

**Training of Teachers/Trainers  
in  
Technical and Vocational  
Education**

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(English, 1995);
4. *New Perspectives on Assessment*  
(English and Chinese, 1995);
5. *Functional Literacy, Workplace Literacy and Technical and Vocational Education: Interfaces and Policy Perspectives*  
(English, 1995);
6. *Vocational Guidance for Equal Access and Opportunity for Girls and Women in Technical and Vocational Education*  
(English, 1996);
7. *Promotion of the Equal Access of Girls and Women to Technical and Vocational Education*  
(English, 1995);
8. *Current Trends and Issues in Technical and Vocational Education*  
(English, 1996);
9. *Technical and Vocational Education for Rural Development: Delivery Patterns*  
(English, 1997);
10. *Promotion of Linkage between Technical and Vocational Education and the World of Work*  
(English, 1997);
11. *Training of Teachers/Trainers in Technical and Vocational Education*  
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## FOREWORD

This UNEVOC publication is addressed to policy-makers, administrators, planners, teachers, specialists and all those interested in the issue of teachers' training in technical and vocational education.

Compiled by the Section for Technical and Vocational Education, UNESCO, Paris, this monograph includes the Final Report of the UNEVOC International Round Table on Training of Teachers/Trainers in Technical and Vocational Education held in Curitiba, Brazil from 7-10 April 1997 and selected discussion papers submitted by the participants of this event.

UNESCO wishes to express its appreciation to all those who contributed their work to this publication.

The views expressed in the papers of this monograph are those of the individuals concerned and do not necessarily reflect those of UNESCO. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the UNESCO Secretariat concerning the legal status of any country, territory, city or area or of its authorities, or concentrating the delimitation of its frontiers or boundaries.

## PREFACE

This is a comprehensive report on an International Round Table that was organized and conducted by the International Project on Technical and Vocational Education (UNEVOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO). Our appreciation is recorded for the considerable assistance given by the Centro Federal de Educação Tecnológica do Paraná, in Curitiba, Brazil, and especially for the willing services of Dr Sonia Ana Leszczynski. Their contribution ensured the success of the event.

Concern for the effective technical and professional training of teachers is increasing the world over. However, such concern frequently does not extend to the area of the professional training essential for those whose role is to teach and train people in preparation for and in the maintaining of their efficiency within the world of work. Yet the global economy, with its competitive productivity, the impact of technology on the skills required for employment, the fast-changing job market with its festering unemployment, demand effective and efficient initial and continuing education for the world of work. However, that education is dependent upon educationalists, in whatever arena they may function, that have the knowledge and skills, the experience and relevance, the flexibility and professional competence to deliver programmes of learning that serve the personal development of the learner, and that develop the learner's potential, especially with respect to performance within the world of work, to the degree possible. People can only fulfil such a professional teaching/training role if they are thoroughly prepared for it.

The above-mentioned International Round Table addressed the multifarious issues that relate to this important area of the training of teachers/trainers in technical and vocational education. It considered these within specific contexts and recorded the most pressing needs for meeting the challenge of this area of professional education within the twenty-first century.

We should like to urge the readers of this monograph to alert people, who are responsible for this area of professional education, all over the world, to the urgency of meeting the variety of needs that are expressed within this report.

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# **International Round Table on Training of Teachers/Trainers in Technical and Vocational Education**

(Curitiba, Brazil, 7-10 April 1997)

Final Report

## **1. INTRODUCTION**

The social and economical changes have significant implications for technical and vocational education. It has considerable ramifications for the teaching/learning processes to be applied and the concomitant expertise of the teachers working in this important sector of education. This inevitably must flow on to the nature and content of teacher education programmes.

In accordance with UNESCO's Programme and Budget for 1996-1997 and within the framework of its International Project on Technical and Vocational Education (UNEVOC), an *International Round Table on Training of Teachers/Trainers in Technical and Vocational Education* was held, in collaboration with the Brazilian Federal Centre for Technological Education (Paraná) at Curitiba, Brazil, from 7-10 April 1997.

The main objective of this activity was to assist Member States' efforts to improve their staff training in technical and vocational education, by facilitating the exchange of experience and ideas, as well as strengthening co-operation between Member States in this field.

The Round Table aimed to address the issues related to technical and vocational teacher training from three dimensions:

- The new technological, economic, political, social and educational developments that have taken place in the past ten years and their impact on technical and vocational education;
- The implication of these developments for technical and vocational education, both formal and non-formal;

- The ramifications of these developments for technical and vocational education, both formal and non-formal.

The meeting was attended by senior technical and vocational education experts from Brazil, Jamaica, Kenya, Pakistan, Poland, as well as representatives from Colombo Plan Staff College for Technician Education (CPSC) and the Commonwealth of Learning (COL).

## **2. MAJOR TRENDS, ISSUES AND THEIR IMPLICATIONS**

The world of work is in a constant state of flux and change. Technological development is introducing new skills and making others redundant, the high rate of unemployment is demanding new training and retraining, the shift from rural to urban employment requires a change in competencies and life style, migration and the displacement of peoples around the globe need a reorientation to a different sphere of the world of work; all these, and other factors, demand commitment to and provision for life-long technical and vocational education. The world of work requires that its participants must be given the opportunity for constant personal and vocational development if we are to avoid the plague of unemployed and redundant workers. But life-long learning requires personal commitment and motivation, which will only come from such learning being rewarded. Further, all our efforts to make continuing technical and vocational education a reality in our societies will fail unless people develop the attitudes and values that encourage them to make the commitments necessary to engage in this area of education. Along with such attitudes must be developed the self-directed learning skills necessary.

Much has been said and written about initial and continuing technical and vocational education; not as much has been done to provide for it. Nevertheless, job change is becoming essential for most people and the prospect of working in five or more different occupations in a life time is becoming the norm. This obviously has significant implications for the establishing of career paths and for the obtaining of sufficient experience within an occupation to be able to move up into senior management positions.

Aspects of technical and vocational teacher education programmes were discussed in the various papers that are appended to this report. The



paper by Dr C. K. Basu addressed a number of the various issues that are significant in the Asia-Pacific countries. Dr R. B. Hobart's paper put forward a suggested technical and vocational teacher education programme that was considered by the International Round Table. The most significant issues relating to the training of teachers/trainers in technical and vocational education were given in a description of a project undertaken by Dr Mavis Bird of the Commonwealth of Learning. A detailed analysis of the training of teachers in technical and vocational education in Poland was given by Dr Stefania Szczurkowska. An in-depth analysis of recent innovations in the training of teachers/trainers in technical and vocational education and training in Asia and the Pacific, was given by Mr M. A. Qureshi. A comprehensive description of instructor training given by the Vocational Training Development Institute, within The Heart/Trust Training Agency in Jamaica, was given by Dr Lurliene Miller. An African perspective to the challenges and prospects in the training of technical and vocational education teachers/trainers was given by Prof. B. W. Kerre. Factors affecting technical and vocational education and technical and vocational teacher education in Pakistan were analysed by Dr Muhammad Hadi Gyavri. These papers led to extensive discussion and debate on various issues addressed within them, and raised other concomitant issues.

