary

In today ' s world, new information media (NIM), represented by computers, is knocking at the door of education with the force of a thunderbolt, and has caused a thorough educational revolution. In China, we have made an overall plan to meet the challenge and have made remarkable achievements in applying NIM in teacher education.

I. Teachers' knowledge, skills and attitudes related to effective utilization of NIM

The results of applying NIM in education rely on teacher's knowledge, skills and attitudes in effectively using NIM, because they, the teachers, are the practitioners in education. In this respect, Chinese teachers have made great efforts and considerable achievements, but there are still gaps between what we have achieved and thc rapid development of educational NIM, and the actual needs of education, especially teacher education, in China. However, we are confident and have strong hopes that the gap will be closed.

2. Fostering and enhancing teachers' abilities to effectively use NIM

Teachers are decisive factor in utilization of NIM. China's practices in fostering and enhancing teachers' abilities to effectively use NIM are the following:

- Combining full-time education with part-time education;
- Combining closed education with open education;
- Combining pre-service education with in-service education.

We have tried to take every possible measure to foster various types of talents in this area in flexible and diversified forms. It is still an important research topic for us to proceed from the consideration of China ' s situation to develop more approaches, to explore models, to enhance quality, in fostering talents in this area.

3. Framework of international communication and cooperation for enhancement of teachers' abilities to use NIM.

We have the following suggestions to make for carrying out international communication and

cooperation to enhance teachers' ability to use NIM;

- Establishing international organizations to strengthen communication and cooperation among various countries.
- Taking all possible measures to strengthen communication and cooperation among various countries, schools and specialists.
- China is going to participate actively in international communication and cooperation, and is looking forward to support and aid from the international society.

1. Using New Information Media in Teacher Education

Education is a process of social activity to systematically foster people in a well-planned way. This process can be regarded as an information dissemination process, which includes three key elements:

1. Teachers, who disseminate information and knowledge;
2. The methods, by which we disseminate information and knowledge, for example, using what kind of media, and methods of dissemination;
3. Students, who receive information and knowledge.

If changes take place in any one of these three elements, which constitutes the education information dissemination process, the other two elements will be affected as well. As a result, the whole education system will be involved. In today's world, NIM, which are represented by computers and also include communication satellites, optical fiber cable, videotape, TV and radio, are knocking at the door of education with the force of thunderbolt. Its spread is speedy, its impact is far-reaching, which is unprecedented in the history of education, and has caused a real and radical educational reform. This reform has drawn the attention of various countries in the world and special attention was paid to teacher education. In the case of China's use of NIM, a comprehensive plan was drawn up, based on the national situation, to meet the challenges brought about by these changes, which, has so far made remarkable achievements.

2. The situation of Chinese teachers' knowledge, skills and attitudes concerning the application of new information media

We are now living in a world that is flooded by NIM. NIM have become a necessity in the life of modern human beings. Education depends more and more on these NIM, which, from a macro-perspective, have solved the problem of discrepancy between education provided and real needs and has accelerated the dissemination of knowledge, from a micro-perspective, which will strengthen learners' motivation, and motivate them to deepen their understanding and

enhance education quality and its results. These facts have caused the public to pay a good deal of attention to NIM. The principle motive for widely applying NIM in China's teacher education is to improve teachers' knowledge, skills and attitudes, which subsequently will result in a more effective utilization of NIM. Teachers, who are fully engaged in educational job, are the final decisive factors in using NIM.

(2-1) Knowledge about effective utilization of NIM

(2-1-1)

When we talk about the effective use of NIM, we should not be concerned with skills only. If we do not systematically consider the teaching and learning psychology and other aspects, and if we do not have an organizational control theory to follow, when making an overall plan for using hardware and software, we will not be able to enhance teaching and learning quality. We may labor hard, but to little avail. We may even be merely wasting our energy, no matter how advanced the hardware and software are. Improperly used NIM aided instruction has no advantage over ordinary instruction.

When speaking about using NIM effectively in China's teachers' education, we must first solve the theoretic problem of how to use it. Without a solid theoretical foundation, using NIM may become a mechanical activity.

(2-1-2)

China trains its teachers in an independent teacher-training system. The teachers' training programmes consist of general educational studies and educational psychology; they aim at introducing basic theories about education, teaching and learning. In these two courses, there is some content about audio- and video-education and other modern education technology, but it is too narrow to provide theoretical guidance for teachers on the effective utilization of NIM. Its main weakness lies in the lack of a proper curriculum. Since China started its policy of reform and openness, especially after the National Work Conference on Teacher Education, educational administration departments, normal universities and teachers' colleges have paid great attention to the problems related to NIM. They have offered elective courses or in-service training programmes as a remediation in this area for teachers. The courses provided or themes discussed mainly include: teaching and learning patterns, learning psychology, teaching and learning design, teaching and learning strategy, educational dissemination, and so forth. Strengthening learning of concrete educational theories is currently the general trend and orientation of teacher education reform in China. Such a reform is having a positive influence on the promotion of effective utilization of NIM.

(2-2) Skills to effectively use NIM

(2-2-1)

The skills to use NIM mainly mean whether teachers are able to use NIM, which is an operational issue and directly affects the effectiveness of using NIM. New information media, represented by electronic equipment, are different from traditional printed mass media, they make higher demands of people's skills. Only by special training people can master their operations. At present, training teachers on how to use NIM has become an important issue in China's teacher education.

(2-2-2)

It is one of the most important tasks in China's teacher education programmes to master skills in using new information. The curriculum design stresses fostering these skills. Almost every specialism offers computer-use courses. At the same time, selective courses aimed at fostering students' other skills are also increased. However, when reviewing these courses from the perspective of content, we find that higher demands on various skills were not set. Much of the training is only aiming at quite ordinary skills. Without being strengthened in learning and working into the future, the required skills will be forgotten gradually.

(2-2-3)

Among various training programmes on using NIM, computer application is the most successful one. Computers are representative of the NIM. The whole world is paying great attention to its importance for education. Whether we're able to seize the opportunity and make full use of the computer, the modern scientific wonder, in today's education, is of vital importance for the modernization of education, and has a bearing on whether education is able to undertake the historically important task which time has entrusted to it. China's training on how to use computers is developing and popularizing not only in normal universities and teachers colleges, but also in primary and middle schools. Many middle schools have their own computer center. More and more teachers can now use computers and their skills in using computers are improving rapidly. At the same time, computers' application has extended into home education.

(2-3) Attitudes concerning effective utilization of NIM .

(2-3-1)

The attitude of using NIM is related to whether educators want to change traditional teaching design and actively try to use NIM to improve teaching. The use of NIM in the education system of China has not been plain sailing. It has brought about many problems, which have perplexed educators. Some teachers refuse to use NIM because they do not

want to change the traditional teaching design that they are accustomed to. Some teachers refuse to use NIM because they do not want to make the extra efforts to learn necessary knowledge of how to use it. Some teachers refuse NIM because they completely deny NIM's function. However, from a more general perspective, in order to enhance educational quality and effectiveness, Chinese educators are meeting the challenges by the scientific achievements of NIM with great enthusiasm and an enterprising spirit. 'CAI fever', 'computer fever', 'TV satellite-aided education fever', training teachers to use computer fever' are continuing without hindrance.

(2-3-2)

While NIM puts vigor into education, it also brings about many new problems. If we do not correctly recognize these problems, then fundamentally changing people's attitudes towards using NIM is only an illusion. As far as the utilization of NIM is concerned, China's teacher education and its practitioners should mainly consider the following issues:

- the use of NIM and losing humanity in education;
- the use of NIM and changing teachers' behavior,
- the use of NIM and polarization of students, and so on.

Right now, China's teacher education is actively and deeply exploring these issues. We still lay our emphasis on people, on teachers, when studying the decisive factors for using NIM. A teacher's task is to reorganize students experiences through meaningful methods which can help students to change their behavior. The aim of instruction is not learning itself, but the arrangement of learning. Using carefully chosen NIM is helpful to such arrangement. In the wake of unhindered development in the theory and practice of using NIM, many Chinese teachers voluntarily chose to use NIM to improve their teaching.

Although there is still a gap between teachers' knowledge, skills, and attitudes, related to the effective utilization of NIM, the development of NIM in educational area and the real needs of China's education, especially teacher education, rapid progress in these area is made

3. Training and Enhancement of Teachers' Skills in using New Information Media

The ability to use NIM effectively can help students to rapidly and accurately acquire knowledge, to master modern science and culture, to use skills smartly and to develop their intelligence. Moreover, it enables teachers to foster talents, to enhance educational quality and effectiveness, and to promote education into a higher developmental stage. NIM make it possible to enhance and promote learning quality and the level of learning. However, to achieve this, we have to rely

upon teachers. Without well-trained teachers, it is difficult to achieve the goal of offering high quality education that uses NIM. In the wake of development of NIM in the field of education, education will need more and more teachers with different levels of ability to use NIM. Enhancement of teachers' abilities to effectively use NIM has become the essential factor to further develop teachers ' education. China's approach to deal with the issue is as follows:

(3-1) Combination of full-time education with part-time training

Full-time education is to foster specialists who are engaged in theoretical study of educational NIM, and supervision over its practical use. Part-time training is to foster the skills of actual users of educational NIM. Generally speaking, full-time education is provided by normal universities and colleges all over the country. Many normal universities have begun to offer degree-courses in this area since the 1980's. For example, the South China Normal University and the South-West Normal University both opened an Audiovisual Education Department, and the East China Normal University opened a Modern Education Technology Department, and so forth. Audiovisual education centers at national, provincial, municipal and county levels, and teacher-training agencies are charged with part-time training for jobs, which are generally not quite difficult, less technically demanding, more daily routine jobs. The skills necessary for these kinds of jobs only can be mastered in a short time. The combination of full-time education and part-time training not only guarantees further development of theoretic research of educational NIM, but also meets the urgent need for wider application of computers and other new technology in education. This is especially important, considering the reality of China. China does not go all the way to blindly foster more than - needed higher level technicians in this area, to avoid an imbalance with other kinds of technicians.

(3-2) Combination of closed education with open education

The so-called 'closed education means to foster talents of educational NIM through full-time on-campus education; 'open education' is to foster talents of educational NIM through public ways, such as Satellite Education TV. Closed education, generally speaking, provides comprehensive and trans-discipline training of educational NIM, and provides learners with various, strongly application-oriented, forms of training. Open training makes it possible to train more learners simultaneously, unlimited by time and space. Consequently, educational effectiveness is significantly enhanced. The combination of closed education and open training not only opens more channels to foster educational NIM talents and saves money, what's more important is that such a method is of vital importance to popularize and spread the use NIM.

(3-2) Combination of pre-service training and in-service training

The so-called pre-service training means to foster future professional teachers' abilities to use

NIM. The in-service training means to train in-service teachers' abilities to use NIM. Normal universities and teachers colleges are in charge of pre-service training in China. These higher learning institutions have well-qualified teachers, and are well-equipped. They are able to offer various courses to foster the use educational NIM, and guarantee a comprehensive, systematic and scientific character of the contents and standards of training.

Teacher-training agencies, such as institutes of education, in-service teacher-training schools, are charged with in-service training. They usually instruct, keeping the reality of learners' circumstances in consideration and offer courses according to actual needs. They combine learning together with using, adopted measures suiting local conditions, with flexible and diversified forms. The combination of pre-service and in-service training not only guarantees systematic learning of NIM, but will also help teachers to catch up with the latest developments of technology, hence, to enhance teachers' ability of using NIM. In China, in-service training makes it possible to make up for the certain deficiencies of pre-service training as well, which is of vital and practical significance to enhance teachers' ability to use NIM. In short, all of these measures aimed at enhancing teachers' abilities to use NIM, show that all possible positive factors to foster various types of talents have been used to meet the requirements of teachers to use NIM, set by social development and scientific and technical development. Considering China's actual situation, to expand ways to foster NIM use, to explore training models and to enhance the quality of training are issues faced by China' s teacher education when carrying out further research and applications.

4. Framework for International Communication and Cooperation to Enhance Teacher's Abilities to Use New Information Media

Since the 1980s, using NIM in education has been developing rapidly in China. Audiovisual education centers have been established at central, provincial and municipal government levels, responsible for administrative and professional tasks. Professional audiovisual educational agencies were established as well in different types of schools at various levels. China has already had a strong team of professionals. Teachers' abilities to use new information are generally enhanced. Already many successful experiences were gained. However, we are late in starting to use NIM. The foundation is weak. Furthermore, the education system of China is large in scale and there are huge gaps between different regions in terms of development. The educational investment has been insufficient. The above-mentioned problems have caused China to lag behind developed nations in the utilization of NIM, and the actual demands for NIM set by educational development are not quite well met. We feel that at a time when various countries are learning from each other in the field of education, it is highly necessary to carry out

international communication and cooperation to support an effective utilization of NIM.

(4-1) Setting up an international organization to strengthen communication and cooperation among various countries for the effective utilization of NIM.

The basic responsibilities of such an organization should be:

- to set up guidelines, approaches and methods for effective utilization of NIM;
- organize international events for effective utilization of NIM,
- disseminate information concerning the effective utilization of NIM in various countries;
- coordinate cooperation among various countries to promote the effective utilization of NIM;
- evaluate achievements, experiences and lessons of communication and cooperation in effective utilization of NIM.

(4-2) Adopting various measures to strengthen communication and cooperation among various countries in effective utilization of NIM,

This should include:

- sending visiting scholars to each others countries to deliver lectures;
- carrying out joint research;
- sending teachers to each other countries for advanced studies;
- sending delegations to each others countries for observation;
- holding international seminars;
- exchanging information of curriculum and experiences.

(4-3) Strengthening of communication and cooperation between schools in effective utilization of NIM

The communication and cooperation between schools should be stabilized, and should be developed in depth. The both parties should discuss a detailed plan for such communication and cooperation.

(4-4) Strengthening of communication and cooperation among scholars and experts.

Such communication and cooperation among individuals should be encouraged and supported by the individual's own country and their working units, in order to encourage them to make their contributions to effective utilization of NIM.

(4-5) China is a developing country.

We have promised the world that nine-year compulsory education will be achieved at the end of

this century, and illiteracy in the adult population eliminated. Effective utilization of NIM is of vital significance to Chinese government to achieve these goals. Therefore, the Chinese government is going to actively participate in international communication and cooperation in order to promote the use of NIM to enhance educational quality and efficiency, and is looking forward to support and aid from the international society.

Information and Communication Technologies in School Education in India

A.N.Maheshwari

National Council of Educational Research and Training
New Delhi, INDIA

1. School Education in India

India is a country with an ancient civilisation well known for its system of education. It had evolved a unique system of education called *gurukul,* which meant teacher's home, as the training of the student took place at the home of the teacher [1]. The system was developed to meet the need of study of the Vedic texts and was elitist, as only a small proportion of young men could be educated in gurukuls. Most boys probably learnt their trade from their fathers. With Buddhism education shifted from the home of the teacher to the monastery. In the Middle Ages some of the monasteries developed into true universities. The most famous was the Buddhist monastery of Nalanda in the 3rd century AD. The 7th century account of Nalanda of Hsuan Tsang reveals that this institution vibrated with intellectual activity and training was imparted not only for the study of Buddhist texts but of Hindu philosophy, logic, grammar, medicine and other disciplines. In monasteries, in addition to oral recitation, teachers used a variety of teaching methods such as exposition, debate, discussion, question-answer, stories and parables. The inductive method was effectively employed for sharpening the intellect of the disciples [2].

More than 10.000 students of different faiths from within the country and abroad, who had passed strict oral entrance examination, were provided with free education in Nalanda. Many other monasteries all over the country developed as centers of learning.

With foreign invasions and changes in the political structures, the indigenous educational system also changed. During the medieval period, Mohammedan rulers in India founded schools (*Maktabs*), colleges (*Madrassahs*) and libraries in their dominions. The ancient indigenous educational system got increasingly marginalized. The final nail on the coffin was the decision of the British government to promote through education the European literature and science among the natives of India. In 1826, the first normal school was started in Madras. For preparing teachers for an expanding school system new teacher-training institutions were established throughout the country. By 1892, 116 training institutions for men, and 16 for women came into existence.

The reach of the school system in India during the colonial period was limited. More persons were out of it than who had access to it. This is clearly revealed by the literacy figures at the time of the independence. According to the census of 1951, only 271 in every 1.000 men and 88 in every 1.000 women could read and write [3]. There has been a phenomenal expansion of education in the past fifty years. The magnitude of the change can be seen from the table below [3]

Table 1: Changes in Indian Education

Total figures for school education from class 1 to class 12	1951	1995
Schools	230.683	837.162
Enrolment	23.800.000	171.700.000
Teachers	751.000	4.282.000
teacher-training institutions	208	1.125

The initial handicap was compounded with high population growth. It has offset the gains of the expansion of the school system. The goal of achieving universal literacy receded faster than the effort put in to catch up with it. After forty years of independence there were more illiterate persons than the total population of the country at the time of independence. According to the census of 1991, out of every 1000 men 641 and out of every 1000 women 392 could read and write [3].

The quantitative expansion of the school system entailed dilution in the quality of education. Sometimes untrained teachers who did not possess the prescribed level of education had to be appointed. The financial constraints and the lack of required resource support at the grassroots level came in the way of providing quality in-service education of teachers. Even after 50 years of independence the colonial legacy of an impersonal school system, marked mainly by its utility as a passport for employment and for upward social mobility, continues as the driving force for running it.

It may be appreciated that the present school system in India is one of the largest in the world. Therefore, introduction of innovations to cover the system uniformly, if not impossible, poses a daunting task. Because of the size of the system and the financial constraints innovations in school education have generally been first tried at pilot scales, with the hope of scaling up them using advanced communication technologies.

In the following two case studies, one on the introduction of computers in schools and the other on the use of teleconferencing for in-service education of teachers have been described in detail. In both experiments training of the teachers in new skills was crucial to their success.

2. Information and Communication Technologies in School Education

(2-1) The CLASS Project

The Indian experiment of taking computers to schools involved participation of a large number of institutions for tasks such as supply of hardware and software, development of Computer Assisted Learning (CAL) packages and the training of teachers. This project called the Computer Literacy and Studies in Schools (CLASS) was a joint initiative of the Department of Education, Ministry of Human Resource Development, the Department of Electronics and the National Council of Educational Research and Training (NCERT).

The CLASS is an ongoing pace-setter programme of the Government of India for introducing computer education in schools. It was started in 1984. The initial objectives of this project were [4]

- *to provide students with broad understanding of computers and their use;*
- *to provide 'hands-on' experience;*
- *to familiarise the students with the range of computer applications in all walks of human activity and the computer's potential as a controlling and information processing tool;*
- *to demystify computers and to develop a degree of ease and familiarity with computers which would be conducive to developing individual creativity in identifying applications relevant to their immediate environment.*

In the first year of the project, 250 schools were selected for the pilot phase of the experiment. Each year, the Project was expanded by adding new schools to the programme. At the end of 1990, the total number of schools covered under the CLASS Project was 2582.

Each of these schools was given two BBC microcomputers and a software package comprising of computer-assisted learning programs on different school subjects, database, spreadsheet, word processor and LOGO.

The responsibility for the academic planning and the co-ordination of the implementation of the project during the pilot phase of the programme lay with the NCERT.

Forty-two Resource Centres for the project were located in some of the leading institutions of higher education and technical education. Each Resource Centre was given the responsibility of a cluster of project schools. The tasks entrusted to the Resource Centres were providing initial training to the teachers, maintenance and back-up of hardware, and meeting the continuing academic needs of the teachers.

In 1986 an evaluation of the pilot phase of the project was carried out by the Space Applications Centre (SAC), Ahemdabad. The broad findings were

- a need for greater interaction between the Resource Centres and the project schools;
- criteria for selection of teachers for the project activities to be reformulated;

- need to reduce time gap between training of teachers, installation of systems and initiation of activities in schools;
- content of teacher-training and its effectiveness to be reviewed;
- adequate 'hands-on' experience for teachers to be ensured;
- computer literacy to be given a place in the school time table;
- need of developing software in regional languages;
- students to be given more hands-on experience.

In 1986, the National Policy on Education was announced by the Government of India. The new policy stated that the programme of computer literacy was to be organised on wider scale at the school stage. The Policy also emphasised that in order to avoid structural dualism, modern educational technology must reach out to the most distant areas and the most deprived section of beneficiaries simultaneously with areas of comparative affluence and ready availability [5].

Also, in 1986 the programme objectives and the system specifications were reviewed by an expert group [6]. The experience obtained from the pilot phase of the CLASS project became an important input for this task. Some of the findings of the review committee are given in the following paragraphs.

*The **CLASS** Project was recognised as a pioneering experiment for introducing computers in schools. Its potential for developing innovativeness in teachers and students suggested that progressively it should be made an educational computing programme around simulation, interactive learning, computer interfaced laboratory experiments and use of CAL software.*

The shortcomings and weaknesses in the programme could be overcome by bringing in changes in implementation strategy and strengthening support arrangements.

As the students and also their teachers faced difficulty in handling software in English, computers selected for schools should have the capability of using regional language software.

Although the teacher is the key to the effective implementation of this programme support given to the teachers by the Resource Centres wanes with time. This was not unexpected if the Resource Centres did not have natural linkage with the school system. Therefore, Resource Centres should be located preferably in teacher education institutions.

The expectation that teachers will supervise the computer literacy activities after the school hours and on holidays was not always fulfilled.

Teachers' feedback was that though the introductory training enabled them to handle the computer, it did not help in integrating its use into pedagogy. Teachers could not handle with confidence computer-based activities in the classroom. The end result was

that CAL software remained under-utilised and the effort that was put in their development became meaningless.

The Project reached an asymptotic level basically for reasons given above. Therefore, for scaling up the project and for making it an effective tool for teaching-learning a re-engineering of its implementation strategy was required. A revised strategy for the CLASS Project was adopted in 1993-94 [7]. In the revised scheme the schools already covered in the pre-revised scheme were made to continue with the BBC microcomputers. For the new schools, the selected hardware was a PC-AT (386) DX with four dumb-terminals, which was to be used with UNIX based application programs. But the revised scheme also has not been able to bring in the desired improvement in the programme or in its scaling up. The reasons for it are not hard to see. Basically, the major flaw in the revised scheme is that it has not taken note of the recent advancements in computer hardware and software. When computers using Pentium processors are available for the price paid for the BBC microcomputers, persistence with the machines that were supplied to schools in eighties is bound to result in lack of interest in the programme. The BBC microcomputers, which even if they are in running conditions today, are out of date when computers with Windows operating system have gained universal acceptability. With the selection of UNIX based computer education the thrust of the programme has shifted more towards computer science from educational computing. To top it all, in the revised scheme training in computers to students is being given by full time instructors hired from outside the school system. Alienation of teachers from the school computer education is now complete.

The singular lesson that we have learnt is that not only the state-of -the-art computers that are available today be provided for the school computer education programme but all the teachers of the school should be helped in developing the competence for using computers for accessing educational resources and their integration in the teaching - learning. Fortunately, Internet offers itself as an effective mode for providing resource support to teachers and learning material to students. Even when access to computers linked to Internet is made available in schools, training of all the teachers for enabling them to make effective use of resources from the cyberspace will be crucial.

For giving new skills to a large number of teachers, instead of depending on experts alone, alternative strategies for large scale training will be required. Recently, the NCERT used satellite based in-service training of teachers using two-way audio and one-way teleconferencing mode. A state-wide classroom was created for the training of primary school teachers of Karnataka, a State in the Southern India, and the training was given on-line by experts from the studios in New Delhi. As this experiment is a success story of use of a modern information medium for the training of teachers, it is described next.

(2-2) Interactive Video Technology: An Alternative Strategy for In-service Training of Teachers

As an alternative training strategy to the cascade approach interactive video technology has been effectively used in some of the developed countries. In the United States and Israel it has become popular to impart education and training programmes at a distance, through the use of a variety of telecommunication technologies. These technologies offer access to learning opportunities to groups and even to individuals who, because of distance and other life circumstances, cannot take advantage of programmes given through face-to-face approach. The teleconferencing approach to education uses one-way video and two-way interactions via satellite, pre-recorded videotaped instruction, computer systems, cable television, telephones, and radio and television broadcasts.

(2-3)The NCERT Experiment

The NCERT has the responsibility to facilitate the conduct of training of primary school teachers in the 32 States and Union Territories with over 20 language groups. It decided to make use of interactive video technology on an experimental basis for conducting in-service training [8].

In the NCERT experiment interactive video technology and face-to-face support of facilitators were suitably integrated. The training methodology involved using two-way audio and one-way video interactions for imparting training to a large number of teachers of a single language group by creating a 'state-wide classroom'. The interaction between the teachers and experts was co-ordinated by an anchorperson. Teachers undergoing the training used Straight Trunk Dialling (STD) on telephone to ask questions to expert panellists. Their answers were transmitted live from the studio of the Indira Gandhi National Open University (IGNOU), New Delhi, which had an uplink with a transponder on an INSAT satellite operated by the Indian Space Research Organisation (ISRO). This transponder is dedicated to communication and training. The TV Uplink Earth Station basically configured for TV Broadcast Service is ext. C-band. It uses one 6.8m diameter solid antenna, High Power Amplifier (HPA), Up-convector, wide-band FM modulator and audio video combiner.

(2-4) Locale of the Experiment

The State of Karnataka in the Southern India which has 20 revenue districts was chosen for carrying out the experiment as its 20 District Training Institutes (DTI's) had dish-antennas for receiving TV signals directly from satellite transmissions. Each district in Karnataka has a functioning District Institute of Education and Training (DIET) and its faculty were actively involved in conducting training in face-to-face mode. Also, the infrastructure for holding the training was readily available in the DTI's.

(2-5) Implementation of the Experiment

For the experiment on in-service training using interactive teleconferencing technology the existing training design was suitably changed. Video clippings to be used by experts in their presentations and the activity sheets to be used by the participants were specially prepared. Schedules for monitoring of the training programmes and concurrent evaluation during the period of training were prepared in advance.

The Development & Educational Communication Unit (DECU), Ahmedabad, a constituent unit of ISRO, was one of the collaborating agencies of the experiment. It managed the uplink of signals from the studio of the Indira Gandhi National Open University (IGNOU) and ensured that the signals were received by all the centers taking part in the experiment. The other major responsibilities of the experiment, such as preparation of training design, production of software, training of facilitators, conduct of evaluation were with the NCERT and were discharged through synergetic involvement of its various constituents - Department of Teacher Education and Extension (DTE&E), Central Institute of Educational Technology (CIET), and the Regional Institute of Education, Mysore.

(2-6) Pre-Training Activities

(a) *Training Curriculum and Training Design*

A group of about twenty content- and media experts planned the content and process of the programme and provided thirteen training sessions with equal number of activity sessions. Each televised presentation session was linked with an interactive question answer session with the experts.

(b) *Software Development*

A set of twenty video clippings of 5-10 minutes duration were produced in advance by recording classroom teaching in actual locations of schools. The clippings were on some concepts generally found difficult to teach. These video clippings were used by experts during live transmissions and were suitably integrated in their lesson plans.

(c) *Arrangements for Uplink & Receiving Facilities*

The uplink facilities of the IGNOU for the programme transmission were booked from January 7-13, 1996. Twenty District Training Institutes (DTI's) were approached through Administrative Training Institute (ATI), Karnataka State for allowing the use of their receiving facilities. These institutions were used as training centers for the experiment.

(d) *Selection of Teachers and Facilitators*

The State Department of Education, Government of Karnataka was approached to identify fifty primary school teachers for attending training at each of the twenty training centers.

From the District Institutes of Education in Karnataka, sixty faculty members were selected for working as facilitators in the training camps. They were given a two-day orientation in the context of their role in the interactive video training. They were given information about the agencies to be contacted in case of hardware problem, failure of signal, etc.

Activity sheets for the participants to be used during the training were prepared by groups of teacher educators. These sheets specified group activities related to the concepts planned to be covered in the training. As mentioned, the facilitators were expected to supervise the activity of the participants in pre-telecast and post-telecast sessions. The activity sheets were developed keeping in view the various topics transacted during the seven-day training programme.

Pre-telecast tasks were mainly to tune the teachers to the live transmission that followed. Teachers were asked to go through individually the self-instructional written material on the topic to be covered in that session. The activity sheets for pre-telecast work were common for each of the sessions and enabled the participants to identify the key ideas of the module to be covered by the expert and to prepare questions that they might ask during the teleconferencing. The activity sheets for the post-telecast work were around development of specific competencies attempted by the experts and involved group work for writing of lesson plans, preparation of teaching aids, use of science and mathematics kits etc. The facilitators also assisted the teachers in asking questions from the experts by establishing telephone links and sometimes by sending facsimile (FAX) transmissions. In all 850 teachers and 60 facilitators at 20 district centers participated in the training programme.

3. Implications of the Experiments

Increasing use of satellite communication and information technology in teaching-learning processes and in in-service education of teachers is becoming a reality. The present pilot project has shown that the use of interactive video technology holds far reaching promise for improving classroom processes and in-service education of teachers specially in the context of developing countries such as India, Pakistan, Bangladesh and Sri Lanka where the number of teachers to be provided recurrent training is very large. It may be added here that once the necessary infrastructures for interactive video technology are set up, the unit training cost using this mode will be favorable in comparison to that of the traditional face-to-face training methodology. In terms of its impact, this alternative strategy can substantially reduce training loss at successive cascades, which invariably accompany multiple level training. In addition, the use of interactive video technology is well suited for distance education of remotely located teachers, a situation common in countries like India and Bangladesh. Training is essential for mastering any new skill,

whether it is effective use of television in school or using a multimedia programme in a classroom. Experience has shown that teachers after they have been demystified of a new technology can creatively put it to use in improving learning of their pupils. The interactive video technology therefore holds a challenge to countries like India for providing training in common skills to a large group of teachers and for offering learning opportunities in the distance education mode.

During the past decade, there has been a worldwide expansion of information in electronic medium. Our experience of 1984 when we introduced computers in schools in India is not relevant today. Computers today instead of being used in isolated stand-alone mode are being increasingly connected with each other through local area networks and global networks. Within a year it is estimated that 50 million users globally will be accessing information on Internet. Information on every conceivable topic of human interest is being put on the Internet by individuals and institutions.

With Internet and knowledge-based resource support for K-12 such as ***CyberLibrary,*** the world has come into the classrooms of the developed countries. Information on education, specially school education, covering a wide spectrum of fields such as early childhood education, lesson plans for teaching of all school subjects at different grade levels, assessment items, tests and tools for educational research, to mention a few, are available on the Internet in an organised and easily accessible form.

Accessing and dissemination of educational material is now available globally for *near zero cost* to all those who want it. However, knowledge of mere existence of information in the World Wide Web will not be enough unless we know how to access it, classify it and process it for solving some problem. The Internet offers itself as an 'expert system' which can reduce the dependence on direct training by experts. It is an ideal medium for interactive learning as it allows information to be put up in multimedia format, effective in self-learning. Therefore, a paradigm shift is needed in teaching-learning for making optimal use of educational resources from the Internet. A crucial ability for taking advantage of the Internet will be *learning to learn.* The ability of learning to learn can then be used individually for developing the ability of *learning to do.* This can be acquired by processing information available on the Web in solving problems of human interest. In the following paragraphs some recent efforts in creating on the Internet a resource for school education have been given.

4. Cyber Resources for School Education

It is not surprising that the support for teaching-learning to the school system in which 150 million students study in about 800.000 schools under four million teachers has not gone much beyond the availability of the textbooks. As more than twenty regional languages are used as

medium of instruction there is a vast diversity of requirements. Teachers' guides and supplementary materials even when available have not reached the target groups. Inexpensively brought out publications are generally not preferred by booksellers.

The Internet, though today is in an infant state in the developing countries like India, is expected to become, before long, widely accessible. Therefore, Internet offers itself as a serious candidate for sharing with teachers resources like lesson plans, test items, demonstration experiments, etc. It can also be used by them as an inexpensive communication medium for interaction with experts and among themselves. The Internet is user friendly as it can be accessed at any convenient time and the user can inexpensively copy material, without infringement of copyrights.

The procedure for setting up on the Internet an Electronic Educational Institution is fairly straightforward. What is required is space on a server-computer connected to the Internet. The size of the electronic space required will be determined by the amount of information that is planned to be put up on the server. In addition to text and graphics, information can be in the form of audio and video clippings. Unlike a book which is a physical object and is read by its owner by turning pages after browsing the content and index pages, the 'electronic book' cannot be held in one's hands and can be read only through a computer by using software called browsers. This apparent disadvantage is more than offset by the new feature that the same resource can be accessed simultaneously by a vast number of persons from any part of the world or at a time of one's choice, and unlike the restriction of the print medium the material can be in multimedia. More than one hundred million persons from all over the world each day visited the NASA site on the Pathfinder landing on Mars. This experience of global sharing of an information resource is unprecedented. Another advantage is that information on the World Wide Web is arranged in 'three' dimensions instead of two for printed text. It enables the user to 'jump' from one location to another location on the same file, to jump to some other file placed in the directory of the same *electronic institution*, and to information on any of the millions of *electronic institutions* on the Internet. Accessing of information from Internet resources through search by following directions available on the information superhighway is called navigation or surfing the cyberspace.

How is information prepared in a form suitable for placing on a server on the Internet? The procedure for converting materials produced using standard computer tools such as word-processor or authoring system to a form suitable for the Internet, though initially unfamiliar, is straightforward. It is done by converting the information as HTML files. HTML is an acronym for HyperText Mark-up Language (HTML). Facility in HTML is easy to acquire, as it is a set of codes which are affixed in a file as tags. What is more challenging than learning HTML is the preparation of material in a self-instructional mode using the multimedia features of the computer.

This calls for collective involvement of subject experts, teachers, experts in cognition, media experts and information technologists for preparation of information to be made available to the target group from an electronic educational institution on the Internet. A rudimentary exercise carried out by the author to experience different steps required for creation of an electronic educational resource on the Internet can be seen by opening the site whose URL is

http://www.geocities.com/Athens/Parthenon/2686 .

The impact of Internet on the mankind as a global resource of information will be to not only shrink the world in space and time but to democratise human knowledge.

5. Summary

Information technology and communication technology in their integrated form such as Internet are expected to play crucial role in enhancing access to educational resources and in improving the quality of learning. Teachers in spite of their academic isolation can update themselves using Internet with the latest learning resource put up by institutions from all over the world. This approach, though intimidating unless experienced first-hand, is extremely user friendly. As of now, in developing countries of Asia access to it might be limited to a few institutions and persons, but considering its cost effectiveness as a learning resource, specially when compared with the cost of expansion of schools and colleges, this technology will gradually be preferred for providing access to resources for developing new skills and competencies.

Even when access to Internet has been arranged in schools it may not get fully used unless teachers are trained on how to use such a resource in teaching-learning. This will require in-service training in information technology skills and in new pedagogy, for which the required expertise might not be available at the grassroots. The NCERT's experiment is a pointer that advanced communication technology such as teleconferencing can be used by experts in conducting interactive training at the location of the teachers. Training will have to be arranged periodically to update teachers on changes in the resources and on how to use effectively the support of the Internet for the attainment of curricular objectives.

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New Information Media in Indonesia: Here, Yet Far Away

Tian Belawati

Head of Centre for Indonesia Studies,
Universitas Terbuka, Open Learning University

Summary

The new information technology age is here and the use of new information media (NIM) is now a common practice in many parts of the world. Indonesia unquestionably will also have to move toward that direction, as I believe NIM can and will improve the way information is disseminated and utilized. The road there, however, is still a long one and in many portions uncharted.

The use of media in primary and secondary schools is still limited. Lack of facilities is usually the first thing blamed. Although this might be true to some extent, the underlying issue, however, seems to be the lack of understanding among teachers that media could help improve the quality of secondary education, including the in-service training program. There has not been any program that is intentionally and/or specifically designed to enhance the competencies/skills of teachers for the effective use of media. For NIM, the situation is even more disheartening. While the use of computers may be more common in schools in large cities, there are still teachers who may never have even seen a computer. If exposure to the hardware were lacking, even less could be expected from usage and utilization of these new media.

Programs to increase awareness of NIM must be the first step to take if Indonesia wants teachers to use them in schools. Mass media such as newspapers, television, and radio that extensively and intensively disseminate information on the development of infrastructure and its usage in Indonesia helps increase Indonesians' awareness of the advancement of new information technology. The remaining challenge is now in moving the required facilities closer to people, especially teachers, let them get to know the technology better and be familiar with its capabilities.

Once awareness and understanding are in place, a specific training program to increase teacher' competencies in NIM use needs to be designed and implemented. To encourage teachers to use a new medium as a new teaching tool to enhance instructional delivery, they have to be made familiar in its use. Training programs could be packaged to showcase the benefits of the medium. However, more important for the advantage of teachers, we have to use

'the same media we want them to use' to train them. Increased understanding and familiarity would increase teachers' inner motivation also to use media in their teaching. This, in turn together with the availability of facilities, would increase the use of media in schools for both teaching and teachers' self-improvement purposes.

Providing teachers with the necessary teaching support materials would be quite an elaborate undertaking. Hence, I am proposing a combination of a centralized 'media' library and the use of the information highway to access and distribute the required media. The media library would develop and compile instructional materials (in a database) and make them available for schools and teachers. Therefore, rather than producing material packages according to a rigid and particular curriculum, development would focus on core content that would allow for greater flexibility for schools and for teachers to package the materials into their own curriculum.

The centralized facility would also allow for wider access. The Center's database would be retrievable from any geographical location having access (e.g. through the Internet) to the Center at any time. The dissemination mechanism of the pre-produced instructional materials from the Center's database could be established based on the availability of the infrastructure. The media library itself needs to be stocked and updated. This would be an expensive undertaking. However, many parties can share the resources and expenses to stock and update the library. In the end, many could yield benefits from this facility. Collaboration will optimize the benefits and cost-effectiveness of NIM use for educational purposes.

1. Background

The new information technology age is here and the use of NIM is now a common practice in many parts of the world. Indonesia unquestionably will also have to move in that direction, as I believe NIM can and will improve the way information is disseminated and utilized. The road there, however, is still a long one and in many ways uncharted. Before discussing issues on the use of NIM in schools (i.e., secondary schools), it would be more appropriate in Indonesia's case to examine issues of usage of more conventional media. This paper explores some of the basic issues underlining the problems Indonesia has been facing, and proposes options to resolve them.

2. Issues

(2-1) Lack of Understanding

The use of media in primary and secondary schools is still limited. Lack of facilities is usually the first thing blamed. Teachers, when they are asked why they do not use media in their

teaching, often mention that there are not enough tools and practical materials to use. Although this might be true to some extent, observations (Mahady at al., 1996) revealed that teachers often deliberately choose to disregard available [conventional] media. Rather than investing in the time to plan, prepare and use media to explain a concept, teachers at best simply use chalk and the blackboard to sketch the most simple illustrative representation to the concept. Some attribute this tendency to reluctance or 'laziness'. The underlying issue, however, seems to be the lack of understanding among teachers that media could help the learning process. In such cases, media are not perceived as tools which help teachers deliver learning materials better or more effectively. Media might have even been perceived as a burden; hence teachers are reluctant to use them.

(2-2) Lack of Training

Indonesia has put teacher-training and teacher qualification upgrading programs as one of national priorities since 1974. Between 1976 and 1997, no less than $1,602 million has been disbursed by The International Bank for Reconstruction and Development (IBRD) for the various education enhancement related programs implemented by the Ministry of Education and Culture (MOEC). In addition, more than $660 million have also been disbursed by IBRD through other ministries (World Bank[a], 1996).

Various initiatives have been introduced to improve the quality of junior secondary education, including the in-service teacher-training program called PKG that was introduced in 1983 and the subject teacher quality improvement forum (MGMP) that was started in 1993 (World Bank[b], 1996). The main objectives of all the projects/programs are to increase teachers understanding on subject matter and to enhance the quality of teaching process in the classroom. This would include enhancement of media use in teaching.

Nevertheless, both the PKG and MGMP programs have been very biased in the content and teaching management such as time allocation (Mahady, 1996). Discussion and practical work were emphasized in content analysis, developing teaching plans for the whole semester, and developing daily teaching plans. The core of teaching itself (including how teachers teach the content, how they ask questions, how they answer students' questions, and how they approached difficult subjects) seemed to be mostly covered on a theoretical basis.

Supervisory visits to each PKG trainee, for example, were only scheduled for one time during the whole program. Additional supervision was expected to be provided by the school principals. The assumption here was that all principals had completed training which in fact was not always the case.

To date, there has not been any program in place that is intensively and/or specifically designed to enhance teachers' competencies/skills for effective use of media. More

fundamentally, the enhancement programs seem to have not touched the underlining philosophy of media utilization and its positive impact on students' learning process. Therefore, evaluation studies of the programs undertaken revealed that they failed to have a permanent impact on the way teachers teach in the classroom (Mahady et al., 1996). Teachers, according to Suprapto (cited in Mahady, 1996) '... who had been trained did practice the new methodology for some time, but many of them went back to the old practices afterwards' (p. 1-2). This indicates that the training programs did have a positive impact on teachers' knowledge but certainly not on their attitudes. In other words, '... evidence of improved pedagogy in the classroom is hard to find outside the most favored schools in large urban centers.' (World Bank[b], 1996).

(2-3) Lack of Access

For NIM, the situation is even more disheartening. Indonesia is a vast country with a disparity in the stages of economic conditions. The general condition in Java is not a fair yardstick for the general condition in other islands. For teachers, this could translate to the opportunity or the chance to have an exposure to NIM. While the use of computers and other sophisticated new information gadgets may be more common in schools in large cities, there are still teachers who may have never even seen a computer (except in newspapers or television). If exposure to the physical hardware were lacking, even less could be expected from the usage and utilization of these new media.