During the process of the discussion and debate the following questions were seen to be pivotal to the issues addressing technical and vocational teacher education and trainer-training.

1. What are the changes in the world of work that must be addressed by technical and vocational education to ensure the genuine implementation of life-long learning, life-long career development and life-long employment?
2. How can technical and vocational education co-operate with the world of employment and economic production to ensure the relevance, and employability, of human resources?
3. How can technical and vocational education encourage the assumption of responsibility by the various entities within the world of work for the protection of the environment?
4. How should technical and vocational education articulate with general education, higher education, and with training within the workplace in order to support the maintenance of people as

- effective and efficient employees within the world of work?
5. How should technical and vocational education support the initiatives of non-formal education, small business enterprise and the self-employed with respect to the effective and efficient performance of employees within the productive process?
  6. What teaching/learning strategies need to be supported, or developed and implemented, by technical and vocational education to increase its contribution to the efficiency of the world of work and to the fair and just distribution of the wealth generated by the world of work?
  7. What are the policies and legislation that need to be developed and implemented by governments to support the universal availability and effectiveness of technical and vocational education?
  8. What financial support needs to be given by governments, and other entities, to formal and informal adult and continuing education for the world of work?
  9. How can education for the world of work contribute to the removing of the disparities of economic return from employment - among countries and within countries - stemming from such factors as sex discrimination, exploitation of the disadvantaged, the internationalising of work, the restructuring of economies, migration, etc.?
  10. How can technical and vocational education contribute significantly to the social effectiveness, social responsibility, personal actualisation and the empowerment of people within the arena of work?

Some of this discussion and debate, with recommendations, is recorded below. Only what was felt to be the most significant factors are addressed in this summary. More detail is given in the papers that are appended.

## **2.1 Socio-political Contexts of Technical and Vocational Teacher Education**

Without question, governments are an essential partner in the national responsibilities for providing an effective and efficient system of education for the world of work. This includes both preparation for the world of work, and maintaining efficiency within it. Thus, technical and vocational education, and relevant and effective education for the

non-formal sector are all included and have a role within this function of preparation and maintenance. Further, the responsibilities of pre-vocational education as a vital component of effective education for the world of work is also within its orbit. Governments should assume a leadership role in this area of social responsibility. They should encourage and support the initiatives of other members of this partnership. They should ensure that all members of the partnership play an active and constructive role. Governments have a primary role of ensuring that efforts within this area of human endeavour are co-ordinated, and that resources are not wasted by unnecessary duplication. They are able to initiate national planning that attends to the disadvantaged, to equal opportunity, to those with minimal power and thrust in the society, as well as to the design of and commitment to long-term plans for educational development within the nation.

There is a healthy development occurring around the world. That is, governments are setting up commissions to recommend the legislative structure needed to support effectively and efficiently all areas of education for the world of work, and to ensure that the various areas of support are co-ordinated. Long-term planning is essential, and it is imperative that such planning is supported by the legislative framework needed to implement it. Governments have the primary role to play in this area of responsibility. This includes all levels of government - national, state, regional, local - depending upon the constitution of the nation. If there are different levels of government involved, it is imperative that these different levels work together to ensure that co-operation and mutual support characterise their individual efforts.

The social, political and economic context of technical and vocational teacher education were thoroughly addressed in Prof. Kerre's paper. They were also addressed in various sections of the paper by Mr M. A. Qureshi. Discussion from these papers led to the following observations:

Governments must institute regulations and enforce mechanisms for technical and vocational teacher education. In this context, it was suggested that governments should allow technical and vocational education teachers to undertake consulting which should raise their standards of knowledge and skills, keep them up-to-date, and supplement their incomes sufficiently to make them more satisfied with their salaries.

It was felt that in this socio-political arena, in many countries there is a need for a second liberation. The first occurred when the colonial powers departed. There is still a need for the establishing of genuine democratic decision making, which was indeed the intent of the first liberation from colonial powers. The problem of human conflict presents itself in this context. Of course, when there is no peace, there is no education. Thus, a stable and peaceful socio-political environment is vital.

It was felt that there tends to be, in many developing countries, an economic malaise stemming from both internal and external forces. Thus, there is a need for strong, determined lobbying groups to be established for technical and vocational teacher education. For technical and vocational education and technical and vocational teacher education and trainer-training to succeed the political will must exist. This may be established by positive statements of the benefits that are to be gained, backed up with the statistics that are now becoming available. These statistics give clear evidence of the considerable value to the economy and the society of effective technical and vocational education and technical and vocational teacher education.

In some developing nations, the principal of "user pays" for technical and vocational education makes it prohibitive for families to afford it. Thus technical and vocational education is the victim of this cost-sharing that makes education more expensive.

It was also stressed that in the socio-political arena a legal context for technical and vocational education and technical and vocational teacher education and trainer-training is vital for them to become equitable entity with academia. Thus, more attention must be given to what should constitute this legal context, and recommendations made for it to be established and enforced by appropriate authorities. In addition, there are both external and internal forces that are determining much that relates to technical and vocational education. Thus, the questions must be asked: "who sets the technical and vocational teacher education agenda?", and "who are the stake holders?" It is recognised that both external and internal forces must be addressed in ways that are acceptable to all stake holders.

## 2.2 Partnership - Linkage with Industry

It would seem unnecessary to emphasise the role of the employer in helping to meet the need for effective technical and vocational education and technical and vocational teacher education. Yet, in many parts of the world there is a traditional concept that such education is the responsibility of educational institutions, and of the government. However, it is being increasingly realised that such a narrow concept of those responsible for this area of education, does not meet its needs. The world of work has a very significant part to play. It must be the focus of the competencies needed to perform effectively within employment. It must provide effective work experience for learners within educational institutions if their learning is to be relevant. It must provide on-going work experience for technical and vocational education teachers and trainers in order to keep their knowledge and skills up-to-date. It must invest significant resources in education and training in order to maintain the competent work force it needs. It must co-operate with governments so as to support national plans for economic development, one component of which is a well educated work force. It must co-operate with unions in order to ensure that the social and economic principles espoused by the nation are implemented. It must support, to the extent necessary, its employees in their pursuit of further knowledge and skills for their personal fulfillment and for their securing of satisfying employment. Thus, the employing world is a primary partner in the endeavour to deliver effective and efficient technical and vocational education.

The need was emphasised for technical and vocational teacher education to work continually towards increased co-operation with industry. Among other benefits, this was seen as an important way of establishing relevance in technical and vocational education programmes. It was emphasised again and again that there must be more than a linkage with industry, rather industry and the education sector should be partners. This may need to be legislated, rather than left to goodwill. Incentives, such as taxation benefit would assist this process.