Furthermore, even when facilities such as computers are available in schools, they are mainly used for administrative purposes (e.g., accounting, registration, etc.). More advantaged schools - usually private schools - may have computer education as one of the subjects taught and a computer laboratory for students to practice in. Nevertheless, the use of computers for teaching other subjects and for teachers' self-improvement is more difficult to find.

For schools in remote areas, the lack of media is even more significant despite many projects devoted to the improvement of Junior Secondary Schools (World Bank, 1996). The projects are mostly aimed at increasing access to junior secondary education as well as to improving the quality of the existing schools. These projects focus on construction of new schools (especially in remote areas), increasing the number of teachers, buildings and/or improving laboratory facilities, and providing practical materials. As such projects mainly target schools in remote areas (in which problems and issues are still at the basic level, i.e., appropriate school buildings, appropriate number of teachers, books, and supplies), the use of NIM is not a (prioritized) issue.

3. What Has Been Done

It is almost inevitable for every country but to catch up with technology. The revolution of

information and communication technology has made a borderless world that affects every aspect of our lives. For education, whether we like it or not, those who are more technologically advanced will definitely lead and color the educational system. More importantly, the challenge of educating people and preparing children for their future is now tougher than ever. The global competition is here, and it is the government's responsibility (along with the society in general) to prepare its people with good education so that they can compete.

Indonesia has made at least two inroads in this issue. Both are nation-wide and they provide opportunities to a wider and better use of new media for education. The first one has the potential to become a receptacle of initiatives for a better use of media, while the second one provides the vehicle for such initiatives.

(3-1) The Indonesian Open Junior Secondary School (SMP Terbuka)

Good education has to be equally accessible to everybody and not just stay in the cities for the more 'affluent' groups. In addition, when such a challenge is faced, NIM become a necessity. For Indonesia this is a double challenge, because while it has to start overcoming the impact of globalization (i.e., increase quality), it still has to struggle to provide the basic necessities of education such as school buildings and teachers.

Open and distance learning has become of crucial importance for Indonesia. As a result, the Open Junior Secondary School (*SMP Terbuka*) was designed and has been implemented since 1979 (Sadiman et al., 1996). The main objective of SMP Terbuka is to extend educational opportunity to disadvantaged primary school graduates -- many of whom have to cope with geographic difficulties and socio-economic hindrances (MOEC, 1992). These are the first and probably the only Junior Secondary Schools that extensively use information media (i.e., audio tapes, radio and television broadcasts) for instructional purposes (the complete model of teaching-learning process will be discussed later). To date, there are 1493 SMP Terbuka throughout Indonesia and this number is expected to reach 13.385 by year 2009 (Sadiman, 1996).

With regard to the use of newer information media, the Ministry of Education and Culture (MOEC) is now collaborating with a private corporation to broaden the use of media for SMP Terbuka into audio-conferencing and broadcast education TV with telephone call-in links (Indonesia Distance Learning Prototype Proposal, 1997). It is expected that the newer technology will enhance the learning process by employing media that allow two-way communication. The detailed concept of the operation is now still under development. If this collaboration is implemented, SMP Terbuka would be able to spread *high quality* education all over the country, and, therefor, answer to the challenges of access and quality.

However, the mechanism to utilize the SMP Terbuka's instructional materials to help teachers

improve their teaching in the conventional face-to-face classrooms remains a concern. How can the well designed and pre-produced instructional materials be shared by other teachers in their classrooms? The remaining question, therefore, is still how to encourage teachers to use the available mediated instructions in their teaching and for self-improvement.

(3-2) Nusantara-21

Unquestionably a revolutionary action is required to provide schools with NIM. Although it is not easy to define, NIM are usually related to high technology hardware and software such as computer applications (i.e., CD-ROM, Video-Disc, Internet, Computer Assisted Learning/Instruction, etc.). It would be very costly for the nation if it has to provide every school with the necessary computer packages. And it would be a waste for the nation if it does not take advantage of the available computer networking.

With one of its mandates to improve education and teaching, the government owned Indonesian Telecommunication Corporation (PT Telkom Indonesia) established a complete information highway called Nusantara-21 as the back bone of network and information system. The development of its infrastructure is emphasized more on 'accessibility' rather than on target density (RisTI PT Telkom Indonesia, 1997). By year 2001, the target is that 178 Junior and Senior Secondary Schools in every province are connected to Nusantara-21 and have on-line library services along with other 1186 access points. This is a huge leap forward for Indonesia in terms of access.

4. The Way to Infobahn

(4-1) Awareness and socialization program

Awareness and socialization are required not only concerning the media and the hype around the Internet. Also required is an awareness program on how to effectively use this information media. Teachers tend to not use even conventional media, or at best use them in a very low intensity manner. In a situation like this, it would be understandably difficult to encourage teachers to venture into using the NIM.

Programs to increase awareness of NIM must be the first step to take if Indonesia wants teachers to use them in schools. The availability of the required infrastructure and facilities to some extent would definitely help socialize the use of those media. Teachers and people in general are now at least aware of the information technology revolution that has been happening in the last few years. Mass media such as newspapers, television, and radio that extensively and intensively disseminate information on the development of infrastructures and their usage in Indonesia help increase Indonesians' awareness of the advancement of new information

technology. The remaining challenge is now in moving such facilities closer to people, especially teacher, let them get to know the technology better and be familiar with its capabilities.

Unlike the establishment of infrastructure and facilities which can be attained relatively fast, building and maintaining people awareness and interest cannot be done through a revolutionary process. It needs time or evolution. People need to know, see, and feel the importance and the benefits of the technology. And as change itself is difficult for everyone, technology can seem to be hard to use at the first stage. It needs skills to be able to enjoy technology, and thus people (i.e., teachers) need to be persistent in finding out its 'beauty'. And training will help teachers find this.

(4-2) Training on NIM

Once awareness and understanding are in place, a specific training program to increase teachers' competencies in NIM use needs to be designed and implemented. Teachers need to be introduced to different information media and their features, and they need to understand the strengths as well as the weaknesses of different media. Full understanding of the nature and benefits of NIM will increase teachers' imagination and creativity with the media. The question is, how such training can be conducted for a large number of teachers such as exist in Indonesia?

(4-3) The Media is the Message

To encourage teachers to use a new medium as a teaching tool to enhance instructional delivery, they have to be made familiar in using it. Training programs need to be packaged to showcase the benefits of the media. But more importantly for the advantage of teachers, we have to use 'the same media we want them to use' to train them. For example, training about the Internet would be better conducted using the Internet facilities than through printed materials. In this fashion, at the same time teachers are being introduced to the subject ideas and concepts, they are being familiarized with how to use the media and how they operate. So the training programs achieve two things: understanding and familiarity.

Increased understanding and familiarity would increase teachers' inner motivation to also use media in their teaching. This, in turn together with the availability of facilities, would increase the use of media in schools for both teaching and teachers' self-improvement purposes.

(4-4) Establishment of a Centre for Instructional Media Applications

Providing teachers with the necessary teaching support materials would be quite an elaborate undertaking. It would also be an expensive one if each and every school is to be supplied in conventional way with a complete set of materials which cover the whole range of subject matter. Hence I am proposing a combination of a centralized 'media' library and the use of the available

information highway to access and distribute the required media.

The media library would develop and compile instructional materials (in a database) and make them available for schools and teachers. But rather than producing material packages according to a rigid and particular curriculum, development would focus on core content. A package could be developed for instance to explain the concept of the ABC formulae in math, to illustrate density in physics, to illustrate a particular event in world history. This would allow for greater flexibility for schools and teachers to package the materials for their own curriculum an even course designs. Teachers have choices of teaching aids and can call upon for assistance to present and clarify concepts and ideas.

Such a media library could be established at the national or regional level. Instructional materials should be produced by a team consisting of subject matter and media specialists coming from anywhere. As the Center is (at least) at the national level, it would be able to pull together the best resources available and, hence, produce the best quality the instructional materials. Furthermore, as the instructional materials would be designed as modular materials, they would easily fit into any curriculum of various users. This benefits the whole prògrams in two ways: quality and cost-effectiveness.

The centralized facility would also allow for wider access both in terms of distance and time. The Center's database would be retrievable from any geographical location having access (e.g. through the Internet) to the Centre and at any time. Although initial investment for such a facility would be expensive, reduced cost per unit arising from access by large number of users at any given time would make up for the investment. There is however a question on how to reclaim cost from users such that in the long run the facility could become self-sustaining or even income generating.

The dissemination mechanism of the pre-produced instructional materials from the Center's database could be established based on the availability of the infrastructure. For Indonesia, the existence of NUSANTARA-21, the SMP Terbuka network, and the proposed educational television channel[1] could be alternatives to consider.

The SMP Terbuka concept could be used to further enhance the dissemination of the Center's materials. Rather than spreading the resources thinly to cover all Junior Secondary schools, the program could concentrate first on a selected few. The so-called 'Base Schools' could be developed and equipped with facilities to use various and more modern media to enhance teaching. These schools can then serve a number of satellite schools with no or fewer facilities.

[1] As a trade-off to the permit to operate a multi-channel commercial communication satellite, a private operator has agreed to dedicate one television channel free of charge for education. The availability of this channel will increase education television broadcast time to 24 hours a day. While educators are quite enthusiastic in embracing the arrival of this new channel, questions such as how to optimize usage, or who is going to prepare the content of programs still remain.

If in the SMP Terbuka concept, the Base Schools only provide support to its Learning Centers (*Tempat Kegiatan Belajar* - TKB), the new approach broadens this support to other schools.

Base schools in the SMP Terbuka network can serve as training and application centers. Teachers can go there to upgrade their capability while at the same time familiarizing themselves with the media. To integrate the efforts, these schools can also be designed and appointed as part of a wider network, which includes those Junior High Schools targeted to have access to the NUSANTARA-21 backbone. Together, both groups can become the lower hierarchy nodes in the dissemination of information through Nusantara-21. Schools having this function, can help their 'satellite' schools indirectly access the Nusantara-21 network. Access in this sense does not necessarily mean real-time access. Satellite schools, instead of pushing their resources to establish direct links with the Nusantara-21, can concentrate on absorbing information already down loaded or specifically requested to be down loaded and retained by and at the Base Schools. This way, satellite schools do not need to be equipped with as sophisticated equipment as the Base ones.

The first usage of such pre-produced instructional materials would be for teacher-training, training on the content and/or the concept being elaborated as well as training on the operation of the technology itself as previously discussed. For Indonesia, the first stage of teacher-training could for example be undertaken in schools already connected to the Nusantara-21.

5. Concluding Remarks

Despite the constraints and challenges, the use of NIM is promising. Increased commercial use and potential of telecommunication has induced large scale investment in this sector. Educators can benefit from this development. The most important hurdle left in the wider use of such media would be whether or not quality materials are available to be disseminated.

What teachers require are good quality materials available on-call to enhance their teaching. To this end, I propose the establishment of a national or regional media library accessible through the Internet. Each access point can in turn function as a lower hierarchy node which serves even more access points located closely geographically but are equipped with less sophisticated access tools than the main node.

The media library itself needs to be stocked and updated. This would be an expensive undertaking. But many parties can share the resources and expenses to stock and update the library. In the end many could yield benefits from this facility.

In other words, NIM can be costly if we do not use it wisely. Collaboration will increase the benefits and cost-effectiveness of NIM use for education purposes. As the greatest benefit of NIM is in its ability to change the concept of space and time: nothing is too far and no time is not

convenient anymore; teacher-training for the effective use of NIM in schools is a must if we want to enhance the quality of and access to quality education.

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Computers in Schools: the Present Situation in Japan

Yoshinori Tabata, Morihisa Suzuki & Hideki Iwasaki

Hiroshima University

1. Introduction

The rapid development of Information Technologies (IT) has expanded the range of information media. These include not only computers, but also advanced information networks, satellite communications, satellite broadcasting and they are changing the world to an information-oriented society.

At Hiroshima University, a Local Access Network (LAN) was set up throughout the campus 5 years ago and most computers were connected to this network (and Internet). At the time the university seemed to be somewhat behind other developed countries and even some of the Asian countries. At first, only faculty, staff, and graduate students received these services. However not before long, the University extended its services to all students, both graduate and undergraduate, without any charge. Various kinds of announcements from the administration office, which used to be sent in the form of copies, started to be delivered to faculty members by e-mail, even though some of them are still resisting the benefits from it. A Video Conferencing System has reduced the need to go to another (distant) campus for meetings. Students seem to be enjoying this new environment more than their professors are. They are getting information more efficiently through networks and are communicating with advisors by e-mail about their studies. As a result, however, we do not see each other as much as we used to.

Universities are not the only institutions that are undergoing a rapid change. Elementary and secondary schools are also changing and many teachers seem somewhat taken by surprise by the rush of new information media (NIM), such as computers in education. To understand the Japanese situation on the topic, educational policies to deal with the shift towards an information-oriented society and the actual conditions at schools and in pre-service and in-service teacher education programs are reviewed in this report.

2. Educational Policies to deal with the Shift to an Information-Oriented Society

In 1985, the National Council on Educational Reform was established under Prime Minister Nakasone. The establishment of such a council had not occurred in 30 years since the

Japanese Education Reform Committee was dissolved in 1952. In a series of reports made by the Council, the need to reform education in order to be able to deal with the shift to an information-oriented society was pointed out. It was reflected in the revised Course of Study of 1989 in the form of 'information education'.

Consequently, the Ministry of Education, Science, Sports and Culture has been developing policies to deal with the shift toward an information-oriented society. These policies include the following focal points:

(1) fostering information literacy, including the ability to obtain desired information from the vast abundance of information available and to use this information efficiently,
(2) applying NIM in education, science, culture, and sports,
(3) developing highly skilled technical personnel to lead the shift to an information-oriented society, and
(4) adaptation of educational facilities to the shift to an information-oriented society and the development of information networks.

There is also a growing interest in the use of multimedia in education. If it is used appropriately and effectively, it has great potential to be a valuable learning tool. However, a number of issues, from philosophical questions to the development of infrastructure, must be tackled. The policies the Ministry of Education, Science, Sports and Culture will implement in the near future, include:

(1) the establishment of new philosophies, content, and methods concerning responses to the advance of multimedia,
(2) the development of hardware infrastructure,
(3) support for software research, development, and utilization,
(4) the development of specialized human resources,
(5) the implementation of a copyright policy that can accommodate advances in multimedia technology and
(6) development of cooperation with other government sectors.

These policies were reinforced by the recommendations made by the Fifteenth Central Education Council to the Minister of Education in July 1996 in order to foster information literacy. The Report of the Council stated that all schools are expected to have a connection to the Internet in the near future by using communication networks effectively. Responding to this recommendation, several projects were started in 1997 to strengthen the role of prefectural and municipal education centers as centers of communication networks.

The Ministry of Education is not the only government sector striving to accelerate the shift towards an information-oriented society. The Ministry of Posts and Telecommunications and the Ministry of International Trade and Industry are also making efforts to establish a fiber-optic communications network which will link schools, libraries and other facilities throughout Japan

by the year 2000.

3. Installing Computers in Schools

In 1990, in a five-year plan, the Ministry of Education, Science, Sports and Culture started to provide subsidies to install educational computers in all public elementary schools, lower and upper secondary schools throughout Japan. In 1994, the Ministry introduced another six-year plan extending from 1994 to 1999 to install computers to further promote information education.

Table 1: Targets to Install Computers in Schools

School	Number of Computers
Elementary	22 (one computer for every two pupils in a class.)
Lower Secondary	42 (one per student)
Upper Secondary	42 (one per student, in general education course)
Special Education	8 (one per student)

Note: Two computers in the elementary, lower secondary and upper secondary schools and one in the special education school are for teachers' use.

Source: Japan Association for Promotion of Educational Technology, *Handbook for the New Installation Plan: Effective Use of Computers in Education*. Tokyo: JAPET, 1997, p.6. (*Japanese*)

Table 2: Number of Computers Installed in Schools by 1999

School	- 1994	1994-1999	Total
Elementary	124.000	275.000	399.000
Lower Secondary	188.000	192.000	380.000
Upper Secondary	48.000	39.600	87.600
Special Education	4.200	2.500	6.700

Source: Japan Association for Promotion of Educational Technology. Handbook for the New Installation Plan: Effective Use of Computers in Education. Tokyo: Tokyo: JAPET, 1997, p.7. (*Japanese*)

The national government provided subsidies to the Computer Installation Project, which started in 1990 (and ended in 1994). However, in the new installation project which started in 1994, tax revenues allocated to local governments were used. The cost for this project is estimated at ¥81.4 billion (equivalent to US$ 670 million) in 1997, ¥105.5 billion for 1998, ¥131.8 billion for 1999, and ¥138.2 billion for every year after 2000. Though computers were purchased in the first installation project, a system enabling the rental of computers was introduced in the new project. The rental fee is estimated at about ¥150,000 per computer a year. To support the computer installation project, the Ministry also provides subsidies not only to construct new buildings but also to convert surplus classrooms and other facilities into computer classrooms.

Various attempts have been made to increase the possibilities of education through the introduction of communication networks to schools. One of those attempts is the 'One Hundred Schools Project' which started in cooperation between the Ministry of Education, Science, Sports and Culture and the Ministry of International Trade and Industry. The project was intended to provide a network environment to approximately 100 elementary, secondary, and

special education schools.

Table 3: Number of Computers Installed in Schools, in 1995 and 1996

School	Number of Schools	Schools With Computers Installed	Percentage	Number of Computers	Average Number per school
Elementary	23.997 *(24.078)*	20.332 (18.716)	84,7 (77,7)	140.023 (114.194)	6,9 (6,1)
Lower Secondary	10.498 (10.515)	10.464 (10.452)	99,7 (99,4)	249.581 (241.515)	23,9 (23,1)
Upper Secondary	4.165 (4.163)	4.165 (4.163)	100,0 (100,0)	257.679 (239.789)	61,9 (57,6)
Schools for the Blind	68 (67)	68 (66)	100,0 (98,5)	1.095 (1.047)	16,1 (15,9)
Schools for the Deaf	103 (103)	103 (103)	100,0 (100,0)	1.432 (1.313)	13,9 (12,7)
Schools for the Physically or Mentally Handicapped	731 (734)	716 (710)	97,9 (96,7)	5.347 (4.817)	7,5 (6,8)
Total	39.562 (39.660)	35.838 (34.210)	90,6 (86,3)	655.157 (602.675)	18,3 (17,6)

Note: Between brackets () denotes figures for 1995
Source: Study Group on the New Tasks in Education, *Essentials and Practices of New Tasks in Education.* Tokyo: Daiichi-houki, 1997(revised), p.3555. (*Japanese*)

Another project is called the 'KONET-plan' which provides various kinds of assistance, such as financial assistance, assistance for effective use of new media etc. to schools for two years to build a multimedia environment, So far 1,014 elementary and secondary schools throughout the country have been participating in this project.

4. Teacher Education

According to a survey by the Ministry of Education, Science, Sports and Culture in 1996 about the conditions of information education in schools (Table 5), considerable differences were observed in the percentages of teachers who could operate computers, between elementary school teachers and junior/senior high school teachers. Among the junior high school teachers who could operate computers, differences were observed in the percentages depending on the subject they teach. In descending order, teachers in industrial arts, science, mathematics, and home economics teachers were most able to operate a computer. For senior high school teachers, this order was largely similar: vocational subjects, mathematics, science, and home economics. It also became clear that as many as 327,119 teachers participated in in-service training programs. Among this group 60.4% participated in training programs provided by either national government or prefectural boards of education, 17.1% in programs provided by computer companies, and 11.0% in programs provided by research associations.

These data seem to reflect the conditions of information education in teacher education programs. For students majoring in subjects other than vocational subjects and natural sciences, opportunities to get information education seem limited. In some teacher education programs, computer skills seem to be taught for only a few hours as part of the audio-visual education course, where making OHP sheets seems to be the mainstream.

Table 4:Teachers able to operate Computers, in 1995 and 1996

School	Total No. of teachers	No. of teachers who can operate a computer	Percentage	No. of teachers who can teach
Elementary	414.107 (420.829)	133.470 (119.096)	32,2 (28,3)	51.362 (42.878)
Lower Secondary	250.671 (254.703)	118.009 (112.912)	47,1 (44,3)	52.754 (51.121)
Upper Secondary	212.778 (213.863)	115.999 (106.776)	54,5 (49,9)	47.951 (45.383)
Schools for the Blind	3.329 (3.317)	1.942 (1.874)	58,3 (56,5)	747 (682)
Schools for the Deaf	4.649 (4.641)	1.906 (1.774)	41,0 (38,2)	794 (804)
Schools for the Physically or Mentally Handicapped	40.495 (40.168)	10.829 (9.520)	26,7 (23,7)	3.719 (3.572)
Total	926.029 (937.521)	382.155 (351.952)	41,3 (37,5)	157.327 (144.440)

Note: Between ( ) denote figures for 1995.
Source: Study Group on the New Tasks in Education, *Essentials and Practices of New Tasks in Education*, Tokyo: Daiichi-houki, 1997(revised), p.3556. (*Japanese*)

Table 5: Numbers of Teachers able to operate Computers, 1988 – 1996

School	1988	1990	1992	1994	1996
Elementary	*32.612*	*56.284*	*85.500*	*119.096*	*133.470*
Lower Secondary	*38.898*	*62.570*	*94.897*	*112.912*	*118.009*
Upper Secondary	*61.774*	*78.086*	*94.379*	*106.776*	*115.999*
Special Education	*4.039*	*6.587*	*9.652*	*13.168*	*14.677*

Source: Japan Association for Promotion of Educational Technology, *Handbook for the New Installation Plan: Effective Use of Computers in Education*, Tokyo: JAPET, 1997, p.38. (*Japanese*)

Various training courses are provided for teachers at in-service training institutions, such as prefectural and municipal education centers. A number of measures have been taken by the Ministry of Education to increase the competencies of teachers to facilitate information education. One of those is a program to employ information-processing technicians to provide training for teachers at schools and to improve their teaching skills. Under this program, which began in 1994, information processing technicians and computer experts are retained as part-time teachers, and provide professional advice. This program appears to be very helpful for teachers since it is quite difficult for them to get in-service training outside school.

5. Introduction of Computer Skills Test in the Service-examination

Some 'progressive' prefectural boards of education have started to introduce a computer skills test in the examination for service at schools. In Oita prefecture, it was introduced to the applicants for elementary school and special education school teachers in 1996. In 1997, it was expanded to all applicants, both at elementary and secondary school level, comprising a total of 2.330 applicants.

The reason for introducing such a test as part of the examination for service is that, according to the Oita prefectural board of education, information education is considered to be very important in the prefecture and teachers are expected to be able to operate personal computers in order to achieve the aim stated in the Course of Study to get children become accustomed to computers. Since elementary school teachers and teachers in special education basically teach all subjects, the computer test was introduced for those teachers first

The test administered in 1996 examined the ability to treat pupils' achievement test scores properly and make a graph of them by using 'Lotus 1-2-3'. The test administered to all applicants in 1997 examined basic competence in the operation of 'Windows95'. However, the real purpose of administering such tests seems to be an evaluation of the attitudes of applicants toward the computer rather than testing their skills.

Table 6: Prefectures Where Computer Skills Tests were administered as part of the Examination for Service at Schools in 1997

Prefecture	Elementary School	Junior High School	Senior High School
Ishikawa		Mathematics Technology Commerce Home Economics Industrial Arts (Primary Exam)	Mathematics Technology Commerce Home Economics Industrial Arts (Primary Exam)
Oita	All Applicants (Primary Exam)	All Applicants (Primary Exam)	All Applicants (Primary Exam)
Okinawa	Only Applicants who passed Primary Exam (Secondary Exam)		

Note: Total number of prefectures in Japan is 50.
Source: 'List of the tests administered in the 1997 examination for services at schools by prefecture', *Kyoushoku-Katei*, October 1997(Extra Number), pp.5-6. (*Japanese*)

The response of the private sector to this trend was very quick. Some corporations started to advertise (not inexpensive) special computer lessons designed for students planning to take the examination for service at schools. However, the response of teacher education institutions seems to be rather slow. Part of the reason for this might be attributed to the lack of teacher

educators who possess the abilities to teach information education and the inflexibility of the Japanese education system as a whole.

The examination for service is actually serving as a qualifying examination for teachers (teacher examination). Like requirements for certification, an examination for service could be very effective in improving teacher education programs.

6. Conclusion

It would not be wrong to say that, except for a few cases, the introduction of NIM, i.e. computers, in schools has just started in Japan. It seems the computer environment in schools is almost ten years behind that of the United States.

In Japan, the number of children has been decreasing, to a degree that we have not experienced before. Many classes in rural areas have been combined because of the decrease in the number of students and the depopulation in those areas, and maintaining education in those areas is becoming more difficult. If multimedia are used appropriately, it has a great potential to be an effective tool, not only to enrich existing programs but also to deliver education to those areas. However, besides developing infrastructure, tasks to train both prospective and in-service teachers, and many other problems still exist to realize an efficient use of NIM in schools.

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Media Literacy and its Development

Hideki Iwasaki, Morihisa Suzuki & Yoshinori Tabata

Hiroshima University

1. Why has media literacy become an issue?

In most Japanese dictionaries the term '*information*', is defined as '*knowledge which is necessary to make an appropriate judgement and to take action according to situations*', it seems therefore possible to say that information is a functional aspect of knowledge. In school education, 'Media literacy' has almost become synonymous with 'learning ability'. Mathematics education has to play an important role in introducing media literacy, as one of the most important components of new learning abilities.

Education has been regarded as the result of a social and historical context, therefore views on learning abilities differ from society and era. Roughly speaking, these views can be divided into two major categories, one is based on a subjective, individual attitude, as well as a subjective autonomy and a subjective way of thinking, that together form the ability to learn. The other is a meritocratic view based on the objective cultural values of a society. From the standpoint of the learning ability formation theory, the former view leads to education based on personal experience, while the latter leads to education that is based on objective science.

If we compare the objectives of the reforms in the latest report from the Curriculum Council (24 December 1987) concerning the basic principles for mathematics education, references to the word 'information' were as follows:

> *'We must pay heed to the promotion of basic abilities necessary for adapting to advancements in science and technology and to the development of multimedia. (...) From this point of view, great importance should be attached, through primary into high school education, to the strengthening of logical thinking power and intuitive power, and to adapt to social changes such as the highly information oriented society. More effort should be made to develop the abilities and the attitudes necessary to achieve logical thinking and resolution of the various phenomena that lie ahead of us.'* [2]

The role of mathematics education at the advent of the information-oriented society is pointed out in the above descriptions. However, if 'strengthening logical thinking power and intuitive power' is regarded as a *new* role, it is very difficult to distinguish this from the present and previous objectives of mathematics education, that is, 'development of mathematical thinking'. It is not easy to give clear-cut solution to the problem of how to strengthen logical thinking power

and intuitive power. This paper attempts to qualify and explain aspects of 'strengthening logical thinking power and intuitive power', where mathematics teaching is likely to contribute to their development. First, the demands made by an information-oriented society need to be clarified.

(1-1) Needs of an Information-oriented Society

If one looks at the issue concerning the goals of mathematics education from a different angle, one could say that the three R's, which were essential educational objectives in order to lay the foundations of modern society, are similar to the 'input, output and processing' of information. Consequently, one might think that it is not necessary to specifically highlight the diffusion of information systems. However, if information in previous periods is understood as knowledge accompanied with 'objects', then today's information can be regarded as existing independently from 'objects'. In other world, information has become a commodity itself, with its own intrinsic value. In the present situation, information is generally interpreted as something highly value-added, supported by the on-going development of computerized new media, such as high-speed processing, ever-increasing memory, effective search and high speed communication. Usually, this kind of situation is described as the information-oriented society, but the problem that arises here, is that this society can expand and function easily, while the development of people's capacities to absorb the vast amounts of information is staying behind.

By just opening a newspaper or looking around town, we are exposed to large amounts of information related to goods and services, entertainment, concerts, traffic, employment, real estate, investment, finance, examinations, and so forth. Contrary to the situation whereby the information is visible, as the ones mentioned above, one can argue that we are increasingly exposed to invisible information networks, which affect our lives enormously. Such an invisible network may cause radical change in the basic social system. For instance, shopping with a cash card is to satisfy our desire for purchase goods by corresponding figures to things, Even more, for example in dealing in commodities and futures vast profits and losses are made by merely corresponding on set of figures with another set. If we look for a more familiar example, one could think of the transfer of salaries through the bank, the actual process is just inputting certain digits into a computer-terminal. A point common to all examples here is that a certain sequence of digits is treated equally as commodities, interests or labour.

Thus, under this highly developed information system, everything is being transformed into 'code'. We enjoy a lot of benefits from this 'code', but in the meantime, it disables us to perceive reality. Moreover, this exerts a lot of influence not just on our lifestyle, but also on our patterns of

[2] Translation by the author.

thinking. If we summarize it in one word, a highly information-oriented society is probably equivalent to a '*coded* society'. Faced with the overwhelming increase of information caused by this new society, we can no longer see the reality and the systems behind the information, unless we tackle them with a way of thinking that of converts quantity into quality, instead of just mastering computer operations or use of a software manual. Only by doing this, we, as human beings, can properly adapt to the situation within the current limits of our capacity to absorb information.

(1-2) Aims of media literacy in information education

In February 1985, the Ministry of Education and Culture established the Cooperative Research Council on the directions of Primary and Secondary Education in coping with Information-oriented Society'. In its discussion paper, which was forwarded to the Curriculum Council, this Research Council pointed out that the 'development of media literacy through the content of education' is an urgent issue for the adaptation to the coming information-oriented society.

T. Mizukoshi, one of the members of this Council, defined media literacy as '*individual basic skills in order to choose and to apply information and media independently*'. He mentions the following four points to define media literacy in more detail: (1988, pp.2-3)

1. the ability to interpret, select, arrange and process information and to create and transfer new information,
2. to understand the characteristics peculiar to an information-oriented society and its influence on society and people,
3. awareness of the importance of information and responsibility towards its usage,
4. to understand the basics and characteristics of information science, and to master basic ability for operations.

The objective of information education by means of multimedia is to develop media literacy. Two streams can be identified in current information education. One stream is to learn about hardware and software for information processing, and the other stream is to study regular subjects in which information education is integrated. Related to the former, a unit on 'Information Basics' was established in technical arts and home economics classes at junior high school. The unit consists among others of instruction about the mechanisms and operation of a computer and interaction between computers, society and people. In the latter stream the focus is on the application of multimedia, including computers, for selecting, arranging and processing information and to create and transfer knowledge based on these activities and media education is dealt with as integral part of existing subjects.

Literacy (reading, writing and arithmetic) has always been related with daily life. In other words,

reading, writing and arithmetic have been studied in order to get ahead in life rather than for a yearning to know how to use abstract symbols. In short, tools and measures have appropriate purposes of their own, and new media literacy, with the computer as its core, is no exception. In this sense, it seems to be appropriate to develop these new abilities through existing subjects.

For instance, as a practice to learn to arrange, process and interpret data, it might be appropriate to let students examine the cause and the level of water pollution by plotting the number and the distribution of aquatic animals on a map of rivers, as shown in Figure 1. Or one could think of learning activities such as summarizing an explanatory essay in the Japanese language class, as a training for processing and creating information, when they attempt to mark keywords in each paragraph and to summarize the whole essay through the context between the keywords and the paragraphs.

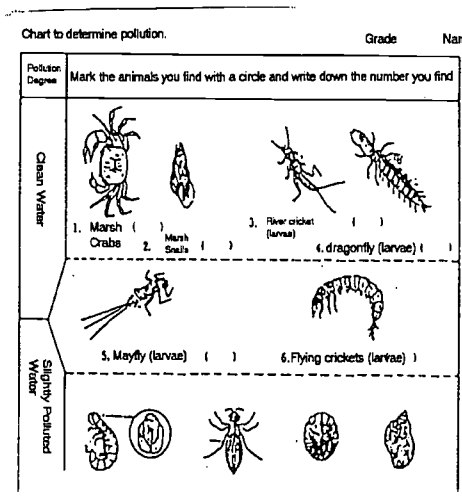


Figure 1: Table for Experience Learning
(Numata,1992, p.132)

If we consider teaching media education through existing subjects, literacy easily develops from just a framework of reading, writing and arithmetic to the various abilities related to information. Tanaka names all these abilities 'media-related abilities', and he proposes the following detailed list of the media-related abilities accordance with the situations in the application of information. (1993,p.11)

1. Acceptance of information (ability to understand and to comment on information)
2. Collection of information (ability to select and to collect information)
3. Information processing (ability to process information)
4. Creation of information (ability to create information)
5. Transference of information (ability to transfer information)

In this paper, the above-mentioned media-related abilities are called 'media literacy' as a general term. These abilities are similar to the three R's in that computer literacy should not remain at an abstract level. They are practical, essential abilities in order to live fruitfully in the 21st century.

Table 1: Media-related Abilities

Type of ability	Examples for activity
1. Ability to understand information	To understand information transmitted by others, to be able to follow their intentions, and to obtain the ability to react on these signals.
2. Ability to select information	To choose necessary information from some of the pre-selected ones according to our own needs.
3. Ability to judge information	To examine the validity and the credibility and so forth, by objectively viewing the process of creation of information.
4. Ability to collect information	To collect the necessary information according to our own needs. It includes interviews, observations, experiments surveys and research in libraries.
5. Ability to process information	To process information as element by using existing processing methods, including processes such as transformation, controlling, synthesizing, saving and so forth. To clarify categories, units, formulas and so forth
6. Ability to create information	To find tendencies, principles, correlations, causalities, and so forth by summarizing various data, and then to reach the conclusion on the basis of these data
7. Ability to transfer information	To explain and transfer the results of own research intelligibly. It includes the ability to conclude the results of research, operation and effective use of media, the way of expression and discussion an so forth

Source: (Mizukoshi, 1988, p.68)

2. Statistical education as a way to develop media literacy

New views on learning ability development regard media literacy as an essential element in order to realize new learning abilities. (Tanaka, 1993, p.24) Corresponding to this new view of learning ability, problem-solving approaches are currently a focal point in arithmetic and mathematics education. This chapter asserts that statistical materials can be very effective for comprehensive teaching of various problem-solving processes, i.e. understanding, creating and solving problems. Furthermore, teaching statistical processing is also effective for the development of media literacy.

(2-1) Views on new learning abilities

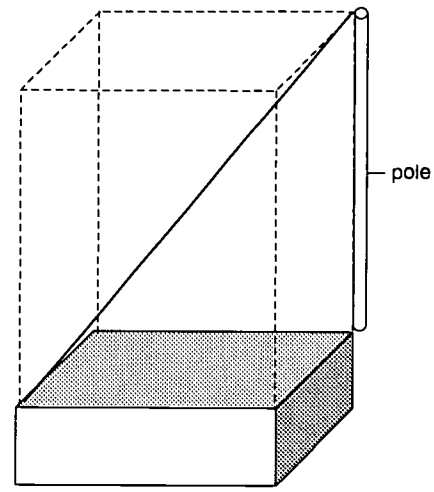
The earlier-mentioned meritocratic and attitude-oriented views of learning abilities could explain changes over time in arithmetic and mathematics education. We could call the meritocratic view 'essentialism', which has as a basic premise the formation of curriculum based on scientifically tested methods. The latter is Dewey's 'progressivism', with as main premises the formation of education on the basis of everyday life. These two views tend to dominate views about learning abilities in turns, without ever disappearing.

However, learning ability, while keeping in mind the above-mentioned contrastive views on learning abilities can be defined 'an ability to study'. If we examine 'study' closely, since it is to know unknown things, we can not discuss learning ability without considering 'to know', which is very basic psychological function. Furthermore, if we try to examine what 'to know' means, we might think this is too fundamental to analyze any further. However, in German, 'to know' can be

translated into two separate terms, namely, '*kennen*' and '*wissen*'. Inferring the difference from the nominal forms of both verbs, that is, '*die Kunst*' and '*die Wissenschaft*', the former means the intellectual method which depends on experiences and attaches importance to techniques, and the method depends on logic and attaches importance to systems. To explain the above difference, consider the case when one attempt to 'know' the length of a diagonal line.

From the standpoint of 'kennen', knowing the length of diagonal line does not make any sense if it is not related to anything in our daily life. As a matter of fact, the price of a gravestone in Japan, which look like a square pillar, is based on the length of its diagonal line, neither the surface area nor the volume. If so, a contrivance is necessary to know the length which can not be measured directly, then this necessity leads us to find out ideas or techniques to measure the length of diagonal line, for example, by making the imaginary rectangle of the same shape as shown in Fig.2.

Figure 2: The Price of a Gravestone



On the other hand, from the standpoint of '*wissen*', knowing the length of diagonal line is the intellectual activity to pursue theoretical authority and methodological generality, and the fruits of the activity was already successful 2,200 years ago in the first volume of the Euclidean principles. This book, which consists of 23 definitions, 5 axioms, 5 postulations and 48 propositions, is, so to speak, a system of the proof in order to know the length of diagonal line, that is, the Pythagorean theorem.

If we call the intellectual method 'a technique' and the latter 'an erudition', a technique is the knowledge or the skills necessary for ordinary people's life, and erudition is the culture for a so-called 'elite group'. In the modern society, whose main goal was mass-production, this kind of intellectual separation functioned very well. However, at present, due to the transformation of Japanese society into an 'intellectual mass society' caused by the rapid increase of the number intellectuals with the educational reforms after the World War II, this kind of classification is losing its practical significance. While in the past trade consisted mainly of import and export of manufactured goods, this is currently being replaced gradually by trade in information and other intangible goods. We are now witnessing the creation of new values that attempt to integrate both 'erudition' and 'technique'. The discussion on learning abilities, which aims at this, should be called a 'new approach on learning abilities'.

For example, in the question of the price of a gravestone, how can we set the price if we do not have actual things but only the numerical data of '(length) x (width) x (height)'? Although it is obvious that the Pythagorean theorem is the only solution for it, the formula of is just an means to imagine and to measure the diagonal line of a gravestone in order to measure its price, but no more than that. If it only means that the $\sqrt{x^2 + y^2 + z^2}$ formula has been used from the past on to calculate the price of gravestones by substituting it with numerical data, it is far beyond the lively contrivances and ideas of artisans and stonemasons. In short, even in such a simple situation, when technique and erudition are not integrated, it is impossible to say that the information is applied in the correct sense of the word. Thus, problem-solving oriented learning can be regarded as a situation in which technique and erudition are integrated. In arithmetic and mathematics classes, we have often emphasized aspects of erudition. 'Arithmetic and mathematics are systematic subjects, if you neglect your daily studies, you will soon fail to understand the class,' the above phrase seems to be a cliche often made by dedicated teachers in Japan. However, this phrase can become a kind of intellectual pressure, which often leads to children losing their interest in mathematics. A better approach would be to study mathematics by using practical problems, which require limited fundamental knowledge but offer a pleasant and interesting way to solve and in the process learn certain mathematical problems.

Since mathematics is an intellectual tool, that mankind has developed as a result of historical accumulation of thought and of organization of social thought, it is good for the tool to have its practical purpose. When we become aware of this point educationally, study in arithmetic and mathematics is much closer to problem-solving oriented learning. However, as tools have two main purposes, that is, to make the other tools and to increase the productivity, arithmetic and mathematics also have similar categories, such as mathematical contents which build up themselves and mathematical methods which are applied and extended beyond mathematical field. The former is an activity from the standpoint of erudition, and it is sometimes called a *vertical mathematization*. The latter is an activity from the standpoint of a technique, and it is sometimes called a *horizontal mathematization*. Since arithmetic fundamentally has an inseparable relation with actual phenomena, it has highly technical tendency. However problem-solving oriented learning in of the four fields in Japanese mathematics education, 'Numbers and Calculations', 'Quantities and Measurements' and 'Geometrical Figures' are said to aim at vertical mathematization, and that the field of 'Quantitative Relations' is said to aim at horizontal mathematization. In this sense, statistical education, as part of the 'Quantitative Relations' field has a strongly practical character.

Furthermore, in relation to problem-solving oriented learning, statistical education is better suited as an ingredient for media education, due to the following points. Students will have to discover and quantify the practical problems themselves. This is a step further from the current

practice in mathematics education, where the problem is already given. This means that it is necessary for the student to start with collecting and arranging data in statistical education. Next, the phase of processing the collected and arranged data will have to take place, in order to identify the problem. Here, it becomes obvious that solving problems this way corresponds to the creation and communication of information. Therefore, in order to perform a series of intellectual activities such as 'making, reading and solving problems' collectively, statistical teaching is the most appropriate material for development of media literacy through arithmetic and mathematics.

(2-2) Statistical education

For example, when we answer, 'it takes me about 50 minutes,' when somebody asks the time spend commuting from home to school, or when we say, 'we are suppose to have much rain at this time every year ', while looking up to the sky during a spell of dry weather, we are already judging a situation on the basis of statistical thought. In the case of commuting time, we have obtained the representative value of 50 minutes as a result of a rough estimate of a number of experiences in the past, these are usually called *descriptive statistics*.

On the other hand, in the case of the rainfall, the situation is generalized according to the files in the memory of one's head, in which an interrelation between past weather-circumstances and time is kept, this is usually called *conjectural statistics*. Hence, it is possible to say that we often think statistically in many cases of our daily life, but the process of quantification is subconsciously, because it is done approximately or intuitively. Therefore, a task of statistical education is to cultivate these unconscious intellectual operations into becoming conscious statistical thought.

If we mention the objective of statistics education in short, it is defined as to clarify rules and laws of a population. Statistical thought is usually regarded as an ability that has been developed through the process of pursuit. Kimura gave a more detailed educational analysis of statistical thought by emphasizing the development of statistical cognition, statistical knowledge and techniques and statistical literacy as three objectives of the statistical education. He explained each objective as follows. (Kimura 1988, p.22)

1. *Statistical cognition*:

Be aware the greater trends in the world, to broaden the horizon towards the world and to know the importance and the effectiveness and the limitations of statistics and statistical data from the statistical data from the standpoint of learning and life.

2. Statistical knowledge and techniques:

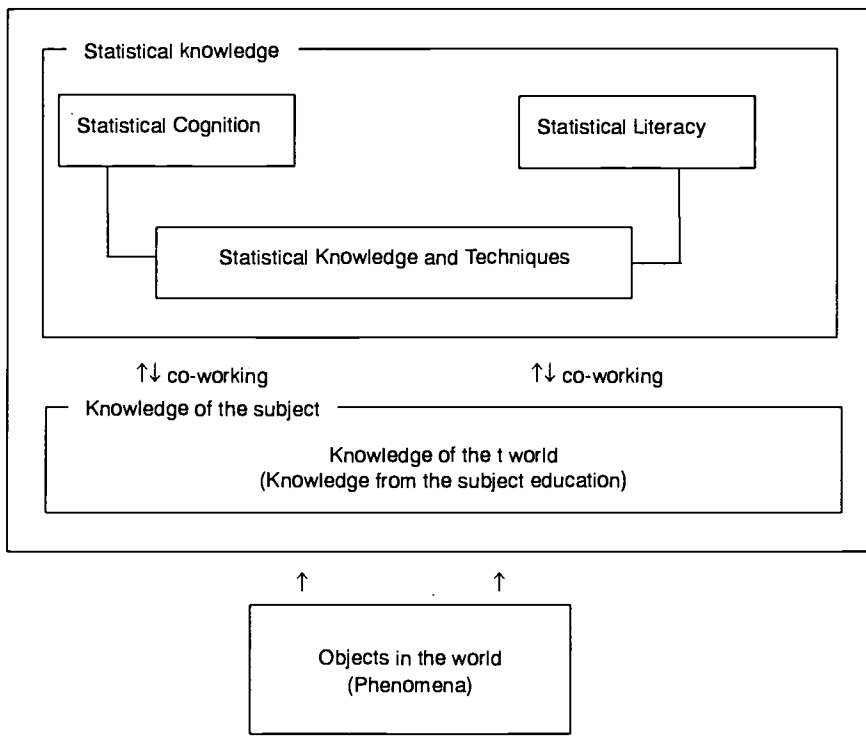
To clarify the object of a problem, to take statistics accurately guided by a clear purpose and to master statistical knowledge and techniques and logical expansion for use of statistics.

3. Statistical literacy:

To attempt to develop an incentive to statistical literacy which enable students; to know the world through intellectual pursuit of natural and social phenomena, to promote a way to deal with in society and rich and varied perspective of the world, society and nature while generating new knowledge about the world, and foster the ability to make decisions and to take actions towards the future.

Furthermore, Kimura did not make statistical education independent from ordinary school-subjects. He placed it within the subjects, as they offer actual data and issues, make thorough understanding of issues possible, and by using the knowledge in those subjects are useful for solving problems and can contribute to achieving the learning objectives of the subjects. According to him, the relation amongst the three, that is, statistical thought, subject and the real or practical world, is structured as follows:

Fig.3: Tri-polar Structure of Statistical Education Objectives



Source: Kimura, 1988, p. 23.

There are many occasions where we judge things statistically without realizing it. As shown in the Fig.3, statistical thought comes into play at the background of forming concepts concerned with either in the process of inductive formation of knowledge through school subjects, or in the case that the knowledge of the subjects is ambiguous in character. Especially in the subject of

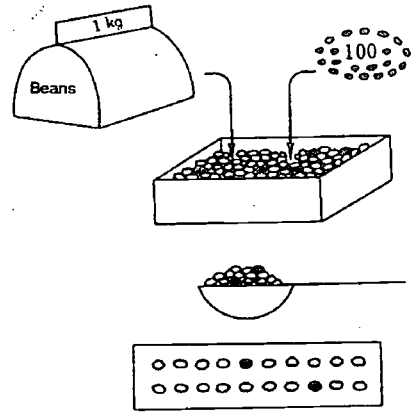
arithmetic, students should be made aware of this thinking process by using real-life phenomena as teaching materials. It is believed that this will result in the formation of statistical knowledge and techniques, which in turn will form the basis of statistical cognition and statistical literacy. It can be illustrated with the following example of 'the number of soybeans'.

(2-3) 'The number of soybeans'

Using computer software, various statistical quantities can be calculated and by entering data one can draw up a frequency table and a chart of the frequency distribution. However, neither hardware nor software can collect data, understand charts and tables or clarify problems. Therefore, children need to know how to collect data, how to classify and arrange it, and interpret the results in order to be able to produce a representative value, such as a mean or an index, and subsequently to create new problems.

For example, how many beans are there in a 1kg bag of beans? Suppose 1kg bags of beans are distributed among students and they are asked to find out the number of beans in it. As counting all the grains is boring for all the students, they are told to estimate the number, and then have to work out how to check the number without counting them.

Fig.4: The Number of Soy Beans



Suppose that a student focuses on the weight of a bean and that it found that the weight of 100 grains equals 120g. The student creates the following a proportional expression:

$100 : x = 120 : 1000, \quad x=833.333\cdots$

and concludes that, 'the weight is about 830 grains'.

The next level of learning will be reached if other children start to say, 'Is that so? Therefore, let us weigh 100 grains of beans again. Let us measure it to the first decimal this time. 'This activity can be regarded as statistical processing: they weigh 100 grains in each group, calculated from each group's results an average score is produced and then the number of soybean grains in 1 kg is estimated. In the other words, media literacy is practiced here depending on an actual situation.

As a next step, one could ask,' What to do if we can't measure the weight because we don't have any scales.' Then, there might be a child who works out the problem as follows. It has

prepared 100 black soybeans, which have almost the same size of white soybeans, and then the black soybeans are mixed with the white ones thoroughly. After this, we scoop up the mixed beans using a big spoon and count the number of white soybeans and the black ones. We repeat the same procedure ten times and calculate the average respectively. Supposing that the average number of white soybeans and black soybeans is respectively 18 and 2,

therefore, the number of soybeans is 900. This is also a clever way of statistical processing, in

$$2 : 100 = 18 : x \qquad x = 900$$

this case sample research.

If somebody points out here that 'the result obtained from the weight is different from that from a proportion,' the accuracy of statistical results will become an issue. Conjectural statistics are necessary to answer this question exactly, but at this level, it would be enough to reaffirm the accuracy or inaccuracy of statistical thought in each attempt, by comparing the estimate and the result from the statistics to the actual number. It is possible to say that statistics, in the first place, was established because of the considerations of inaccuracy. It is because our cognition and observation is always accompanied with some degree of inaccuracy. As the precaution for this, we take the averages of the results in the above occasion, and made it possible to express the statistical significance of the conclusions numerically.

(2-4) Education for information receivers and transmitters

With the increase in the quantity of information, its quality inevitably becomes a problem. In fact, transmitting information without taking the information receiver into consideration is merely a discharge of noise. In order to improve the quality of social information networks, it is firstly necessary for information receivers to be able to evaluate information correctly. For this purpose, the development of logical thinking power and intuitive power becomes crucial, and in particular, media literacy based on statistical thought should be developed as it is an important means to develop these powers. Therefore, in order to educate the people on the transmitting side, we need to complete education on the receiving side in the first place.

On the other hand, the interchangeable relationship between transmitting and receiving information, it will become even more essential as children grow up, where they will need to change their position continuously as both receiver and transmitter of information. One has to bear responsibility for information, and transmit only information of high quality. Therefore, it is also necessary to have ability to self-evaluate before transmitting. If such an improvement of evaluative skills is achieved widely in society, the content of information networks improve in quality remarkably, It will be the only way to prevent the network from malfunctioning. Consequently, it is self-evident to focus on both logical thinking power and intuitive power. Media literacy based on statistical thought holds the key to achieve this. It is therefore of crucial

importance that we move away from a system where students are just evaluated, to an educational system where students evaluate by themselves.

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Teacher Education for the Effective Use of New Information Media in Schools - A Malaysian Perspective -

Mohammed Sani Bin Ibrahim

Principal Assistant Director Teacher Education Division
Ministry of Education, Malaysia

Summary

With our interest in the goals in Vision 2020, we are beginning to look at what it takes to educate our children for the world of the future and what skills they will need to acquire to become productive citizens. It is interesting to explore the wide range of skills in communication, critical thinking, and even problem solving that the world of work would ask educators to consider when planning curriculum, as well as the advanced technical skills associated with the information society we are going to become. Teacher education in the utilization of technology should have an instructional focus.

It is against this background that Smart Schools has been made one of the flagship application in the Multimedia Super Corridor (M.S.C.). The introduction of information technology into Malaysian Smart Schools will have impact on teacher education to the extent that information technology skills would have to be incorporated as part of the basic skills required in teacher preparation.

In Malaysia, information technology is an essential component in the teacher education curriculum. The Teacher Education Division (TED) is responsible for designing the framework for a comprehensive and coherent training strategy for smart school based on the concept of professional growth and partnership. The training framework will cover three target group namely, the pre-service student teachers, the in-service teachers and the teacher educators in the training institutions. The Ministry has taken steps to upgrade the knowledge and attitudes of sending teachers in new information media (NIM) in schools. Teachers, teacher educators, administrators and supporting staff at all levels must meet at the baseline of technology which requires a complete paradigm shift in the way teaching and learning is managed and negotiated. All personnel will have to be provided training to enable them to meet the different level of job demands beginning 1999 when Smart Schools will formally start.

The training curriculum is structured along a developmental sequence with projected long

term training objectives. The *first phase* inducts participants into the generic skills required of smart teachers such as basic information technology skills, critical and creative thinking skills, study skills, facilitating skills and assessment skills. The *second phase* focuses on the integration of these skills into the subject areas through collaborative and partnership strategies especially in the development and use of multimedia technology for the preparation of teaching and learning plans.

Although there is evidence of inadequate infrastructure, technical support systems and teacher preparation, the Ministry of Education has taken all the necessary steps to ensure so that our schools can meet the needs of students in the 21st century.

This paper will look at some of the strategic steps taken on the macro level to improve both pre-service and in-service teacher education at the TED and the Teacher-training Colleges. This will be in terms of both management and implementation of the programs for the effective use of NIM in schools.

1. Introduction

The information age poses a whole new set of challenges and questions to Malaysian schools. The quality of our nation's political, social and economic future will depend on the ability our young generation to become functioning members of society who understand how to access information (and determine its significance), handle data, draw independent rational conclusions and communicate findings.

Students today need a higher level of academic, technical, communication and information-processing skills in order to function effectively in society. The contemporary workplace requires that employees be adaptable team players with strong problem-solving and decision-making skills. Schools will have to accommodate a variety of learning styles, interests and life experiences if they are to educate today's students. Leading experts have suggested that an organization's ability to learn, and to keep improving the way it learns, may be the ultimate competitive advantage.

With our interest in the goals for students in Vision 2020, we are beginning to look at what it takes to educate our children for the world of the future and what skills they will need to acquire to become productive citizens. It is interesting to explore the wide range of skills in communication, critical thinking, and even problem solving that the world of work would ask educators to consider when planning curriculum, as well as the advanced technical skills associated with the information society we are going to become.

For today's children, the information age is already a reality. Students are taking more responsibility for specifying and initiating some of the learning tasks, including team-oriented

investigation. A new pedagogy, supported by a set of widespread classroom practices, is emerging that encourages individual and small group investigation of student-generated questions. The teacher becomes a consultant, guide and facilitator as students seek answers and develop skills. As a mechanism of accomplishing these tasks, technology becomes a most important enabling asset.

Technology can make the learning process more efficient without detracting from established educational objectives. Once the individual is proficient in the basics of reading, writing, computations and oral communication, then the learning experience can be further enhanced by calculators, distance learning, computer-assisted instruction using integrated learning systems, microcomputer-based labs, presentation software and telecommunications.

While educational technology includes numerous modes of delivery and support mechanisms, the computer is often a major component. Simply placing computers into classrooms is not going to change teaching and learning. The training of teachers and students is essential. New ways of teaching and developing critical thinking must be invented. New facilities such as multi-media learning centers that allow teachers and students to use graphics, media integration, desktop publishing, authoring tools, simulations and access to telecommunications will bring teaching learning processes to life.

The role of the classroom teacher is evolving from that of a giver of information to that of a facilitator of student learning. Thus, we are witnessing a shift in the paradigm of the teacher to that of information manager. The implication for teacher education is that pre-service teachers should be trained in both the processes and products of technology-based instruction.

Teacher education in the utilization of technology should have an instructional focus. In addition to the operational aspects of information technology (IT), pre-service teachers should be able to integrate technology within the curriculum to achieve instructional objectives.

IT is coming rapidly to Malaysian schools and these can be observed through the growing number of software and homepages available for the public today. Schools are no longer alien to the new technology and so are teachers. The government and private sectors are helping in providing the infrastructures of IT environment in schools throughout the country.

The world today is getting smaller, the pace of change rapid, as information technology is set to change the lives and the work culture of Malaysians.

As Vision 2020 has made the entire nation realize the need for the pursuit of excellence, it is time therefore to bring down the constraining towers of self-doubt and insecurities Malaysians have built around them. There needs to be enough flexibility to be able to adapt and take on new challenges when necessary. It has become necessary, with the life cycle of knowledge being shortened, for the trend in education to change towards promoting learning rather than just plain teaching. This new learning paradigm can be attributed to the realization that man learns more

from meaningful experiences.

The mission basically is to develop a world class quality educational system which will realize the full potential of the individual and fulfil the aspiration of the Malaysian nation. This will only happen if education departs from the disinterested rote learning mode, and explores how information technology can be used to encourage active, creative, and independent learning. Malaysia needs to make the critical transition from an industrial economy to being a leader in the Information Age. In order to make this vision a reality, Malaysians need to make a fundamental shift towards a more technologically literate and thinking workforce, able to perform in a global work environment and use the tools and technology available in the Information Age. To make this shift, the education system under the guidance of the National Philosophy of Education, must undergo a radical transformation. The schooling culture must be transformed from one that is memory-based to one that is informed, thinking, creative and caring. One way to make this happen is through the use of leading-edge technology.

2. Development of Information media in Malaysian Schools

The development of information media in Malaysian Schools has different levels of media usage depending on the available facilities. Some schools are technologically inclined while others are still struggling with the technology. The main concern is not just about the physical aspects of the technology but to use the technology effectively in teaching and learning. Many teachers are not exposed on how to use technology effectively in the classroom. Technology must be seen as important tools in diversifying techniques in teaching: thus making classroom activities more flexible, interesting and more challenging. Technology, without proper use will not bring out its full potential. Worse still, teachers will find it as burdensome and resort to the traditional teaching strategies.

One of the initial projects for a NIM is the implementation of the *Munsyi* Project to 14 secondary schools nationwide in 1996. This project was sponsored by Telekom Malaysia that includes the supply of 220 computers, makes up a RM3.75 million network providing services on information technology, including internet. Another project in the utilization of NIM is *Jaringan Iimu*, administered by the National Library. This project connects all the information centers and libraries throughout the country in the network. Users can access information online from information centers from 137 countries and states fast and at a lower cost. Users can access information in the form of bibliography, text, multimedia and hypermedia.

The Ministry of Education have plans to. equip most schools with computers in the Seventh Malaysia Plan. Initial deployment of a computer lab that comprises 21 multimedia networked personal computers and related peripherals and software to 110 secondary schools was carried

out. Teachers from these schools have undergone 14 weeks of intensive Computer In Education course. Another 90 primary schools nationwide have also been selected to participate in the project. These schools will receive one computer lab by the year end.

The Teacher Education Division, (TED) Ministry of Education, has supplied a third computer lab that comprises of 35 multimedia computers, LCD projectors, digital cameras, scanners and software. This is apart from other computer facilities that were sponsored by the students' union.

Due to the need for upgrading of technology usage in schools, the Educational Technology Division has supplied computers to all its Teacher Activities Centres throughout the nation. This will enable serving teachers to outsource for more knowledge with the help of the Coordinator of these centers.

3. Demand for Teachers to Use Information Technology

Ever since the advent of technologies into society and the work place, teacher education programs have struggled with the question of how to teach and apply the wide variety of technologies that are available to enhance the teaching and learning process. While parents and communities stress the importance of students having access to technology, it is a mistake to focus primarily on students.

For the educational enterprise to adapt appropriately to our new world, we must invest in training teachers to integrate technology into the curriculum IT is coming to the classroom and it is almost inevitable that teachers will use it. With the initial implementation of the Smart School concept in 1999, IT will play the role as a very essential tool in facilitating teaching and learning. The effective use of IT, be it for the teacher's preparation or in the classroom is very important in making sure that the running of the school will be smooth and efficient. Internet for example will facilitate teachers in communicating with others in sharing of the lesson planning and getting feedback from colleagues nationwide or worldwide. Without Internet, communication will be so inefficient that some of the plans might be too slow to work.

4. Teacher Education for the Third Millennium

In Malaysia, the direction of teacher education has been determined by the *Philosophy of Teacher Education* which was documented in 1982. The philosophy emphasizes on the desire to educate and produce teachers who are noble in character, progressive and scientific in outlook, committed to uphold the aspirations of the nation, proud of their heritage and dedicated towards the development of the individual and the preservation of a united, progressive and disciplined society. The Philosophy of Teacher Education is compatible and in alignment with The National

Philosophy of Education.

(4.1) The National Philosophy of Education and Teacher Education.

Malaysia is one of those unique countries which has a standardized school curriculum guided by an espoused vision enshrined as the National Philosophy of Education (NPE). The NPE States:

> *'Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, so as to produce individuals who are intellectually, spiritually, emotionally and physically balanced and harmonious, based on a firm belief in and devotion to God. Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving high levels of personal well-being as well as being able to contribute to the harmony and betterment of the family, the society and the nation at large'.*
> *(Education in Malaysia, 1993, p. vii)*

Thus the objectives of the above philosophy emphasize the 'country specific' developmental needs for students through physical, intellectual and spiritual dimensions. These aspects of human development, interlinked to societal development, were again highlighted when in 1991 the Malaysian Government announced the direction of the national development for the 2lst Century, i.e. the aspiration to turn Malaysia into a fully-developed nation by the year 2020, where the conceptual definition is country specific and contextually bound:

> *'By the year 2020, Malaysia can be a united nation, with a confident Malaysian Society, infused by strong moral and ethical values, living in a society that is democratic, liberal and tolerant, caring, economically just and equitable, progressive and prosperous, and in full possession of an economy that is competitive, dynamic and resilient.'*
> *(Mahathir Mohamed, 1991)*

In the evolution of our world class quality educational system, the teaching profession has always been considered the crucial agent of change. In order for the vision and mission IT be materialized fully, it is pertinent to educate and produce quality teachers who could contribute positively and would be able to meet the challenges of the 21st century.

Our vision of a nation of highly educated and skillful citizenry is guided by moral values, inculcated by a strong belief in God. As mentioned above, the mission towards the achievement of this vision lies in the education of our teachers who should be competent not only intellectually,

pedagogically but also spiritually. In line with this, all our teacher education programs (both pre-service and in-service) has incorporated thinking skills, moral and religious education and information technology into the Teacher Dynamics Component which is an essential component in all our programs. In addition, these elements are further infused into the subject areas across the curriculum.

(4.2) The Concept of Smart Schools

It is against this background that Smart Schools have been made one of the flagship application in the Multimedia Super Corridor (M.S.C). The concept of Smart Schools is no longer a fashionable luxury but the only way forward.

The advent of Smart Schools, where computers with appropriate software offer tremendous scope and potential for self-paced and interactive learning. The Smart School will not be elitist in nature, but will be innovative, creative and stimulating, coupled with extensive usage of computers along the areas covered by the multimedia super corridor.

Smart Schools will be different from existing ones in aspects of pedagogy and in methodology of learning, curriculum and examination format: they will be in tandem with the nation's development. Smart Schools will promote the full democratization of education, to provide equal access to learning opportunities. These schools are not for the smartest students but really a smart way of ensuring that every student strong or weak, rich or poor - stretches to his/her fullest potential in a way that is best to his/her learning pace and styles. In the next century, the current obsession towards examination will become history. Students will be tested on their ability to be innovative, creative, how to apply knowledge and how they perform in projects. But all this goes beyond merely putting in the latest technological hardware into classrooms. The human factor will still be vital. Machines cannot and will not replace the teacher in the classrooms. It is the teachers and educators who must harness the technology to make teaching more fun, effective and interesting. The Malaysian's Ministry of Education is giving higher recognition to the teaching profession at all levels. The Ministry is taking measures to attract good human resources into the teaching profession.

Malaysia's dream in the next millennium is to turn Malaysia into a center of academic excellence, providing excellent facilities. That dream is already beginning to take shape. But this dream needs the cumulative efforts of an entire nation. Malaysians must get excited to the change, progress, and the challenges. We must march to the same drumbeat. Change is a challenge, and it's a challenge we must face, whether we like it or not.

(4.3) Smart Schools and Teacher Education

The development of smart schools which emphasize effective learning and teaching through

the use of technological resources have made it necessary to extend the pedagogical repertoire of teachers. Pedagogical content knowledge needs to be updated and skills need to be extended to include the skillful use of electronic resources to manage teaching and learning both inside and outside the classroom. In addition, an in-depth understanding of the learning process is needed to ensure that the essential attributes of smart teaching and learning are met.

The Malaysian concept of Smart Schools is unique to the extent that the use of technology is not the sole criteria for effective learning. More importantly smart teaching and learning entails three essential attributes:

i. Values across the curriculum
ii. Language across the curriculum
iii. Thinking across the curriculum

i. Values across the curriculum

The teaching of values is an essential component both in the schools and institutions of higher learning, including Teacher Training Colleges. Values are both explicitly taught in the Moral Subject and implicitly infused in all the subject areas. In teacher education, the focus is not only on the personal development of the individual but also the development of group dynamics through team or group work. Trainees develop tolerance and understanding, caring and sharing through team teaching, personal and professional awareness through reflective teaching strategies. Collaborative learning is strongly encouraged.

ii. Language across the curriculum

To prepare our trainees to function effectively in the classroom and in line with our national language policy, Bahasa Melayu is taught as a compulsory subject in all our teacher-training programs. However to ensure that our future teachers do not lose out in the knowledge revolution, English is also a compulsory subject for four semesters in the Pre-Service Curriculum.

iii. Thinking Skills across the Curriculum

Critical and creative thinking skills are taught as a compulsory subject and are also infused into all the subject areas.

The inclusion of these attributes in our curriculum is however, not a sufficient condition for effective or smart teacher education. Smart teacher education, we feel should also include the following skills:

i. Basic Technological Skills
ii. Facilitating Skills
iii. Study Skills

i. Basic technological Skills

The impact of telecommunications on teaching and learning can neither be ignored nor be underestimated. Teachers must have at least the basic word-processing skills and the predisposition towards the use of technology to enable them to facilitate teaching and learning. Based on this, information technology is an essential component on all our teacher-training programs. In addition, a module on basic information processing skills has been produced to train lecturers in all the Teacher Training Colleges and also teachers in the schools.

ii. Facilitating Skills

In the smart schools, the teachers are no longer the fountains of knowledge. In fact, knowledge is accessible to everyone. But teachers need to help and guide students to identify, select and use the knowledge available. These skills are infused into the pedagogical practices or methodological component and a module has been prepared to train lecturers and school teachers.

iii. Study Skills

To enable trainees to further develop themselves we feel that trainees must have the skills to access knowledge. Aside from technological or computer skills, trainees must have the ability to identify and select information. These skills are taught as part of their language courses and a module has been prepared to train lecturers and teachers.

5. An Integrated Teacher Education Program

An increasingly open society with an expanding technology and a rapid increase in knowledge requires a different school where teachers do not just instruct. Instead they are enablers, facilitators, problem solvers, catalyzes or organizers of learning. The role of teachers becomes more complex and the change in role focus minimized prevailing 'role-model' orientation of today's teachers who surrender their individual developmental needs and interest to the dictates of their academic supervisors. (Bernstein 1984 and Meighan, 1971).

The present structure of teacher education cannot accommodate these changes in the teacher's role and the new skills, new attitudes and new knowledge required of teachers in the contemporary milieu. Therefore, it is proposed that a teacher education program which integrates pre-service, in-service and continuing education be required components of the career pattern for all teachers.

The concept of integration in teacher education is based on the view that teaching is a life-long career and that for teachers the pursuit of learning and professional growth should be continuous,

with reflection, analysis and practice as essential parts of the process (UNESCO, Paris, 1985).

Integration would eliminate the segmentation of teacher education which prevents continuity and the development of self-direction. The traditional pattern of learning-basic concepts with short periods of teaching practice no longer suffices for teachers of the present, let alone the future. Teacher education is a career long endeavor. It does not therefore end with initial teacher certification. It follows that pre-service can never be an adequate preparation for a full time teaching career. It must be supplemented by on-going professional development and continuing in-service education for all teachers (Elliott, 1988). Thus, one suggested strategy to prepare teachers for their role in the 21st century is life-long education. A shift in the model for staff development requires a concomitant shift in the model for schooling.

6. Information Technology and Teacher Education

Teacher education is conceptually a process of teacher development which aims at preparing teachers with not only the pedagogical skills and knowledge but also with the skills for continued life-long intellectual, attitudinal and professional growth. As mentioned above, the education of teachers will have to be seen as a continuum of lifelong professional development starting from day one a student teacher enters a Teacher Training College or the university. As such the divide between pre-service and in-service teacher-training is a superficial one. A coherent and comprehensive framework for teacher education will have a 'growth plan' for teachers. This then is the premise for teacher education .

The introduction of information technology into smart schools will have impact on teacher education to the extent that information technology skills would have to be incorporated as part of the basic skills required in teacher preparation. Teachers will have to be prepared to move from a two-dimensional curriculum into a multi-dimensional curriculum. The focus on skills and thinking development will require an entirely different way of training. Facilitating learning through the use of technology is very different from the traditional top-down approaches based on print and audio-visual resources. Teachers will have to consider the use of technology and its capacity to move beyond the walls of the classroom. This would mean an entirely different way of organizing learning and managing learning. Teaching therefore cannot be conducted in the traditional mould of teacher-directed learning. Technology now will provide the challenge and the opportunity for teachers to guide students to use resources beyond the textbook and other audio-visual materials. Students will be able to interact electronically with people outside the classroom, the school and even outside the country. This multi-faceted approach would mean that teacher-training will no longer be pedagogically sound if technological skills are not part of the training curriculum.

In Malaysia, information technology is an essential component in the teacher education curriculum. It is aimed at enhancing the basic technological skills of word-processing and at developing trainees' capacity to make creative use of technology for curriculum instructional design. Authoring tools are part of the curriculum whilst the promotion of creativity in this aspect is provided for by the yearly Expo on pedagogy.

7. Smart Teacher Training: A Training Program for Teacher

The Teacher Education Division is responsible for designing the framework for a comprehensive and coherent training strategy for smart school based on the concept of professional growth and partnerships.

For the immediate needs of smart schools, training modules in basic technology have been prepared whilst modules for higher levels are in the pipeline. However , we realize too, that it is impossible to keep pace with developments in technology but we are trying to make things happen through a *cascade model* which incorporates both *on-site* and *off-site* training. The use of standardized modules will ensure that there is no dilution in training.

On another front, we realize that there is a need to invite the participation of the private sector. Based on guidelines provided by the Ministry of Education, private vendors are invited to draw up teaching and training modules. The Ministry is now currently in the process of responding to inquiries from all over the world.

A new agenda in education is partnership. Partnership especially in business in order to bring Information Technology into the classroom and create a learning curriculum for the new era. Partnership to us is a collaborative relationship. We believe we have valuable information and ideas but at the same time, we acknowledge that there are others who have a wealth of experience which we can draw from. The idea is to create a win-win situation for all.

8. Training Framework

The training framework will cover three target group namely, the pre-service student teachers, the in-service teachers and the teacher educators in the training institutions.

(8.1) Pre-Service Teacher Training

The new three-year teaching diploma program which was implemented in August 1996 is a completely revamped version of the teaching certificate course. Teacher Dynamics which encompasses Information Technology Skills, Critical and Creative Thinking Skills, Moral Education and Religious Education, Bahasa Melayu, English Language Proficiency and

Environmental Education forms the basic component of the curriculum. Similarly, the pre-service post-diploma program and post-graduate diploma program also have Teacher Dynamics as a basic component. Recently the pre-service curriculum went through a second review to incorporate smart teaching elements incorporating higher order thinking skills and values across the curriculum. Information technology is incorporated into the teaching methodology of all subject areas. In addition, student teachers will be taught the basics of media production using authoring tools. By 1999 all pre-service graduates of the primary teaching diploma program will be computer literate and will be able to use technology in the delivery of the Integrated Primary School and Integrated Secondary School Curriculum.

Pre-service teachers in Malaysia are exposed to information technology from the first year of their training. The expected outcome of these courses is for the pre-service teachers to gain a certain level of computer literacy. At this level, pre-service teachers must have an understanding of concepts regarding what computers can do, what learners can do with computers, and what teachers can do with learners and computers. It is our objective that pre-service teachers to feel comfortable integrating technologies into the curriculum they must first feel comfortable with technology as a tool for personal productivity.

Many pre-service teachers were becoming efficient in the use of applications programs and in software evaluation, as part of their college courses of study. However, computers were not being utilized as teaching tools due to constraints such as the lack of computers and computers that are not equipped with new capabilities (multimedia and internet capabilities). This realization led to another reexamination of computer literacy for pre-service teachers. Emphasis on how to use computers in teaching Mathematics,. Science, English, Bahasa Melayu and other disciplines become the focus for the Ministry of Education as a starting point.

Pre-service teachers are usually directed to develop an in-class presentation using various technologies as appropriate. Furthermore, in their search for appropriate media to complement, supplement, or enhance their presentations, they need to become familiar with the technology that displays or produces the item. When potential media are located, they can use them as they are or modify them as needed. If media are not located or available, students are then encouraged to use the technology to develop their own.

Ubiquitous multimedia instruction for pre-service teachers will probably be the next step in computer literacy evolution. At this juncture, our new batch of Teacher Training College students is being introduced to the wonders of multimedia and the Internet. This new area of computer literacy is exciting and vibrant. Computers are now being sold as 'multimedia and Internet ready computers' indicating that business recognizes multimedia as a successful teaching tool. Just as authoring tools are now being taught to pre-service teachers for content specific software development, multimedia development shall become and accepted part of the pre-service

teacher's computer literacy skills.

This development is considerably better than their counterpart in the rest of the world. These teachers dynamics are essential for them to be technology literate. Some modification is required though, in stressing more on the use of technology in teaching and learning activities, Malaysians also have teachers trained in IT as a subject major, which is very uncommon in the rest of the world. These IT teachers are exposed to not only the application of IT but to develop suitable courseware for classroom use. This fits into the country's need for locally developed software as those written overseas are not tailored to our curriculum. Only teacher knows best what should be included in the Malaysian Curriculum.

8.2 In-Service Teacher Training

The Teacher Education Division runs a number of courses ranging from 14-week to one-year in-service courses which are offered yearly to primary school teachers who fulfill the basic requirements of a credit in *Bahasa Melayu* and who had had at least five year experience. New Courses including Computers In Education and Computing have been introduced in line with developments in Smart Schools. At the same time, Teacher Dynamics similar to that in the Pre-service/curriculum forms the basic component in the program.

In line with implementation of the Multimedia Super-corridor, TED is given the leading role in planning and training primary and secondary school teachers who will introduce and integrate the use of computers in teaching and learning of all subjects by the year 1999. Based on a cascading model, a training model had been designed to train resource personnel/teachers (Master Trainers) in computer aided instruction so that they are able to train the other primary and secondary school teachers in their regions. It is hoped that the teachers will use and integrate the computer knowledge in their classroom teaching practice. All the 31 Teacher-trainings were involved in training the Master Trainers. The training program was divided into two phases. The first phase was carried out from 10-21 December 1996 (2 weeks) whereby 824 teachers were trained. The second phase was carried out from 26 May - 6 June 1997 for West Malaysia and from 19 May - 30 May 1997 for East Malaysia. In this second phase, 947 teachers were trained. So there are 1771 Master Trainers who are given the responsibility to train a total of 30.000 teachers by the end of this year (1997).

As we stress the integration of technology into education, many educators and students readily acknowledge the importance of its use. However, few know how to incorporate technology into their own teaching or use. Both groups, pre-service education students and teacher education faculty, must become aware of what is available in technology resources (e.g. CD-ROM, programs, laserdisc, internet) in their content, subject, or grade. Then technology must be modeled for them to show how the hardware and software are set up and used.

After the initial exposure and they are aware of available resources and have seen some modeling of technology, they are ready to select technology resources to use. This includes both hardware and software selections and how they will be used by an individual or group.

The Ministry have taken steps to upgrade the knowledge and attitudes of serving teachers in NIM. The 14-week Computer in Education courses in seven Teacher Training Colleges are also open to teachers who are not involved in the Computer In Education Project, although only a small portion of them are successful due to the limitations of infrastructure and staffing. The Language Institute in Kuala Lumpur does offer a course of 14 weeks on Computers in Teaching and Learning of *Bahasa Melayu*.

Apart from that various sectors, such as the Education Technology Division through the State Educational Resource Centres and the district level Teachers Activities Centre do conduct various courses on IT, and its uses in education. Developments in smart schools however, necessitated a change in the overall nature of TED's in-service function. A more coherent and comprehensive framework is necessary to meet the immediate, exacting and dedicated demands of smart schools. Teachers, teacher educators, administrators and supporting staff at all levels must meet at the baseline of technology which requires a complete paradigm shift in the way teaching and learning is managed and negotiated. All personnel will have to be provided training to enable them to meet the different level of job demands beginning 1999.

9. Operational Strategy

(9.1)The Training Approach

The training of smart teacher educators and teachers in service (both primary and secondary) is based on a cascade model. Initial training will be given to master trainers who will train key teachers. Both master trainers and key trainers will work in collaboration to provide on-site training of teachers in schools. The training programme will be delivered through use of training modules. The master trainers, and key teachers will follow the same programme as for teachers. This allows trainers to be engaged in the same kind of learning activities that they are to provide to the teachers. This is to create an environment of learning through a culture of partnership and collaboration between teachers and their trainers.

(9.2)The Training Curriculum

The training curriculum is structured along a developmental sequence with projected long term training objectives. The *first phase* inducts participants into the generic skills required of smart teachers such as basic information technology skills, critical and creative thinking skill, study skills, facilitating skills and assessment skills. The first phase training will utilize training

modules prepared by a group of specialist writers comprising experienced teacher educators and officers from the TED.

The *second phase* focuses on the integration of these skills into the subject areas through collaborative and partnership strategies especially in the development and use of multimedia technology for the preparation of teaching and learning plans. Training shifts from the basic use of technology for increased productivity and allows teachers to explore their creative and innovative potentials in the preparation of teaching and learning materials. A major emphasis is on the use of computers to access continuously updated information through networking as well as to accomplish management goals. Training for the second phase will be facilitated by the use of training modules developed by vendors who are awarded contracts to the Concept Request For Proposal (CRFP) for teaching-learning materials. Other training program, materials and approaches will also be sourced to facilitate training during the second phase.

(9.3) The Training Features

i. *Practical Oriented*

A hands-on approach is used to ensure that all teachers and teacher educators have an immediate feels of the experience and understanding of the skills needed to facilitate learning using technology. Such an approach also provides the necessary challenge to the traditional mind-set of teacher-centered approaches and is an impetus for change towards a more experiential and student-centered teaching and learning. An on-site strategy allows for immediacy of operations and provides a 'safe climate ' for experimentation with support from fellow colleagues.

ii. *Follow-up Support*

Master trainers and key teachers will provide follow-up support to ensure teachers implement what they learned during on-site training. Trainers will also help key teachers and teachers to develop support team and encourage peer and onsite coaching.

This will provide opportunities for all parties to share and reflect practice within their own topic, level and subjects.

10. Smart School Implementation Schedule

The implementation strategy of Smart Schools will be accomplished in two stages. The first stage will be implemented to an initial 90 pilot schools in January 1999. This stage will provide important learning for the remaining roll out plan for the broad deployment in the rest of the schools in Malaysia. A constant rate approach will be used in the broad deployment in which a total of 643 primary schools and 137 secondary schools will selected for smart school

implementation each year. The remaining 8,500 existing schools and all new schools will achieve Smart Schools status by the year 2010.

11. The Use of Computer Technology in Evaluation and Examination Programmes of the Teacher Education Division

The Examination and Evaluation Unit of the TED started using computers to process examination results in 1985. The Examination and Evaluation Unit has progressed rapidly since than and the use of computers has spread from mere processing of results to word processing, item building, preparation of examination papers, analysis of results, interactive item response analysis, item banking and preparation of CGPA'S for the Examination Board.

(11.1) Computer In Planning And Management

Every task in planning and management of Examination and Evaluation is word processed and enhanced through extensive use of Windows 95 and Lotus Suite Preparation of Examination Indents, Time Table and Marking Schedules are examples of tasks accomplished via computer.

(11 .2) Computers In Item Building

Draft questions prepared in the 31 colleges are sent via diskettes and hard copy for security reasons. The drafts are compiled centrally and selected to make up the final papers. Editing and checking of the draft is made easier by the use of computers. Items in the examination papers are enhanced by graphics (and color for the Art paper). The photo-ready final draft is then sent for printing under tight security.

(11 .3) Using Computers In Coursework Evaluation

Coursework in teachers' colleges are moderated. All option subjects carry 50% weight for coursework and 50% for examinations. Students are encouraged to use computers for completing assignments required in their coursework. Lecturers process the results of their students using computers which are coordinated by the examination secretary at the respective colleges. External Moderators and validators make use of the coursework evaluation statistics to make recommendations to each college on their performance.

(11 .4) Analysis of Examination Results

Each semester's examination results from 31 colleges are analyzed using computers. Lotus and SPSS are the common software, but TED has prepared a uniform format for analysis by all colleges and the composite results are processed centrally.

These analyses are important to the colleges to see how they fared in the examinations in relation to other colleges. Another use of the analysis is in enhancing teaching learning strategies based on feedback of the results obtained.

(11.5) Item Analysis - Interactive Response Model

Items in all option subjects are item analyzed using the QUEST* software licensed from the Australian Council of Education Research (ACER), Melbourne. The usefulness of this program is that items are ranked in terms of difficulty level in relation to the candidates' ability level. The production of 'kid-maps' enables the teacher to take remedial measures after analysis of the items.

(11.6) Presentation Of Examination Results To The Examination Board

The final overall results of evaluation and examinations from 31 colleges are presented to the Examinations Board of the Teacher Education Division of the Ministry of Education for approval and certification. Every candidate has results produced in terms of grade and marks for each subject taken in college. The final grade CGPA (Cumulative Grade Point Average) is the measure of the student's achievement.

(11 .7) Item Bank

The Examination And Evaluation Unit has built up an item bank of questions categorized into difficulty levels via item analysis. This item bank will serve future on-line item building.

(11 .8) Going on-line

The TED has planned for the eventual on-line link-up between all colleges and the division. Question papers, processing of marks, analysis of results, item analysis and overall presentation of results for the Examinations Board may be enhanced in terms of speed accuracy and security. Officers of the Examination And Evaluation Unit and TED already use e-mail and the Internet extensively.

12. Issues

While incorporating technology in the learning process is becoming increasingly essential, access to the requisite equipment is limited. Most school especially the rural ones do not have the support system to maximize the learning process using NIM.

Even if the schools have the necessary equipment, most schools do not fully utilize modern technology. They do not have the system or building infrastructure to maximize the potential benefit of this equipment. Moreover, because computers and other equipment are often not connected to any other computers in the school or the outside world in a network, they cannot access the information superhighway.

Although there is evidence of inadequate infrastructure, technical support systems and teacher preparation, the Ministry of Education have taken all the necessary steps to ensure so that our schools can meet the needs of students in the 21st century.

13. Concluding Remarks

The conviction that educational technology and the integration of NIM is important to the learning process is gathering support from leaders of government. business and education. Information is no longer primarily in the minds of teachers and in books. Information is everywhere. Thus, we are aware that there are significant barriers that must be confronted.

Our focus is how technology can be applied creatively to enhance teaching and learning. In addition, it is imperative to address the fears and concerns of teachers. Teachers must have opportunities to see new methods in action, realize their significance and be convinced of the tremendous benefit to children. Teachers need access to hardware and training. They need time to become familiar with how technology can enhance learning and how administrative duties could be accomplished more efficiently. Of significant importance is fulfilling the teacher's need to interact with others who are struggling with the same experiences.

Integration of technology into the curriculum ought to be interrelated with learning techniques that can improve student achievement. Teachers of the 21st century must be prepared to maximize the learning of all children; ready to share their knowledge and experience; ready to share their heart; and, dedicated to helping all children find success in their world. New information technologies can help them do that and we are committed to prepare the teachers for the next millenium.

The move towards the incorporation of technology in education is a natural process of development in the preparation of human resources for the next millenium. The debate on the importance of technology in education is unnecessary. Rather the emphasis should be on how technology could make learning effective and schooling a joy. Our bottom line after all, is an effective education system that will be able to address the issues of quality of access and opportunities for all to ensure that our vision as enshrined in our NPE are met.