In the discussion on linkage with industry, the question was asked as to what precisely is being referred to, in some economies, when we use the words "industry" and "employers"? It was hard to retain a stable industry base for long in some countries. It tends to shift with the economic factors that prevail. Thus low cost production may be

undertaken in those countries that have low salaries. This may cause developing countries to become the dumping ground for cheap production and the exploitation of cheaper labour. The global economy allows industry to move around the world and to go from country to country seeking lower costs of production. This may make it well nigh impossible to determine just what is industry in a particular context. It may shift any day in pursuit of lower costs.

When seeking to identify industry, even some of the so-called "formal sector" is really "informal" because it is often not clearly known who constitutes this sector. Sometimes for reasons of financial benefit, entities within the sector seek to keep their identities secret. Thus, it becomes impossible to provide appropriate training for a sector when it is not known who really constitutes the sector. This is true in certain developing world contexts where there is a continual shift of enterprises from one country to another in order to obtain cheaper costs of production.

Although close links with industry contribute to the relevance of the teacher's knowledge and skills, it does also increase the risk of losing such persons to industry. However, it was suggested that although there appeared to be a loss when people that were trained to become effective teachers and trainers shifted to employment in enterprises; over time, these people had value to the technical and vocational education system in that they became sympathetic links with that system. Their presence in industry ensures that there was a significant cadre of people in industry who understand technical and vocational education and can support it in a meaningful way.

It was to be regretted that some areas of industry look for unqualified people because of short-term benefits. This area of industry may employ qualified people. But it tends to under utilise highly qualified people in order to minimise their remuneration. Such industry must be persuaded that genuinely qualified people will benefit them in the long run: especially in the context of the global economy and world competition.

Frequently, small business enterprises are not really interested in training. They would prefer to poach trained people from larger enterprises. In this context, we have to examine carefully what type of teacher training, if any, is being given to trainers in small business

enterprise. This may be very little or none at all. Yet this sector is the largest sector of employers, the world over.

### **2.3 Technical and Vocational Education Curricula**

Throughout the various discussion times it was recognised that it is hard to differentiate between technical and vocational education, with its teachers, as such, and technical and vocational teacher education. For example, the curricula of technical and vocational education is, of course, vitally important to the relevance ascribed to such education by the world of work. However, such curricula are also a significant determinant of the type of programmes needed to select and train effective technical and vocational education teachers. Thus, some time was spent on technical and vocational education curricula and concomitant issues.

If we are to apply credit for prior learning; if we are to allow for open entry and increased access to learning; if we are to encourage life-long learning and recurrent education; if we are to support a career path that is supported by both horizontal and vertical occupational development and change; then the curricula needs to be sufficiently flexible to allow meaningful entrance to and exit from the learning process.

A detailed analysis of changes in the world of work and their implications for technical and vocational education programmes was given by Dr R. B. Hobart in his paper appended. Implications of these changes were also addressed in the context of an economy in transition in Part 6 of the paper by Dr Szczurkowska. Some of the specific issues addressed in those papers were taken up for discussion in relation to the curricula for technical and vocational education and technical and vocational teacher education. These particular issues are addressed below.

The globalisation of work, the continual restructuring of economies, the greater mobility of workers, the urbanisation of societies, and other such factors, also impact upon career prospects. These make recurrent education for the world of work, and life-long technical and vocational education essential. However, the curriculum content and teaching/learning systems essential for this area of education, in many parts of the world, are not well developed.

The importance of making the technical and vocational education curricula relevant through undertaking occupational analyses, needs analyses and task analyses - in conjunction with industry - was seen as vital. These processes should ensure that the knowledge, skills and attitudes that are required by the ultimate clients are being taught. However, the ability to undertake these processes must be an outcome of technical and vocational teacher education. Thus, there are obvious implications for the selection and training of technical teachers and for trainer-training.

In the light of the vicissitudes of the world of work, it was suggested that greater flexibility in the application of the knowledge, skills and attitudes that are essential to the transfer of learning and that must be developed in the general education process. Training offered within industry is understandably productivity driven, while the aspect of transferability of skills and knowledge is best accommodated within an industry/education partnership. Again, with the phenomenon of job change and the restructuring of economies, a greater emphasis is being placed on the need for generic knowledge, skills and attitudes that are essential to the transfer of learning and that must be developed in the general education process.

Within the context of the curricula for technical and vocational education, the problem of environmental education was raised in section 4.6 of Dr C. K. Basu's paper. It was considered that this should be a core component. Further, it was suggested that environmental education should be made relevant to specific occupational and skill areas; for example, the disposal of hazardous wastes. This recommendation requires that within technical and vocational teacher education the knowledge necessary for teachers to address such issues within their own teaching programmes be included, but also that sufficient emphasis be given to heighten the perception of the teachers to the significance of environmental education in their own teaching programmes.

There was some debate between the importance of generic knowledge and skills being an essential part of technical and vocational education curricula, and the importance of job-specific knowledge and skills. It was suggested that some enterprises recruit people with existing knowledge and skills because they are unwilling to undertake the cost of further training. Thus, they tend to want job-specific training. To counter this tendency, it was deemed to be imperative that incentives,



and other regulatory mechanisms, such as through tax exemption, be introduced to encourage enterprises to invest in training. On the other hand, it was also recognised that some enterprises were willing to orient a skilled person to the specifics of in-house skills. Such enterprises would prefer people who had sufficient generic skills to transfer these to other organisational work situations, or to other areas of the trade or profession within the organization. This ambivalence is difficult for technical and vocational education to address.

Some discussion we had was on the issue of the degree of comprehensiveness needed to address effectively a particular area in the technical and vocational education curricula. Entrepreneurship was cited as a case in point. Some curricula dealt with this issue only briefly. This was because the aim of the particular curriculum was to arouse "awareness" of such an issue, and encourage those who identified with it to pursue it in greater depth. The other school of thought felt it essential to deal with such issues in sufficient depth to develop definite knowledge and skills that could be successfully applied. It was ultimately agreed that such decisions could only be made in the light of the performance expectations of the graduates of such programmes of learning. This reinforced the assertion made above that there is a need to make such a careful analyses of relevant work situations in the developing and amending of technical and vocational education curricula as to ensure that technical and vocational education is perceived to be relevant.

It was also advocated that the curricula should be designed to develop in the learner a "work awareness", that is, a self-questioning attitude that asks: "What else could I do with my skills?" Thus a person losing a job should not then feel they are unemployable: but rather, search for other outlets for their competencies. This led to the concept that people should not aim at permanent employment. That was considered to be unrealistic in the global economy and changing job markets. Rather, people should receive the type of technical and vocational education that gives them the competencies to further their education as necessary; and, thus, makes them confident that they are permanently employable.

#### **2.4 Status of Technical and Vocational Education Teachers**

There is a universal need to lift the status of these teachers within the educational arena. This is directly dependent upon the status and value

of technical and vocational education itself being lifted within societies as a whole. A significant factor in achieving this goal is to establish a much closer articulation between technical and vocational education and university education than exists in most countries at present. University education must no longer command such a status as to bias the wage reward structures within the economy. It is imperative that the distribution of the generated wealth of the economy encourages participation in the wide spectrum of education for the world of work, and not just in the narrow sphere of 'higher-order' professions. Education for the world of work will not achieve its national goals until technical and vocational education is given the status it needs to attract a sufficient clientele to meet the manpower needs of the nation.

Coupled with this is the need to establish better economic rewards for undertaking technical and vocational education programmes. Again, the teaching personnel within technical education institutions need to be well qualified in both their area of specialty and pedagogical skills, and have had sufficient and relevant world of work experience. Further, they need to keep their knowledge and skills up to date by periods of further experience within the world of work. Many of these institutions suffer from insufficient resources to purchase the complex and expensive equipment needed for their workshops and laboratories. Thus, a close liaison with employing institutions in the world of work needs to be established so that effective on-the-job experience programmes for students may be worked out co-operatively between the education institution and the employing enterprise.

However, there was a degree of cynicism expressed with respect to the status of technical and vocational education and technical and vocational teacher education and trainer-training. It was felt that recognition for the need to lift the status of this area of education was often verbalised; but, in the final analysis, little that is really significant is done about it. However, it was thoroughly agreed that the lifting of such status is vital to its success.

A significant problem to the achieving of higher status for technical and vocational teachers and trainers was seen to be their wages. In some circumstances, these are restricted by government regulations and are tied into official salary levels in the public service. To counter this problem, it was suggested that other conditions of technical and vocational education teaching are often more attractive than similar

conditions prevailing in industry employment. However, these conditions - holidays, work hours, superannuation etc. - were sometimes not taken into account by teachers when they made comparisons between themselves and those employed in industry. Thus, it was seen to be important that the positive aspects of technical and vocational education teaching and trainer-training should be emphasised so as to woo people to the profession, and not to alienate them with too much negative communication and criticism.

It was recognised that the problem of status, in any arena, is deeply entrenched in a society. In most societies, there is an inequitable status between jobs, such as that of a professor and that of an artisan. A recognisable equity process is required. This could be partly overcome if higher education was made more readily available for graduates from technical and vocational education and technical and vocational teacher education. This reinforces the claim that there is a pressing need for a greater degree of articulation between higher education and technical and vocational education, especially in the area of technical and vocational teacher education.

The constant change in the knowledge and skills required for a particular occupation, and the need for frequent change in employment, makes it imperative that a person has the basis for developing further knowledge and skills as quickly and effectively as possible. This requires a sufficient knowledge base for developing an understanding of other related areas of knowledge, that is, "generic knowledge" which includes, among other things, basic scientific, mathematics, and technological principles. This is why the increasing articulation between general education and technical and vocational education is so very important.

For genuine career paths to be established, and for the developing to a maximum of the potential of individuals, higher education around the world must become more open in its recognition of prior learning and in its accrediting of learning gained from programmes offered in other institutions that are not part of the higher education arena. The resistance of higher education in many countries to this greater degree of articulation with other educational institutions stems frequently from tradition, conservatism and the desire to preserve status, rather than from genuine educational concerns.

The issue of articulation among relevant educational institutions was addressed in detail in Part 3 of the paper by Dr Lurliene Miller.

## **2.5 Models of Technical and Vocational Teacher Education**

Technical and vocational teacher education must be analysed in terms of the three possible models that are applied. The first is where appropriate people from industry who have been employed in their trade or profession for some years are selected for technical and vocational education teaching. These people have industry experience but no formal qualifications. They must then be given pedagogical training and in some cases, formal technical qualifications. The second model is where concurrent training is offered to a person through which the person is given the technical knowledge and skills needed for teaching, and the pedagogical training at the same time. These people lack industry experience and may find it difficult to make their teaching relevant to the real world of work. Further, they may find it difficult to keep their knowledge and skills up-to-date by obtaining some periods of work placement within a relevant occupation. The third model is where employees with some years of experience in a relevant work situation and who already have the necessary technical qualifications are brought into technical and vocational education teaching. These people primarily need pedagogical knowledge and skills to function as teachers. They may also have the advantage of gaining graduate status for further study. This third model was thoroughly endorsed by the International Round Table as the preferred model, and should be adopted, as far as is possible, around the world.

However, it was recognised that it is difficult to entice such people into teaching, given the low comparative wages with industry. It also had to be admitted that a significant number of such people who were well trained and who came into technical and vocational education teaching, often returned to industry or to the private sector of the technical and vocational education system. This resulted from their greater expertise and their capacity to share their knowledge and skills effectively within industry through their pedagogical development. Even though this may occur, it was felt that in the long term, this does have some benefit to technical and vocational education teaching as it creates real links between providers of technical and vocational education and industry itself.

In this context, the question was debated as to what is really meant when we claim that technical and vocational education is losing valuable teachers to industry? Perhaps it might be considered that when people go back to industry, they are not really lost. Rather, it is a form of nation building. However, when people move out of the sector for which they were trained, they are lost in the sense that it requires a total training of someone else to prepare the person for that sector.

## **2.6 Technical and Vocational Teacher Education Programmes**

The focal points for the professional responsibilities of technical and vocational education teachers and trainers embrace formal technical and vocational education institutions, private technical and vocational education providers, training units within government and non-government organizations, community education centres, and supervisors and others who must assume some training responsibilities as a part of their occupational role. In the light of the fact that the success of teaching/learning programmes is highly dependent upon the effectiveness of teachers and trainers, there is a great need for the provision of effective teacher training and trainer-training programmes. For those whose primary occupational responsibilities are not training, but who nevertheless have some responsibilities for training, programmes to assist them with these training responsibilities will need to be delivered through strategies that accommodate the other demands and commitments that such people have.

Suggestions of what should be included in programmes for technical and vocational teacher education are given by Dr Szczurkowska in Part 2 of her paper. They are also thoroughly analysed in the light of significant changes in the world of work within the Asian and Pacific region by Mr Qureshi. A description of the programme offered in Jamaica by the Vocational Training Development Institute is given by Dr Lurliene Miller. Dr R. B. Hobart offers a suggested outline for such a programme in his paper. The issues addressed in these papers led to the following conclusions:

It was generally agreed that there is a vital need to address common standards for technical and vocational education teachers, both nationally and internationally. This is a primary responsibility of technical and vocational teacher education programmes.

In terms of learning materials, whether modules, distance education materials, competency-based materials, or other specific programmes, it was agreed that these cannot be transferred from one arena into another without the adaptation to the specific conditions that prevail in each arena in which they are applied.