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A Glimpse of Secondary Education and Professional Competencies of Teacher Education in Nepal

Bharat Nepali Pyakurel

Deputy Director HMGN's Curriculum Development Centre, Bhaktapur, Nepal

Summary

My report which follows is the outcome of a glimpse extending over the years 1971 - 1997. Over some 26 years, a large part of the secondary school system had undergone tremendous reorganization, substantial curricular reforms along with teacher education specifically in terms of teachers' role and their competencies in Nepal.

This report offers the following topics :

1. Background Knowledge
2. Education Structure
3. The National Goals of Education
4. The Aims of Secondary Education
5. New Direction of Secondary Education
6. Teachers' Present Role and Their Competencies
7. Overview of the Development of Teacher Education Programmes
8. Teachers to Develop Competencies
9. Conclusion

1. Background

Nepal is a small country on the southern side of the Himalayas, bordered by the People's Republic of China in north and India in the south, east and west. With an east-west length of about 885 kilometer, the country covers an area of 147.181 square kilometers. The north-south ecological regions and five east-west development administrative regions divide the country into 75 district units.

The attitudinal and climatic variation has led to a natural division of the country in three broad ecological regions, the *Terai*, hills and the mountains. The *Terai* in the south is a fertile plain land which covers 23% of the total area of the country. The hill region, lying between the *Terai* in the south and the mountains in the north which covers 42% of total land area of the country. The

mountain region comprises the land above 4877 meters covers 35% of the country.

The population of Nepal is approximately 20 million. The country has a high birth rate and a slowly declining death rate, which has resulted in very rapid population growth. The 1991 census has shown an annual growth rate of 2.1% per annum during 1981 and 1991. Population density is 126 people per sq. km.

Katmandu is the capital city of Nepal from where I come and where the Ministry of Education's Curriculum Development Centre (CDC) is based. CDC is also responsible for supporting Teacher Education through providing relevant curricula, training packages and instructional materials.

2. Education Structure

The structure of the Nepal Education System is as follows:

◦ Pre-primary	◦ Preparatory phase for primary education
◦ Primary	◦ Classes 1-5
◦ Lower secondary	◦ Classes 6-8
◦ Secondary	◦ Classes 9-10
◦ Higher secondary	◦ Classes 11-12
◦ Campuses and Universities for specific areas.	Degree Programs: ◦ Bachelors : 3 years ◦ Masters : 2 years ◦ Ph.D. : 3 years

My purpose here is to focus on secondary education only, the structure of which has changed over time.

It was changed in 1993 to two levels: Lower Secondary Level from classes 6 - 8 and Secondary from classes 9 - 10. However, it can be considered as one level covering classes 6 -10 as such.

3. The National Goals of Education

- To nurture and develop the personality and inherent talents of each person.
- To instill respect for human values and the will to safeguard national and social beliefs so as to help develop a healthy social unity.
- To help the individual to socialize, enhancing social unity.
- To help the individual keep his or her identity in the national and international context and to help him/her lead a socially harmonious life in the modern world.
- To help the modernization of the country by creating able manpower for its development.
- To teach the thoughtful protection and wise use of Nepal's natural resources.

- To help bring those who are underprivileged into the mainstream of the nation.

4. The Aims of Secondary Education

The Aims of Secondary Education are to produce healthy citizens who are:

- familiar with national tradition, culture and social environment;
- familiar with democratic values;
- able to use language in daily life;
- aware of scientific issues;
- creative, co-operative, industrious and independent; and
- able to contribute to economic development.

5. New Direction of Secondary Education

The restoration of multiparty democracy in 1990 made some changes in the education system possible. The National Educational Commission was constituted to recommend improvements in the education system. In the field of secondary education, the following recommendations were included:

- No secondary student should have to walk for more than two hours to reach a school.
- Secondary education to have three levels: grades 6 to 8 of lower secondary; grades 9 to 10 of secondary and grades 11 to 12 of higher secondary education.
- The principal goal of secondary education was defined as being to produce citizens
  - → who recognize the dignity of labor,
  - → Who believe in the nation and democracy,
  - → Who have a suitable level of knowledge in Nepali language, mathematics and science and
  - → who possess a good moral character.
- Secondary education was also stated to be main foundation of manpower needs for national development.
- Gross enrolment ratio targets were set at 60%, 45% and 30% respectively for lower secondary, secondary and higher secondary education.

Internal and External. Efficiency

The efficiency of secondary education suggests that there is an urgent need for reform measures to improve the Internal Efficiency of Secondary Schools. The promotion, repetition and drop-out rates for lower secondary and secondary grades also indicate that the internal

efficiency in secondary education is a matter of serious concern and there is much room for improvement. The dropout rates are very high at grades 1, 5 and 8. The proportions of trained teachers in lower and secondary schools are 31% and 42% respectively. The low percentage of trained teachers has adversely affected the internal efficiency of secondary education.

6. Teachers' Role and their Competencies

As the number of students is increasing, a larger number of well-trained teachers is required. At the same time, if' the standard of teaching is to be improved then the general education, subject knowledge and professional skills of teachers will have to be extended. Both the increase in the number of teachers and the improvement in quality necessitate reform and investment in pre-service teacher education and in-service training. The leading agencies in teacher education are currently the Faculty of Education of Tribhuvan University and the Centre for National Education Development (NCED). They will have to think and rearrange their programs to meet the expected changes. The teacher seems to be the key-determining factor with regard to quality of education. And so role of these institutions is vital through the teacher-training programmes.

Expected role of the Teachers:

- The teacher should have a fairly adequate knowledge of the subject matter
- The teacher should possess the professional skills to teach.
- The teacher should have adequate motivation to teach.
- The teacher should be frequently helped by specialists, supervisors and trainers.
- The teacher should be dedicated to his/her job.
- The teacher should collect, develop and use appropriate material.

Beside this, the following teachers' competencies need to be developed among the teachers, because currently teachers in Nepal seem to lack these.

- Preparing simple supplementary materials from locally available materials based on pupil's needs.
- Using single-grade and multi-grade teaching techniques.
- Preparing and selecting instructional materials.
- Making instructional plans responsive to pupil needs.
- Making class-room climate conducive for pupil learning.
- Utilizing local human resources such as farmers, carpenters etc.
- Using games and stories when appropriate.
- Assisting students to develop a study habit at school and at home.

- Promoting effective personnel communication skills and interaction among students.
- Encouraging promotion of a positive reinforcement and a helpful attitude in the classroom.
- Selecting appropriate new techniques of teaching.
- Making students aware of their achievements and responsibilities.
- Designing class-room instruction, based on development characteristics of children in a particular class and their needs and problems.
- Adopt effective techniques of arousing and sustaining pupil interest in class-room activities.

The above-mentioned points should be given priority to develop competencies in the teacher-training programmes.

7. Overview of the Development of Teacher Education Programmes

The implementation of the National Education System Plan (NESP) in 1971 provided a new impact to expansion and diversification of teacher education programme. As result of this plan the scope of activities of the Institute of Education (IOE) was considerably enlarged and diversified. The higher expectation placed by NESP on teachers and their training brought about a large increment in enrolment in the education campuses. The IOE was compelled to over-stretch its training capacity.

Regarding the importance of teacher-training programme, in the early 1980s the MOEC (Ministry of Education) initiated a series of innovative projects like *Seti* Education for Rural Development, the Primary Education Project, the Radio Education Project and the Science Education Project, in which Teacher Training was a major component. Nowadays the Basic Primary Education Project (BPEP), the Distance Education Centre, the Centre of National Education Development (NCED) and the Secondary Education Development Project (SEDP) are continuing teacher-training programmes as a major part of their activities. Although, MOEC has placed more emphasis on teacher-training programmes, major issues and problems are still affecting the whole programme. They are:

- A lack of clear and consistent directions in teacher education,
- A lack of appropriate organization structure,
- A lack of comprehensive planning,
- A lack of NIM
- lack of co-ordination
- a lack of sustenance of innovative approaches
- inappropriate facilities
- severe budgetary constraints

The teacher education has seen good and bad episodes in its history. The teacher education programme has been established permanently, which is a good sign in this field. The matter is only related with the quality of teaching. The quality of teaching in secondary schools largely depends on specialist subject teachers. Management of instruction and the process of leaning can be efficiently run by teachers, who are well-motivated, well-informed about the content, knowledgeable of NIM and well-equipped with a range of pedagogical skills. Only one of these attributes is not sufficient for improvement of secondary education. A pedagogically sound teacher may not apply his or her skill if his or her skill if he/she is not motivated.

The motivation of teachers can be enhanced by improving their working environment, recognition, rewards, benefits, promotion opportunities and job satisfaction. Opportunities for training itself are considered as a motivating factor but this newly acquired motivation may decline after the training period is over, unless the training leads to further opportunities for improved reward or status. Special incentives should therefore be designed to motivate teachers to work in rural and remote areas.

Dynamic world wide changes are taking place in the flows of information, communication, and technology and in understanding of all areas of knowledge. Consequently, secondary school teachers need to keep abreast of their subjects rather than to reply on outdated knowledge acquired years before. In order to keep up-to-date, a teacher has not only to learn new facts and figures, but also has to appreciate the modern application of the subjects and their relevance for Nepal. In order to enhance the quality, relevance and impact of teacher-training, the content and the delivery mode of the existing pre-service and in-service teacher-training programmes need to be revived and improved.

While content knowledge in important in imparting correct information, it is equally important that teachers know how to present the subject in a way that encourages the development of student's interests, understanding and skills. Pedagogical skills training will provide teachers with a range of teaching methods which place emphasis on the promotion of more effective learning.

8. Teachers to Develop Competencies

Teacher competencies are evaluated mainly by their teaching. How well teachers teach, is the main concern of parents, administrators, students, and even the average citizen. Everyone wants to have the best utilization of the input made on education. Effective teaching should be the main criteria for evaluating teacher competencies. We have to decide the major components that determine whether the teaching is actually effective or not. It is very difficult to distinguish

between effective and ineffective teaching, merely by observation. So the effectiveness of teaching mainly lies on the behavioral change of the target group. The teacher must be successful in carrying out all the intended behavior in his/her students. Teachers should therefore demonstrate the following competencies in effective teaching.

- selecting the objective at the correct level of difficulty,
- teaching to the objective,
- learners follow the objective,
- monitoring adjusting in his/her instruction
- appropriately using the principles of learning.

The difference between teaching and keeping student motivation while they learn, lies primarily in the use of the teacher's knowledge to make learning or achievement of an education goal easier, more rapid, and more predictably successful for a student. So the teacher has to know a lot of things in order to equip his/her knowledge with modern strategies of teaching. The teacher must have a knowledge of different sources that are helping in day-to-day teaching.

Technological innovations have brought about wide-ranging changes in the area of teacher education as in many other areas. Subject mastery is a pre-requisite for any teacher to be able to teach effectively, but it does not imply that this would make one an efficient teacher. The use of appropriate NIM and materials are also equally important for improving the efficiency level of the performance of the teacher.

The use of NIM involves with the process of the transfer or communication of information, knowledge and skills from the teacher to the learner. For decades, in Nepal, this process has hinged mainly on the spoken words of teachers. Our teacher-training was focused more on content and much less on methodology. The teachers were hardly given an exposure to application of appropriate media except to the use of a few materials. The teaching techniques that were used, often lacked the flexibility so important to suit to the different levels of students potentials and achievements and the varying sizes of the classes. In fact, the whole programme was not conducted systematically, as a result of which the NIM system could not be as effective as expected.

Instructional media are used as tools for teaching. They include, things which are handled, seen, heard, read as talked about, plus the equipment which goes with such activity. The growing use of such technology in today's schools and campuses in all developed and developing countries has helped relieve teachers from the routine role of 'information giving' . As a result, the teacher can devote his or her time and effort more to the important tasks of planning, arranging and evaluating learning experiences and out-comes. Another noticeable trend is the creation of a multimedia learning environment in the class-room which involves the use of a

variety of inter-related learning experiences.

Furthermore, today's teachers are expected to play the role of helping children to lead a more meaningful life. In order to be able to fulfill this role satisfactorily, the teacher needs to be sufficiently skilled as well as innovative in his working style. Teachers need to acquire a 'media competency', in addition to having the usual instructional skills. It is important to consider the application of NIM in teacher education and the need to bring about expected behavioral changes among the pupils through the teachers by making teaching-learning, exercises move effective and resourceful.

With these discussions on the expected behavior of teachers and learners, we can conclude that present knowledge of teachers should be upgraded and teachers need to be equipped with modern educational tools. Teachers need extra help to cope with the ever-changing nature of society, teachers are in need of new techniques of teaching, that can foster the learning of the students in a directed way and help teachers to look forward to having updated skills to keep up their prestige. To this end, teacher educators should provide the teacher with trainers who necessary professional knowledge and give guidance with aims to develop the required skills that can help make the teaching system effective as well as improve the immediate environment in which the pupils live.

9. Conclusion

Thus, it is assumed that teacher must always have studied a specialist subject for at least two years beyond the level at which he or she will teach. All programmes should include and contain elements that aim at the personal development of the student and provide supervised practical teaching. The academic focus will mainly be for concurrent secondary teacher-training of the understanding of the subject, educational foundations, curriculum content, teaching strategies and pedagogical skills are most sought-after.

For distance teacher education any of the above component may be included, depending on the background and needs of the individual participants.

Several of these possible models of secondary teacher education may need to be employed in Nepal, in order to meet the challenges of recruiting untrained teachers and significantly increase the proportion of trained teachers in secondary schools during this decade.

Considering the crucial role of teacher-training in view of raising the efficiency and effectiveness of the education system, it is important to consider the teacher education programme as a National priority. As part of this there is an urgent need to equip the schools with computers and other multi-media equipment. It is also necessary that a minimum amount of training is to be made compulsory for entering teaching and that promotion be made contingent

upon advanced training plus professional performance in the school. Obviously, the professional status of teachers will enhance the utility and impact of teacher-training and these measures are seriously being undertaken at the moment.

Table 1: Educational Statistics of Nepal at a Glance (1995) (2052)

Schools	Primary	Low-Sec	Secondary	Total
	(1-5)	(6-8)	(9-10)	(1-10)
Enrolments	**21.473**	**5.041**	**2.654**	**21.692**
Total	3.263.050	726.300	290.143	4.279.493
Boys	1.961.410	461.310	189.976	2.612.696
Girls	1.301.640	264.990	100.167	1.666.797
Girls (%)	40%	36%	35%	39%
Teachers				
Total	82.645	16.821	14.585	114.051
Total trained	35.057	5.438	6.491	46.986
Total trained (%)	42	32	45	41
Female	15.885	2.285	1.248	19.418
Female (%)	19	14	9	17
Female trained	5.787	779	624	7.190
Female trained (%)	36	34	50	37
Urban areas				
Schools	1.467	720	497	1509
Students	323.803	124.572	61.890	510.265
Teachers	9.941	4.076	4.049	18.066
Private Sector				
Schools	3.077	2.417	1.370	5.185
Students	250.681	144.123	103.396	498.200
Teachers	10.464	4.444	4.701	19.609
Ratios				
Student/School	152	144	109	197
Teacher/School	4	3	5	5
Student/Teacher	39	43	20	38
Student/ Tr. Teacher	93	134	45	91
School/Female Teacher	1	2	2	1
Age Group Population	(6-10)	(11-13)	(14-15)	(6-15)
Total	2.858.956	1.515.019	919.546	5.293.521
Male	1.477.687	783.591	472.109	2.733.387
Female	1.381.269	731.428	447.437	2.560.134
Gross Enrolment Ratio (%)				
Total	114,1	47,9	31,6	80,8
Boys	132,7	58,9	40,2	95,6
Girls	94,2	36,2	22,4	65,1
Net Enrolment Ratio (%)				
Total	67,5	26,1	17,3	47,0
Boys	78,7	32,9	22,3	55,9
Girls	55,6	18,9	12,0	37,5

Table 1: Educational Statistics of Nepal at a Glance (1995) (2052)

SLC Result (Regular Only)			
	Boys	Girls	Total
Appeared	61.625	29.251	90.876
Pass	25.097	9.545	34.642
Pass %	40,7%	32,6%	38,1%

Promotion, Repetition and Dropout 1994 (2051)

	Promotion		**Repetition**		**Dropout**	
	Total	Girls	Total	Girls	Total	Girls
Grade 1	37,6	37	41,9	40,5	20,8	22,5
Grade 2	70,1	71,1	18,9	19,1	11	9,8
Grade 3	77,3	77,8	17	15,8	5,7	6,3
Grade 4	73,2	75,4	16,9	16,9	9,9	7,7
Grade 5	67	66,8	17,4	16,8	15,6	16,5
Grade 6	79,4	81,2	13,2	13,2	7,4	5,6
Grade 7	81,1	80	11,1	11	7,8	8,9
Grade 8	71,2	72,3	16,9	17,9	11,9	9,8
Grade 9	76,8	80,4	12	13,6	11,2	6,1
Grade 10			18,3	20,8		

Teacher Education for the Effective Use of New Information Media in Pakistani Schools

Marajuddin Bhatti

Director of Training,

Institute for the Promotion of Science Education and Training

Ministry of Education, Pakistan

Summary

1. The Islamic Republic of Pakistan is a federation of four provinces, namely Punjab, Sindh, North West Frontier Province and Baluchistan. It is an active member of the Commonwealth, United Nations, Non Alignment Movement (NAM), Organisation of the Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC) and the Economic Cooperation Organization (ECO). Pakistan is world's ninth populous country. About 70% of its population lives in rural areas and 30% in the urban areas.
2. According to the constitution of Pakistan, education is the responsibility of the provinces except those which the provinces agree to put on the concurrent list. Thus, general policy, planning and overall guidelines, including curricula textbooks and educational standards are set by the Federal Government. Accordingly, the Ministry of Education, at the federal level, deals with curricula for all grades (I-XII), as well as with technical and vocational subjects, while provincial governments are responsible for their implementation and monitoring.
3. Formal education in Pakistan consists of four tiers and is essentially financed by either federal or provincial governments. However, in recent years schools, technical institutions, professional colleges and universities have been established in the private sector as well, such as the Lahore University of Management Sciences and the Institute for Educational Development (Aga Khan University).
4. Pakistan is actively pursuing a policy of encouraging non-formal education through programmes initiated by both public and private sectors, for example through the Allama Iqbal Open University (AIOU), Prime Minister's Literacy Commission, Provincial Education Foundations and NGO's .
5. Among the major problems related to education that the country has been facing over the last 50 years since independence are; i) how to raise literacy rates, especially among the rural female population; ii) to increase participation and retention rates at the primary level; iii) to increase physical facilities in schools in order to make the teaching-learning environment more attractive; iv) improving the curricula and making it more relevant to the needs of the person, society and the country; and v) enhancing competence and skills of

teachers by improving curricula of pre-service and in-service teacher education and providing more opportunities for the training and re-training of teachers.

6. Pre-service and in-service teacher-training programmes emphasize the use of one or another type of educational technology or information medium. Teachers are quite aware of the importance of audio-visual aids. The AIOU is implementing its distance education programmes through intensive and effective use of information media such as interactive Teaching Learning Resources, radio broadcasts, television programmes, video- and audio-cassettes. A separate Educational Television channel (ETV) has been set up for educational purposes.
7. Universities and professional Institutions (general and engineering/technical), business concerns, federal and provincial ministries/government offices, are increasingly using the new information media (NIM) such as computers, Internet, e-mail, video-conferencing, tele-conferencing. Some elite schools in major cities and towns are offering computer education and are using NIM in their programmes.
8. Although the government has initiated various schemes/projects to introduce computer education into middle and secondary schools and colleges, a large number of the educational institutions in public sector remain devoid of computer facilities.
9. Teacher training programmes have a component of communication technologies in their curriculum, but the necessary physical and other facilities are not available in most of the teachers training institutions and schools. This is due to many reasons: a paucity of funds, shortage of trained manpower; little emphasis and weight in the teacher education and school curriculum, are the most prominent reasons
10. There is a lot of potential in the use of NIM, but this requires sincere and strenuous efforts by both the public and private sectors. Special efforts are needed to make the necessary infrastructure available and ensure maintenance for the effective use of information media in education and integration into the educational system.
11. Innovative programmes are developed, keeping in view of the available resources for the introduction of computer education. It is imperative that the effective use of NIM in pre-service and in-service teachers training programmes is made mandatory and necessary competencies ought to be incorporated in the teacher education curriculum.
12. For effective and result-oriented implementation, there is a need that the Teacher Educators, Master Trainers and teachers are trained in the effective use of NIM.
13. NIM must receive due recognition, importance and place in teacher education curriculum and the school curriculum.
14. A national action plan will be prepared, based upon the experiences of advanced countries, and with the involvement of all stakeholders such as teachers, policy-makers; public in

general, and industry.

1. Background

The Islamic Republic of Pakistan emerged as an independent State in 1947. Stretching over an area of 796,095 sq. km. Pakistan has four provinces namely Punjab, Sindh, Baluchistan and the North West Frontier Province (NWFP). Islamabad is the federal capital. The country borders Iran on the West, India in the East, Afghanistan in the North and Northwest and the People's Republic of China in the Northwest to Northeast. There are 24 divisions, 124 districts, 400 *tehsils/talukas*, 4000 union councils and 50,000 villages in the country. It is committed for ideals of peace, security and progress as an active member of the U.N, the Commonwealth, Non-Aligned Movement (NAM), Organization of Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC) and Economic Cooperation Organization (ECO).

Pakistan is the world's ninth populous country (estimated as 135 million, 97% Population is Muslim). About 70% of its population lives in the rural areas and 30% in the urban areas. Its GNP per capita is US$ 476, while its expenditure on education is 2.3% of the GNP.

2. Educational System

According to the constitution of Pakistan, education is on the concurrent list and is largely a provincial responsibility. However, the Federal Government sets planning and overall guidelines, including curricula, textbooks and educational standards general policy.

(2-1) Formal Education

The formal education system in Pakistan consists of four tiers.[3]

Tier	*Grades*	*Age group*
Primary	Grades I-V	5-9 years
Secondary	Grades VI-X	10-14 years
Higher Secondary	Grades XI-XII	15-16 years
Tertiary	Grades XIII-XVI	17-22 years

Grades I-X are part of school education, whereas higher secondary education is usually part of college education. In recent years, primary schools have been upgraded as elementary schools (Grade I-VIII) and some secondary schools have been upgraded to host higher secondary classes. Universities offer graduate, post-degree and research programmes.

[3] *See also Chart 1 at the end of this chapter.*

Education in Pakistan is largely a public sector affair, about 10% of all students enroll into private schools. Most of the private schools are English medium schools and are located in cities and towns. The enrolment into various educational institutions by kind and level is given in Table 1.

Table 1: Number of Institutions, Enrolment, and Participation Rates, 1995-1997

Level of Education	*Number of Institutions*	*Enrolment 1995-1996*	*Enrolment 1996-1997(E)*	*Participation Rate (%)*
Primary Level (Grades I-V)	151	14.527	15.553	74,8
Middle Level (Grades VI-VIII)	146	3.605	3.756	31,6
Higher Level (Classes IX-X)	981	1.447	1.546	29,7
Arts & Science Colleges	0,798	735	830	-
Professional Colleges	0,161	147.218	150.969	-
Universities	0,035	74.441	71.819	-

Note: (E) Estimate

(2-2)Non-formal Education

The *Allama Iqbal* Open University runs functional literacy and occupational education programmes through distance education by correspondence courses and mass media. The target groups include women, rural people, unemployed youth, illiterate adults and the handicapped. The University also conducts teacher-training programmes.

The Government has initiated a special nationwide literacy programme under the Prime Minister's Literacy Commission (PMLC). More than 7000 non-formal schools have been established throughout the country. Provincial governments and NGO's are also sharing the burden of educating the population, especially females.

3. Overview of the Education Sector

(3-1) Science Education

In the existing Course of Studies, science is compulsory from classes I-VIII and is taught as an integrated subject, covering physical, biological and environmental sciences. There is a separate textbook of science for each class and the subject constitutes 10% of the total curriculum. General teachers as opposed to subject teachers teach science in the Elementary level (Classes I-VIII). Traditionally, the 'chalk and talk' method or recitation from the book are the most common methods of instruction. However, motivated and committed teachers do use audio-visual aids, in particular charts, models and displays. A large number of schools are also

using the Teaching Kit developed for primary classes.

Students who enroll in the science-stream at the secondary school level study physics, chemistry, biology and mathematics, together with other subjects. Those who enroll in the humanities group study general science along with other subjects.

About 40% of the students enroll in the science group at secondary level. In the urban areas, there is no significant difference between male and female enrollments. However, in the rural areas, a very small proportion of female students is enrolled in science subjects. In order to provide uniform quality science education up to secondary level, a professional body, the 'Institute for the Promotion of Science Education and Training' (IPSET) has been established in Islamabad, along with four provincial Science Education Centers (SEC's). The Institute has developed numerous books on various science subjects, which are being implemented in a phased manner. The Teaching Learning Resources (TLR's) developed at IPSET for Grades VI-X, are based on a pupil-centered, activity-oriented approach to teaching-learning. The new curriculum for Grades VI-VIII revolves around the central theme 'environment'. A science kit for grade VI-VIII has been developed and distributed to more than 5000 schools and an additional 5000 will be facilitated shortly.

(3-2) Curricula & Instruction Materials (Sec. & Higher Sec. Levels)

While the Federal Government controls curriculum development and approval of textbook manuscripts, textbooks are published and distributed by four Provincial Textbook Boards. Examinations are conducted by 22 independent Examination Boards.

The National Education Equipment Centre (NEEC), established in Lahore 27 years ago, has been developing prototypes of basic and inexpensive science equipment required in Schools and Colleges. The NEEC has, in collaboration with the Institute for the Promotion of Science Education and Training (IPSET), and the Department of Education and Research, been successful in developing primary and middle school science kits, which have been distributed to schools throughout the country.

(3-3) University Education

After higher secondary or the intermediate level, students in the science group can also opt for an academic stream or for professional education in engineering, medicine, dentistry or Veterinary sciences, depending upon their merit and choice. There has been an exceptional expansion of the number universities. Public sector universities have increased from 2 in 1948 to 25 in 1997. As the result of a liberal policy, which encourages the private sector to establish high quality educational institutions, nine universities have been given due charter. The University Grants Commission (UGC) co-ordinates university education.

(3-4) Technical and Vocational Education

(3-4-1) Secondary:

Pre-vocational orientation of various trades is provided to the students at lower secondary levels under the agro-technical education programme. Subjects offered at Grade VI-VIII are: industrial arts for urban schools, agriculture for rural boys and home economics for girls. Besides, some vocational subjects are also offered to students in grades IX-X.

(3-4-2) Post Secondary:

At present, there are 60 polytechnics (including 13 for women) and 14 colleges of technology in the country with a total enrollment of 28,827. These institutions offer a three-year post-secondary Diploma of Associate Engineering (DAE) in 27 technologies.

There are eight engineering universities, three engineering colleges and a few specialized engineering institutions. Their capacity is about 4,500 students. Most of these institutions offer graduate and research programmes in various engineering disciplines.

Post-secondary technical training education is divided into the following categories:

i) Polytechnic/Mono-technical schools offering a 3-year diploma course for Associate Engineers,

ii) Vocational training institutions offering certificate courses,

iii) Commercial Training Institutes offering D.Com/C.Com. courses

(3-5) Computer and Information Technology

The new information and communication technologies are being employed by various government departments, commercial organizations, universities and professional colleges. The spread of computer awareness, knowledge about computer applications, induction of programming skills and enrichment of the learning processes are among the few to be cited Presently, the following information and communication technologies are in use:

i) Internet and e-mail

ii) Audio-visual equipment (Overhead projectors, multi-media kits; slides. cameras, television sets, video-cassette recorders, video projectors, Fax-machines etc.)

iii) Closed-circuit television and video conferencing

iv) Use of computers and Desk Top Publishing

Pakistan entered the computer era in 1960 when PIA acquired an IBM mainframe computer. In 1971, the Pakistan Computer Bureau (PCB) was established to cater for the needs of computer education and training in the country. Over the years, in addition to organizing computer awareness and training programmes for different categories of government functionaries, the bureau provided advisory and consultancy services for computerization of

federal and provincial ministries and public sector organizations. The PCB also organizes National Computer Conferences from time to time and is publishing two computer-journals titled 'Computer Review' and 'Informatics Bulletin'.

Presently, all vendors/suppliers are assembling micro-computers and the exact number of PC's in the country is difficult to assess. According to a recent survey by PCB, there are 116 main frames, and 1508 minicomputers installed in the country in the public and private sectors. 168 organizations in the public sector, and about 300 organizations in the private sector are making use of mainframe and mini-computer systems.

(3-5-1) Computer Education at Secondary and Higher Secondary Levels

The New Education Policy of 1992 emphasized for the first time the initiation of computer education programmes in schools and colleges. Accordingly, computer studies as a subject were implemented at various levels of education in a limited number of schools in the public sector.

Computer awareness courses	Grade I to V
Computer literacy courses	Grade VI to VII
Computer studies as an optional subject	Grade IX to X
Computer Science as an optional subject	Grade XI to XIV

Some of the more notable projects launched by the Federal Ministry of Education in computer education are the following:

a) Computer Literacy in Pakistan Schools (CLIPS) for Grades VI-VIII,

b) Introduction of Computer Studies as a subject for Grade IX&X,

c) Prime Minister's Computer Literacy Programme and

d) Computer Aided Instruction (CAI).

Efforts in the direction of introducing CAI (Computer Aided Instruction) in schools have been made under the Science Education Project. A CAI course for Physics has been developed. However, this software is still at an experimental stage.

Almost all universities, professional colleges, and special institutions, both public and private, are offering computer courses of various nature and duration.

The government has set up a high-powered private software export board, for the production and export of software. A number of public and private sector organizations is actively involved in the development of software; 130 organizations have been registered with the board. Courseware and educational packages in the national languages are also in use and under development.

(3-6) Media in Education

New knowledge is changing so fast, that rapid transfer of these new scientific developments and technologies to the students through the textbooks alone is becoming increasingly difficult. The wider availability and cheaper cost of electronic technologies has made it possible to disseminate the new knowledge rapidly through the electronic media. A number of private schools and some of the well-established institutions (such as public schools) in big cities are using the NIM for the teaching-learning-process. However, the NIM are yet to integrate in the school system in the country.

(3-7) Teachers Training Programmes (Pre-service)

The role of teacher and his/her teaching competencies - knowledge, skills and attitudes - are of paramount importance particularly at the school level. The acquisition of all these competencies, skills and attitudes makes a teacher more effective in a classroom situation.

The rapid expansion of the educational system has been accompanied by important advances in teacher education. The general strategy in training programmes has been directed by two requirements: (a) an increase in the number of teachers, especially at the primary level and (b) the quality of training. On both counts, substantial progress has been made, yet, viewed from the overall requirements of teachers for various educational levels, the teacher-training programmes have suffered from 'stagnation and slow growth'.

(3-7.1) *Training of elementary school teachers*

Elementary level teacher-training programs are being offered in 67 Government Colleges of Elementary Teachers (GCET's). There are two kinds of programmes: the PTC (Primary Teaching Certificate)-program and CT (Certificate in Teaching)-program. The PTC program is meant for teachers who are trained to teach the primary classes I-V.

The CT-program prepares teachers to teach all subjects including English for grades VI-VIII. Both the programs are of one academic year duration (45 weeks). The curricula for both the PTC- and CT-program embrace ten subject areas in addition to teaching practice.

The system of evaluation for both the PTC- and CT-courses comprises of a mixture of internal and external assessment of both theory and teaching practice components. The award of the PT or CT certificates is determined by the Board of Examination in each Province.

(3-7.2) *Training of secondary school teachers*

The institutions preparing secondary school teachers are known as Colleges of

Education, and those offering advanced training, leading to M.A.Ed. or M.Ed. degrees, are called Institutes of Education and Research (IER's) or Departments of Education. These are usually affiliated to universities. At present, there are four IER's, two Departments of Education, and 11 Colleges of Education.

Two types of programmes are offered for the training of secondary school teachers (a) one-year B.Ed. programme (14 + 1 model) and (b) three years B.S.Ed. programme (12 + 3 model)

(3-7.3) *In-service Training*

The post-qualification professional development of teachers is the responsibility of Curriculum Bureaus and Extension Centers. The courses offered to teachers vary in their frequency according to local conditions. There are four types of in-service training programmes:

a) In-service training of untrained staff on full-time basis,

b) Crash programmes of three months duration,

c) Short-term refresher courses,

d) Seminars and Project/Schemes such as SEP-1, TTP, PMSP, GPEP.

Throughout the country, there are 13 in-service Teachers Education Centers or institutions, which conduct sporadic in-service refresher courses for teachers. The number of teachers who benefit from such refresher courses is insignificant.

4. Issues and Concerns

The current system of education facilitates the memorization of facts. Theories, principles and laws are emphasized rather than independent thinking, understanding and comprehension. As a consequence, the quality of education is on the decline. Among many other factors, the current system of teacher education and training is also responsible for this crisis. Following are some of the most important issues concerning teacher education:

(4-1) Professional Teachers Training

There are three main concerns in the professional training of teachers:

i) The inculcation of a value system appropriate to a career in teaching.

ii) The imparting of specific new skills, competencies and knowledge.

iii) The retraining of teachers to enable them to keep pace with new trends in education through in-service education.

In order to improve teacher-training in Pakistan the following areas need to be strengthened:

a) Quality of Teacher Training

Regular revision of the curriculum, enhancement of pre-service duration, lengthening of teaching practice, the addition of new technologies, and a strengthening of the assessment procedures are some of the aspects that need improvement.

b) Management and Coordination of Teacher Training

Responsibility for the planning and development of teacher-training does not rest with any single authority. Different agencies within MOE and PED's are responsible for the curriculum, staffing, textbook and examination functions. A more comprehensive approach is needed to improve strategic planning and development of teacher education.

c) Access to Teacher Training in Rural Communities

The existing system of investment in the educational sector favors the developed sections of the society. Rural communities, especially the female population, suffer in terms of low participation rates and low quality of education. For women in rural areas, access to teacher-training is constrained by (a) the lack of available training facilities in rural areas, (b) low salary benefits and a lack of incentives and motivation for females to enter the teaching profession, (c) social traditions that discourage women from learning or taking further studies which often involves travel to larger centers, and (d) the cost of providing separate schools for males and females limits the provisions of schools in rural areas.

5. Use of Information Media

(5-1) Status

It is recognized that only a small proportion of students adequately follow verbal communication in the classrooms, whereas a majority of the students, who are said to be contextual learners, learn better with aids and sensory experiences. These aids include both conventional materials and modern technologies including the information and communication technology (ICT).

The use of modern technologies depends upon a) availability b) appropriate training in the use of these technologies and c) due emphasis and place within the curriculum.

Courses of pre-service teacher education do not particularly emphasize the use of NIM at all levels due to various impediments. The most important ones are lack of financial resources, lack of trained manpower and insufficient availability and maintenance levels of necessary equipment

and materials. The only component that has some relevance is usually audiovisual aids, which include use of traditional, as well as electronic media. A substantial proportion of TTI's have facilities such as video-cassette recorders, television sets, radios, overhead projectors and slide projectors, but training in the use of these aids is given low priority as these facilities are not available in most of the schools where teachers will teach. The training received by teachers on these aspects has thus very little relevance to the actual classroom situation.

(5-2) Problems and Issues

Major problems in teacher education regarding information media, audio-visual aids and technologies are:

a) Physical Facilities

i) Adequate, appropriate audio-visual aids and modern information technologies are not available in TTI's and whatever is available is highly under-utilized,
ii) Inadequacy of funds available for this purpose,
iii) Lack of equipment and materials, outdated second generation hardware,
iv) Lack of audio-visual aids rooms,
v) Lack of facilities for maintenance and repair of equipment.

b) Teacher Education Curriculum

i) Teacher education curriculum at all levels, does not reflect the emphasis on the development and use of teaching aids, (audio-visual aids) and use of modern technologies,
ii) Very little importance is attached to the use of technologies during the teaching practice and in the assessment of student performance,
iii) The training being imparted in the preparation and use of audio-visual aids and technologies in teacher education is only partially relevant to the actual school situation,
iv) Shortage of qualified and skilled staff and teacher educators.
v) Teacher educators do not have proper training to prepare teachers for the use of audio-visual aids and other educational technologies.
vi) Teacher educators do not make use of sufficient use of available facilities.

6. Innovations in the Education Sector

(6-1) A parallel system of vocational high schools will be established for imparting employable skills, such as computer languages, word processing, typing, basic accountancy, industrial arts, agricultural skills. It will be introduced in selected secondary schools in

accordance with the requirements of the local market.

(6-2) To improve the quality of current teachers, a variety of approaches will be adopted for their in-service training. These approaches will include; a) distance learning through non-formal education; b) establishment of teacher resource centers in selected places; and c) mobile teacher-training programmes, particularly for female teachers in rural areas and on-the-job training through learning coordinators.

(6-3) The existing Education Extension Centers will be developed as Centers of Mobile Teacher Training. Innovative programmes of teacher-training, such as modular approaches and audio/video cassettes containing training lessons will also be used.

(6-4) A system of incentives in the form of awards and recognition will be introduced by linking the career of teachers with their periodical in-service training and efficiency.

(6-5) Teacher Education

Some of the major innovations in teacher education are:

i) Mobile teacher-training programs for females,
ii) Learning coordinators (LC's) and learning modules ,
iii) Teaching kits for primary schools and science kits for middle schools,
iv) Institutionalization of science education improvement efforts at the school level ,
v) Field based one year postgraduate diploma program in primary education (AIE),
vi) Two-year field-based MED program of IED(Aga Khan University) in Karachi for primary teachers,
vii) Field-oriented teacher-training programs under TTP/Ministry of Education,
viii) Programs for community model schools for girls PEP-III,
ix) Two-phased *Tehsil*-based training program under PMSP,
x) Integrated teacher-training programs for training master trainers, supervisors, administrators, and examiners under holistic approach of SEP-I/IPSET.

(6-6) Computer Education

i) Under various projects, computer-based MIS for whole education system are to be organized. This will facilitate planners, administrators, policy makers and teachers in their own area of operation. It is proposed that District Science Schools (DSS's) and Regional Teachers Training Centers (RTC's) are to be set up under SEP-2, they will be linked through the Internet.
ii) For the development of software, a special high-powered group has been established for initiating a crash programme for training in the software development.
iii) Computer education will be a compulsory component for all training programmes in the

education sector.

iv) Computer education will be a compulsory part of the curriculum at all levels of technical and vocational education.

v) Incentives, in the form of matching grants, will be provided to the private sector to support the establishment of high quality training and research institutes in computer and electronics.

vi) Incentives will be provided to the education-related industries to provide computers at low-cost.

7. Future programs

With the importance of primary and secondary school education in mind, various projects and programmes will be launched to improve primary and secondary school education. Efforts will focus on three fronts: a) enhancing the learning environment; b) improving the preparation and motivation of teachers; and c) strengthening educational management.

(7.1) Primary Education:

Universalization of primary education is the highest priority of the government. By the year 2002, almost all boys and girls in the 5-9 age group will be enrolled in primary or mosque schools. Awareness programmes for computer education will be initiated at primary level with the participation of the community.

(7.2) Secondary and Higher Secondary Education:

Facilities for secondary education will be expanded to absorb the increased output from primary schools. For this purpose, about 2.4 million additional seats in classes VI to X will be created by upgrading primary and middle schools, establishment of new high schools and adding classrooms in the existing schools. Facilities for teaching science subjects will be improved by provision of additional laboratories and equipment and better-trained teachers.

(7.3) Curriculum and Instructional Materials:

In order to make the curriculum more relevant to the learners' needs, a new curriculum development cycle will be initiated to encourage inquiry, creativity and analytical thinking through project-oriented and problem-solving approaches in teaching. New concepts of immediate importance, such as computer education, environmental education, health education and population education shall be integrated into the school curricula. The textbooks will be revised and updated to incorporate new knowledge, using graded vocabulary and pedagogical

approaches compatible to the age level of the learners.

(7.4)Teacher Education:

Alternate new teacher-training models being proposed are:

10 + 3	For diploma in primary education (PTC/CT)
12 + 3	For B.Ed/BS(Ed)
B.Ed + 1 ½ years	For M.Ed

(7.5) Institutionalization of Teacher Education:

The Technical Panel on Teacher Education (TPTE) at federal level and four Provincial Institutes of Teacher Education (PITE's) are established to institutionalize teacher education. To provide better in-service and pre-service facilities, training outposts are to be established in rural areas.

(7.6) Media in Education:

Special programmes of video lessons, based on school and college curricula, particularly on complicated topics of science and technology, will be produced and disseminated through electronic media. Copies of these video lessons will also be made available to libraries and individuals on non-profit basis. Special enrichment programmes of new scientific disciplines will be made accessible to the learners, both through electronic media and through videocassettes. Furthermore, studio facilities available through a Second Educational TV Channel will be used as well.

Curricula will be revised to establish the use of information media in school education. Necessary measures will be taken to reach far-flung areas through satellite, radio and television.

8. The way ahead

With the development of new information and communication technologies, globalization, and for the sake of the sustainable development, it is imperative that the developing nations are provided with more opportunities for development. Therefore, it is essential that the member states agree on a regional action plan that will make a rapid development, integration and implementation of information technologies into the educational system possible. This regional action plan needs to be developed, while keeping the specific needs, aspirations and resources of each member state in mind. Some suggestions are:

(a) Regional Level

i) ICT-Related competencies, skills, and attitudes should be categorized in order of

importance.

ii) International cooperation and assistance should be provided to develop a stage-wise and level-wise curriculum for the introduction to and development of skills, competencies and attitudes of teachers both in pre-service and in in-service teachers training programmes.

iii) To facilitate a rapid implementation, a phased implementation programme must be developed and members should be asked to adhere to such a programme.

iv) To provide equal opportunity to each of the member countries, the government agencies, organizations, institutions should be asked to agree on the action plan in line with current impetus and the allocation of necessary financial, material and human resources.

v) Programmes and courses involving cost-effective equipment ought to be developed, and disseminated among the member countries.

vi) Each member state should assign an organization or institution to the task coordinating and monitoring activities related to introduction of information technology and media at various levels of the educational system.

vii) UNESCO, or related programs such as APEID, should coordinate the efforts to introduce and strengthen NIM education in the member-countries.

(b) National Level

i) NIM should be given due importance and emphasis in teacher education and the school curriculum.

ii) A national conference of agencies, organizations and institutions involved in the development, preparation and implementation of teacher education curriculum ought to be organized to discuss problems and issues related to the effective use of NIM in schools.

iii) In the light of the findings of the Conference and the guidelines that emerged from the APEID seminar, a national action plan ought to be prepared with the participation of all the stakeholders, such as government agencies, the public in general, NGO's, teachers, Teacher Educators and industries.

iv) After the approval of the action-plan by authorities, especially the political leadership, the plan ought to be implemented with the active involvement of the stakeholders.

v) An organization or institution ought to be given the responsibility of monitoring and evaluation of the progress, effective and efficient implementation and coordination.

vi) To overcome possible resistance from teachers, information packages ought to be developed for teachers, heads of institutions and the general public ant others.

vii) Training packages for the introduction of NIM in teacher education (Master Trainers, Teacher Educators and Teachers) ought to be developed, evaluated and disseminated to all the teacher-training institutions for adoption.

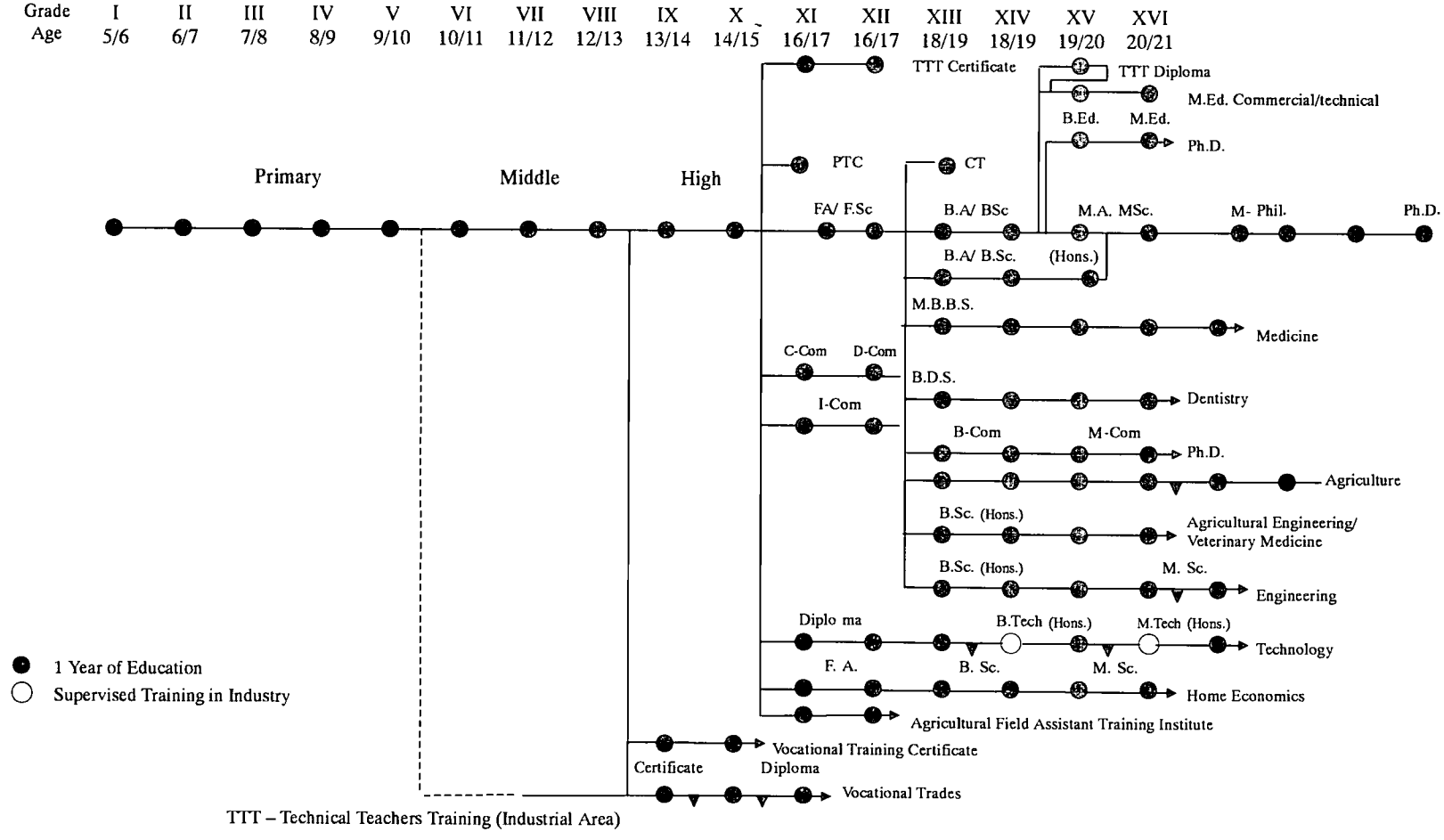
viii) During the recent past, there has been a sporadic spread of institutions offering computer training in the country. This needs to be regularized, and regulated.

ix) Periodical conferences, workshops, and seminars on NIM should be held in order to review the situation and recommend further measures.

Table 2: Educational Targets up to the year 2002

Policy Targets	*1992*	*2002*	*Policy Targets*	*1992*	*2002*
Primary Education			*(B) Colleges of Technology*		
Schools	124.000	230.957	Institutions	11	19
Enrolment	11.500.000	21.800.000	Enrolment	13.180	32.506
Teachers	329.000	594.000	Teachers	737	945
Participation rate (%)	66,30	99,10			
Secondary Education			*(C) Vocational Institutions*		
Schools	19.000	48.487	Institutions	194	527
Enrolment	4.750.000	9.150.000	Enrolment	12.000	41.130
Teachers	130.000	338.586	Teachers	1.685	6.288
Participation rate (%)	32,64	49,87			
Higher Secondary Education			**Higher Education** *Degree Colleges*		
Colleges	535	935	Institutions	359	795
Enrolment	450.000	832.000	Enrolment	142.000	267.000
Teachers	8.026	14.025	Teachers	9.322	14.822
Participation rate (%)	7,30	14,00	Participation rate (%)	2,80	5,00
Technical and Vocational Education			*Universities*		
(A) Polytechnic			Institutions	23	43
Institutions	60	99	Enrolment	86.000	186.000
Enrolment	26.000	60.643	Teachers	4.485	6.415
Teachers	1.546	4.176	Participation rate (%)	0.90	2.00

Structure of the Educational System (Formal Only)



The Philippine Country Report

Robinson C. Soria
Department of Educational Technology
College of Education
University of the Philippines

Summary

The major role of schools in the Philippines, as in other societies, is to teach the young and to certify the students' academic preparedness. However, the schools have been unprepared to perform this role in the case of the use of NIM or instructional computing. Until now, many neither have the adequate computer facilities nor the properly trained teachers to be able to teach with or teach about computers.

This is true even in collegiate programs, where there is a government mandate to include computer technology, such as accountancy and engineering. However the situation the gravest at the elementary and high school levels. In public schools where 95% of elementary pupils and 65% of high school students enroll, there are no educational computing programs at all. As for the private schools, only a few have offered such programs so far. At present, Philippine schools are sadly unable to teach children about new information technology and media.

This could be traced back to the lack of training of school teachers in elementary, secondary and even tertiary levels, due to the lack of computer literacy courses in their pre-service education. Until recently, teachers who have been fortunate to grasp and understand this NIM learned it through short-term crash courses, if not from vicarious experiences.

Meanwhile, the demand for computer courses continues to build up. Nowadays, computer education is becoming one of the more popular courses. Students take computer courses despite of inadequate facilities and instruction. And their teachers, realizing the need for them to know and understand the technology have joined them in taking remedial, if not crash courses in use of the computer.

This situation needs to be corrected in a number of ways. One is in its economics. The demand for computer courses is so high that the cost and quality of educational computing is virtually dictated by the supplier, often in the form of training centers. To right this situation, it is important to take into account the needs and capacities of the clientele as well, i.e. make the courses affordable while ensuring quality at the same time. Any school, which complies with this, would earn the confidence of the public and thereby promotes its long-term interests.

A second way is to redirect the situation by introducing educational computing at the lower

levels -the elementary and high school -especially in public schools, where most school children enroll. From a pedagogical point of view, the best time to teach computer skills is at these levels; It seems a waste to wait until college to teach these.

Another way is, to expand the use of computers in schools, from teaching about computers (which has been the emphasis to date) to teaching with computers. To be able to do this, drastic change in the pre-service education of teachers is necessary. Furthermore, improvement of in-service training of teachers in this respect is also imperative.

Governmental and non-governmental organizations, including private corporations need to forge an alliance to ensure that school children through their teachers will be able to grasp these new technologies and will learn to use them in other curriculum areas as well.

1. Introduction

Not long ago, Rita Moreno, a teacher, shared with us some of her memories of the way teachers used media to effectively teach foreign language courses when she was in high school. Language teachers were noted for capitalizing on the strengths of the many of instructional media. Besides the use of authentic objects from foreign cultures, including food, jewelry, clothing, and even games and toys, a variety of visual aids were also displayed around the classroom. Ms. Moreno remembers brightly colored posters and maps, as well as decorations and brochures. As the students' facility with the particular language increased, Spanish newspapers were and magazines were read. Novels and textbooks written in foreign languages were read and discussed, and phonograph records were used to present popular music from other cultures. Occasionally, even a foreign film was shown. Rita also described the yearly homemade slide shows that her language teacher would make following her most recent trip overseas.

One of the most innovative applications Rita experienced was the language laboratory, which was a great way to offer individualized language instruction to each student. Rita remembers working in small study-cubicles equipped with audiotape recorders and headphones, listening to passages in different languages. What was interesting about the setup of these laboratories was that, even though students' responses were not recorded on the tape being played, the teacher could listen in on the cubicle and give students feedback. This kept students on track and also provided opportunities for teacher-student interactions based on specific learners' needs. This was fairly popular approach at the time, and Ms. Moreno, as a student, appreciated the features of individual work, opportunities for practice, and tailor-made teacher feedback.

When Rita first started teaching she utilized many of the techniques she was familiar with (only instead of creating a slide show, she used a video recorder when she traveled overseas). The

traditional media and methods still had a lot to offer language students. Yet, she began to experience some frustrations, due in part to the widening range of students enrolling in her courses. She needed to find ways to increase her own capacities to meet individual learners' needs. Rita described her initial hesitation and early frustration in trying to use the computer to meet those needs. '*It was awful. I was so afraid I was going to break something or mess up a program, or lose what I was working on. I knew nothing about the computer. I did not even know what a floppy disk or a hard drive was, I attended a workshop one summer that covered a lot of basic technical stuff, and I managed to hook up with another language teacher who was just a few steps ahead of me. The thing that saved me? I learned how to learn from my mistakes!*'

Rita has grown a lot in both knowledge and confidence since she took that first computer course. She continues to look for new ways to make learning meaningful and exciting for her students, and, as one might expect, many of Ms. Moreno's recent innovations revolve around some type of computer application. Yet what she is able to accomplish today, still rests on the basic knowledge she gained during that summer workshop. Knowledge of computer basics is still fundamental in order to be able to use the computer as a NIM in an effective manner.

The above is one example of how a number of Filipino teachers are slowly taking on the challenge of the use of computers in Philippine classrooms. While this story may be true to private school teachers, a different situation is being painted by teachers in public or government schools, as a survey, conducted for this report, shows

2. Problem Areas and Issues

(2-1) Computer Literacy in the Teacher Education Curriculum

As Ms. Moreno's case shows, pre-service training in a teacher education institution until very recently, did not include a course on the use of computers or other NIM. Most teacher education programs offer only a course on instructional media resources or audio-visual aids. It was only recently that courses on computer literacy were introduced into the curriculum. At the College of Education of the University of the Philippines, prospective teachers are required to take at least three 3-unit courses:

(1) Instructional Media Resources,

(2) Introduction to Computers in Education, and

(3) Introduction to Research.

This is in addition to a number of courses where computer-use is integrated. Some of the more resourceful prospective teachers manage to take a course or two outside their regular curriculum, either as electives or cognates. A number of them enroll in short-term computer literacy programs offered by private institutions. However this is mainly because they are aware of the

need for the technology in performing course requirements for research undertakings or paper preparation and presentations, but *not* as something necessary in their future work as teachers. Therefore, it is not surprising that the likes of Ms. Moreno claim to be computer illiterate.

Sadly, most of the 500 teachers in the sample used in the survey do not even know what a *hard disk* is, or what a *disk drive* is, or what a *CPU* is. Most of the computer-jargon, including the terms *hardware* and *software*, is foreign to them.

Though the term *multimedia* has been around for a while, most of the teachers still think of it as a system composed of a bank of slide projectors dissolving one image into another and synchronized to a master audiotape. Only a few of them realized that this term refers to a system in which various media (e.g. text, graphics, video, and audio) are integrated into a single delivery system under computer control. The same small number also realized that interactive multimedia system makes it possible to weaver together text, graphics, animations, data, video and audio from various sources, including videodiscs, CD's and computers themselves.

When asked about one of the most important developments in educational technology, that is the notion of information-processing machines that work by associations, just as the human brain does, almost all of the teachers in the survey claim to have no knowledge of the concept hypermedia and hypertext. Only a negligible few know that a hypermedia system represents nodes of information containing graphics, animation, video, or audio as well as, or instead, of text.

(2-2) Teachers' Knowledge versus Skills in Computer Use

When asked about the roles of computers in education, most of the teachers agree with the popular categorization scheme developed by Robert Taylor (1980), who divided these roles into three broad categories: the *computer as a teacher*, the *computer as a tool*, and the *computer as a learner*. Most of the teachers say that in the first category, the computer presents instruction to the learner as in computer-based instruction (CBI), computer-assisted instruction (CAI), or computer-assisted learning (CAL). However, only a few checked instructional approaches such as drill and practice, tutorial, simulation, problem-solving, and instructional games as being related to CBI. When asked if they use or have any experience in employing these instructional approaches with the computers, almost all of them answered 'never.' When this non-use was investigated more closely, their lack of training and application of computers within classroom setting surfaced as a primary reason, besides the lack of the appropriate hardware and the programs or software.

In the computer as a tool category, a good number of the teachers agrees that computer aids the teacher or the learner in performing routine work tasks. Most of them say that it can be a substitute for a typewriter. Only a few teachers believed it could also be utilized as a filing system,

a financial worksheet, artist's canvas, or a drafting table. Most of them see the promise of the computer as a tool in the production of instructional materials (e.g., printed matter, graphics, and interactive presentations). Teachers also see it as an aide in developing students' research and critical-thinking skills through work with computer databases. While most of them know that computer applications for education include word processors, only a small number knows about databases, spreadsheets and other numerical tools, graphic packages, computer communication tools, and integrated tools, which combine more than one of the preceding applications. As in earlier queries on practice and use of these applications, the teachers in the survey claimed their knowledge of these are superficial and only vicarious - relayed by friends or read in journals and books.

The third category of computer usage in education is all too common for all the teachers in the survey. All of them agree that the traditional roles of computer and learner are reversed with the computer becoming the learner and the user becoming the teacher. The teachers perceive that the objective is for the user to '*teach*' the computer to perform some task and in order to achieve this objective, the user must gain an understanding of how to perform the task and must be able to communicate this to the computer in a way that the computer will '*understand.*' Few of the teachers, mostly those, who have enrolled in graduate school, boast to have started using computers for performing statistical calculations in relation to their requirements in statistics or research courses. Moreover, these are the only ones who claimed that they have some working knowledge of computer languages such as Logo, BASIC and Pascal. None of them, however, have any knowledge of the newer multimedia/hypermedia authoring tools such as *HyperCard*, *HyperStudio*, *Linkway* and *Toolbook*.

As appears from the answers in the open-ended questions, the main reason for teachers' non-use of computers for instructional purposes or even for personal use is the limited access to, if not the lack or absence of, computer facilities in their own schools. The teachers' claim that the price of computer is prohibitive, due to the very low salary of teachers. Ranked next in the reasons is the teachers' lack of confidence or ability in the use of computers. Others even claim to have developed fear of or anxiety about the use of the technology for instructional purposes and settings. A complete ignorance of computer applications in education is listed last among the reasons by only a few of the teachers.

(2-3) Teachers' Attitudes towards Computers and its Use in Education

The apparent lukewarm attitude of teachers towards computer use, either for personal purposes or educational use has its roots in a number of factors. Aside from those already mentioned in the discussion of the survey, other factors gathered from literature on the subject, in particular those outlined by Michael Apple (1992) which are applicable to the Philippine public

school teachers' situation, deserve mention here.

For one, considerable pressure, is building up to have both teaching and school curriculum specified in greater detail and have them tightly controlled for the sake of 'efficiency', 'cost-effectiveness' and 'accountability'. In many ways, the de-skilling, the removal of the use of personal abilities in work, that is affecting jobs in general is now having an impact on the work of teachers as well, as more and more decision-making is removed out of their hands and consequently their jobs have become even more difficult to do.

Given the already heavy workload of most teachers and the expenses involved, one can assume that most teachers will be given a very small amount of training in the use of computers, their social effects, and programming. This will be especially the case at the elementary and secondary school levels, where most teachers already teach a wide array of subjects. Research indicates that few teachers are given substantial information before computer curricula are implemented. Often, only one or two teachers are 'resident experts'. As a result, most teachers have to rely on prepackaged materials and existing software.

Reliance on prepackaged software can have a number of long-term effects. First, it can cause a crucial loss of important skills and dispositions on the part of the teachers. If skills, such as local curriculum planning, individual evaluation are not used, they will atrophy. The tendency to look outside one's own or colleagues' past experiences about curriculum and teaching is lessened, as considerably more curriculum, teaching and evaluation processes that surround it become something that one purchases. As a result, the school is transformed into a lucrative market; the industrialization of the school is complemented, by further opening up the classroom to the mass-produced commodities of industry. It will be a publisher's and salesperson's delight. However, whether students' educational experiences will improve remains the question.

The relationship between purchased software and hardware and the possible loss of skills and power teachers does not end here, though. The problem is even made more difficult by the speed with which software developers are constructing and marketing their products. There is no guarantee that the majority of such materials have any major educational value.

While perhaps overstating his case, the director of software evaluation for one of the largest school systems in the US concluded that of the more than 10,000 programs currently available, approximately only 200 are educationally significant. However, the sheer volume of material, the massive amount of money spent on advertising software, the utter overestimation of the claims made about it, and the constant pressure to introduce computer programs to schools make it nearly impossible to do more than cause a small dent in the perennial nature this problem.

Teachers simply do not have the time to thoroughly evaluate a considerable portion of existing curricular material and texts. It only increases their workload. Teachers' work is increasingly becoming, what students of the labor process call, 'intensified'. More and more needs to be done

in less and less time. Thus, one has little choice but to simply buy ready-made material from sources whose major aim is profit, not necessarily educational merit.

Another important reason is gender. One cannot ignore the fact that in the Philippines, and perhaps the world over, the majority of teachers are women. Historically, the introduction of prepackaged or standardized curricula and teaching strategies were often related to the rationalization, and the attempt to gain external control, of the labor progress of women workers. Hence, no one can completely understand what is happening to the removal of teachers' skills, intensification of work, the separation of conception from execution i.e. loss of control over the educational process unless one situates these tendencies into this longer history of what has often happened to occupations primarily made up of women. Only by raising the question of who is most often doing the teaching in many schools that are now introducing prepackaged software, can one see the connection between the effects of the curricula and the composition of the teaching force in terms of gender

Another significant consideration is funding. First, we may be dealing with a 'zero-sum game'. While the prices of computers has dropped significantly they are still relatively high. The funds for the new technology must come from somewhere. In a time of fiscal crisis, the addition of computer curricula most often means funds must be drained from one area and given to another. What will be sacrificed? If history is any indication, it may be programs that have benefited the least advantaged.

A second issue of costs concerns staffing. At secondary schools, layoffs of teachers have not been unusual as funding for education is cut. The declining enrollment in some regions has meant loss of positions as well. This has caused intense competition over students. Social studies, art, music and other subjects must fight it out with newer, more 'glamorous' subject areas. To lose the student numbers game is to lose a job. Is it really educationally or socially wise to tacitly eliminate a good deal of the choices in other fields so that one can support the glamour of a digital future?

This is not only a financial decision but an ethical question as well. Given the future developments in the labor market, do we really want to claim that computers will be more important than further work in humanities and social sciences or in students' own cultural, historical, and political heritage and struggles? Such decisions must not be made by only looking at the accountant's bottom line: - A lengthy democratic deliberation of all parties is necessary.

Third, given the development of prices of microcomputers and software, the pressure to introduce such technology may increase already wide social imbalances. Private schools and public schools in more affluent areas will have more ready access to technology. Schools in depressed and rural areas will be largely priced out of the market, even if costs continue to decline. Thus, the computer and computer literacy will 'naturally' generate further inequalities. It

will be the top 10-20% of the population who will have computers in their homes, and many of the jobs and institutions of higher education, they will be applying for, will either ask or assume computer skills as keys to entry or advancement.

This can only result in a further disadvantagedness of large groups of students. Students who already have computer skills – either acquired at schools or at home - will proceed more rapidly. Their original advantage which is not due to 'natural ability', but due to wealth, will be enlarged. We should not think of it as odd that many parents, especially middle-class parents, pursue a computer-dominated future for their children. Computer skills and 'literacy' are partly a strategy for maintenance of middle-class mobility. Having such expertise is like having an insurance policy: It partly guarantees that certain doors remain open in a changing labor market. In a time of credential inflation, more credentials mean fewer closed doors.

The issues and problems surrounding the application of computers in education are far-reaching. They include the very way students are taught to think about their education, their future roles in society, and the place of technology in that society. The new technology embodies a way of thinking that orients a person in a particular way. Computers involve ways of thinking that, under current educational conditions, are primarily technical. The more new technology transforms the classrooms into its own image, the more technical logic will replace critical end ethical understanding. The discourse of the classroom will center on technique, and less on substance. Consequently this shift will require social, not technical literacy for all students.

It is crucial that when new technology is introduced into schools, students have a serious understanding of the issues surrounding its larger social effect. Unfortunately, the social and ethical impact of computers is usually addressed in an unconvincing manner. Most curricula stress technical components. Only a brief glance is given to the history of computers. Yet, in this history, the close relationship between military use and computer development is largely absent. 'Benign' usage of computers is stressed coupled with a less than realistic description of the content and possibility of computer careers. Hardly ever mentioned is job loss or social disenfranchisement. The ethical dilemmas involved when we choose between, say 'efficiency' and the quality of the work that people experience, or between profit and someone's job, are made invisible.

We could counterbalance this by making it clear from the outset that necessary knowledge about new technology goes well beyond what we now take for granted too easily. A considerable portion of the curriculum should be organized around questions concerned with social literacy. Where are computers used? What do people need to know to be able to *actually* use them? Does the computer enhance one's life? Whose? Does it damage one's life? Whose? Who decides when and where computers will be used?

Raising questions of this type is even more essential for teachers in teacher education

programs and in-service workshops. Unless teachers and students are able to deal honestly and critically with these complex ethical and social issues, only those now with the power to control technology's uses will have the capacity to act.

New technology is linked to transformations in real people's lives, jobs, hopes, and dreams. Wise choices about its appropriate place in education are not only educational decisions. They are fundamental choices about the kind of society we shall have, about the social and ethical responsiveness of our institutions to the majority of our citizens in the future and to the teachers who now work in schools. New technology will not go away. It is of utmost important that we question whether the wagon we have been asked to ride on is going in the right direction. It will be a long walk back, if we are mistaken.

3. Innovative Methods and Approaches Presently Employed for Enhancing Teacher Competencies

(3-1) Restructuring Pre-service Teacher Education

In recent years, a number of national investigations, evaluative studies, including surveys, have been conducted to assess Philippine education. The results of these studies paved the way for a call for measures transforming the entire system. This includes the curriculum for teacher education, the curriculum for elementary (PRODED) and secondary education (SEDP) as well as the general education curriculum for tertiary education, the professional licensure examination for teachers (PBET then LET), and even the restructuring of the bureaucracy.

The UP College of Education has spearheaded this transformation by restructuring its own curricula for the various undergraduate programs and those of the masters' and doctoral levels. In the undergraduate programs, the College has set up courses on computer literacy and its educational applications. From one educational technology course previously, it has now at least three courses dealing with NIM. Other teacher education institutions in the country have since followed suit.

(3-2) Making Computer Literacy a Basic Requirement for Teachers

The move at restructuring the pre-service curricula for teachers runs parallel to the recent requirement by the Department of Education, Culture and Sports (DECS) that makes computer literacy a basic requirement for new teachers starting from the school-year 1997-1998. This requirement according to the DECS is in accordance with modernization program of the bureaucracy. This reform complements other moves and thrusts of the department to achieve that a sizable group within the teaching force will possess computer skills, which will result in a revitalization of teaching learning processes in the schools through the use of their information

technology skills. Teacher-applicants with a computer background in word-processing, use of spreadsheet, and database software will be preferred for new or vacant teaching positions. Those who have no computer background, will have to take crash courses in computer skills before taking on the teaching jobs.

For teachers who are already on the job, the College of Education is presently restructuring its masters' program in educational technology. In addition, plans are being finalized for the institution of three areas of specialization: - instructional designing, instructional media production and instructional computing. The old program has graduated close to three hundred teachers, most of them are currently heads or directors of their local school audio-visual centers, educational media centers or learning resource centers. The new and revitalized programs hope to receive a good number of prospective enrollees. Already arrangements are being made with the Department of Science and Technology-Science Education Institute (DOST-SEI) for the establishment of scholarship programs for teachers from selected basic education schools in the provinces and regions, where they have assisted in the establishment of model information technology classrooms and laboratories.

(3-3) Media Literacy as a Springboard

Teachers at the basic education level have started to teach special courses on media literacy, which will hopefully serve as a springboard for the introduction of the subject of computer use in the regular school curriculum. Private schools, as the trend in the county shows, have led the way in this respect.

(3-4) In-Service Training and Retraining of Teachers

Schools, mostly private schools, have started conducting in-service training for teachers on computer use. If not conducted in the school, their teachers are send to one of the hundreds of private computer schools in the country to attend short-term training programs. Leading these institutions in conducting short-term training courses in computer and the NIM is the government-owned National Computer Training Center, which has been in existence for over 25 years. This center also offers on-site training for teachers in schools where computer facilities are available.

(3-5) Non-Government Sector Initiatives

In response to the call by the President Fidel V. Ramos, a good number of private corporations have either adopted a school to provide computer facilities or have volunteered to train teachers in the new information technology and information media.

Eduvision, a private corporation established to help pursue a vision for the Philippines and the

Filipinos for the year 2000 and beyond, has pledged support to the President's National Information Technology Plan. Their Eduvision 2000 plan seeks to prepare young Filipinos for life in the 21st century, to enable them to enjoy its amenities and to be able to participate productively by promoting computer and information technology within the school system. Specifically, it gives assistance to schools to develop a capability to teach computer courses by:

- training teachers the ability to teach information technology (TT);
- training teachers to use Information Technology in non-IT course at all of levels of schooling, and for scientific, professional and other purposes;
- preparing affordable instructional materials and systems, that meet high professional standards;
- providing technical assistance in terms of content, methods, outcomes and other aspects of teaching computer courses; and
- supporting both the schools and the teachers with an Equipment Endowment Program.

On top of these, Eduvision will help schools upgrade their management systems with the use of IT, and by training supporting staff. Also, improve coordination with non-school entities through provision of computer education to articulate instruction within and outside the school system, and coordinate efforts with entities concerned with matching education and training, on one hand, and employment on the other. To date, there are some 300 computer schools and corporations aiming at the provision of training in computer-use and NIM.

4. National and International Co-operative Frameworks and Action Plans for the Enhancement of Teacher Competencies

(4-1) National Information Technology Plan 2000

The National Information Technology Plan 2000 (NITP 2000) documents an overall strategy to spur the country to global competitiveness through Information Technology (IT) diffusion. With its vision of a '*Smart Philippines*', NITP 2000 is designed to contribute to peoples' empowerment and socioeconomic development. It is based on the belief that the country can benefit from a shared national vision of harnessing IT, in the same way that businesses and nations world-wide have done, and to launch the Philippines as a Newly Industrializing Country (NIC). It consists of a strategy by which the government and the private sector will work together in order to optimize the benefits of IT.

The forging of NITP2000 has benefited from the results of previous proposals such as SPRINT85, PCS NITP1988 and NITP1989, and particularly used the results of a study of national IT policies of Asia-Pacific countries conducted by the Center for Research and Information Technology Organizations (CRITO) at University of California in Irvine. The plan is

the product of extensive consultations between the private sector, notably the key players in the IT industry, the academic community and government. It is intended to be a sectoral plan for IT in the Medium Term Philippine Development Plan (MTPDP).

Among its structural components, which includes sectors of telecommunication, industry, government, research and services, is the education sector. The education sector has two components: IT literacy and IT manpower development. IT literacy is a major concern of both the educational system and IT solutions providers (hardware, software and consulting) supported by the mass media. IT manpower development is a major responsibility for the educational system in strategic alliance with technology sources for the academic aspect of manpower development and with the various industries for the practical training aspect.

The underlying objective of this component is to promote extensive IT use. It intends to educate government and business leaders and executives on the importance and the use of IT in the technology-based contemporary setting for enterprise and nation building. Furthermore, it aims to produce an adequate number of IT-competent workers, to improve the technical capabilities of R&D, IT education and training institutions, to promote the country as an alternative IT education center and to expand general IT awareness.

(4-2) Establishment of the National Information Technology Council (NITC)

To oversee the work for the NITP 2000 the National Information Technology Council (NITC) was formed. It will serve as the IT advisory body to the President of the Philippines. The NITC has received a mandate to:

- recommend to the President, policies relative to the implementation of the NITP2000 in consultation with all the agencies concerned;
- monitor and ensure the implementation, and to undertake periodic review and upgrading of the NITP2000
- recommend to the President a legislative agenda that will promote an accelerated development and application of IT in the country;
- monitor major IT projects, significant developments and activities that affect NITP 2000, especially in the government, through an institutionalized system of networking;
- assess, review and provide direction to continuing research on various relevant aspects of IT, including the assessment of the IT industry's progress and problems;
- advocate strategic alliances between government, business, academe and non-government organizations in order to promote a team approach in IT efforts, especially in the area of technology transfer;
- catalyze industry growth by syndicating alliances with the international community for large national projects with massive private sector participation; and

- facilitate the sourcing of funds to support the implementation of programs and projects.

(3) Mandatory Teaching of Computer Courses in Public Schools

Currently a proposal is being deliberated in Philippine Congress making integrated computer education mandatory in all schools nationwide as part of preparations for training Filipino youth for the next century. Senate Bill No. 1273 authored by Senator Edgardo Angara provides for the establishment of a Board of Computer Education and the institutionalization of a voucher system for specialized computer education in the country's poorest 19 provinces. Co-authored by other members of the seven-man 'conscience bloc', the bill also provides for the inclusion of basic computer applications and programming in the school curriculum.

Under the bill, the proposed Board of Computer Education would have the task to train school personnel, prepare curriculum for computer-aided logic, mathematics and science education at the elementary level, monitor schools' performance and evaluate the abilities of students enrolled in the program.

It also proposes setting aside of a 100-million pesos seed fund from lottery-proceeds of the Philippine Charity Sweepstakes Office and the allocation of 5 million pesos annually to each of the 19 poorest provinces in the country for the promotion of computer education.

Students from these 19 provinces who have completed secondary education would be allowed to take competitive aptitude tests in specialized computer applications. Those who passed the tests would then be given a voucher worth 5.000 Pesos to enroll in a computer school of their choice to finish advanced programming courses, such as computer-aided design and networking.

To sustain the quality of education in computer schools, the board would be tasked to monitor their performance, sponsor national competitions, grant incentives and demand a periodical renewal of licenses to operate. Incentives to promote excellence include the tax-free import of all computer hardware, software, peripherals, and documentary material needed in the schools.

5. Conclusion

There is still a long way ahead before the Philippines can match Japan or most of its Asia-Pacific neighbors in terms of computer literacy or the use of information technology and NIM. It 's a slow, but hopefully certain process. However, the government, the private sector and the non-governmental organizations as well as teachers, students and their parents are full of anticipation of its information technology's applications, not only in education, but in other areas of national concern as well

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Master Plan for Reforming Teacher Training, Teacher and Educational Personnel Development in Thailand

Chukiat Leesuwan

Dept. Dean for Foreign Relations and Special Affairs
Faculty of Education, Chang Mai University, Thailand

1. Background

The 1992 Educational Scheme established its policy concerning teachers and educational personnel on reforming teacher-training and in-service teacher development. The policy aimed at developing the teaching profession; to create a sense of teacher awareness, to develop and standardize knowledge, academic and professional capabilities, and also to raise the teaching professional standard.

The seventh National Educational Plan (1992-1996) established its policy upon teachers and educational personnel to accelerate the reform of teacher-training, developing employed teachers, and raising the teaching professional standard. The plan's objective was to produce qualified teachers who would be able to perform their duties directly relating to the national plan's goals. As a result, it was expected that there would be an appropriate number of teachers trained relating to the various needs of educational levels and categories.

In December 1992, the National Educational Commission Office (NECO) organized a summative study on the problems relating teachers and educational personnel with a special relation to the goals of 1992 National Educational Scheme and the seventh National Educational Plan (B.E. 2535-2539). The results of this study were as follows:

1. *Quantitative problems*: There was a lack of systematic mechanisms to coordinate between organizations concerned with teacher training, the use of teachers for further planning of training, and among the organizations concerned with teacher training specifically. Those organizations neglected the coordination in terms of quantity, resulting in producing teachers in number unmatched to the teacher requirement both in overall and specific subjects.
2. *Qualitative Problems*: Qualitative problems can be classified as follows:
   2.1 Problems related to socio-economic situation, concerning the economic problems of the teachers and inappropriate behavior of the current teachers.
   2.2 Problems regarding teacher-training, concerning inappropriate recruitment of teacher students, and a small amount of practical training in their teaching and learning curricula.

2.3 Problems concerned with the use and training of teachers; teachers' appointments were unrelated to subjects and capabilities they were trained for. In-service training programmes usually were organized for teachers in order to upgrade their educational qualifications rather than to increase their capabilities.

2.4 The image of a teaching career and profession were regarded lower than other professions.

In January 1993, an operational workshop was organized to mobilize the ideas for conceptualizing tendencies and principles of teacher-training reform, and the training of teachers and educational personnel. That workshop concluded that:

1. Teacher-training reform and training of teachers and educational personnel should be conducted as a continuing and systematic process. Therefore, teachers' education should be related to the development of teachers, improvement of their positions, salaries, and welfare and also the improvement of the image of teaching profession.
2. There should be a systematic coordination among the organizations concerned with the selection and training of teachers.
3. Standardized criteria for teaching profession should be established.

In April 1993, the National Educational Commission Board held a meeting and agreed upon the concepts of the reform of teacher-training, and the education of teachers and educational personnel. These concepts were as follows:

1. Philosophy and principles in teacher training:

The teaching profession ought to be regarded as a high profession that requires a limited number of outputs to meet the standard already established. Personnel recruitment for teaching should be restricted and standardized. The teaching and learning process should be efficient.

2. Tendency of teachers' quality development:

Teachers' Training Institutes must be improved terms of efficiency and quality, and teacher training and educational methods, such as the use of boarding school system, reviewed. The administrative system should also be improved into a more flexible and free organization in order to attract people to become teacher students, through providing scholarships and special funds for those who are in the teaching profession.

3. Teachers' training should be organized as an overall system:

Teachers' training should be regarded as an overall system covering a recruitment of potential teacher students, management of teaching and learning, raising the teaching status and profession, building up morale and motivation. This system should help encourage intelligent and motivated people to enter the teachers' career.

The Board appointed a sub-committee to develop an operational master plan for the teacher-training reform, education of teachers and other educational personnel. That sub-committee was composed of the representatives of the Education Ministry, University Bureau, the National Social and Economic Development Board, and a number of academic members from the National Educational Commission Office. The main responsibility was to mobilize ideas and set up the principles and methods for teacher-training reform, teacher- and educational personnel development. The sub-committee has organized a number of seminars, workshops and meetings, and submitted the results to the National Educational Commission Board at the 7/2536 general meeting in November 1993. The Board's agreed upon the principles and methods of teacher-training reform, and teacher and personnel development. Then, the proposal was submitted to the cabinet, which also agreed upon it on December 14, 1993. The National Educational Commission Board was been designated by the cabinet to develop further details of the principles and methods.

(1-1) January 1994

The National Educational Commission Board consequently appointed a coordinating sub-committee on teacher-training reform, teacher and educational personnel development. The sub-committee members consisted of the representatives of the Ministry of Education. University Bureau, National Social and Economic Development Board Office, Budget Bureau, Public Relations Department, and a number of academic staff from the National Educational Commission Board Office. The Minister attached to the Office of the Prime Minister chaired that sub-committee. It was designated to coordinate among the concerned organizations in establishing operational plans with special relations to the principles and methods of teacher-training reform and teacher and educational personnel development, and also consider the amount of budget required for implementing these principles and methods.

(1-2) May 1994.

The National Educational Commission Board organized a seminar in the form of a public hearing on the principles and methods of teacher-training reform and teacher and educational personnel development. The seminar was attended by the coordinating sub-committee on the principles and methods of teacher-training reform, and teacher and educational personnel development, scholars, and people in various fields such as teachers, university lecturers, business people, PTA representatives, community leaders and journalists. The results of these discussions and debates were registered and integrated in the clarification of the principles and methods of teacher-training reform, and teacher and educational personnel development.

(1-3) June 1994.

The National Educational Commission Board Office recommended to the Board to appoint four sub-committees on the planning the principles and methods of teacher-training reform, and teacher and educational personnel development. The sub-committees were responsible for work out the details, goals, duration, and budgeting framework under the context of the principles and methods of teacher-training reform, and teacher and educational personnel development. The following sub-committees were set up:

1. The master planning sub-committee on the recruitment principle for students in the teaching.
2. The master planning sub-committee on the development of teaching profession. ,
3. The master planning sub-committee on teaching and learning reform in teacher training.
4. The master planning sub-committee on in-service teacher training

In addition, the National Educational Commission Board appointed another sub-committee on mass media campaigning for teacher reform, and the development of teachers and educational personnel, with the Director General of the Public Relations Department as its chairperson. However, there was not any appointment made to deal with the administration and management of the *Rajchapat* Institute (Teachers Training College), because the Rajchapat Act had already been approved by the Cabinet. Therefore, there was no need to do any more about this matter.

The chairperson of another sub-committee on the establishment of '*Ratchawitayalai Karusart*' (the Royal Teaching Professional College), proposed another hearing to gather the opinions from other concerned people at that stage. The main reason was that that matter was quite new. After this hearing, the formulation of clearer model would be possible with a careful and mutual understanding amongst all sectors and persons involved.

(1-4) September 1994.

A meeting was held by a taskforce which was comprised of various sub-committees on the planning the principles and methods of teacher-training reform, and teacher and educational personnel development, and the newly appointed sub-committee on charged with the mass-media campaign. The meeting considered the contents and framework of the taskforce's responsibilities. As a result, a number of items needed to be studied carefully and tasks were assigned to each taskforce's member to complete their responsibilities in form of interrelated and concrete work.

When each sub-committee had completed its assignment and deliberations were getting to the stage of issuing the main points of the teacher-training reform's principles, the National Educational Commission Board Office (NECB Office) organized a workshop to develop an

operational plan of the principles and methods of teacher-training reform, and teacher and educational personnel development, between September 26-27, 1994. It was a meeting in which all sub-committees participated in order to study of all contents of the principles and methods of teacher-training reform, and teacher and educational personnel development from a holistic viewpoint.

(1-5) February 1995.

Various sub-committees completed their assigned operational plans and submitted them to the NECB Office in a workshop held between February 17-18, 1995. That workshop helped the sub-committee members and the Board members to exchange their ideas and find out the feasible ways to implement the plans. Taking time, budget and other activities into consideration, they agreed upon the following objectives:

1. To inform the operational and concerned agencies about the master or principal plans on reforming teacher-training and other matters relating to operational tendencies, duration and budget.
2. To give an opportunity to the sub-committees on the principal plans of teacher-training reform, and other operational agencies' representatives to exchange their views and thoughts towards the plans. This was meant was to encourage them to develop a coordinating mechanism for further implementation relating to the Government's goals.

Afterwards, the NECB Office and other principal plans' sub-committees made use of the workshops' results to integrate the previous ideas, and then, formulated a Master or Principal Plan for Teacher Reform, Teacher and Educational Personnel Development. This will be explained in detail in the next paragraph.

2. The Master Plan

Among the changing circumstances and critical situation of the current society, there was an enlargement of vision on educational management far beyond the quantitative expectation to reach the quality and capability of the individual. International competitiveness in human resource development depends upon teaching and learning efficiency in both formal and non-formal educational systems. Successful human resource development depends upon a number of factors of which the teachers are most important. Accordingly, teachers have a high degree of influence directly on the learning effectiveness of their students.