A thorough analysis of the pedagogical knowledge and the skills required by technical and vocational education teachers, and the means for satisfying these needs through utilising distance education, was given in the paper by Dr Mavis Bird, of The Commonwealth of Learning. Discussion from this paper led to the conclusion that it is important that consideration be given to how distance education materials could be developed and used in a wider spectrum of learning areas. Some discussion was had on the way that such materials could be used in harmony with other modules for self-learning pursuits. It was suggested that representatives of those who develop such materials could attend regional meetings that are designed to evaluate and modify, as appropriate, available materials. These meetings could allow for input from different countries as to the particular needs of that country.

Another suggestion for technical and vocational teacher education programmes was that role models of good teachers in specific behavioural areas of teaching could be identified, video-taped and become available to support pedagogical theory.

Consultancy by technical and vocational education teachers was debated as a means of supplementing the teacher's income, and of keeping the teachers up-to-date and valued by industry. This was generally seen as beneficial. However, a warning was given that consultancy can be exploited if the teacher involved in the consulting is not genuinely rewarded for the consulting. Another important issue with respect to consulting that emerged was the difficulty of selecting the appropriate teachers to undertake the consulting without making others feel that they were neglected or discriminated against. Yet, the fact is that some teachers are just not suitable to undertake consulting, for a variety of reasons.

## **2.7 Financing Technical and Vocational Education**

While it is undeniable that governments have a primary responsibility for financing education for the world of work, it has been shown that

such support from the private sector can also enhance significantly the availability and quality of such education. As in many other areas of social responsibility, governments need to support those areas of education that may well be neglected by the society as a whole. These include appropriate education for the disadvantaged and those with minimal clout in the political arena. Governments also have the primary responsibility financing long-term planning. Much of education falls in this sphere.

Various suggestions for financing technical and vocational education were given by Prof. Kerre in his paper. From discussion on this issue it was generally agreed that funds for technical and vocational education activities are scarce and, thus, it is important to identify particular sources of funds for particular projects. This had been done successfully by some institutions. An example was given where a greater depth of treatment of an issue, with appropriate authorship, such as entrepreneurship, persuaded project financial support for the purchase of modules and for their adoption and adaptation. However, the real issue is, who should pay for technical and vocational education?

Unfortunately, in the present social context there is a scramble for resources. This makes it difficult for education to receive an appropriate share; let alone technical and vocational education. Rising costs are tending to marginalise technical and vocational education. However, financing, of course, was seen as a very important issue. In terms of financing, it was contended that some industries, especially small business enterprises, prefer to poach people for their employment because they are not willing to finance appropriate training to employees. However, it must also be recognised that industries will only invest in education if they feel that there is something of significance in it for them.

With respect to obtaining the maximum benefit from certain sources of finance, it was suggested that UNESCO, and other donor agencies, could focus the funding and make this more efficient and effective by stipulating the conditions that must prevail. This will tend to ensure that the real objectives of technical and vocational education are attained. However, this may have only a short term effect. It was considered preferable, therefore, for agencies to finance only short sections of a total project and reserve their willingness to finance further sections of the project until it is established that the conditions of the agreement are

actually being fulfilled.

It was considered vital that the following conditions of any agreement with a donor agency are fulfilled: (a) a thorough statement of the project is specified in sufficient detail, with appropriate conditions, to ensure that the intended outcomes are clearly specified and are attainable, (b) there is an on-going monitoring of the project: that is, there is a back-stopping, (c) the project, and the monitoring of it, should be seen to be sustainable. Further, support should be given in small amounts that allow for more extensive and on-going supervision of the project.

### **3. FUTURE ACTIVITIES**

#### **3.1 A Proposal for an International Comparative Study on the Recruitment and Training of Technical and Vocational Education Teachers**

##### **3.1.1 Rationale**

The discussion papers of the International Round Table reveal that all over the world it is now widely accepted that effective, innovative, and relevant technical and vocational teacher education programmes and economic growth are closely linked. Liberalisation of the economy in many countries and consequential moves towards globalisation of the industrial work-force has led to the inevitable question of comparison of the quality and technical competencies of technical and vocational workers in the different countries. Much of the competitive success of technical and vocational education is dependent upon the quality and competencies of technical and vocational education teachers/trainers.

Up to now, systematic international comparative studies on education achievement have been limited to science, mathematics and other non-technology subjects. The time has come to undertake such studies in the area of technical and vocational education.

Among the emerging economies in Asia-Pacific, the most successful countries like Japan, Singapore, Korea, Philippines are also the countries those who have paid particular attention to the development and renovations of TVET. Most successful are those that have educated and trained their middle-level manpower up to, and in many cases, well



beyond, the TVET Standards in the developed countries like Germany, USA or UK.

TVET teachers, teacher-trainers, and policy-makers must seek out the best and most-relevant teaching/learning methods, techniques and practices in TVET for their effective adoption, adaptation and appropriate integration in the TVET class-rooms.

CPSC surveys in Asia-Pacific Countries revealed that there are great variation in standards of recruitment and teaching/learning practices and performances of the TVET teachers in the region. That must be true of other regions as well, but comparative data is not available. Yet performance of the TVET teachers is the most important single factor for the success of the TVET students.

The biggest piece of international comparative study on the students achievement in Mathematics and Science, involving 41 countries around the world, has shown that East-Asian Tiger economies like Singapore, South-Korea, Japan are at the top of the list of countries in the survey. What are the secrets of these successes? And how can others emulate those successful teaching/learning experiences to make the students internationally competitive? A similar study for TVET would interest worldwide audience in education.

### **3.1.2 Need for an International Comparative Study of TVET Teachers**

An International Comparative Study on Recruitment and Teacher-Training practices of TVET is urgently needed if the quality of teaching/learning in TVET is to be improved significantly. Success experiences must be carefully evaluated for their wider applications. This, will be a key factor in effectively globalising the technical workforce in the next century and giving the required competitive edge to the TVET students.

### **3.1.3 Consideration by the Round-Table Members**

The round table on TVET Teacher Education in Brazil considered and unanimously endorsed the idea of carrying out an international comparative study as proposed by Dr. C.K. Basu - Director CPSC, Manila.

UNESCO/UNEVOC in co-operation with other partners like CPSC, COL, CEFET, Moi University Kenya and others, may take the lead role in this matter for presenting the report in the UNEVOC world conference in 1999.

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# **Training of Teachers/Trainers in Technical and Vocational Education**

Position Paper

by

R. Barry Hobart

(UNESCO Consultant and Resource Person for the Round Table)

This **International Round Table** is designed to address the issues related to technical and vocational teacher education from three dimensions. These are:

- The new technological, economic, political, social and educational developments that have taken place in the past ten years and their impact on technical and vocational education;
- The implication of these developments for technical and vocational education, both formal and non-formal;
- The ramifications of these two dimensions for programmes of technical and vocational teacher education.