Teacher development is an important key leading us to the development of educational quality. Teacher development should be operated in a systematically cyclic order, relating to the goals and priorities set. Teacher development process should begin at a personnel recruitment to find

the most suitable teacher students. Teachers' development for creating a good model of teachers and the adjustment of teaching and learning process should be related to the improvement of the use and development of in-service teachers. Those tasks will be completed if there is an organizational system of status, salaries and motivations appropriately. Therefore, to have a strong teacher profession association is rather important through the establishment of *'Ratchawitayalai Kurusart'* (the Royal Teacher College), reform of teacher-training, and development of teachers and educational personnel. The details of the above mentioned issues are as follows:

(2-1) Recruitment of Teacher Students.

The recruitment of persons to become teacher students aims at searching more knowledgeable and capable people with appropriate behaviors for entering the teacher profession. There are various ways to do so such as creating motivation with various fringe benefits and sufficient scholarships, acceptation and honoring the dignity of this teaching profession, improving teacher students' recruitment system, developing training and educational system, and promoting and extending the existing teacher training. Such teacher training programmes are such as '*Kurutayart*' project of the Education Ministry, and '*Pet-Nal-Tom*' project of *Srinakarintarawirot* University. Simultaneously, it is important to find out and make use of local wisdom and specific experts within communities to support the provision of knowledge and experience for learners.

There are four groups of people that are potentially recruited to be teacher students:

1. Those people who completed upper-secondary education level: Using a special method to recruit the people with capability, appropriate personality and behavior to further their study in the teacher-training Institutes by providing scholarships in line with the 'Kurutayart' project's concept, but in bigger scale and more money;
2. Those people who completed vocational education: Selecting those people who completed vocational education and wish to be teacher students, to receive educational awards with similar rights to the first group:
3. Those people who have completed bachelor degree in other fields than education or teacher-training: In order to solve the scarcity of teachers in some specific subjects, or to let the people who are interested in teaching career to become teachers a selection should be made for them to be on a one year training course in education after being appointed. However, an increased salary should be offered too.
4. Those people who have special talents or with success in their career could be recruited to become teachers in some specific field.

There is a need to develop a coordinating mechanism in the recruitment system between the

agencies involved in using and training teachers. An establishment of a permanent central committee to mutually coordinate the benefits potentially gained from such system may be useful and necessary. Additionally, some measures particularly the improvement of positioning system and promotional evaluation should be developed including a building of quality and creative dormitories for the teacher students.

The learning culture within educational institutes could help attracting young people into this teaching career.

(2-2) The Development of teaching staff in education/teaching career.

Based on the objective to strengthen the teaching staff academically within teacher-training institutes in order to be capable enough to develop a body of knowledge on the teaching career, to create a teachers' ideology among the teaching staff, and to develop teaching professional networks, there are 6 priority goals:

1. Creating a new body of knowledge in developing the teaching profession: Promoting the teaching staff to create a new body of knowledge, and develop the science of the teaching profession to be more universal, with relevance to the Thai culture and local wisdom in every aspect:
2. Strengthening academically the teaching staff in educational fields: Setting a condition for all teaching staff to follow up academic advancement continuously, with promotion to attaining higher educational levels and publicizing their experiences at large:
3. Involving the community to participate in teaching staff development;
4. Establishing a system of supporting, monitoring, investigating and motivating teacher at work:
5. Improving regulations, rules and laws that obstruct the teaching staff development;
6. Establishing a teaching staff fund.

(2-3) Reform in Teacher Training Institutes.

The adjustment and change of curriculum and teaching and learning process in teacher-training institutes aim at developing the curriculum and teaching and learning process capable enough to create teacher graduates with good characteristics, wider visions and knowledgeable behaviours. Seven goals have been set up as follows:

1. Improving and developing teacher-training curriculum in various dimensions, but based on mutual principles;
2. Improving and developing a practical experience training system for teachers to facilitate their learning from teachers who are good models in schools and communities:
3. Improving and developing teaching and learning methods by focusing on helping the students to have wide vision and are more knowledgeable:

4. Giving opportunities for new management, development and production of teaching and learning media, and making more use of local resources for teaching and learning;
5. Improving and developing methods of evaluation and measurement: The main idea is to have such instruments and methods that can be used to measure knowledge, processing skills, aptitudes and faith towards the profession including cultural and ethical aspects. Evaluation should be conducted internally in order to make use of the results for learning and teaching improvement.
6. Improving and promoting basic factors of teaching and learning matters for producing learning and teaching efficiency: It is important to improve the administrative system, particularly the work load of the teaching staff and to have an exchange scheme for teachers and students between different institutes.
7. Establishing and developing learning networks in order to promote specific teacher-training schemes: This method will help to train and develop teacher students effectively with relevance to the community needs and problems. Moreover, the establishment of inter-institute relationships between teacher-training institutes and community educational institutes, economic and other social institutes is also necessary both domestically and internationally. Moreover, the selection of good master teachers, knowledgeable people and experts from various concerned institutes or communities to participate in the teacher-training process is strongly encouraged.

(2-4) Development of in-service teacher-training

There is another intention in the principal plan to establish a system and plan for developing in-service training for teacher and educational personnel of the country to be more effective. Inter-agency coordination should be made between the agencies needed to use and produce teachers. Motivation should be built upon in-service training for teachers and educational personnel to participate in such development with full capacity. The establishment of a development center for highly competent on-the-job teachers and educational personnel within any teacher training agency should be put into effect. Such a center must be ready to function as a reference source for further study and investigation. Research promoting development in teaching and learning methods involving innovation and new technology should be encouraged in order to develop teachers and educational personnel.

The programmes of in-service teacher-training have been set up with seven aspects as follows:

1. To establish an agency to control the policy with principal and sub-systems, and patterns of teacher and educational personnel development;
2. To establish an efficient center capable to develop teachers and educational personnel, and

to conduct research in teaching and learning development. This center should be ready to function as a reference source for further investigation and study, to help teachers develop their teaching and learning methods. The center establishment should be organized through a selection from any teacher-training institutes in each locality with a high degree of readiness and capability.

3. Every on-the-job teacher and educational personnel at every level and category should be developed continuously while serving in their profession. Each year at least 20 per cent of the total number of teachers all over the country should be trained, and 2 per cent should do study tours both domestically and internationally. The teachers should be promoted to continue their study for higher degrees and knowledge with relevance to their subjects being taught and also their organizational needs.
4. To establish a motivation and strengthening system that helps increasing the teachers' profession efficiency. This can be done through the establishment of a teacher's salary system, recognition of the teaching profession, provision of appropriate welfare and the opportunity for academic advancement with an accreditation system.
5. To monitor, follow up and evaluate the development of on-the-job teachers and educational personnel effectively:
6. To develop educational administrators and personnel in order to increase their managerial capability and educational services effectively and efficiently:
7. To develop educational innovation, technology and communication assisting on-the-job teachers and educational personnel:

(2-5) Establishment of 'Ratchawitayalai Karusart' or Royal Academy of Teachers.

In order to maintain the honor and dignity of teacher profession and to secure beneficial rights being 'professional teachers', there has been a proposal a concept to establish *'Ratchawitayalai Karusart'* or Royal Academy of Teachers. This institute will be a teacher professional organization with a legal status financial supported by the Government, but will not be a governmental organization. It will be responsible for promoting the professional advancement of teachers, standardize practices in the teaching profession, control the standard and teachers' behaviors, and supporting the advancement of all teachers. However, this institute will also function as a mechanism to preserve the teachers' professional standard, become an academically standardized community, to promote a body of knowledge in education, and dignity and faith in the teaching occupation.

An operational guideline has been given in sequential steps. Firstly, establishment of the Royal Academy of Teachers will begin by organizing a group of knowledgeable, capable and socially acceptable people who are not politicians of government officers. Then, the group has to start by

studying roles and functions of various concerned organizations in order to clarify their roles and functions clearly, studying and improving the regulations and rules that are the barriers to the Royal Academy of Teachers' work. Last, a budget should be provided by the Government to support its functions annually.

3. Project Administration and Management.

Project administration and management have to be geared to meet the project goals. It is, therefore, important to establish a 'Special Project' with a project office under the National Educational Commission Board Office. The project office should receive around 5 to 10 per cent of the budget for salaries and supportive financial segments. The concerned agencies should set up plans or projects within the operational framework of the principal or master plan of the teacher-training reform and educational personnel development, and submit them to the Special Project Office for further consideration. The Office should be chaired by a highly competent person who can monitor, follow up and evaluate effectively.

4. Strategy for Teacher Training Reform and Educational Personnel Development

1. When the 'The Master Plan for Reforming Teacher Training, Teacher and Educational Personnel Development' is approved by the National Educational Commission and the Cabinet, the National Educational Commission Board Office will propose to the Cabinet the establishment of a Special Project. This Special Project will be under the National Educational Commission Board Office, commissioned to manage and administer the implementation of the principal plan implementation. A highly competent person, who is able to direct the monitoring, follow up and evaluation of the reforms should chair the Office.
2. In order to make the 'Master Plan' effective, the Government must show its political will to the public by its continuous support, particularly, financial support. Within the principal plan's framework, 5 to 10 per cent of the budget for salaries and supportive financial commitment should be provided annually.
3. The National Educational Commission Board will include the 'Master Plan' into the eighth National Educational Plan. Accordingly, various organizations at the level of department, university and institute will be able to make use of the principal plan as their operational guidelines to develop their programmes/projects, for submissions to the Special Project Office.

Synthesis of the country reports

Introduction

The country reports showed commonalties and modalities for innovations and reforms in the teacher education for the 21st century: 'Teacher Education for the Effective Use of New Information Media (NIM) in Schools.' The synthesis consists of reports from ten participating countries (Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, The Philippines, and Thailand) including the host country (Japan).

The country reports responded to the three essential objectives of the seminar, which are:

1. To identify and exchange key experiences about problem areas and issues related to teacher's knowledge, skills, and attitudes, that are vital to the enhancement of the effective use of NIM;
2. To explore innovative methods and approaches presently employed to enhance key teacher competencies for the effective use of NIM; and
3. To design national and international cooperative framework and action plans for the enhancement of teacher competencies in the effective use of NIM.

Common Issues

The era of new information and communication technology has arrived. All countries are aware of the NIM revolution and are recognizing the importance of their application for educational purposes. This recognition lead to the following shared issues:

- The importance of NIM literacy for teacher educators and teachers
- The importance of developing standardized curriculum for NIM at all levels of school education, including teacher education (pre-service and in-service)
- The importance of teaching secondary school students about and through NIM
- The importance of providing to schools standardized hardware, software, and support systems for NIM based education.

With the awareness of the importance of NIM for education in the 21st century, some countries in the region (e.g. Bangladesh, Malaysia, Nepal, and Pakistan) have revised or are revising their secondary school curriculum to accommodate changes and to integrate computer literacy into school curriculum and teaching methods.

Except in Japan, where computers were already installed in schools, the country reports clearly show that the utilization of NIM in other participating countries is still limited. Although in some schools in Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, and Thailand computers have been introduced, they are still limited in the city areas and are in the

experimental stage.

The problems shared by all countries, despite their differences in the degree of NIM availability and utilization, are the lack of:

- technology infrastructure,
- access,
- skills and motivation,
- support systems,
- sustainability of the technology beyond what is provided for by 'outside funding' sources,
- maintenance of hardware, and
- development and availability of good teaching-learning resources for NIM.

The other common concern that arose during the discussion was teachers' social and economic status. Comparatively, except for China and Japan, teachers are usually under paid and are regarded as being low in social status. The low social and economic status of teachers has led to a situation where teaching is regarded as a second or even third-rate profession. As a result, the teaching profession does not generally attract talented people. Therefore, it is agreed that an incentive system for teachers like those of China and Japan needs to be introduced.

Recommendations

1. Development of awareness and cooperation among stakeholders such as policy planners, administrators, and the community of the relevance and application of NIM in school education.
2. Integration of information technology in school education curriculum and teacher education programs.
3. Utilization of Internet and other advanced information and communication technologies to access and to disseminate educational resources.
4. Integration of current teacher education programs such as pre-service, induction, and in-service into one continuous process.
5. Utilization of distance education modes such as teleconferencing for interactive teacher-training programs.
6. Establishment of and support to an international cooperative pilot project for the use of NIM for school education and teacher education in the Asia-Pacific region by Japan and UNESCO.
7. Establishment of an 'International Instructional Media Research and Development Center' for providing resource support to teachers (e.g. lesson plans, teaching materials, assessment items, computer simulations, teaching methodologies, etc.) on culture

independent and universal school subjects such as Mathematics, Science, Environmental Science, Social Sciences, Humanities, and Technology Education.

8. Establishment of teacher exchange programs for training and sharing of experiences on the use of NIM among countries in the Asia-Pacific region.

Hiroshima, October 3rd 1997

Action Plans

Action Plan : Bangladesh

1. Policy Makers

(2) International Cooperation:

To motivate policy makers and educational administrators, international workshops on NIM should be organized.

2. Teacher Education

(1) National Level:

Follow-up in-service training workshops should be organized at the national level to disseminate the ideas of NIM for education in the country.

(2) International Cooperation:

Teacher educators should be trained in Japan or other participating countries in the region on NIM for education and for preparing master trainers. Teacher educators exchange programs should be organized among countries in the region.

3. In-Service Teacher Training Centre

(1) National Level:

Continuous in-service training should be provided to secondary school teachers on the use of NIM in education.

(3) ODA from Japan:

In-service teacher-training centers in the country need to be equipped with computers and other relevant facilities, with ODA-support from Japan.

4. Curriculum in Secondary Schools

(1) National Level:

To achieve the goal of computer literacy for all secondary school students, computers should be integrated in science, social sciences and mathematics in addition to teaching of computer education as a separate subject.

5. Textbooks

(1) National Level:

Textbooks in science, social sciences and mathematics should be integrated with computer based topics.

6. Teaching Aids

(1) National Level, (2) International Cooperation, and (3) ODA from Japan:

Teacher Training Colleges and some selected secondary schools should be equipped with appropriate computers and other teaching aids with the help of international cooperation as well as ODA support from Japan.

Action Plan: China

1. Policy Makers

(1) National Level:

Policy makers should exchange and share their experiences in policy-making in terms of teachers training.

(2) International Cooperation

With the help of UNESCO, various effective and practical strategies should be adopted to carry out an anti-illiteracy campaign in the developing countries.

2. Teacher Education

(1) International Cooperation

It would be appreciated greatly if Japan could train teacher educators from developing countries in the region to effectively utilize NIM in schools.

3. In-Service Teacher Training Center

(1) National Level:

It is necessary to strengthen the implementation of cooperation and exchanges of teaching plans among various teacher-training centers.

Action Plan: India

1. Policy Makers

(1) National Level:

To provide access to Internet at the district level by making telephone connections to Internet Service Providers at the local call rates. This would help the schools not located in the major metropolitan cities to take advantage of the global information resources.

2. Teacher Educators

(1) National Level:

Teacher educators need to be exposed to the latest computer hardware and software so that they may develop pedagogy integrated with learning resources in multimedia CD-ROMs and the Internet.

3. In-Service Teacher Training Center

(1) National Level and (3) ODA Support from Japan:

Computer laboratories to be set up in at least one major Teacher Training Center in each of the States in India for training of teachers in NIM and for development of educational software. The computer laboratories should have at least 30 computers and a media/software library on the pattern of similar facilities provided in the Prefecture and City Education Centers in Japan.

4. Curriculum in Secondary Schools

(1) National Level:

Curriculum in secondary schools needs to be focused on information processing skills, problem solving abilities, and on learning-to-learn.

5. Textbooks

(1) National Level and (2) International Cooperation:

Textbooks from their present form of printed texts on paper need to be supplemented with electronic learning resources either through Internet or be made available on CD-ROM.

6. Teaching Aids

(1) National Level and (2) International Cooperation:

Computer interfaced experiments, virtual experiments using simulation and multimedia software need to be produced on school subjects. Such learning resources should then be

made available to teachers through pre-service and in-service programs.

Action Plan: Indonesia

1. Policy Makers

(1) National Level:

Launch a campaign to raise awareness about the importance of computer and NIM literacy for teachers and secondary school students.

(2) International Cooperation:

Seminars to increase governments will for the use of computer and NIM in secondary schools (whenever feasible).

(3) ODA from Japan:

More funding for international seminars would be appreciated.

2. Teacher Education

(1) National Level:

Workshops for integrating computers and NIM in the teacher education curriculum; workshops for operating computers and using available educational software.

(2) International Cooperation:

Teacher educators exchange programs: seminars, workshops.

(3) ODA from Japan:

Financial and experts (human resources) support.

3. In-Service Teacher Training Center

(1) National Level:

Strengthen the current in-service teacher-training programs and centers (i.e. hardware installment).

(2) International Cooperation:

Standardization of software and hardware; teacher exchange programs.

(3) ODA from Japan:

Provision of models of Teacher Training Centers as are common in Japan (e.g. City or Prefectural Education Center) and funding supports.

4. Curriculum in Secondary Schools

(1) National Level:

Integration of computer and NIM literacy in school curriculum.

(2) International Cooperation:

Standardization of computer and NIM curriculum.

(3) ODA from Japan:

Consultancy.

5. Textbooks

(1) National Level:

Free books on computer and NIM for school libraries.

(2) International Cooperation:

Workshops to share experiences and to develop computer and NIM textbooks for school levels.

(3) ODA from Japan:

Funding supports and provision of expertise.

6. Teaching Aids

(1) National Level:

Workshops to develop instructional media (computer simulations) in national language.

(2) International Cooperation:

Development of instructional media for subjects, which are culture independent, and on universal subject matters.

(3) ODA from Japan:

Initiations of and funding supports for the establishment of an 'International Instructional Media Research and Development Center'.

Action Plan: Malaysia

1. Policy Makers

(1) National Level:

(1-1) All administrators, heads of departments, Ministry of Education's officials, Teacher Training Colleges' principals and policy makers should be trained on NIM.

(1-2) There should be collaborative efforts of all heads, government's officials and representatives from all concerned agencies and sectors in reviewing the teacher education programs. Such review should result in a shared philosophy of education, which will serve as the basis of policy and practice.

(2) International Cooperation:

To organize international workshops for educators at all levels.

(3) ODA from Japan:

Funding for seminars.

2. Teacher Education

(1) National Level:

(1-1) More attention should be paid to the selection of teacher educators for teacher-training institutions. They should possess training, academic and professional qualifications as well as being good role models.

(1-2) Teacher educators should continuously upgrade their expertise and guide the teachers.

(1-3) The importance of self-renewal and self-analysis among teacher educators in their attempt at implementing change. There should also be collaborative efforts among teacher educators, especially in research and government support for the progress and development of teacher education.

(1-4) Teachers who are successful to be appointed as teacher educators should be trained first before they start to perform their duties in teacher-training institutions.

(1-5) Appropriate training on NIM and study tours should be given to selected teacher educators every year and this should be sponsored by ODA from Japan.

(2) International Cooperation:

Introduce teacher educators exchange programs.

(3) ODA from Japan:

Provide consultancy on pedagogical approaches in integrating NIM at classroom levels.

3. In-Service Teacher Training Center

(1) National Level:

(1-1) The teacher-training programs, especially in-service courses, should emphasize more on training on 'how to teach' and 'what to teach' and, these ought to be given due consideration.

(1-2) All universities should play new roles as 'providers of in-service courses for teachers'.

(1-3) All untrained teachers should be trained through holiday INSET courses or through distance education/teleconferencing.

(1-4) All teachers and teacher educators should be trained in the use of NIM through INSET or staff development courses.

(1-5) Teacher educators must be trained to design and develop INSET programs as well as be able to conduct relevant and effective INSET courses.

(1-6) Follow-up support is a critical factor in ensuring that teachers implement what they have learnt during their training. Trainers should contact teachers in their classrooms to offer on-site coaching, mentoring and provide technical support. Trainers should help teachers to develop support teams and encourage peer-coaching, thus providing opportunities for sharing and reflecting on the practice within their own topic, level and subject.

(1-7) Standardisation of software and hardware; teacher exchange programs.

(3) ODA from Japan:

ODA (Japan) should sponsor and equip teleconferencing facilities in all Teacher Training colleges in the ASIA-PACIFIC region to enable these countries to conduct in-service courses via distance education.

4. Curriculum in Secondary Schools

(1) National Level:

It should be designed to enable the education system to achieve the goals of the National Philosophy of Education. The characteristics of the secondary school curriculum are:

(1-1) To help students achieve overall and balanced development;

(1-2) To integrate knowledge, skills, values and correct usage of language across the curriculum;

(1-3) To explicitly state intended learning outcomes for different levels of abilities, ensuring all secondary students gain equal access to quality learning and allowing self-paced learning across grades;

(1-4) To develop multidisciplinary, thematic, and continuous learning across subject areas;

(1-5) To integrate knowledge, skills and attitudes suitable for the information age; NIM should be made a compulsory subject in all secondary school curriculum.

5. Textbooks

(1) National Level:

Textbooks should be reviewed and updated to suit the requirements of the information age.

(2) International Cooperation:

Training in the production of textbooks in the form of CD-ROMs.

6. Teaching Aids

(1) National Level:

(1-1) Teachers and teacher educators should have to be technically trained to be able to produce their own software instead of relying on external sources. Also, there ought to be cooperative efforts among schools/Teacher Training Colleges (TTC) to produce software because it is unlikely that one school/TTC alone can by itself develop all the software it needs.

(1-2) Production of computer-based teaching-learning materials in the forms of modules and handbooks for teachers should be developed from a wide range of sources.

(3) ODA from Japan:

Provide consultants who can train our teachers and teacher educators to produce teaching-learning software/course ware.

Action Plan: Nepal

1. Policy Makers

(1) National Level:

The National Curriculum Council and Curriculum Development Center are to make National Policy for NIM use in schools

2. Teacher Educators

(1) National Level:

The School Supervisors and Subject Specialists can be involved as Teacher Educators for the introduction of NIM in schools.

3. In-Service Teacher Training Center

(1) National Level:

The Secondary Education Unit (SEDU), Curriculum Development Center and Primary Teacher Training Center (PTTC) can be used for training for NIM.

(2) International Cooperation:

International support is needed for the physical establishment of NIM, as well as educational materials to enhance NIM in schools.

4. Curriculum in Secondary Schools

(1) National Level:

Curriculum can be developed by the CDC. However, the elaboration of curriculum, subject elaboration, teacher-training packages and curriculum support materials will need financial support and international cooperation.

5. Textbooks

(1) National Level and (3) ODA from Japan:

It can be jointly developed at national level and with assistance of ODA from Japan. Some reference materials are needed to support this.

6. Teaching Aids

(1) National Level, (2) International Cooperation and (3) ODA from Japan:

The development of teaching aids needs support from the national level (CDC), international cooperation, and ODA from Japan.

Action Plan: Pakistan

1. Policy Makers

(1) National Level:

Awareness should be developed among the stake holders of educational sector (policy makers, planners, politicians, students, teachers, teacher educators, industry) for the use of NIM in school and teacher education.

(2) International Cooperation:

UNESCO and advanced countries can assist by providing academic inputs/consultancy services.

(3) ODA from Japan:

ODA should consider providing financial assistance for seminars/workshops.

2. Teacher Educators

(1) National Level:

Necessary training should be provided to teacher educators for the development of essential and desirable competencies for the use of NIM in schools. Two teacher educators from each TTI may be provided with training in NIM, along with the installment of equipment and related facilities.

(2) International Cooperation:

Advanced countries like Japan and Malaysia may share experiences and materials for training.

(3) ODA from Japan:

ODA should provide financial assistance.

3. In-Service Teacher Training Center

(1) National Level:

Key trainers and master trainers should be trained on NIM.

(2) International Cooperation:

Academic inputs from UNESCO and advanced countries in the form of materials /consultancy services.

(3) ODA from Japan:

Financial assistance from ODA to achieve these goals.

4. Curriculum in Secondary Schools

(1) National Level:

The revision and development of curriculum should be based on evaluation and need assessment.

(2) International Cooperation:

Experiences can be shared. UNESCO and advanced countries may support by providing consultancy services.

(3) ODA from Japan:

ODA consider providing financial support for such a process.

5. Textbooks

(1) National Level:

Technical assistance is required to improve the production of textbooks.

(2) International Cooperation:

Technical support in the production of textbooks.

(3) ODA from Japan:

Financial support.

6. Teaching Aids

(1) National Level:

All TTI's should have a section on the development of teaching aids; TTI's need to be equipped with necessary inputs (academic and physical).

(2) International Cooperation:

Materials developed by other countries may be exchanged.

(3) ODA from Japan:

ODA may consider providing financial assistance for such a project.

Action Plan: Philippines

1. Policy Makers

(1) National Level:

Establish a network/committee of policy makers, school administrators, teacher educators, teachers and business as well as other stakeholders to monitor and evaluate implementation of the planned computerization of schools.

(2) International Cooperation:

Sustain/maintain communication/ information links for sharing inter-country experiences, whether it are successes or failures.

(3) ODA Support from Japan:

Provide reports of successful experiences as well as plans for introduction of NIM literacy and instructional technology in schools.

2. Teacher Educators

(1) National Level:

Make the designated centers of excellence in Teacher Education spearhead the introduction of NIM into the classroom by restructuring the teacher education curriculum.

(2) International Cooperation:

Provide standards for adoption (where feasible) of NIM-based teacher education.

(3) ODA support from Japan:

Arrange for training of teacher educators on NIM.

3. In-Service Teacher Training Centers

(1) National Level:

Look into the feasibility of the adoption of the Japanese model or prototype of Educational Development Center (EDC).

(2) International Cooperation:

Share the experience including the concept, development and implementation of the Japan model of EDC.

(3) ODA from Japan:

Provide consultancy/ advice on the setting up of EDC's and training teacher educators on technology management.

4. Curriculum in Secondary Schools

(1) National Level:

Review to evaluate/ revise secondary school, if not the whole basic education curriculum, to include NIM and technology education.

(2) International Cooperation:

Research on different models of revised curricula from other countries especially on the integration not only of teaching about computers but also teaching with computers and other NIM.

(3) ODA from Japan:

Provide consultancy / advice on the revision of the curriculum.

5. Textbooks

(1) National Level:

Continue/ sustain move to Filipinize textbooks, where applicable.

(2) International Cooperation:

Share experiences of countries where textbooks are written in their national languages.

(3) ODA from Japan:

Share/teach the lessons learned by Japan in the use of Japanese textbooks.

6. Teaching Aids

(1) National Level:

Provide incentives and increase motivation for teacher-made or developed, NIM-based aids, but also allow for the use of available software and other materials.

(2) International Cooperation:

Compare, contrast and share experiences on the development, use and evaluation, if any, of NIM- and technology-based instructional aids.

(3) ODA from Japan:

Provide advice/ consultancy and training for teacher educators who will be required to conduct echo training to teachers in the field.

Action Plan: Thailand

1. Policy Makers

(1) National Level:

(1-1) Awareness of and familiarization with NIM through international seminars/study tours.

(1-2) Investment in and support for NIM in schools.

(2) International Cooperation:

Support for international cooperation projects and development of networks among schools.

(3) ODA support from Japan:

Support from ODA for study tours of NIM usage in Japanese schools.

2. Teacher Educators

(1) National Level:

(1-1) Training for master teachers.

(1-2) Substantive use of NIM in teacher-training programs.

(1-3) Demonstration and supervision of the use of NIM in teaching/ learning activities.

(2) International Cooperation:

Participation in international networks of NIM in education.

(3) ODA support from Japan:

Support from ODA for installment of NIM facilities.

3. In-Service Teacher Training Center

(1) National Level:

Provision of training and study tour programs in NIM for teachers.

(3) ODA support from Japan:

Partial funding for installment of NIM facilities.

4. Curriculum in Secondary Schools

(1) National Level:

(1-1) Improvement of the curriculum to accommodate the roles of NIM in teaching-learning processes.

(1-2) Development of computer / NIM literacy among secondary school students.

5. Textbooks

(1) National Level:

(1-1) Development of model textbooks with NIM supplement.

(1-2) Involvement of private agencies in textbook production by providing various incentives.

6. Teaching Aids

(1) National Level:

(1-1) Standardization of teaching aids.

(1-2) Development of model teaching aids with NIM support.

(1-3) Involvement of private agencies by providing various incentives.

Action Plan: International Cooperation

1. Policy Makers

International Seminars and Workshops should be held regularly to increase the awareness and the motivation of policy makers on NIM, and to maintain a continuation of a communication /information link among the countries of Asia-Pacific Region.

2. Teacher Educators

Introduction of exchange programs for the enhancement of skills and the development, as well as the sharing of teaching materials which can be utilized for teacher education on NIM in the various participating countries.

3. In-Service Teacher Training Centers

Teacher consultants and curriculum specialists such as those at the Teacher Training Institutes (TTI) in Pakistan and the Prefectural Education Centers in Japan should be trained first as a key persons to promote the use of NIM technology in education

4. Curriculum in Secondary Schools

Research and development of standardized computers, software and a NIM curriculum for the secondary school level.

5. Textbooks

Workshops to share experiences and develop textbooks for the use of computers and the NIM for various school levels which are to be translated into each national language.

6. Teaching Aids

Development and installment of teaching aids, including instructional media for subjects that are culture independent and universal in character.

Action Plan: ODA from Japan

1. Policy Makers

(1) Provide funding for seminars. *(Indonesia)*

(2) Furnish reports of successful experiences as well as plans for NIM literacy and technology. *(The Philippines)*

2. Teacher Educators

(1) Offer Financial and experts (human resources) support. *(Indonesia)*

(2) Provide necessary materials and machines. *(Thailand)*

(3) Arrange for the training of teacher educators on NIM. *(The Philippines)*

3. In-Service Teacher Training Center

(1) Provide a model of such a Center and support in terms of funding. *(Indonesia)*

(2) It is necessary to equip In-Service Training Centers in Bangladesh. *(Bangladesh)*

(3) Provide consultancy/advice on the setting up of Education Development Centers (EDC) and train teacher educators on technology management. *(The Philippines)*

(4) Sponsoring and equipping teleconferencing facilities in all Teacher Training Colleges in the ASIA-PACIFIC region to enable these countries to conduct in-service courses via distance education. *(Malaysia)*

4. Curriculum in Secondary Schools

(1) Provision of consultants for curriculum development. *(Indonesia)*

(2) As Pakistan is about to commence another cycle of revision of curriculum, experiences can be shared. Japan should consider providing financial support for such a process. Also evaluation and need-based studies need to be carried out. *(Pakistan)*

(3) Provide consultancy / advice on revising the curriculum. *(The Philippines)*

5. Textbooks

(1) Funding and provision of experts, in the field of textbook development. *(Indonesia)*

(2) Teach the lessons learned by Japan in their use of textbooks. *(The Philippines)*

6. Teaching Aids

(1) Initiations of and funding for the establishment of an 'International Instructional Media Research and Development Center'. (*Indonesia*)

(2) Japan should supply aid in developing teacher aids.(*Nepal*)

(3) ODA should consider providing financial assistance in order to support a sustainable development in a broad sense. (See concluding paragraph of the Country Report of Pakistan, '*The Way Ahead*') (*Pakistan*)

(4) Teachers Training Colleges and some selected secondary schools should be equipped with an appropriate number of computers and other teaching aids with the help through International Cooperation as well as Japanese ODA. (*Bangladesh*)

(5) Provision of advice/consultancy and training in the development, utilization and evaluation of technology as aids for teacher educators, who will echo these to teachers in the field. (*The Philippines*)

Evaluation of Seminar Results

Evaluation of Seminar Results

Introduction

For the first time in its history the Hiroshima University UNESCO-APEID seminar was followed by a meeting of Japanese experts in the field of education in various APEID member states, representatives from the UNESCO-PROAP office in Bangkok and members of the Hiroshima University UNESCO-APEID Associated Center. This so-called 'Follow-up Meeting' took place at Hiroshima University from January 29 until January 31 1998.

The purpose of the Follow-up Meeting was threefold:

- Discussion and assessment of the various country-reports,
- Discussion and assessment of the Action Plans in terms of their practicability,
- Evaluation of Seminar-proceedings.

This part of the report states the remarks made by the various participants of the Follow-up Meeting, and aims to provide hints for the improvement of the future seminars. The remarks are meant to offer opportunities for further discussion to the parties interested and to provide directions to the APEID-members on how to continue their efforts to improve standards in their respective educational systems.

Participants

The following participants attended the first UNESCO-APEID seminar Follow-up Meeting were:

- Ian Birch, *Education consultant at UNESCO- PROAP in Bangkok, Thailand*
- Reiko Hojo, *Associate Professor at the Joetsu University of Education, Japan*
- David J. Mcloughlin, *Resource person, Principal at the North Chigwell School in Tasmania, Australia*
- Yasushi Mizoue, *Vice-President of Naruto University of Education, Japan*
- Yoshikazu Murakami, *Director of the Center for Educational Research and Practice at Ehime University, Japan*
- Tsuguo Nakasato, *Professor at the Fukuoka University of Education*
- Shigeru Narita, *Professor at the Research Centre for School Education, Hyogo University of Education, Japan*
- Fumihiko Shinohara, *Associate Professor at the Division of Education, Faculty of Education, Tokyo Gakugei University, and Consultant of SEAMO-INNOTECH, Japan*
- Masami Umezu, *Associate Professor at the Faculty of Education, Naruto University of Education.*

- Shuichi Nakayama, *Professor at Hiroshima University, chairman of the UNESCO-APEID seminar organizing committee*
- Yoshinori Tabata, *Professor at Hiroshima University*
- Hideki Iwasaki, *Associate Professor at Hiroshima University*
- Takashi Kato, *Junior Lecturer at Hiroshima University*
- Lyckle Griek, *Junior Lecturer at Hiroshima University*

Establishment of a Framework: Outline of APEID Activities

In order to offer the participants more information about the workings and activities of the UNESCO-APEID program, the discussions were preceded by an outline of the APEID-activities, by Dr. Ian Birch, education consultant at the UNESCO-ACEID office in Bangkok.

The Work Plan of APEID for the Sixth Project Cycle 1997-2001

Dr. Ian Birch

ACEID, UNESCO PROAP Bangkok

1. APEID Mission Statement

The fundamental mission of APEID is:

to contribute to sustainable human development (underpinned by tolerance, human rights and a culture of peace) through the design and implementation of educational programmes and projects, mainly at the post primary level of education, which stress "educational innovation for development".

In pursuing this mission, APEID lays stress on

- Fostering educational innovation and research in support of development, in its widest sense;
- Forging effective partnerships in education with particular reference to the establishment and servicing of networks between and within countries (and across regions) which facilitate the free and open flow of information between those involved;
- Performing pro-active and anticipatory roles in undertaking its various programme activities; and
- Providing a visionary and futuristic orientation.

2. Purpose of APEID

APEID aims to help Member States strengthen their capabilities and self-reliance at the national, sub-national and grassroots levels, for the creation and use of educational innovations to solve educational problems for the realization of national development goals.

The programmes developed to achieve these goals are based upon the sharing of experiences between countries to help achieve educational innovation for the economic, social and cultural development of the countries in the region.

To achieve its purpose, APEID has four key objectives:

- To promote an awareness change; s of the need for innovation and the possibilities for change;
- To stimulate an understanding of the process and practices of innovation, and to identify and stimulate innovative activities and co-operative action amongst Member States with a view to encouraging the systematic experimentation and adoption of educational innovations in response to the problems associated with development;
- To assist the Member States in strengthening on-going national programmes which are developing innovative, indigenous techniques for dealing with one or more aspects of development-oriented education in terms of personnel, techniques and management capacity; and
- To encourage the inter-country transfer of experiences and technical cooperation, particularly through exchange activities, advisory services and the dissemination of information.

3. The Delors International Commission on Education for the Twenty-first Century (*Learning: The Treasure Within*)

Along with the *innovation* motif, the Sixth Cycle will be very much influenced by the *Delors Report*. Overarching considerations in this report include:

- The need to adjust to changing life cycles where study, work and leisure will no longer occur in separate departments but will intertwine; and where life-long learning will be the accepted norm.
- Ways of accommodating the phenomenon of globalization, with its stress on a move from focusing on national and local communities to that of a world society, and a global village where there are many areas of interdependence;
- Building on the four pillars that constitute the foundations of education (learning to be, learning to know, learning to do and learning to live together) to find effective ways of ensuring that individual freedoms and the intellectual development and creativity of everyone are achieved without exception while, at the same time, ensuring social cohesion, so that people live together in harmony and peace;
- The importance of ensuring that the benefits of development reach all groups in society, including women and minorities; and
- The importance of moral and values education particularly at a time when modernization and development increasingly stress materialism and greed has been harnessed as part of the engine of development.

Following Delors, new paradigms for the future will embrace:

- Lifelong modalities of the future;
- Educational technologies of the future;
- The teacher of the future; and
- The curriculum of the future.

4. Poverty Eradication

Poverty eradication is an overriding goal in Asia-Pacific and the various education and training activities are conceived and implemented with a view to their impact on and contribution to local development and the empowerment of the poor. They take into account the self-reliance and autonomy of the target groups, with the aim of achieving locally-generated social and economic growth. This integrated strategy also provides the link with other substantive areas of human development, such as sanitation health and environmental awareness. This integrated strategy also provides the link with other substantive areas of human development, such as sanitation, health and environmental awareness, with education and training as the cornerstones for achieving peace and development.

5. Programme Activities for the Sixth Cycle

APEID programme activities for this sixth cycle will address the following nine Major Programme Areas (in no particular order of importance):

- Secondary education;
- Teacher education;
- Higher education;
- Technical and vocational education, and enterprise education;
- International, moral and values education;
- Educational technology and science education;
- Research and innovation;
- Education of girls and other disadvantaged groups, including special education or those with learning disabilities; and
- Environmental education.

Given the theme of this meeting, only teacher education and educational technology will be discussed in this paper.

6. Teacher Education

Countries in the Asia-Pacific region recognize that the quality of any education system correlates to a high degree with the knowledge and skills of its teaching personnel. In view of the constantly evolving nature of the field of education, which should reflect socio-economic and technological changes in society, many share the view that teacher education should be regarded as a career-long process with possibilities for accessing further training at any time and any level. Distance education may be cited as one cost-effective way for upgrading in-service teachers. Another example is the Pacific States Regional Basic Education and Life Skills (BELS) programme, which is based on the principle of the maximum decentralization of school management and skill development functions to the head teacher of a particular school.

Member States at both MINEDAP VI and EDCOM noted that the crucial challenge in this regard is to recruit, train and retain competent teachers (since teachers are the main agents of change); and that as the Delors Report (1996) puts it "good schools require good teachers". As countries modernize, it is increasingly difficult to recruit suitable people into the occupation and to provide a reward structure that maintains their career-long involvement, in competition with other employment opportunities. EDCOM specified that as countries seek to re-engineer, strengthen and upgrade their education systems, special attention should be given to the pivotal role of teachers in the process of educational improvement and transformation.

Countries have stressed the importance of the career-long professional development of teachers. There is also consensus that teachers across the region require retraining opportunities due to emerging demands such as the inclusion of special needs children in ordinary classrooms, and attempts to make the most of opportunities presented by technology. The International Commission on Education for Twenty-first Century has forcefully advocated a greater use of technology in education (in general) and teacher education (in particular). EDCOM, while considering the report of the Commission, agreed that UNESCO should facilitate assistance to Member States in this area through such means as investment, teacher education and international networking.

Countries are concerned that a trend towards the globalization of curricular inputs is reducing the effectiveness of teaching traditional values and cultures. Learning to learn, and becoming a life-long learner, are both seen as important areas to be emphasized in teacher education as well as in the curriculum of schools. Both MINEDAP VI and EDCOM were also of the view that in order to establish a culture of peace and understanding across the region, the curricula of the future, in schools and teacher education institutions alike, should help promote more effective multi-cultural learning.

EDCOM noted the importance of partnerships in education (in general) and teacher education (in particular) since these reinforce the message from Jomtien that education is far too important to be left only to governments. In this regard, enterprise/education partnerships; school/community and parent partnerships; and NGO/Donor Agency/ Government partnerships, and networks to enable the sharing of information and experience with regard to teacher training programmes, teaching and learning resources, and skilled personnel, were particularly emphasized.

In light of the manifest importance of the teacher to any programme to influence quality, teacher morale and motivation is of importance. While it is self-evident that talented and highly motivated persons should be encouraged to join the teaching profession, after receiving high quality pre-service education, taking the region as a whole little has been done to provide for a career-long teacher development process.

Member States have requested that greater attention to in-service education and training be given by UNESCO by drawing on its experience worldwide in various decentralized intervention strategies, teachers guides, awards schemes and interactive radio instructional methods. Reference may be made to the desirability of calling on untapped resource people for this purpose such as head teachers and principals, curriculum developers, school inspectors and head office administrators. In referring to the 1966 ILO-UNESCO Recommendation on the Status of Teachers, Member States have expressed the hope that UNESCO would provide guidance in national efforts to improve the conditions of service of teachers.

APEID programme actions in teacher education will fundamentally focus on two requirements, namely:

- Effective and quality-based teacher training programmes for new teachers, using a variety of methods; and
- Upgrading the knowledge and skills of current teachers on a continuing basis, utilizing a variety of methods.
- APEID programme activities will be directed at providing technical advice and other forms of assistance to Member Countries to:
- Strengthen and upgrade their systems of teacher education at both the pre-service and in-service levels;
- Assist with the development of teaching and learning materials and appropriate delivery systems to improve the, professional development of teacher educators; and ,
- Provide opportunities for key teacher educators in Member Countries to study abroad in order that they can develop improved knowledge, skills and understanding to upgrade their own countries' systems of teacher education.

Although a teacher education component is included in all appropriate programme areas, in

view of the special importance of this area there is still a need to concentrate on the renovation of teacher education. The following types of APEID programme activities are envisaged:

- Co-operative activities with participating countries to develop an upgrading system of in-service education for teachers and other educational personnel; and
- Activities aimed at the modernization of pre-service education for new teachers and, to this end, the development of prototypes incorporating the new teacher competencies needed in the new learning environments, including integrating training and problem-oriented research as well as the use of educational technologies.

The main outcomes of these activities will focus on improving the competencies of both existing and prospective teachers to foster innovation with regard to the use of educational technologies in the systems of education in the Member States in order to improve their quality and efficiency.

ACEID will also continue to pursue its ongoing project on *Innovations in Teacher Education through Environmental Education*, in co-operation with Griffith University and the Australian Government. Under this project, prototype teacher education materials for Environmental Education have already been produced and are currently being trailed in national languages in a number of countries in the region. The number and range of countries involved with this project will be further expanded; and regional meetings will be convened to review the outcomes of these trials and to lay down guidelines for in-country training workshops and region-wide implementation. Full details about this project are presented in a later section of this report.

7. Educational Technology and Science Education

Scientific and technological literacy have been flagged by Member Countries as an essential underpinning of human development. *Project 2000+: Scientific and Technological Literacy for All* is considered to have the capacity to create appropriate mechanisms for the worldwide exchange of knowledge and ideas, and a firm commitment to scientific and technological literacy for all.

Both MINEDAP VI and EDCOM recognized that technology and science in education offer substantial opportunities for those with the necessary infrastructure. Notwithstanding the view that technology also poses a considerable threat, regarding possibly widening the gap between the haves and have-nots, UNESCO has been asked to facilitate assistance in this area by investment, teacher education and international networking.

There remains a still largely untapped potential to harness educational technology at affordable prices. Advances made recently in the field of distance education suggest that this intervention strategy holds great promise for accessing insufficiently-serviced rural and isolated

areas. One example is the use of computer modems, which are already being used with success to promote literacy in some countries.

Countries with large numbers of languages and dialects experience enormous difficulties in producing mother-tongue readers and core curriculum texts. The use of modems linked to e-mail technology make possible the immediate sending of common core material to provincial centers. There, with their local language specialists, translations into the vernacular and computer-assisted publishing are a feasible undertaking.

> It is possible to foresee in the near future, the extensive use of computer-assisted instruction throughout the length and breadth of education. This development should, if it materializes, free up the teacher to carry out the interpersonal functions of the educational process which only human contact can provide.

EDCOM laid down the following priorities for action in the area of technology education:

- Facilitating carefully targeted investments to ensure equity of access to information technology, across the Asia-Pacific;
- Working with the support of institutions such as the Asian Development Bank, to provide programmes for the upskilling of teachers to enable the best opportunities for learning to be taken from information technology;
- Construction and maintenance of regional networks (such as the APEID Network of Associated Centers) to ensure that children in all Member States benefit from technology education; and
- Establishment of a regional resource center to promote educational technology.

It has been observed that, in general, science and technology education have not been able to keep pace with the rate of progress in this field. In accordance with the special emphasis placed by UNESCO's Medium Term Strategy on the renovation of education at the secondary level, there is a need to particularly emphasize the updating of curricular programmes for science and technology streams to ensure they are responsive to the emerging demands of societal development needs. ACEID will, for this purpose, serve as a focal point of information and technical expertise and will encourage both region-wide and world-wide collaboration amongst specialists in developing a content that is relevant to the changing needs of society.

- APEID programme activities in science and technology education will focus on:
- Developing appropriate in-school and out-of-school opportunities (at both the formal and non-formal levels), for science and technology education in order to respond to the human development needs of scientific and technological societies;
- Active promotional efforts to achieve a greater, more effective provision of science (including mathematics and technology education) for girls in-school and out-of-school programmes;

- Co-operative programmes of participating countries aimed at developing innovative and relevant prototype curricula and teaching materials within the framework of UNESCO's International Project on Science 2000 + ; and
- Helping countries utilize most effectively the latest information technology such as the Internet.

ACEID will undertake a critical review of its regional networks and establish, in co-operation with those of its Associated Centers that specialize in educational technology, a co-operative network to facilitate Member States initiatives to benefit from technology in education, to reach the unreached and to improve the quality of education. ACEID will also assist in the identification and establishment of a Regional Resource Centre in Educational Technology at one of its Associated Centers in the Asia-Pacific region.

The main outcomes of the proposed APEID programme activities will be:

- Guidelines for the production and adaptation of written curriculum materials. and for the development of new materials;
- A curriculum audit of existing courses and materials;
- The training of teacher educators in appropriate teaching and learning strategies; and
- The training of teachers in gender-inclusive teaching and learning strategies.

Discussion of Country Reports: Thailand

Remarks by David J. Mcloughlin

1. Country-report

David J. Mcloughlin has been visiting Thailand in a professional capacity for over seven years. Coincidentally, he has also been doing research on the main topic of Prof. Leesuwan's report, the Thai Master Plan for Education. In his remarks he points out a number of flaws and ambiguities, which he found in the Thai country report, in fact, in most of the reports presented on the seminar:

- Whose views are represented in the reports?
- Does this report represent a collaborative effort?
- Who has the ownership of this report?
- Who are the stakeholders in the report? Now and in the future.
- Very little attention is actually paid to NIM,
- Target on representative viewpoints,
- Lack of focus on the outcomes.

The Thai report focuses mainly on proceedings of (sub-) committees, and workshops, but fails to pay attention to concrete goals and targets. Some aspects can be called innovative such as the establishment of a Royal Academy of Teachers. The report states that the Master Plan is likely to become the 8th National Education Plan, but there is little mentioning of the successes and failures of the previous seven Nation Education Plans in the report. It also lacks a budgetary dimension. The Country Report reflects that there are strong overturns of political control in the Thai educational system. Given the topic of last year's seminar there is very little mentioning of NIM in the report. Mcloughlin had hoped to see strategies that are implemented that try to do more with less, instead of looking for assistance from overseas.

2. Action Plan

Mcloughlin continues with discussing the Action Plan, and in particular the format of the Action Plan. He poses the question: What constitutes an effective format for an action-plan? In his opinion is should have the following characteristics:

- It should be a working document, with clear targets and goals.
- It defines key strategies to undertake those goals.
- It indicates clearly, the outcomes or the success-indicators of these strategies.

- An Action Plan should include a timeframe, and budgetary, human and financial resource implications.

The Thai Action Plan lacks most of these characteristics, as no clear goals, targets and strategies are defined. Future Action Reports will have to give more research and information in order to be practical and useful.

Furthermore, who support and are represented in the Action Plan? Who are the stakeholders: -Government, Institutions, Teachers, Schools, and Communities? Do these stakeholders support what is mentioned in the Action Plan? Action should be targeted at a representative viewpoint.

3. Thai education in crisis

When Mcloughlin had a meeting with Thai government officials in 1997, he told them, to their utter shock, that Thai education had failed and that this was a national concern, not just and educational concern. Education is not remedy for all the problems, and NIM is only a very small part of the puzzle teacher education reform, but a very important piece.

4. Triangle of perspectives

If one reviews or investigates any plan, or as in this context NIM, on e has to look first at the *What is*-question. What is happening in the country? What has happened, where have we been, where are we now? What processes have we gone through?

Secondly, it is question *What could be?* What are the possibilities, what are we looking for, what does research show us what we need? Where are we heading for? This is something that needs to be researched. The point is that one needs data, not just beliefs.

From these two questions the third part of the triangle is being formed. *What should be?* That is finding the direction, discussion the plans, supporting the practices and evaluating the plans.

These perspectives are lacking in both Country Report and Action Plan. If assistance is given, there is a need for quantitative and qualitative data, not just beliefs and wishes. Support is not about study tours or large-scale financial assistance. Assistance should be integrated in a system and with a process of review as a starting point. A good look at your own back yard is first priority.

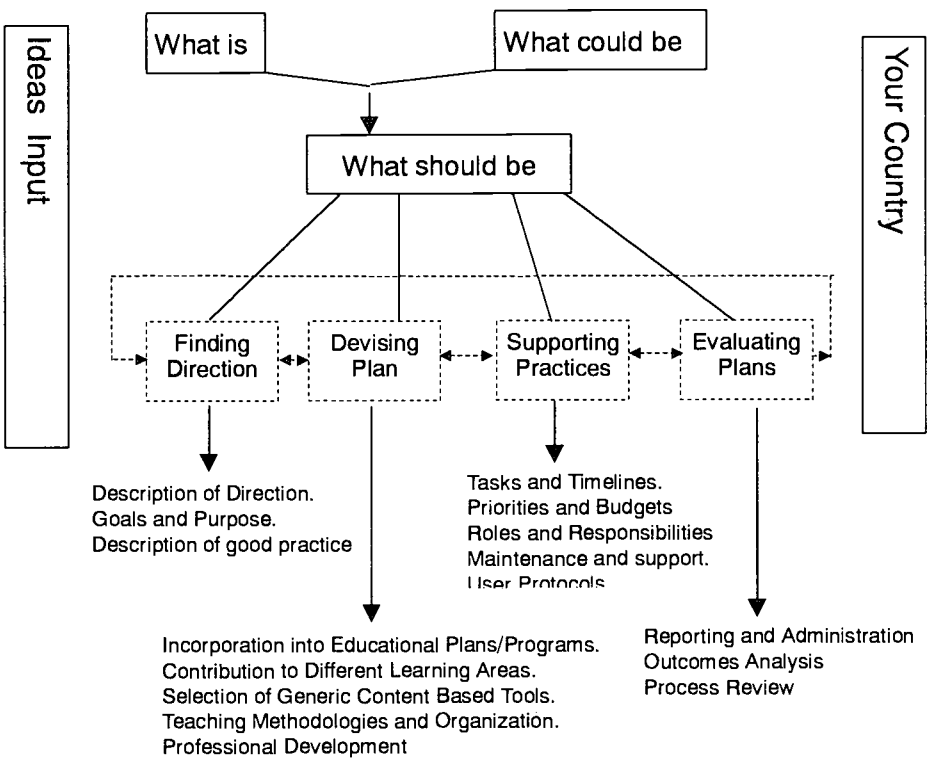
Assistance in fostering NIM could be in the form of a productive planning model. This model consists of the following steps:

1. First, by *recruiting key experts* form a team that can bear responsibility. These experts are present in the country, the problem is that they just do not know each other.

2. Secondly, a *researching aspect*, which involves a needs-analysis to clearly identify targets, identify technologies, current and those that can be applied.
3. *Construction of a plan*. This means to identify from research the vision and mission of NIM in Thailand. To find goals and tasks required to fulfill this task and mission. This part is often missing from plans, as we have many dreams but the realization of them is lacking.
4. The last part of a successful planning model for NIM is the *ongoing and continuing implementation, evaluation and revision* of that plan.

The APEID-committee could play a significant role in helping to establish a NIM-plan through this process, which is more important than study-tours or financial assistance. Because, how do you know where you want to go, if you do not know where you are in the first place.

Chart 1: UNESCO-APEID Project: NIM Planning Model



5. Where is Thailand's Education now?

Thailand needs educational reform in order to make its workforce ready to compete in changing world markets. This means not only children, but the whole workforce. Thailand can no

longer rely on its natural resources and cheap labor. In education so far, there has been a focus on rote learning, but a more creative, analytical approach is needed to develop human resources and that is a key to Thailand's future. Educational spending in Thailand is relatively low, Malaysia spends twice as much and Singapore spends 10 times as much on education. The present Thai educational system has led to a scarcity of properly skilled people, such as scientists, researchers and technicians. These types of people are necessary in particular for the successful implementation of NIM into education.

If you wish to develop NIM in Thailand, you need literate and numerate people. There is no national curriculum in Thailand, nor any national guidelines for learning. There is no uniform assessment of outcomes.

A problem is that skills become redundant in an increasingly faster pace. Job categories will disappear, and new ones will appear. There is therefore an growing need for a system of lifelong education. So far, there is no sign for such a system in Thailand.

Educational systems should produce graduates with a desire for continued learning. Individuals need to create their 'enterprise passport'. An enterprising individual is active and will create his or her own future. Students should not finish school to land a job; they should create a job. Technology is promoting a trend towards learner-driven learning, but this requires that people already possess the desire to learn and an ability to learn. Consequently, learning will be more active, and become more learning by doing. The enterprise passport is the key to the passport of knowledge for lifelong learning in education institutions in Thailand and a key competency for developing NIM in Thailand's education system. So far, most educational systems have not adapted yet to this situation.

The value attached to education in Thailand needs to be higher. The UNESCO-APEID-committee should not look at dreams, in assisting the development of NIM in Thailand, but to develop a concrete base to build those dreams one, and to assist in the development of that base. This can be done through an ASSR (Assisted Self Study Review) process. (See Chart 2)

6. Discussion

The subsequent discussion after Mcloughlin's presentation focused on the following points:

- The problematically low work ethic of many Thai teachers, due to low wages and low esteem of the job of the teachers.
- Motivated *ajaans* do not receive support from the government.
- Political dimension behind Thai educational policies、the political culture of Thailand has a negative influence on policy-making.
- High levels of non-attendance

- Thai cultural perceptions of the importance of education.

Chart 2: Assisted Self Study Review

- Look at education management/administration systems
- Review teaching methodologies and practices
- Review pre- and in-service training opportunities.
- Recruitment of students
- Recruitment of a*jaans* or teachers
- To look at TQM and QA review
- To review the monitoring and assessment to students' performance
- *RODS (Records of Development System) to track the development of abilities, capabilities and learning outcomes of students.*
- Development of Curriculum framework
- *Learning field statements and profiles, guidelines*
- *Key Capabilities and Competencies*
- Look at outcomes based learning systems
- To review the decentralization and self-management of institutions
- To review networking, resource management and best practices
- To review professional development and a competency framework for all teachers of children and students
- One of the base features to review is self-discipline and professional work ethics
- To look at and review teacher appraisal, peer appraisal systems, accountability
- Information/Learning Technology as a means to improve the current teaching process.

Discussion of Country Reports: Indonesia
Remarks by Shigeru Narita

1. Country Report

The Indonesian Country Report looks well documented in terms of background-information. According to Narita the main issues in the report are:

- Issues related to disparities within the Indonesia Archipelago, due to the vastness of the country, and social-economic inequalities,
- NIM, including networking, can be very important for the further development of distance education, and help in lessening the disparities within the country,
- At present, there is a lack of understanding concerning NIM. The use of NIM is still very limited in primary and secondary schools, as teachers do not know how to use it, or are not convinced of its necessity. However, this is not an issue limited to Indonesia, in Japan similar problems exist,
- Children of well-to-do families attend private schools, which offer better access to NIM. As a result the gap between richer and poorer segments of society increases,
- There is a lack of training, there are no programs available for teachers to improve skills, empowerment programs seem not to have any impact,
- There is a lack of access, i.e. computers in schools are mainly used for administrative purposes.

The solutions addressed in the report by Dr. Belawati are that a fostering of awareness or an awakening towards NIM are critical issues for Indonesia. Further dissemination of NIM and improvement of the infrastructure are needed to foster NIM. In the Country Report, the focus was on training in order to address the problems of lack of awareness and understanding. However, how this training is to be set up, who will be responsible and to whom this training is to be offered, remains unclear in the Report. The Report recommends the establishment of a Center for Instructional Media Applications, which should provide a media library, training of teachers and offer access to NIM for teachers, students and citizens on both a national and regional scale.

2. Action plan

The Action Plan needs revision in the following points. The Action Plan lacks in accountability, who is in charge of the Action Plan for design, execution and evaluation? Furthermore, for whom is the Action Plan intended i.e. what is the target population? What outcomes can be predicted

and finally how are these outcomes going to be evaluated and by whom?

The Action Plan also lacks a timeline. It is unclear when the Plan is going to be put into practice. There is also a lack of validity. It remains unclear whether any financial resources will be made available for implementing the Action Plan. The Action Plan also shows a lack of coordination and collaboration. It is not specified how and by whom the Action Plan will be executed.

Therefore, the focus should be on *action*. A clear time-line needs to be set, and a government agency put in charge of the implementation of the AP. In the first instance, Indonesia should rely on internal funding sources, not on Japanese funding. They should be independent from outside sources as much as possible. Only in case of a clearly formulated program, international institutions such as the World Bank and UNESCO and donors such as Japan should consider assistance. At this point in time, the Action Plan's position remains up in the air.

3. Suggestions to the Hiroshima UNESCO-APEID Seminar Committee

The Hiroshima University UNESCO-APEID Seminar Committee has to keep track of the progress of the Action Plan implementation. It should:

1. keep Action Plan authors informed about following Action Plan discussions,
2. remind the Action Plan authors to update and report the interactions regarding the implementation of the Action Plan,
3. plan a Action Plan follow-up session during the 1998 APEID seminar,
4. keep an eye on the continuation of the Action Plan progress and development,
5. keep providing assistance for the progress of the Action Plan.

Furthermore all discussion and interactions should be published through electronic media such as the World Wide Web and FTP This Web page should have interactive function to enable interactions.

4. Discussion

In the ensuing discussion, present educational reform efforts in Indonesia were deliberated. According to Prof. Nakasato, much effort is being put in the retraining of teachers in remote areas by using communication facilities such as parabolic antennas. A big issue currently is how to supply in-service training to teacher in elementary schools in particular. The current situation is that many teachers pay for their own courses, in order to improve their skills.

One of the major problems in Indonesia is the surplus of teachers, even if someone finishes

university, many have difficulty securing a job. In terms of changes in the educational system for teachers, the present phenomenon is that Teacher Colleges are changing into general universities.

Another point, made by Prof. Yoshinori Tabata during this discussion, was that it is crucial for developing nations to get on the train of NIM. Mastery of NIM could become a factor that will widen the gap between developing and developed countries.

The establishment of a Media Centre, as proposed in the Report should not only be national and regional, but also, due to the character of NIM where information flows freely, ignoring national borders, this Center should also have an international dimension. There is no need to limit oneself to national borders and have each country invent the wheel again. For example, sharing experiences with Malaysia, which has the same linguistic background, could be very valuable for the development of NIM in Indonesian education.

UNESCO is also considering the creation of a database on teacher education in the Asian-Pacific region, there is however a need for data that can be published, and these data need to be translated in English to enable international dissemination of these data. Hiroshima University has already made a first step to create an APEID-related database.

Discussion of Country Reports: Malaysia
Remarks by Masami Umezu

1. Outline of the Country Report

If one summarizes the Report very briefly, the central aim of the Malaysia government is to develop the nation and become a developed country by the year 2020. This is reflected in the catch-phrase a "Vision 2020". The reform of education by using PC's is an important part of this policy. The policy towards improving teacher education aims at the development of problem-solving skills, critical, and creative-thinking skills, and the introduction of NIM is seen as an important means to achieve these aims.

The formulation of the Malaysian curriculum seems to revolve around three central aims:

- fostering of values,
- language education with the Malay language as its core
- fostering of thinking skills.

The introduction of NIM seems to be imbedded into the context of these three main aims.

Smart schools

In order to achieve these aims, one of the central new concepts in Malaysian educational reform is the realization of so-called 'Smart Schools'. According to the Report, Media education will play a central role in these Smart Schools at both primary and secondary education and projections are that by 1999, 90 Smart Schools will have been established. The goal is to have all current schools replaced by Smart Schools everywhere in the country by the year 2020.

In teacher education, the plan is to make media education compulsory for prospective teachers and to tie up teacher education with the realization of Smart Schools. In-service training of teachers, with the Teacher Education Division as central organization is also being mentioned. In many ways, there are similarities with the Japanese situation, as there has been a rapid increase in the demands on teachers, in terms of their qualities and skills, such as technological skills, critical and creative thinking, moral education and religion education and language education and so on.

2. Assessment and Remarks

The report mentions, mainly from an educational administrator's viewpoint, general aims in terms of the system, or the "hard-ware" side of the reform. Unfortunately, for someone who researches teaching methods, the report mentions little about the "soft" side of the educational

reform, i.e. in what way is going to be taught and what kind educational materials are developed and used in order to achieve the aims that are mentioned in the report. In other words, the concrete development of teaching materials and methods is unfortunately not mentioned in the report. The impression is that, from the side of the administration, extensive efforts are made in Malaysia, but it remains a doubtful whether all these efforts have any concrete significance in the schools themselves, as there is no mentioning of concrete methods.

Based upon own experience, what seems to be lacking, is critical and creative thinking among Malaysian students, however, this should not be mistaken as a lack of ability to study. The current situation is that the educational style and educational content Malaysian students receive until high school does not foster any critical thinking skills or decision-making skills.

A number of factors decide the educational practices in public schools in Malaysia. First, value education, in the multi-ethic Malaysian society common values are being stressed, under the banner of the 'Good Malaysian Citizen' program. In order to attain this goal the Malay language is promoted as the common language for all ethnic groups in education. This has lead to a situation were non-Malay speakers have a disadvantage as they have to spend extra time to master Malay in order to take the national examinations (SRP and SPM) for higher secondary education and universities. Furthermore, the national examinations have led to a situation where average score of his or her students is determining a teacher's status, and most attention is paid to exam-preparations. The result is a focus on rote learning and conditioned value education. As a result, it will be difficult to bring these factors in line with aims such as development of critical and creative thinking and problem-solving skills.

It would have been a better Action Plan if a cycle including preparation of concrete methods and content, experimental implementation, the results analysis and feedback to improve the aims, had been included in the Action Plan.

Concerns relating to social composition of Malaysia

The current situation in Malaysia is that the Chinese community dominates the country economically. The Malay community, in particular in rural communities, is economically behind, and as for many of this community, harbor dissatisfaction about the disparity in economic power between them and the Chinese community. For this reason, so-called *Bumiputra* policies have been formulated, favoring the Malay community in terms of work, land-ownership and education. In particular on the university level this has led to favoring ethnic Malay students over Chinese students. As a result, many of the Chinese students, who have the means to do so, are send to universities in the United States and Great Britain. For the third large ethnic group in Malaysia, the Indian community, the situation is the worst as they both lack economic and political clout, to assure their part of the educational pie. The concern is that by just focusing on the hardware i.e.

facilities-side of media education, and if concrete educational materials are not developed, educational equality of opportunity will be further damaged. The report by Prof. Ibrahim hardly addresses the concerns that were mentioned in the former paragraphs. This makes the aims mentioned in the report, sound very idealistic.

3. Conclusion and suggestions

The acceptance of following suggestions could make the Action Plan more useful, facilitate the development of NIM-use in education in Malaysia.

Concerning Elementary and Secondary School Curriculum

- Acknowledgement of the problems through analysis and assessment of concrete multimedia-based teaching materials, that are already used at schools. Based on these, establishment of a method for development of multimedia-based teaching materials becomes possible.
- By using the Internet, establish an interactive system that facilitates the production of multimedia teaching materials and assessment. To support this, the establishment of a databank available through the Internet is desirable.

Suggestions to policy-makers

Establishment of an exchange-program both for students and teachers between Japan and Malaysia, in the fields of media education and development of educational materials.

Until now it seems that within the framework of the "Look East" policy of the Malaysian government, too much importance has been attached to the exact sciences, which has resulted in a situation where Malaysian foreign students primarily engage in engineering, science and economics. On the other hand, Malaysian students specializing in teacher education, development of educational materials and media-education have been almost non-existent in Japan. Future country reports are expected to be more a reflection of the present situation, and should report on educational approaches and their subsequent outcomes.

4. Discussion

The ensuing discussion focused on the following points:

- The incongruity between the outer appearance of the country, signified by large-scale projects of modernization, the increase of wealth and modern social systems and the intrinsic quality of the country, such as educational content. In education, efforts are focused

on hardware, such as in the case of media education, the installment of computers in "Smart Schools', but the "software" side of the problem is being neglected, such as critical thinking skills, decision-making skills. As a result, countries who have mainly been focusing on the hardware-side will be more vulnerable to rapid economic changes, such as the one that occurred in the second half of 1997.

- Issues related to the multi-ethnic character of the country, in particular in relation to efforts towards integration of several ethnic groups in Malaysia. Is there a volition to integrate? A delicate relation of "give and take" seems to exist in Malaysia between the Malay and Chinese population, with mutual respect, while the third largest ethnic group of Indian descent, seem to missed the boat on both.
- The situation where each ethnic group attends their own schools. Public schools are separated according to ethnic background. The ethnic-Chinese Malaysians have been able to establish their own private schools, due to their relative economic wealth. However, Smart Schools will be established equally for each group, but the problem of inequality exists already, as children of well-of families are more likely to have access to computers, as a result most of the Indian-ethnic group children will already be in a disadvantaged position. Achievement of absolute equality seems to be impossible at the moment.
- The need for the establishment of a system of cooperative development of educational materials, preferably on an international scale, for example, by using the Internet.

Discussion of Country Reports: Philippines

Remarks by Reiko Hojo, Yoshikazu Murakami, and Fumihiko Shinohara

1. Remarks by Prof. Hojo

The report by Prof. Soria draws heavily on the results of a survey he has done, unfortunately no concrete details about the survey were given. This makes it hard to assess the validity of the conclusions made.

In general, the Filipino plans for the promotion of the use of NIM in (teacher) education sound great, but to understand the actual situation in the Philippines and enable further analysis, more detailed and concrete date are necessary.

2. Remarks by Prof. Murakami

Introduction

According to the Nippon Keizai Shimbun(Jan. 26, 1998), Japanese ODA expenditures in 1996 were close to US$9.43 billion and despite recent proposals to cut the amount of ODA, Japan is still the number 1 donor in the world. Recent surveys have shown that the Japanese public opinion favors to keep ODA and international cooperation efforts at the same level, almost 50% believes that ODA expenditure should be kept at the same level, while 34% favors an increase and 15% a decrease. However, although Japan is number 1 donor in absolute terms, Japan's position is much lower, if one looks from other perspectives. ODA expenditure per capita in, for example, Denmark is close to US$337, while that of Japan is only US$ 75. If one looks at the ratio of ODA expenditures against the GNP, Japan's position becomes even less favorable. Denmark, Norway and the Netherlands rank 1,2 and 3, with ratios of respectively, 1.04%, 0.85% and 0.83%, whereas Japan is a distant 19th in this ranking with just 0.2%. Looking from these perspectives a more active policy of international cooperation and assistance should be promoted.

Action Plan

Prof. Soria mentions in the paragraph on ODA from Japan, Japan's successful experiences and plans for developing NIM literacy and technology, and requests assistance in training of teacher educators of NIM and consultancy and advise on setting up Education Development Centers. We have been involved cooperation in field of teacher education in the Philippines already for quite a while, but from this report is it very difficult to assess what more assistance is needed. The report should have been clearer in formulating what kind of cooperation is

necessary. Otherwise, one can not get a clear-cut idea on what can be done.

Cooperation is first and foremost *co*-operation. It is not a single-sided operation. It should be a *mutual* and *interactive* operation. It can only be executed effectively if it is on a fifty-fifty basis. It can not be a simple handover of funds.

The actual situation is already that Japan as a country can not do without other countries, as it is highly dependent on imports in terms of food and oil. International cooperation is not only in the interest of the recipients, it is beneficial for the donors as well. Actually, one could say that some kind of fifty-fifty basis relationship already exists.

The present situation of international cooperation needs to be clarified and should be comprehensively written in the report. The "International Cooperative Framework" in the Philippines' report does not give any clear-cut framework under which they want to work with others in the region.

Suggestions

When looking for APEID-related sites on the World Wide Web, only a small number of hits were produced by search engines. There is still little information available on the Internet. For Asia and the Pacific, it is invaluable to set up an electronic communications channel that is connected to the Internet. It can eliminate geographical differences in terms of access to outside information. To install computers for educational information services at a selected organization such as PROAP ACEID-Bangkok is not a technologically difficult matter. High performance and expensive computers used for such purposes are now affordable as personal tools. If this channel were to be realized, not only educators in the Philippines and Japan, but others in the region could exchange and share educational information instantaneously and unhindered by national borders.

Information regarding APEID activities is scattered at the moment. We need a better electronic management system for the information we have accumulated. Only a small portion of it is on the WWW. It is not yet abundantly available. By setting up such a system with our international cooperation, we can enrich the contents to cope with the educational needs in the region.

3. Interim discussion

Main topics of the interim-discussion after Prof. Murakami's presentation:

- Possibility to set up a server that will gather APEID-related information, and who should maintain this server,
- The issue of cooperation between the Associated Centers inside Japan and the possibility to improve coordination of the activities of the Japanese Associated Centers.

- Although there are more that 160 Associated Centers in the Region, if one would add the word 'active' the number of Associated Centers would decrease enormously. At the Bangkok office there are moves to cull the number of Associated Centers to only the active ones. The expectation is that only 30 Associated Centers will remain in the end.
- The need to enforce guidelines for the authors of the reports to back their contributions up with concrete data and research, in order provide the opportunity to make informed decisions of support. Without key targets and key strategies the participants are hesitant to endorse assistance.

4. Remarks by Prof. Shinohara

Although having being involved in UNESCO, JICA and APEID international activities for over twenty years, there is some feeling of frustration. This seminar, being the first of the sixth cycle of APEID seminars, means that already 25 years have past, but still there are no data or proof whatsoever whether these seminars have made any significant contribution to the development of education in the region.

When assessing the report the following basic premises were:

1. The Japanese education system is completely centralized in terms of pre-service and in-service training of teachers as well as education contents in schools.
   Countries who want to become part of the developed world should therefore centralize their education system as well. One of the problems with UNESCO is that it can only contribute through exchange ideas, but has not ways to enforce change.
2. Computers or new information technologies are really an integrated system compared to other existing old media. In order to utilize computers in education we have to carefully consider educational technology, which is specified by both a scientific way of thinking and the so-called systems approach and has been attacked since 1974 from the beginning of APEID activities. Educational technology is one of the key issues in order to improve education in the region. Those educators who want to install computers should have some idea about educational technology, or the systems approach.
3. The Country Report and Action Plan are not just expression of personal ideas, but authorized documents by the UNESCO Philippines as well as the organizing committee of Hiroshima APEID. They should reflect the Philippines' government policies in terms of computers in schools. In the field of computers in education by international institutions, UNESCO PROAP has published two comprehensive books, '*Computers in Education: An Outline of Country Experiences*' in 1985 and '*Preparing ASEAN for the Information Century: A Comparative Study of Policies and Programmes on Computers in Science and*

Mathematics Education' in 1991.

Besides these two publications from UNESCO, SEAMEO INNOTECH published *'New Information Technologies in Teacher education'* in 1993, which includes papers from several member countries in the region, while SEMEO RECSAM, IEA and OECD-CERI each have carried out surveys on the use of microcomputers/computers respectively.

Comments on the Country Paper and Action Plan

While the author points out several good statements or aspects of introducing NIM in the Philippines , a number of question remained after reading the country report:

Firstly, how do you accommodate NIM to the current situation in education system and educational content? In his summary, Prof. Soria mentions inadequate facilities, but what does this mean? Nobody knows the appropriate number of computers, how to arrange computers in the classroom, how to organize computers in subject matters or how to use computers within the curriculum, how to develop and run teacher training curriculum, etc. However, Japanese educators have experience about these issues in the Japanese context. Therefore, research in such matters should be done in the Philippine context in a systematical way.

Secondly, one has to ask why we need educational computing in schools. What are the biggest problems being faced with school teachers and administrators?

Thirdly, it will be necessary to further specify methods and content of:

- The proposed drastic change in pre-service education,
- How to realize that teachers will use new technologies in other curriculum areas as well,
- The various surveys, national investigations, evaluative studies mentioned in the report.
- The Restructuring of the University of the Philippines College of Education curriculum.

Finally, in the Action Plan, in each of the statements, method, purpose and the extent to which certain aims have already been achieved should have been described more clearly.

Suggestions and recommendations

- Upon receiving a plan of activities, documents or a list of related materials collected and/or compiled during its activities since 1974 by PROAP, should be sent to the organizing committee. Therefore, more interactions between UNESCO-PROAP and the organizing committees must be encouraged. A better dissemination of information is necessary, through for example the earlier-mentioned establishment of a database. The Hiroshima University Associated Center should take the lead in the establishment of this database and start gathering documents of the past 25 years.
- Effectiveness, which is just like the systems-approach, one of the fundamental components of education technology that has been promoted by UNESCO-PROAP since 1974 through a

classic, very significant book on educational technology published in 1995. Mass production of teachers should be much more encouraged to be carried out in the same way as Japan experienced in the 1960's and 1970's in order to solve the problems of shortage of qualified teachers and increase in the number of students. However, people in the region do not want take effectiveness or mass-production into consideration.

- UNESCO-PROAP should continuously take initiatives using the experience of Malaysia. The report from Malaysia looks like it is written by Japanese. Perhaps it is based on the "Look East Japan" policy in Malaysia. They want to follow Japanese ideas. Malaysia has in a way become an example for other countries, as more Malaysian are used as resource persons in international workshops and seminars in the region.
  It is not necessary to follow the Japanese model completely, for a long time computers in Japanese schools were mainly used for administrative purposes, but some parts of the past Japanese experience might be useful for countries in the region.
- UNESCO-PROAP should encourage Associated Centers in the region to cooperate with institutions and enterprises including Asian Development Bank, World Bank, IEA to realize a way to gather funds, not just from Japan. Funds can only be obtained with a clear plan and should be based on give-and-take situation.

Recommendations

1. As the 1997 Hiroshima Seminar was marked as the first one in the sixth programming cycle of APEID activities, each country report could be considered as an initial, official and/or basic reference. Based upon the comments developed in this Follow-up Meeting, the organizing committee should request the participants of the next seminars when being nominated to offer official and concrete data to make the current country report much more clearer, and then based on these data he or she should consider in a scientific way on conducting further research. There should be a cyclical process of constant evaluation of the results of seminars, whereby participants report about and add to the achievements of their predecessors. So far continuity has been lacking, until now participants have been attending the seminars independently, providing very broad reports, and the seminars only have produced similar recommendations every year. In order to prevent this, a cyclical process should be put in place.
2. In order to continuously and dynamically exchange information and creating human networks, so-called Hiroshima Alumni of APEID Activities ought to be established for example by delivery of a newsletter.

5. Common remarks

1. As the 1997 Hiroshima Seminar is marked as the first one in the sixth programming cycle of APEID activities, each country report will be considered as an initial, official and/or basic reference. The comments developed in this Follow-up Meeting should be given to the participants of the next seminar to enable them to prepare their reports backed by empirical data. The Country Reports, presented at the seminar should be sent to each national UNESCO committee for approval, before the seminar, in order to ensure that the paper is a country paper.
2. In doing so, the participants could follow a more scientific way in conducting their educational research.
3. For Asia and the Pacific region, it is especially invaluable to set up an electronic communications channel, which is connected to the Internet. It can eliminate geographical difficulties in terms of access to outside information. The information regarding APEID activities is scattered and difficult to assess. Today we need a better electronic management system for the information we have accumulated.
4. In order to continue a dynamic exchange of information and to create a human network, a kind of the Hiroshima Alumni or the Reunion of APEID Activities could be established, and their activities would include delivering newsletters and so on.
5. Proposing the establishment of a database is not so much a problem, the support-structure for the maintenance is the problem and needs to be discussed. You need people to implement these kinds of proposals.

6. Discussion

In the ensuing discussion the following topics were addressed:

- In the present situation of international cooperation, Japan is acting like "Father Christmas". One has to be aware that neither UNESCO nor Japan are funding agencies. UNESCO's main function is to provide technical assistance. If countries start to ask for funding without any thorough plans there is a good reason to question and refuse funding. ACEID as well is a technical support system, not a funding organization
- Improvement of direct relations between Associated Centers and institutions such as the World Bank, Asian Development Bank and national foundations. The problem is however that sometimes countries do not know how to manage these institutions. Also internal political instability in certain countries makes it difficult to obtain the proper feedback of

results. Finally, often participants to the seminars do not have the political leverage to endorse proposals.

- ACEID does not have expertise in educational technology. ACEID can provide technical assistance in some areas, but is actual dependent on the expertise of outside sources, such as academics. The initial aim of APEID was to get and gather expertise rather than provide it. This is also one of the rationales for the revamping of the AC network.

Discussion of Country Reports: India

Remarks by Tsuguo Nakasato

1. Background

Indian education has experienced major changes over the past few decades. In particular, the development of teacher education possesses its own distinctive character. For a long time, education in India was perceived by the government as a social service, and responsibility for education was for a long time left to the various states, with the national government only having indirect influence. A major turning point in the development of Indian education was the Constitutional Amendment on Education in 1976. This marked a shift in terms of responsibility, towards a form of joint responsibility shared between the states and the country. As a result, the Union government got more actively involved in educational development. One of the major factors behind this shift was the population explosion in the seventies, which drew attention to education for the poor and socially weak.

The second major caesura was the promulgation of the National Policy on Education (NPE) in 1986. This major educational reform is the main determinant of the present educational system in India. In 1986, the views on education of the Indian government shifted further away from a mere social service to a view in terms of educational development, i.e. to make education the basis for a nation's economic development. This way of thinking had been almost non-existent before 1986.

India's economy was until the middle of the eighties, a highly planned economy, socialist styled economy. It was largely closed to the world and a free market hardly existed. From the start of this decade however, foreign capital was partly allowed to enter the Indian market, and saw amongst others the entry of Japanese carmakers into India. In the political field major changes also occurred as the ruling Congress Party gradually lost its absolute power.

With the liberalization of the economy progressing into the nineties, there is also change visible in the teacher education area. In 1993, the National Council for Teacher Education (NCTE) is being established, when it is made independent from the National Council of Educational Research and Training (NCERT). The NCTE was created with as its primary aim the establishment of a highly planned, national teacher education system

Presently, NCTE plays a central role as it certifies all teacher education facilities in the country. This is the first time that the national administration has obtained control on education, through teacher education. Judging from moves to centralize educational administration, one can conclude that in India, political and economic events and the development of teacher education

have been intertwined.

Besides political change, social changes in India also need to be taken into account when reading this report. Changes, such as the growth of support for fundamental Hindu movements such as the BJP, at the expense of the Congress party, and the fact that the national government for the first time has obtained central control of teacher education, as signs of a highly dynamic situation.

The environment surrounding education in India is very diverse, there are enormous problems that the system faces, such as its sheer size, population explosion, poverty and high illiteracy. These problems are to be addressed in a country with a high diversity in religion, language, its long history of colonial domination, being an agricultural society and very male dominated. We must read the report keeping this background in mind.

2. Remarks on Country Report

The report is very detailed and accurate, as it deals with two practical cases, which were probably promoted by the author of the report himself. The author himself points out a number of problems, which still need to be addressed. All this made it difficult to attach many comments. After reading the report the following remarks can be made:

a) Data on the expenses and the cost-benefit analysis of the two sample projects should have been given. The educational results of the sample projects should be used as measuring stick with future methods. Furthermore, it would be appropriate to look further into the issue whether the unit-training-cost using NIM will be favorable in comparison to that of the traditional "face to face training methodology".

b) The relationship between the aims that are expected of using NIM and the aims of education are not clear. 'For what purpose', 'for whose purpose', and 'With what kind of procedures' are issues that need to be clarified.

c) The question is whether NIM is appropriate to overcome this dual structure of education.

d) That the Internet is "Global sharing of information sources" is correct, however, it is a bit too optimistic a perspective to praise it highly as being economical and zero-cost. Purchase costs, maintenance costs, service costs are high with modern science and technology. Furthermore, science and technology are continuously progressing, in this sense an awareness of the high costs of NIM is necessary.

e) As a nation, why is the problem of illiteracy neglected, as education is not simply expected to be a social service.

f) As elementary school teachers in rural areas, if you compare them with *Sabah* (gurus), are not very highly respected, more philosophical education should be inserted into subjects, in

order to let education make a big contribution to nation-building while at the same time improving the skills using NIM.

g) There are many problems involving the educational environment. Among these, the goals of the National Policy on Education of 1986 and the relation with NIM and the effectiveness of NIM should have been described more concretely and in more detail.

3. Comments on the Action Plan

1. Policymakers

Are there actually any teachers who access the Internet, paying local rates? Furthermore aren't only teachers, capable of understanding English, able to use the global information resources?

3. In-service Teacher Training Center

The problems can only be solved if the cooperation between the Union and the State-level is strengthened. However, there are problems, such as the establishment of computer laboratories and the building of networks where specific assistance from the Japanese government could be considered.

4. Curriculum in Secondary Schools

Agree, it is necessary to move from learning centered on rote memorization, to foster of problem-solving skills.

5. Textbooks

The problem is how to access electronic learning resources, it will require funds for the purchase of facilities. The problem is that free allowance of textbooks comes first.

6. Teaching Aids

Agreement. But in what way can this be realized?

4. Final Impressions

When one looks at the actual situation in India's rural areas, the situation is quite severe. Even if someone graduates from university, there is often no job waiting. The only thing many can do it to open private schools.

In this time and age one has to speak English, otherwise job-prospects are bleak. If you do not go to school from elementary school to high school you will not learn sufficient English. The children of local elite do not go to the local village school, but go to boarding schools in larger cities. Many have certainly no high expectations of public schools. More and more people in rural areas are coping with this; in fact, the country's policies and the situation in rural areas do no connect at all. People cope themselves. It would be good if among the liberalization policies, a

centralization of education, including teacher education progresses, were to be stimulated. However the fact is already that rural areas increasingly move independently. It is difficult to foresee how education, the development of the country and administrative centralization will link to each other. However, there are many fruitful ideas present in India, which should be supported with ODA from Japan

5. Discussion

In the ensuing discussion the following points were mentioned:

- The existence of quite diverse views in India on the use of NIM in teacher training among policy-makers.
- There is the fundamental question of change in a bureaucratic organization of the size of that in India.
- The problem that the content of teacher training is not applicable in practice, due to the lack of adequate facilities and funding, It will be necessary to bridge the gap between further modernizing the curriculum in teacher training institutions and the actual situation at the school were the teachers are going to be employed. This gap is particularly large in rural areas.
- Indian education and its policy-makers have been predominantly following developments in the West, in particular Great Britain, as example for reform. Only since the liberalization of the economy in beginning of the nineties, India has shown a larger interest in East- and Southeast Asia. As computer education is more advanced in certain European countries than Japan, the case of India might be an opportunity to obtain more expertise on European developments.
- The report may give a broader, better view than other reports, as it seems to be the result of a collaborative effort. The Action Plan of India is also different from the other in that it does not request for support, it reflects a very strong sense of self-management.