The first two of these dimensions record the various changes that have occurred under three headings. These are:

- Socio-economic issues;
- World of work issues;
- Educational issues.

Reflection upon these issues confronts one with the extensive changes that have occurred in the contexts of technical and vocational education and the challenges these present to the establishing and maintaining of effective technical and vocational teacher education programmes. Not only are the changes extensive, but also those changes permeate every element of the learning programmes, both formal and non-formal, that are designed to prepare people for, and maintain their efficiency in, the world of work. This, of course, is the mandate of technical and vocational education itself.

The social and political changes have significant implications for

technical and vocational education. For example, the social context of technical and vocational education is increasingly that of persons foreign to the immediate culture and language. Such a development has considerable ramifications for the teaching/learning processes to be applied and the concomitant expertise of the teachers. This inevitably must flow on to the nature and content of teacher education programmes. Again, the political developments around the world are probably more far-reaching than have occurred at any other similar time in history. Such changes not only have significant implications for the provision of access to technical and vocational education, but also for the content of curricula of technical and vocational education programmes.

With respect to changes in the world of work, not only has technology impacted extensively upon the knowledge and skills needed for employment, but, even more significantly, the precarious nature of employment, and the extent of unemployment with no available work; these have profound effects on the type of technical and vocational education programmes that need to be offered, and the teaching/learning strategies that need to be employed. Increasingly, the implications of changes in the world of work for technical and vocational education point in the direction of life-long learning and continuing and recurrent technical and vocational education. Such a direction requires the continuing professional development of teachers and trainers, and even of shop-floor supervisors whose responsibilities include the support of the on-going change and development of the competencies required by employees. These personnel responsible for the development of competencies in people to perform effectively within the world of work, need to be familiar with that world of work and its changes. This familiarization is one of the goals of this International Round Table.

Educational issues have also come to the fore. New training technologies have emerged. For example, distance education is being seen around the world as a valuable means of extending the availability of technical and vocational education. Again, the increasing power and flexibility of computers hold out considerable hope for individualizing learning and for extending the reach of available expertise. The need for the constant revision of technical and vocational education curricula, for more efficient ways of profiling occupational skills, for providing bridging and remedial courses for career development, and many other such needs, constitute challenges to the educational processes that are

employed by technical and vocational education, and, thus, to the preparation of teachers to meet those challenges.

### **Changes in the World of Work and their Implications for Technical and Vocational Education.**

#### **Socio-economic Issues**

##### *Social issues*

- Increase in private enterprise and market economies;
- Migration;
- Dislocation of people - refugees;
- Globalisation of work;
- Urbanisation;
- Education must be provided that ensures the appropriate distribution of wealth from economic activity;
- Education for the world of work must:
  - provide for the non-work experiences and times of the worker;
  - support the effective participation of the worker in the political and social arena;
  - enable the worker to support democratic developments and processes within the nation;
  - support the on-going self-actualisation and personal fulfillment of the worker;
  - support the ethical commitments needed in effective and efficient employment, management, political leadership, union leadership, job placement etc.

##### *Political Issues*

- A clear locus of control of adult and continuing technical and vocational education in government administration;
- Co-operation between ministries responsible for the training of people for and in the world of work;
- Legislation needed to support effective education and employment of women and the disadvantaged;
- Government support of the non-formal sector;
- A genuine partnership between technical and vocational education institutions, the government and private enterprise

needs to be developed, and maintained.

## **World of Work Issues**

### **Changes in employment conditions**

- People with precarious employment;
- People without jobs and without work;
- Restructuring of the economy - primary to secondary to service;
- Restructuring of an employing institution.

### **Changes in employment contexts**

- Job preparation in rural settings;
- Job transition to urban settings;
- Urban settings and unemployment with no work;
- Employment in small enterprise;
- Work in the non-formal sector;
- Individual and collective self-employment.

### **Special Groups**

- Migrant workers;
- The disadvantaged in the world of work;
- The role of women in the world of work.

### **Changes in job skills**

- Mechanisation of work;
- Computerisation of jobs;
- Globalisation of work;
- Restructuring of work;
- Technological change;
- Globalisation of job skills;
- The new international division of labour.

### **Educational Issues**

#### **General**

- Globalisation of technical and vocational education curricula.

- Methodological developments:
- Distance education;
- Computers and learning;
- Competency-based education.
  
- The need to provide life-long or continuing technical and vocational education;
- The need to increase the status of technical and vocational education;
- The need to tie general education more closely into technical and vocational education.
- The need to ensure that technical and vocational education can lead on to higher education.
- Increasing the transferability of skills.
- Increasing the effectiveness and efficiency of the teaching/learning process.

#### **Technical teacher education**

- The need to keep teachers relevant to the contemporary world of work.
- The need to prevent unsuitable persons from becoming vocational teachers and trainers.
- Increasing the status of technical and vocational education teachers.
- Increasing the wages of technical and vocational education teachers.
- Providing for world of work experience for technical and vocational education teachers.
- Improving the selection criteria and procedures for technical and vocational education teachers.
- Ensuring the contemporary relevance of the knowledge and skills of technical and vocational education teachers.
- Establishing a career path for technical and vocational education teachers.

In the light of the above dimensions, important aspects of technical and vocational teacher education and training come to the fore. These include:

- Valid and reliable ways of selecting appropriate personnel for



- technical and vocational education teaching;
- Inducting new teachers into their employment arena and initiating them to the new profession of teaching;
- The technical knowledge and skills and work experiences needed for technical and vocational education teachers;
- The pedagogical knowledge and skills required by technical and vocational education teachers and trainers, and the means for developing this area of their professional competencies;
- The nature of, and provision for, the career development of technical and vocational education teachers.

### **Suggested TVE Teacher Education Programme**

#### **Selection of teaching personnel**

- Determining appropriate selection criteria for specific technical and vocational education teachers;
- Designing, or obtaining, valid and reliable instruments to measure that criteria;
- Measuring the relevance and value of employment experience;
- Deciding on essential qualifications;
- Using a broad range of measures for judging the value of an applicant.

#### **Induction**

- Assisting the new recruit to become oriented to technical and vocational education;
- Relating the new recruit, as appropriate, to the world of work;
- Ensuring that the new recruit fully understands the employer's requirements and how they are to be implemented;
- Informing the new recruit fully of the conditions of employment;
- Assisting the new recruit to establish appropriate professional relationships with colleagues.

#### **Initiation**

- Orienting the new recruit to the fundamental processes of classroom teaching;
- Orienting the new recruit to conducting workshop and laboratory sessions;

- Assisting the new recruit to develop skills in information search: the use of libraries; references, journals, instruction manuals, etc;
- Guiding the new recruit in the processes of developing, preparing and using teaching materials;
- Assisting the new recruit to develop the skills necessary to undertake a teacher education; course, such as completing assignments, developing writing skills, presenting ideas logically and to the point, etc.