Discussion of Country Reports: Nepal

Remarks by Yasushi Mizoue

1. Remarks on Country Report

Nepal is a country that faces numerous problems such as the gap between rich and poor, high rates of illiteracy, and large difference in social position within the country. Prof. Pyakurel states in his report that secondary education is regarded as the main foundation of manpower needs for development of the country. In recent years, Nepal has reformed its secondary education system and curriculum. Unfortunately the report did not mentioned the reason why Nepal had to reform of their educational system

The report mentions that the dropout rates are very high at grades 1, 5 and 8. It is necessary to clarify the reasons why the dropout rates are so high at these grade levels. Furthermore, what kinds of strategies are implemented to prevent these high dropout rates? If, for example the low volition of children to attend school is one of the reasons for this high dropout, the use of media might be one of the means to lure back these children.

The report says the proportions of trained teachers in lower and secondary education are 31% and 42% respectively. If would have been helpful if more detailed information on what constitutes a trained teacher, and the content of their training had been given.

If the number of trained teachers is as low as is reported, Nepal should consider the introduction or increase of the opportunities for an in-service training system. In addition, it is necessary to reform the pre-service system i.e. the reform of teacher training institutions.

Teacher are the key-determining factor with regard to the quality of education, as Prof. Pyakural aptly states. In the report, the expected role of teachers and their competencies are mentioned. These tend to be universal. It would however be helpful to know what the most important items and needs are in the Nepalese educational situation.

The eradication of illiteracy is regarded as an urgent task for education in Nepal. The question that comes up is, how Nepal will combine the introduction of media, information technology with the policy and practice of prevention of dropout and decrease of illiteracy. At least, one of the first points that needs to be clarified is, if the use of computers or other media will be useful in the combat against illiteracy.

It is reasonable the NIM is introduced into teacher education and schools. However, this introduction of NIM can not be undertaken independently, but needs several supporting elements. One could question the feasibility of the introduction of computers in current Nepalese education, as it has still to solve more basic problems, such as the establishment of schools. This means educational practice needs to use several education media and materials; cartoons,

pictures, videotapes, posters etc. All this has to be according to the students' need of motivation and level of education.

In addition, a revision of the teaching-learning process for problem-solving methods is needed. Thinking skills and decision-making skills are to be regarded the most effective way of learning.

Therefore, the introduction of new information technology should be accompanied by other crucial elements of teaching-learning methods as well.

Discussion of Country Reports: Pakistan

Remarks by Yasushi Mizoue

1. Remarks on Country report

The Pakistan report is well organized. However, there is a need for more concrete data about the current situation in Pakistani education. In the report Teacher training is regarded as the core of the success of the new educational system in Pakistan.

Referring to this, I would like to make the following proposal. Naruto University of Education, has as its main feature the in-service training of teachers. The University is currently planning to establish a special Graduate Course for teachers, educational policy-makers from developing countries in East and Southeast Asia. In this course, training on the use of information technology in education is included. Research and training are more practical in both the University and the City of Naruto.

Naruto is the most progressive education institution in terms of the introduction of computers in primary and secondary schools. Experts of the University have made contact with the City Board of Education to provide technical and educational support to the needs of the school. Graduate students could join in such collaborative projects. This Graduate Course will bestow a Master-degree to students who complete the two years of training. At the moment, we are seeking funding to support students from other countries. We have asked to make ODA-funds available for this development of human resources and in each country in Asia. If successful, the students can learn about the collaborative structure that exists in Naruto between university, local district, local board of education, the Ministry of Education, UNESCO Associate Centers and UNESCO-PROAP and other international agencies. This training system could be applicable to each situation of the district, where the student comes from.

If a country wants to improve NIM in education, I believe the first step is to obtain the necessary facilities, this is also the situation in Japan. Present teachers need to be retrained in the use of computers. Japan can make a contribution by inviting teachers to receive their retraining in Japan, the problem is of course funding. However, institutions such as JICA could be approached to support such programs.

2. Discussion

In the ensuing discussions about the Nepal and Pakistan report the following points were mentioned:

- The proposal to introduce an in-service graduate program for teachers from APEID countries in Japan. The problem is that many exchange students who are trained here as teachers, after return to their country do not become teacher, but use their competency in

Japanese to find work in Japanese corporations, which offer much higher salaries.

- The risk of training only selected teachers in media use even within their own country carriers the risk that they will leave the teaching profession for more lucrative careers as media-literacy is still a scarce commodity.
- The issue how NIM, including computers, can attract poorly motivated children to attend school. Nepal is currently only focusing on distance education by radio, as other media are beyond current means. The role of television can be very important as educational medium as for many people in developed countries the television is even more attractive than school. For many countries computer based education is still beyond reach, and education that makes use of older media such as television will presently be a more attainable goal.

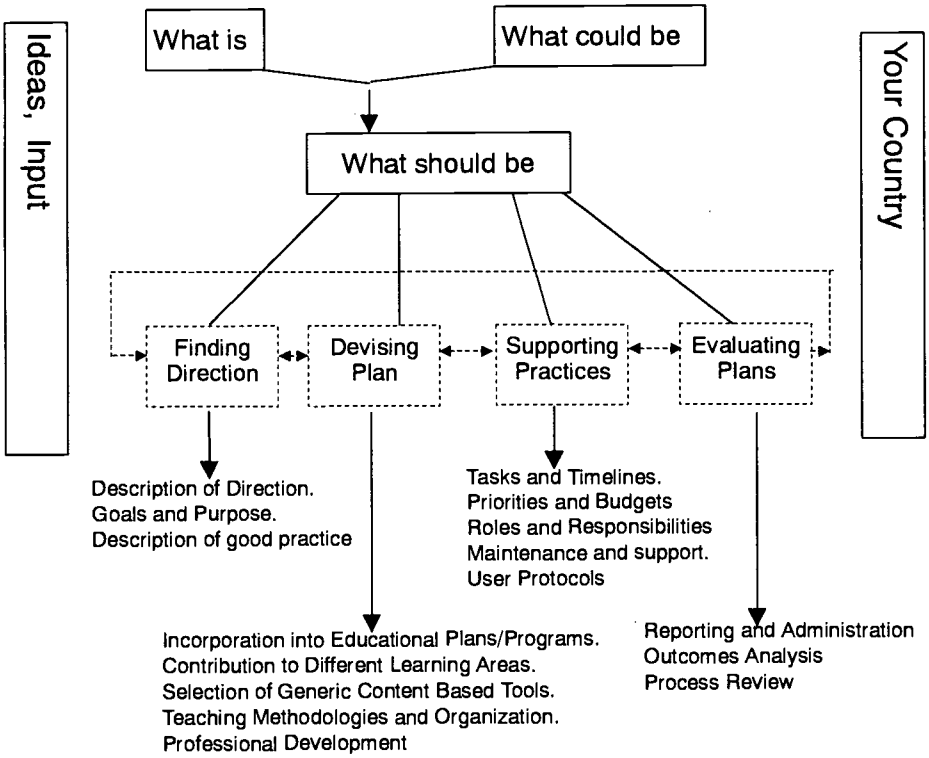
Devising a effective Action Plan

David J. Mcloughlin

1. Introduction

The members of the Follow-up Meeting in January 1998 had difficulty gaining an understanding of the Action Plans submitted by the 1997 Seminar participants. For this reason, the Hiroshima Associated Committee asked the resource person of the Follow-up Meeting, David Mcloughlin, to shed some light on this issue. Parts of these remarks already came up in his assessment of the Thai country-report.

Chart 1: UNESCO-APEID Project NIM Planning Model



2. Future Action Plans

Chart 1 gives an example of a planning model, of which many aspects were already discussed earlier on. To have projects undertaken by the Hiroshima University Committee and participants of the Follow-up Meeting it is very important that correct information is provided in order to be

able to make any decisions. For that purpose, one needs to go back to the source of this information, in this case the participating countries. This is to ensure and to assist these countries in whatever way possible, to formulate their plan. That may be seen as a role of this committee, to put that proposal in assistance to those countries in mean. In mean, because all countries do have different level, not every country requires this.

In short, there are ideas and input, and your country. Then the fundamental questions that were discussed in the discussion about the Thai report and Action Plan: "What is?", "What could be?" and "What should be?" It is important that those countries in their reports go through the process of finding direction, devising plan, supporting practices and evaluating plans. Between the various stages of this process, one can go back and forth. This whole process would become cyclic. This is a very simple model, and if a country looks at the NIM-plan or model, the committee can get some very valuable information from these countries. This information will be more accurate, and it will be the information that the committee requires in order to be able to assist.

Chart 2: Thoughts for a proposal: Basic format

UNESCO-APEID Project
Teacher Education for the effective use of New Information Media in Schools

Writer: _____

Document Level of Approval: _____

Action Plan for International Cooperation

Statement 1-6 **AREA**.....

Action Plan Overview

Current Situation Targets/ Outcomes	New Key Targets/ Goals	Strategies To be Undertaken	New Outcomes	Time Frame	Resources Required	Responsibility Who is responsible?	Other Support agencies

Chart 2 is just a basic format, a format that could be given to a country, so it can briefly give an overview of their detailed, articulate plan, if they have formulated one. Statement 1-6 refers to the statements that were used in the format of the Action Plans in the 1997 Seminar. As a result, one would have one of these for each area. For example, the area of policymakers, one could mention the need of international workshop. The committee will obtain information about the current situation, from the bottom part of the chart. One needs to know the current situation in that country, targets and their outcomes.

If something new is proposed, for example a center to promote NIM, new key targets and goals will have to be given. What strategies are to be undertaken to establish that center? What are the outcomes you are looking for in teaching and learning of NIM? In the establishment of that center through those strategies? What is the timeframe for the implementation of those strategies, what are the resources you require: - human, physical and financial – Who is responsible for that? Finally, is there support from other agencies, or commitment of other projects, that complement this?

If you had one page made of four key targets on one particular area, and follow that targets across. You can clearly see, in one page, what the process is, what the aims are and what the outcomes are that you want to achieve. It is not hidden away in a twenty or forty page report filled with facts that are not relevant to that target. Participants of the Follow-up Meeting have spend too much time finding those targets in the various reports, what they want to achieve.

3. Technology Planning Model

The Technology Planning Model which I used to assess the Thai Report, has been developed on the basis of three years of international research by Mississippi University, by looking at best practices. This model identifies five phases: [4]

Phase 1: Recruit and Organize Planning team
Team members should be representative of all stakeholders and should be leaders who excel in planning, relationships, and communication skills.

Phase 2: Research
Identify the technology needs of the individuals and organizations in your educational institutions, identify the technologies that can be applied to those needs, and identify how they can be applied.

Phase 3: Construct Technology Plan
Use what you have learned from your research to define your vision/mission and to define the goals and tasks that will lead to fulfilling your vision and mission.

Phase 4: Formalize the Planning
Articulate in a document what is believed, what exists, what is to be, and how goals are to be achieved

Phase 5: *Continually* Implement, Evaluate and Revise

Any team wishing to undertake the development of a NIM-plan, should consider using these

[4] Larry S, Anderson, *Guidebook For Developing an Effective Instructional Technology Plan, Version 2.0* (Mississippi State University, National Center for Technology Planning)

kinds of models. It will make future jobs for the participants of the Follow-up meeting and requesting information of other countries more effective and more specific.

Appendices

Appendix A: List of Participants

Special Adviser from UNESCO PROAP, Bangkok

Dr. Rupert MACLEAN

Chief of ACEID, UNESCO PROAP

Bangladesh

Mr. Gholam Rasul MIAH

Director (Training), Secondary and Higher Education, Ministry of Education

China

Mr. Gao ANMIN

Professor & President, Shanxi Education Institute

India

Mr. Amar Nath MAHESWARI

Joint Director, National Council of Educational Research and Training (NCERT)

Indonesia

Dr. Tian BELAWATI

Head of Centre for Indonesian Studies, The Indonesian Open Learning University

Malaysia

Dr. Hj. Mohammad Sani Hj. IBRAHIM

Principal Assistant Director, Teacher Education Division, Ministry of Education

Nepal

Mr. Bharat Nepali PYAKUREL

Dept. Director, National Curriculum Development Center

Pakistan

Dr. Marajuddin BHATTI

Director of Training, Institute for the Promotion of Science Education and Training Ministry of Education

Philippines

Dr. Robinson C. SORIA

Professor, Dept. of Educational Technology, College of Education University of the Philippines

Thailand

Dr. Chukiat LEESUWAN

Assoc. Professor, Dept. Dean for Foreign Relations and Special Affairs, Faculty of Education, Chiang Mai University

UNESCO Japan National Commission

Mr. Takashi UEDA

International Planning Officer, Science and International Affairs Bureau, Ministry of Education, Science, Sports and Culture (Monbusho)

Hiroshima University Representatives:

Mr. Kazuhiro Mori

Vice-President & Professor, Hiroshima University,

Mr. Shoichi YAMASHITA

Professor, Chairperson of Hiroshima University APEID Committee & Dean, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Tamotsu TOSHIMA

Professor, Vice-Chairperson of Hiroshima University APEID Committee & Dean, Faculty of Education, Hiroshima University

Mr. Yasuhiro MADA

Professor, Vice-Chairperson of Hiroshima University APEID Committee & Dean, Faculty of School Education, Hiroshima University

Ms. Mariko SANO

Associate Professor, Faculty of Integrated Arts and Sciences, Hiroshima University

Mr. Shigenobu MATSUOKA

Professor, Faculty of Education, Hiroshima University

Mr. Morihisa SUZUKI

Professor, Faculty of School Education, Hiroshima University

Mr. Norihiro KURODA

Professor, Center for the Study of International Cooperation in Education, Hiroshima University

Mr. Nobuhide SAWAMURA

Associate Professor, Center for the Study of International Cooperation in Education, Hiroshima University

Mr. Kazuo KURODA

Lecturer, Center for the Study of International Cooperation in Education, Hiroshima University

Mr. Shuichi NAKAYAMA

Professor, Director of Hiroshima University APEID Project Committee, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Yoshinori TABATA

Professor, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Tatsuya KASAI

Professor, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Hitoshi KIKUMOTO

Professor, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Hideki IWASAKI

Associate Professor, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Takashi KATO

Junior Lecturer, Graduate School for International Development and Cooperation, Hiroshima University

Mr. Lyckle GRIEK

Junior Lecturer, Graduate School for International Development and Cooperation, Hiroshima University

Appendix B: Seminar Program

24 September - 3 October, 1997

Sept. 23 (Tue) Arrival at Higashi-Hiroshima City
(Hiroshima International Plaza)

Sept. 24 (Wed) 10:30-12:00 Registration
12:00-14:00 Lunch
14:00-16:00 Business Meeting
18:00-20:00 Reception by the Hiroshima University
(Hiroshima International Plaza)

Sept. 25 (Thu) 10:00-10:45 Opening Ceremony
Welcome Remarks:
Dr. Yasuo Harada (President of Hiroshima University)
Dr. Rupert Maclean (Chief of ACEID, UNESCO PROAP)
Mr. Takashi Ueda (International Planning Director. Science and International Affairs Bureau, Ministry of Education)
Dr. Shoichi Yamashita (Chairman, Hiroshima University UNESCO-APEID Project Committee)
10:45-11:00 Break
11:00-11:45 Keynote Address
Dr. Rupert Maclean (Chief of ACEID, UNESCO PROAP)
Strengthening Teacher Education, and the Role of Teachers, in a Technologically Changing World: An Asia-Pacific Perspective"
11:45-14:00 Lunch

> Each presenter of a country report is asked to speak to (not read) their paper for about 20 minutes, with about 10 minutes available for discussion. Teaching aids such as OHP white board, etc. will be available for use.

14:00-14:30 Presentation of Country Report and Open Forum
Dr. Miah, Gholam Rasul
Director (Training), Secondary and Higher Education
Ministry of Education, Bangladesh
14:30-15:00 Presentation of Country Report and Open Forum
Mr. Maheshwari, Amar Nath
Joint Director, National Council of Educational Research and Training Member Secretary, National Council for Teacher Education, New Delhi, India
15:00-15:30 Tea/Coffee Break

15:30-16:00 Presentation of Country Report and Open Forum
Mr. Bharat Nepali Pyakurel
Deputy Director, Curriculum Development Centre
Nepal

16:00-16:30 Presentation of Country Report and Open Forum
Dr. Marajuddin Bhatti
Director of Training, Institute for the Promotion of
Science Education and Training
Ministry of Education
Islamabad, Pakistan

Sept. 26(Fri) 9:30-10:00 Dr. Rupert Maclean (Chief of ACEID, UNESCO PROAP)
An Overview of APEID Activities and Modalities of
Operation during the Sixth Programme Cycle, and Our Plan
for the Future"

10:00-10:30 Presentation of Country Report and Open Forum
Mr. Gao Anmin
Professor and President
Shanxi Education Institute
China

10:30-11:00 Tea/Coffee Break

11:00-11:30 Presentation of Country Report and Open Forum
Mrs. Tian Belawati
Lecturer, Indonesian Open Learning University
Ministry of Education and Culture
Jakarta, Indonesia

11:30-12:00 Presentation of Country Report and Open Forum
Dr. Hj. Mohammad Sani Hj. Ibrahim
Principal Assistant Director of Staff Development Unit
Teacher Training Division
Ministry of Education
Malaysia

12:00-13:30 Lunch

13:30-14:00 Presentation of Country Report and Open Forum
Dr. Robinson C. Soria
Professor, Department of Technology
College of Education
University of the Philippines
Quezon City, Philippines

14:00-14:30 Presentation of Country Report and Open Forum
Dr. Chukiat Leesuwan
Assoc. Professor
Dy. Dean for Foreign Relations and Special Affairs
Faculty of Education, Chiang Mai University
Chiang Mai, Thailand

	14:45	Leave Hiroshima International Plaza
	15:00-17:00	Visit to the Hiroshima Prefectural Education Center
	17.15-	Return to Hiroshima International Plaza
Sept. 27 (Sat)	9:00	Leave Hiroshima International Plaza
	9:10-10:00	Tour to the Hiroshima University
	11:00	Arrival at Rijo-Kaikan Hotel, Hiroshima City
	12:00-13:00	Lunch
	13:00-14:30	Excursion to the Hiroshima Castle
	15:00-17:00	Excursion to the Peace Memorial Park and A-Bomb Museum
Sept. 28(Sun)	9:30	Leave Rijo-Kaikan Hotel
	10:00-11:00	Visit to Ohno-Higashi Elementary School Observation of the School Sports Festival
	12:00-13:00	Lunch
	13:00-16:00	Excursion to Miyajima Shrine
	17:00	Return to the Hotel
Sept. 29(Mon)	9:30-10:00	Presentation of Country Report and Open Forum Dr.Tabata, Dr.Iwasaki, and Dr.Suzuki Hiroshima University UNESCO-APEID 1997 Seminar Committee Hiroshima University, Japan
	10:00-10:30	Tea/Coffee Break
	10:30-12:00	General Session "Presentation of Framework based on Country Reports followed by Open Forum"
	12:00-13:30	Lunch
	13:30-17:00	Preparation for the Draft Report
	(15:00-15:30)	Tea/Coffee Break
Sept. 30(Tue)	8:30	Leave Rijo-Kaikan Hotel for 1-Day Visit
	9:00-11:00	Visit to Hiroshima Municipal Education Center
	11:35-12:15	Lunch
	13:00-15:00	Visit to Chiyoda High School Observation of Multimedia Class Using Video Conference System
	16:30	Return to the Hotel
Oct. 1(Wed)	8:30	Leave Rijo-Kaikan Hotel for 1-Day Visit to Rural Schools
	10:30-12:20	Visit to Tsukushi Elementary School (Sera-Gun) Observation of the Internet Project
	12:35-13:15	Lunch
	13:30-15:00	Visit to Ohmi Elementary School (Sera-Gun) Observation of School Facilities and Classes

	16:30	Return to the Hotel
	18:30-20:30	Hiroshima International Center Discussion on educational problems in Asian countries at the Asian Studies Seminar
Oct. 2(Thu)	9:30-12:00	Preparing for the Draft Report
	(10:30-11:00)	Tea/Coffee Break
	Afternoon	Free
Oct. 3(Fri)	9:30-12:00	General Session (Miel Parque Hiroshima) Finalizing the Draft Report
	(10:30-11:00)	Tea/Coffee Break
	12:00-13:30	Lunch
	13:30-14:00	Closing Ceremony (Miel Parque Hiroshima) Closing Remarks: Dr. Shoichi Yamashita (Chairman, Hiroshima University UNESCO-APEID Project Committee)
	14:00-15:00	Business Meeting
	18:00-	Farewell Dinner Party
Oct. 4(Sat)		Departure

Appendix C: Explanatory notes

24 September – 3 October, 1997

Jointly organised by
The Hiroshima University APEID Committee
and the Japanese National Commission for UNESCO
within the Framework of the Asia-Pacific Program
of Educational Innovation for Development (APEID)
UNESCO PROAP, Bangkok

A. Objectives

As countries move towards the dawn of the 21st century, many are still struggling with poverty, conflicts, and environmental problems. On the other hand, high-technologies such as new information technologies have been developing rapidly and changing society. To live in a global village, people should acquire knowledge, skills and attitudes to solve these problems. To live in a highly technological society, people should acquire new information media (NIM) literacy so as not to be left behind in the change process. These are some of the issues that education in the next century has to cope with. Effective use of NIM, such as multimedia, could no doubt contribute to effective education.

For the next five years, responding to the sixth programming cycle of APEID, the international seminar in Hiroshima is planned to explore innovative strategies to improve the quality of teacher education in the Asia-Pacific Region with yearly topics such as: enhancing the NIM literacy (1997); promotion of international understanding (1998); life-long education for work and leisure (1999); education for the disadvantaged groups (2000); and, reforms in teacher education system (2001).

This year, in 1997, the seminar focuses on issues and problems related to teacher competencies, especially in the context of NIM literacy, in the Asia-Pacific Region. Specifically, the seminar will have the following objectives:

1. To identify and exchange key experiences about problem areas and issues related to teacher's knowledge, skills and attitudes, that are vital to the enhancement of the effective use of NIM;
2. To explore innovative methods and approaches presently employed to enhance key

teacher competencies for the effective use of NIM; and

3. To design national and international cooperative frameworks and action-plans for the enhancement of teacher competencies in support of improving the effective use of NIM.

B. Rationale

The teacher is a key factor in the reform, redirection, and renewal of education. UNESCO-APEID has recommended that action for the upgrading and renewal of education, through enhancing the knowledge, skills and attitudes of teachers, should focus on the following concerns:

1. Achievement of education for all, through both formal and non-formal education, including the enhancement of achievement in all subject areas;
2. Implementation of action to meet the needs of disadvantaged population groups, particularly women and girls and those in remote rural and inner-city areas;
3. Improvement of "quality of life" education with particular reference to environmental education, preventive education, values education, and education for international understanding; and
4. Enhancement of teacher education for all, including mathematics and technology education; and the use of information processing education which involves learning about information technology, the use of computer technology and learning with computers. Teacher competencies in secondary education should be geared towards the enhancement of knowledge, skills, and attitudes in the above cited areas.

C. Procedure

Specifically, activities during the seminar will include the followings:

1. Registration and Opening Ceremony:

Registration will occur from 12:00 to 13:00 on Tuesday, 24 September 1997. The opening and welcoming ceremonies will be held at 14:00 - 17:00, and will include the presentation of remarks from representatives of Hiroshima University, the Japan National Commission for UNESCO, and the Chief of ACEID on behalf of UNESCO PROAP in Bangkok. The venue for the registration, opening and welcoming ceremonies will be the Hiroshima International Plaza in Higashi-Hiroshima City (35 km east of Hiroshima City).

2. Seminar Sessions and Visits:

On September 25-26, seminar sessions will be held at Hiroshima International Plaza. Participants will present their country papers and discuss issues about the improvement of teacher competencies, focusing on NIM literacy. During the first half of the session, visits to the Hiroshima Prefectural Education Center, and Hiroshima University (Faculty of Education, Faculty of School Education), as well as and excursion to Japanese old capital, Kyoto and Nara (September 27-28) are scheduled.

On September 29-October 3, seminar sessions will be held in Hiroshima City. Discussions and the preparation of a Seminar Report are expected. Participants are expected to develop national and regional framework action plans and finalize the draft report of the seminar. During the second half of the session, participants will visit the Hiroshima Municipal Education Center in Hiroshima City, to observe procedures for developing the competencies of teachers in different subject areas, based on the experience of Japan. An excursion to the A-bomb Dome and Museum, and to the Miyajima-Shrine is also planned.

3. Closing Ceremony:

The closing ceremony will take place during the afternoon of Saturday, 3 October, 1997.

D. Qualification for Participation

One outstanding specialist or administrator with considerable experience related to improving the quality of teacher competencies will be invited from Bangladesh, China, India, Indonesia, Malaysia, Nepal, Pakistan, Philippines, and Thailand. Resource persons and consultants from UNESCO-ACEID, Bangkok and Japan will also be invited to the seminar.

E. Seminar Preparation

Each participant is required to prepare a country paper on improving the effectiveness and quality of mainly secondary education through the strengthening and upgrading of teacher performance and professional competencies in the Asia-Pacific Region. Specifically, the country paper should discuss the following items:

To identify key experiences about problem areas and issues related to teacher's knowledge, skills and attitudes that are vital to the enhancement of the effective use of NIM in various subject areas ;

1. To explore innovative methods and approaches presently employed for enhancing key

teacher competencies for the effective use of NIM ; and

2. To design national and international cooperative frameworks and action plans for the enhancement of teacher competencies in support of improving the effective use of NIM.

The country report should be written in English, approximately 15～20 pages in length, with a separate summary of about 2 pages. It should be typewritten, double spaced using the 8-1/2 by 11 or A4 bond paper. The paper must be received by the secretariat of the seminar, Hiroshima University no later than September 5, 1997.

F. Working Language

English will be the working language throughout the seminar.

Appendix D: Hiroshima University APEID Seminar Committee

Committee Director

Shuichi NAKAYAMA,
Professor, Graduate School for International Development and Cooperation

Members

Yoshinori TABATA
Professor, Graduate School for International Development and Cooperation (IDEC)

Seiji INOUE
Professor, Graduate School for International Development and Cooperation (IDEC)

Hitoshi KIKUMOTO
Professor, Graduate School for International Development and Cooperation (IDEC)

Tatsuya KASAI
Professor, Graduate School for International Development and Cooperation (IDEC)

Hideki IWASAKI
Professor, Graduate School for International Development and Cooperation (IDEC)

Shigenobu MATSUOKA
Professor, Faculty of Education

Virgilio U. MANZANO
Associate Professor, Faculty of Education

Haruhiko TANAKA
Professor, Faculty of School Education

Morihisa SUZUKI
Professor, Faculty of School Education

Appendix E: Welcome Remarks by Dr. Rupert Maclean

Welcome Remarks

Rupert Maclean

Chief of the Asia-Pacific Centre of Educational Innovation for Development, UNESCO-PROAP, Bangkok

Professor Harada, President of Hiroshima University; Professor Yamashita, Chairman of the Hiroshima University UNESCO-APEID Project Committee; Mr. Ueda, Executive Secretary, Japanese National Commission for UNESCO; Professors Nakayama and Tabata, and other Members of the Organising Committee; Distinguished Participants Ladies and Gentleman,

On behalf of UNESCO's Asia-Pacific Centre of Educational Innovation for Development (ACEID) in Bangkok, and also on my own behalf, I would like to welcome all participants most warmly to this 1997 APEID International Seminar on Innovation and Reform in Teacher Education for the 2lst Century in the Asia -Pacific Region.

This important and timely meeting has been organised by Hiroshima University under the umbrella of APEID programme activities.

The theme of the meeting this year, Teacher Education for the Effective Use of New Information Media in Schools, is a particularly important one, since it brings together two key topics:

First, the development of N*ew Information Media.* (NIM) We are living through an unprecedented period of rapid and radical change. Nowhere is this more apparent than in the area of technological change, with the quite stunning implications this has had for the development of NIM and on what has been called the ' information superhighway' and,

Second, the importance of strengthening and upgrading *teacher education* to ensure that teachers are adequately trained to most effectively harness this NIM for use in the school and classroom. In addition, the NIM can be used within teacher education institutions themselves, and as a modality for the delivery of teacher education programmes, to help make it most influential and cost effective as part of the career long professional development of teachers.

Ladies and Gentleman,

Over the years, there have been many (e.g. the psychologist Skinner), who have argued that with the advent of increasingly sophisticated technology, that machines can and will replace the

teacher. During the 1960's much discussion centered on the importance of initial forms of teaching machines in the classroom, while today speculation relates to the role of computers in education and schooling. What are your views, I wonder, on this matter: do you believe that technology can replace the teacher in the classroom, or do you think that the teacher will continue to play a central role as facilitator and co-ordinator of the education environment, with the new technologies and education media simply being part of the repertoire of facilities available to the teacher in going about his or her work? These are matters we will have ample opportunity to discuss during this meeting.

We are meeting over the next nine days to examine the 'state of the art' in each of our countries regarding the ways in which teacher education can be re-orientated and improved to ensure the most effective use of new information technologies and media in schools. More specifically, our purposes are:

1. To identify and exchange key experiences about problem areas and issues related to teacher's knowledge, skills and attitudes, that are important to ensuring the effective use of NIM;
2. To explore innovative competencies for the effective use of NIM; and
3. To design national and international co-operative frameworks and action plans for the enhancement of teacher competencies in support of improving the effective use of NIM.

Ladies and Gentlemen,

Hiroshima University has, for many years, been one of the most highly effective and valued of APEID's 198 Associated Centres that exist in 29 countries in the Asia-Pacific region. Along with countries throughout the region, UNESCO very much appreciates Hiroshima Universities pro-active and generous approach to facilitating the sharing of education information and experiences between countries, through organising annual regional meetings on education, such as the one we are all attending here over the next week and a half.

These annual meetings at Hiroshima University have become a significant part of the calendar of education meetings held in our region each year.

Over the next five years (1997 to 2001) Hiroshima University is committed to holding one such APEID International Seminar each year which examines various aspects of the theme: *Innovation and Reform in Teacher Education For the 2lst Century in the Asia-Pacific Region.*

These meetings will assist educators throughout the region to share information and experience, and explore possibilities for fruitful cooperation and collaboration, as we all strive to improve the quality, relevance and effectiveness of our respective education systems in the Asia-Pacific region.

In conclusion, may I again thank Hiroshima University for its generosity and foresight in organising this important meeting.

Thank you and good morning.

Appendix F: Follow-up Meeting, Program

UNESCO-APEID Hiroshima International Seminar

Follow-up Meeting

January 29th – February 1st 1998

Program

Venue: Hiroshima University, Faculty of International Arts and Science

Thursday January 29th 1998

14:00-14:30	Opening Ceremony
	Welcome Remarks by Prof. Shoichi Yamashita, Chairman, Hiroshima University UNESCO-APEID Project Committee
14:30-15:00	Outline of APEID-activities by Dr. Ian Birch, APEID Education Consultant
15:00-15:30	Coffee/Tea Break
15.30-16.30	Preparatory Consultations
18:00-20:00	Welcome Reception (Venue: Higashi-Hiroshima-city Hotel)

Friday January 30th 1998

09:00-10:30	Discussion of Country Reports: Prof. Narita moderator
	Thailand by Prof. McLaughlin
10:30-11:00	Coffee/Tea Break
11:00-12:30	Discussion of Country Reports: Prof. Birch moderator
	Indonesia by Prof. Narita
12:30-14:00	Lunch
14:00-15:30	Discussion of Country Reports: Prof. McLaughlin moderator
	Malaysia by Prof. Umezu
15:30-16:00	Coffee/Tea Break
16:00-17:00	Excursion to Hiroshima International Plaza

Saturday January 31st 1998

09:00-10:30	Discussion of Country Reports: Prof. Mizoue moderator
	Philippines by Prof. Shinohara, Murakami & Hojo
10:30-11:00	Coffee/Tea Break
11:00-12:00	Discussion of Country Reports: Prof. Murakami moderator
	India by Prof. Nakasato
	Nepal & Pakistan by Prof. Mizoue
12:00-13:30	Lunch
13:30-15:00	Discussion of the Action Plan: Synthesis on International Cooperation
	Prof. Nakayama moderator
15:00-15:30	Coffee/Tea Break
15:30-17:00	Discussion of Action Plan: Synthesis on ODA from Japan
	Prof. Nakayama moderator

List of Abbreviations:

AC	Associated Center
ACER	Australian Council of Educational Research (Malaysia)
AIE	Ali Institute of Education (Lahore, Pakistan)
AIOU	Allama Iqbal Open University (Islamabad, Pakistan)
APNIEVE	Asia-Pacific Network for International Education and Values Education
APPEAL	Asia-Pacific Programme of Educational for All
ASP	The Associated Schools Project Network
BPEP	Basic Primary Education Project (Nepal)
C.Com.	Certificate in Commerce (Pakistan)
C.in Ed.	Certificate in Education (Bangladesh)
CAI	Computer Aided Instruction
CAL	Computer Assisted Learning
CBI	Computer Based Instruction
CDC	Curriculum Development Centre (Nepal)
CGPA	Cumulative Grade Point Average (Malaysia)
CIET	Central Institute of Educational Technology (India)
CLASS	Computer Literacy and Studies in Schools (India)
CLIPS	Computer Literacy in Pakistan Schools (Pakistan)
CRFP	Concept Request For Proposal (Malaysia)
CRITO	Centre for Research and Information Technology Organization (Philippines)
CT	Certificate in Teaching (Pakistan)
D.Com.	Diploma in Commerce (Pakistan)
DAE	Diploma of Associate Engineer (Pakistan)
DECU	Development and Educational Communication Unit (India)
DIET	District Institute of Education and Training (India)
DOST-SEI	Department of Science and Technology-Science Education Institute (Philippines)
DSS	District Science High Schools (Pakistan)
DTEE	Department of Teacher Education and Extension (India)
DTI	District Training Institutes (India)
EDCOM	Intergovernmental Regional Committee on Education in Asia and the Pacific
ECO	Economic Cooperation Organization
EFA	Education for All (Bangladesh)
FSESP	Female Secondary Education Stipend Project (Bangladesh)
FSSAP	Female Secondary School Assistance Project (Bangladesh)
FSSP	Female Secondary Stipend Program (Bangladesh)
GCET	Government College of Elementary Teachers (Pakistan)
GIKT	Gulam Ishag Khan Institute (Swabi NWFP, Pakistan)
GNP	Gross National Product
GPEP	Girls Primary Education sector Project (Pakistan)
HC in Ed.	Higher Certificate in Education (Bangladesh)
HPA	High Power Amplifier (India)
HSC (Voc.)	Higher Secondary Certificate (Vocational (Bangladesh)
HSEP	Higher Secondary Education Project (Pakistan)
HSTTI	Higher Secondary Teacher Training Institute (Bangladesh)
HSTTI	Higher Secondary Teacher Training Institute (Pakistan)
HTML	Hyper Text Mark up Language
IBE	International Bureau of Education
I.Com.	Intermediate Commerce (Pakistan)
IBRD	International Bank for Reconstruction and Development (Indonesia)
ICE	International Conference on Education (Bangladesh)
ICT	Information Communication Technologies
IEDAKU	Institute of Education Development, Aga Khan University (Pakistan)
IER	Institute of Education Research (Pakistan)

IGNOV	Indira Gandhi National Open University (New Delhi, India)
IOE	Institute of Education (Nepal)
IPSET	Institute for the Promotion of Science Education and Training (Islamabad, Pakistan)
ISRO	Indian Space Research Organization (India)
IT	Information Technology
JIP	Joint Innovation Project
LAN	Local Area Network
LC	Learning Coordinator (Pakistan)
LUMS	Lahore University of Management Sciences (Pakistan)
MGMP	Musyawarah Guru Mata Pelajaran *Subject Teacher Quality Improvement Forum (Indonesia)*
MOE	Ministry of Education (Nepal)
MOEC	Ministry of Education and Culture (Indonesia)
MSC	Multi-media Super Corridor (Malaysia)
MTPDP	Medium Term Philippine Development Plan (Philippines)
MTT	Mobile Training Team
NAEM	National Academy for Educational Management (Pakistan)
NAM	Non Aligned Movement
NASA	National Aeronautics and Space Administration.
NCED	Centre for National Education Development (Nepal)
NCERT	National Council of Educational Research and Training (India)
NDIE	Notre Dam Institute of Education (Karachi, Pakistan)
NECB	National Educational Commission Board office (Thailand)
NECO	National Educational Commission (Thailand)
NEEC	National Education Equipment Centre (Lahore Pakistan)
NESP	National Education System Plan (Nepal)
NGO	Non Governmental Organization
NGD	National Development Group
NIC	Newly Industrialized Country
NITC	National Information Technology Council (Philippines)
NITP2000	National Information Technology Plan 2000 (Philippines)
NPE	National Philosophy of Education (Malaysia)
NWFP	North Western Frontier Province (Pakistan)
OIC	Organization of Islamic Conference
PKG	Pemantapan Kerja Guru *In-service Teacher Training Programme (Indonesia)*
PMLC	Prime Minister's Literacy Commission(Pakistan)
PMSP	Punjab Middle Schooling Project (Pakistan)
PRODED	Curriculum for Primary Education (Philippines)
PTC	Primary Teaching Certifications (Pakistan)
PTI	Primary Training Institutes (Bangladesh)
RTC	Regional Teacher Training Center (Pakistan)
SAARC	South Asian Association for Regional Cooperation
SAC	Space Application Centre (Ahmedabad, India)
SEDP	Secondary Education Development Project (Nepal)
SEDP	Secondary Education Development Project (Bangladesh)
SEDP	Secondary Education Development Project (Philippines)
SEP	Science Education Project (Pakistan)
SMP	Junior Secondary Education (Indonesia)
SMP Terbuka	Open Junior Secondary Education (Indonesia)
SSC (Voc.)	Secondary School Certificate (Vocational) (Bangladesh)
STD	Straight Trunk Dialing (India)
TED	Teacher Education Division, Ministry of Education (Malaysia)
TRC	Teacher Resource Centre (Karachi, Pakistan)
TTC	Teacher Training Centre (Bangladesh)
TTI	Teacher Training Institute (Pakistan)
TTP	Teacher Training Project (Pakistan)

UN	United Nations
UNEVOC	UNESCO International Network on Technical and Vocational Education
UNDP	United Nations Development Programme

Innovation and Reform in Teacher Education for the 21st Century in the Asia-Pacific Region: Teacher Education for the Effective Use of New Information Media in Schools. 1997 Report

Shuichi Nakayama & Lyckle Griek Eds.

UNESCO-APEID Associated Center

Hiroshima University, Japan

1-5-1 Kagamiyama, Higashi-Hiroshima city

〒 739-8529 JAPAN

Tel: +81-824-24-6905

Fax: +81-24-6904

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Teacher Education for the Effective Use of New Information Media

The Sixth Cycle (1997-2001) of the Asian Pacific Programme of Educational Innovation for Development (APEID) deals with a broad range of issues related to meeting the educational challenges of the present and future. The *Delors Report: Learning the Treasure Within* to UNESCO of the International Commission on Education for the 21st Century has provided the conceptual framework which has guided the formulation of the Work Plan of APEID for this Cycle.

In September 1997 the Hiroshima University UNESCO Associated Center organized the first seminar of the Sixth Cycle in its designated Programme Area, Teacher Education. The topic of the Seminar was "Teacher Education for the Effective Use of New Information Media". This report describes the current issues concerning New Information Media in Teacher Education in ten countries: Bangladesh, China, India, Indonesia, Japan, Malaysia, Nepal, Pakistan, Philippines and Thailand. The report summarizes discussions on the various contributions made by the participants during the seminar and attempts to provide an outline for future targets in Teacher Education and international cooperation.

Hiroshima University UNESCO-APEID Associated Centre

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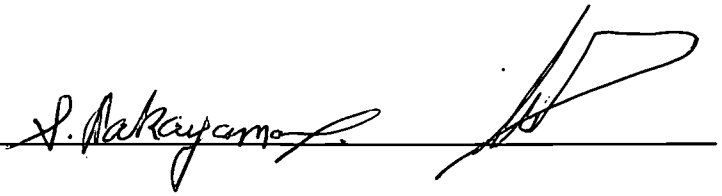
Please  Sign Here,

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Signature:  Position: Professor

Printed Name: Shuichi Nakayama Organization: Hiroshima University Graduate School for International Development and Cooperation

Address: Kagamiyama 1-5-1 Higashi-Hiroshima-city 739-8529 JAPAN

Telephone Number: 0824-22-7111

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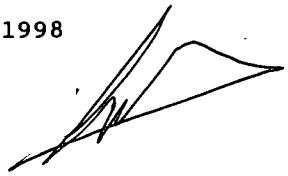
Signature:  Position: Research Associate

Printed Name: Lyckle Griek Organization: Hiroshima University Graduate School for International Development and Cooperation

Address: Kagamiyama 1-5-1 Higashi-Hiroshima-city 739-8529 JAPAN

Telephone Number: 0824-22-7111

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