### **The teacher education course**

#### **Technical knowledge and skills**

- Providing for the upgrading technical knowledge;
- Providing for the upgrading technical skills;
- Developing new technical knowledge;
- Developing new technical skills;
- Broadening the ability to apply existing technical knowledge and skills.

#### **Pedagogical knowledge and skills**

##### *Setting objectives*

- undertaking, when appropriate, a job analysis;
- developing skills in task analyses;
- setting appropriate cognitive objectives;
- writing and using relevant affective (attitudinal) objectives;
- constructing psycho-motor objectives (skills).

##### *Psychology of learning*

- understanding and applying the concepts of motivation;
- understanding and applying the essential principles of reinforcement;
- understanding and applying the factors that lead to improved retention of learning;
- applying the teaching methods that lead to a greater transfer of learning;
- determining the logical structure of content and of the sequence

- of the lesson;
- understanding and applying the essential principles of effective practice.

### ***Psychology of work***

- understanding the principles of achievement motivation;
- encouraging an appreciation of the need for co-operation in the work place;
- appreciating the need for and value of authority;
- encouraging the development of attitudes that support the need to accept responsibility;
- engendering confidence for the taking of initiative.

### ***Sociology***

- being able to explain the factors that determine classroom climate;
- being able to analyse the organisational climate of an institution and the factors determining that climate;
- understanding and using group dynamics.

### ***Communication***

- improving oral skills;
- developing and refining written skills;
- understanding and applying effectively the factors involved in successful interviewing;
- developing skills in win-win negotiating abilities.

### ***Methodology***

- conducting effective demonstration sessions;
- imparting cognitive concepts;
- supervising effective and efficient practice sessions;
- giving appropriate and continual feedback;
- conducting workshops and laboratory sessions;
- setting and supervising relevant projects;
- designing and constructing job sheets;
- supervising student placements in the world of work in co-operation with in-house personnel;

- understanding and applying, where appropriate, competency-based education;
- when appropriate, understanding and applying effective distance education strategies;
- being able to use the computer in the teaching/learning process.

### *Evaluation*

- developing effective instruments and strategies for formative evaluation;
- developing effective instruments for summative evaluation;
- developing the knowledge and skills necessary for constructing evaluation instruments including:
  - objective tests;
  - written assignments;
  - practical assignments;
  - oral tests;
  - being able to determine the reliability of tests;
  - being able to analyse the validity of tests;
  - using both objective and subjective testing appropriately;
  - estimating the economy of testing programme;
  - grading assignments.

### *Management*

- keeping student records
- managing workshops
- managing laboratories
- managing equipment
- planning
- ordering
- receiving and recording resources
- supervising borrowing
- maintaining the efficiency of equipment
- preserving equipment

## **Career Development**

### **Professional feedback and evaluation**

- using student evaluation
- organising for peer evaluation
- relating effectively and appreciatively to supervisor evaluation
- designing an on-going programme of self-evaluation

### **A commitment to life-long learning**

- undertaking night studies
- undertaking distance education studies
- engaging in the world of work
- undertaking sabbaticals

The above aspects of technical teacher education and trainer-training need to be analysed in the light of the many different country and cultural contexts in which they occur. This analysis will include implications for general education in terms of the prior preparation of persons for the profession of teaching; implications for the nature and extent of the co-operation needed by the employing world in providing for the initial and on-going occupational experience needed by technical and vocational education teachers; and the implications for government support and intervention in achieving the goal of an effective and efficient technical and vocational education system supported by well trained teachers and trainers. The analysis needs also be undertaken in reference to various case studies of effective technical and vocational teacher education programmes, and of the concepts, ideas and recommendations that have been made in the past two to three years by expert bodies in the arena of technical and vocational teacher education

# **Challenges of Current Social, Economical and Technological Developments and Need for Reforms/Renovations in Training of Teachers in Technical and Vocational Education**

by

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## **INTRODUCTION**

This document is prepared as a discussion paper in the **UNEVOC/UNESCO International Round Table on Training of Teachers/Trainers in Technical and Vocational Education (RTTTVE)**. The document draws on many published reports and articles and also reflects the views and opinions expressed by many experts and participants of the regional training programmes organized by the Colombo Plan Staff College for Technician Education (CPSC), a regional inter-governmental organization of nineteen member countries in the Asia-Pacific region, established to improve the quality and relevance of technical and vocational education and training (TVET) in the CPSC member countries. However, the views expressed in this document are the views and experiences of the author only who has worked in CPSC and in TVET field in the Asia-Pacific region for the last twenty-three years.

The document has been organized in three parts. Part I draws attention to the challenges posed by the current social, economical and technological developments in the Asia-Pacific region in the context of global changes and challenges. Part II overviews how the countries in the region are responding to various challenges and demands, and finally, Part III looks ahead with possible international cooperation to deal with issues related to training of TVET teachers/trainers in Asia-Pacific countries.

In the field of teacher-training and training-of-trainers in TVET for the Asia-Pacific countries, CPSC has contributed significantly over the last twenty-three years. CPSC's regional research and training activities

enabled us to identify the issues, problems and strategies which are critical for effective teacher-training in TVET. This paper is devoted to exploring the experiences related to emerging directions in training of TVET teachers and pinpointing some of the elements of success with a focus on Asia-Pacific countries. The document, however, does not claim to be comprehensive. It aims to provide a starting point for the expected discussion in the Round Table.

### **CHALLENGES OF CURRENT SOCIAL, ECONOMICAL AND TECHNOLOGICAL DEVELOPMENTS IN THE ASIA-PACIFIC COUNTRIES**

In spite of great geographical, economic and demographic diversities among Asia-Pacific countries, they share many common challenges and pose many common issues which are fundamental to improve the quality and relevance of TVET to gain a competitive edge in the market economy of the 21st century. The *Asian Development Outlook 1996/97*, prepared by ADB, points out that the developing Asia, during the past decade recorded remarkable buoyant economic performance achieving an overall growth rate of 7.9 percent in 1995. There were, nevertheless, large variations and disparities in economic growth among the countries. Poverty remained one of the critical issues in many of the countries in the region. What strategic policy measure is necessary for converging the growth rate amongst the countries and eradicate poverty in the region? The Human Resource Development (HRD) theory, developed over the past decade, provides a useful direction for addressing this question. It recognizes the role of teachers/trainers and innovations in education and training for raising productivity as the ultimate engine of socio-economic growth. In order to develop a coherent strategy of training of TVET teachers, the following are some of the critical issues in the region which need to be examined in depth and their impact on recruitment and training of TVET teachers/trainers have to be assessed:

- population growth and rapid urbanization;
- poverty and lack of skills for income-generation;
- increasing demand for secondary education, technical education and female education;
- technological change and labour market shift;
- changing patterns of international trade, liberalization and

- globalization of the workforce;
- pollution and environmental degradation;
- new technologies of training for TVET education.

### **Population Growth and Urbanization**

By the end of the century, the world population will number around six billion. Most of them will be in Asia-Pacific. Thirteen “Mega Cities” with more than ten million population each will grow in Asia in the next twenty-five to thirty years. The high rate of population growth added with rapid urbanization in many countries, and general improvement of communication techniques and higher level of aspirations would require in Asia new strategies of education and training for skill-development and income-generation. Technology education at all levels of education will play critical roles in this changing process.

### **Poverty and Lack of Skills for Income-generation in Rural Areas**

Poverty remains a critical problem and continue to pose a great challenge at dawn of the 21st century. Approximately 800 million people in Asia and the Pacific live below the poverty line. The great majority of the poor live in rural areas. Many poor do not have enough skills to find productive employment. Rural poverty continues to pose one of the greatest development challenges in many Asian developing countries, particularly in countries with low per capita income. Eradication of poverty in many developing countries through various development projects cannot be optimum without carefully coordinated remedial strategies, policies and programmes.

There is often a persistent bias against investment in skill-development for women who have less opportunities for education and training than do their male counterparts. Women must be brought into the mainstream of economic policy and develop skills for income-generation and self-reliance. Currently, following the Grameen Bank Model of Bangladesh, micro-credit and enterprise development is gaining grounds as a poverty-alleviation strategy, particularly for rural women.

### **Increasing Demand for Secondary Education, Technical Education, and Female Education**

Developing economies in Asia, particularly in East Asia, are continuing



to prosper leading to changing life style, education aspirations, living standards and use of modern technologies. As poverty remains one of the critical problems in some of the countries in the region, particularly in South Asia, human resource development and skill- development for improving income-generating capacities will be a key factor in the quest for improving the quality of life in the Asia-Pacific.

Technical-vocational education and training are areas of major interest in Asian countries, especially in those reflecting a singular economic growth like those in South-East Asia and China. Most countries in the region regard TVET as being pivotal to their development as it is intimately linked to job creation, employment provision, income-generation and life skills-training.

The growth in the enrolment in technical/vocational education, as a percentage of secondary education, is a salient feature in the countries of the region. The increase in the number of students is most apparent in countries whose economies are in transition or rapid growth, such as in South-East Asia and China (see chart).

Similarly, the percentage of female students enrolled in TVET has witnessed significant increase in some Asian countries. This trend is likely to continue in other countries of the region, if it is not visible yet. (See charts in the next two pages, 3-a, 3-b).

### **Technological Change and Labor Market Shift**

Many Asian countries are fast adopting the new and emerging technologies in industry and agriculture. The new technologies, in general, need higher knowledge-base and would require knowledge-intensive application. The role of manual skills are going down. This has profound effect on employment, education and training of technical manpower, and training of teachers of TVET. One analysis (World Bank, Knight and Wasty, 1991) recognizes six main elements of technological transformation:

- the increased rate of technological innovation (especially in micro-electronics, bio-technology, and new materials);
- the cross-cutting nature of technological change (the application effect);
- shortened technology life cycles and flexibility in meeting

- needs;
- increased automation with a smaller role for unskilled labor;
  - increased energy and material savings;
  - substitution of traditional materials with new ones.

Technological development is transforming the opportunities for, and also methodologies of HRD. This raises the challenge to develop institutional and non-institutional capacities to develop and adopt strategies for continuing training and upgrading of teachers and teacher trainers in TVET. A new 'technical leadership' will be required of the TVET teachers to suit the needs of the 21st century technology. Continuing education and training of teachers will be the best investment to meet the demands of the next millennium.

### **Changing Patterns of International Trade, Liberalization leading to Globalization of the Workforce**

International trade and investment have expanded rapidly during the past decade. Trade liberalization and structural reforms have been initiated by most of the countries in the Asia-Pacific region. Most notably, the two most populous countries in the region, India and China, are moving towards the market economy. The GATT agreement, the creation of APEC, WTO, and other organizations will further accelerate the process of globalization of trade and commerce leading to creating a global workforce. The Information Technology Agreement (ITA) in the last WTO meeting in Singapore has added a new dimension to IT. The global economic interdependence will certainly intensify further. Asia-Pacific countries with the highest rate of economic growth in the world are particularly well-placed to benefit from this process of liberalization. To remain competitive in the global workforce, high productivity and appropriate skills for that are needed by the Asian workers. Continuing professional education will become imperative with the onset of global trade liberalization.

### **Pollution and Environmental Degradation**

Pollution and environmental degradation has phenomenally increased in Asian countries along with industrial development and population growth. Agenda 21 of the UNCED made it clear that "education is critical for promoting sustainable development". Proposals in Agenda 21 focus on re-orienting education and training at all levels, particularly

of the teachers towards sustainable development. This is an urgent global need.

As ESCAP (1993) points out, five aspects of the environmental situation in the Asian and Pacific region require urgent policy intervention:

- Unsustainable human settlements environments, including inadequate or inappropriate shelter, lack of water supply, poor sanitation, poor nutrition, shortage of cooking fuel, excessive use of agro-chemicals, and increasingly concentrated habitation of environmentally fragile and hazard-prone areas;
- Pollution, including pollution of ambient air in cities and of household air in villages; pollution of lakes, rivers, underground reservoirs and marine water; toxic and nuclear waste dumping; and environmental hazards emanating from energy-related activities;
- Degradation and destruction of natural resources, including excessive resource extraction, loss of biological diversity, deforestation, soil erosion, soil fertility loss, waterlogging, salinization and toxification of soils, damage to and destruction of coastal and marine resources, and depletion of fresh water supplies;
- Environmental calamities and natural disasters, such as floods, droughts, cyclones and storm surges, earthquakes, landslides and volcanic eruptions, which periodically affect many countries in the region, causing increasing loss of life and damage to property and infrastructure under conditions of growing population pressure;
- Global environmental problems, particularly the greenhouse effect, ozone depletion and biodiversity loss, which are intensifying the threat to already widespread environmental degradation in the region.

### **New Technologies of Training for TVET and Teacher-training**

New technologies of training (NTT) has been introduced in many countries in the region and can go a long way to facilitate the process

of curriculum development and curriculum delivery for the 21st century. Satellite communication, electronic media, computer technology, telecommunication and internet facilities are introducing a fundamental shift in the nature of education and training. In the new context, the teachers would interact very differently with students, more as guiders and mentors and less like instructors or lecturers. These new technologies and their appropriate applications are being progressively introduced in many countries in Asia-Pacific. Countries like Singapore, Malaysia, Thailand, Philippines, India, Pakistan, etc. are already in the path of applying the NTT in educational institutions. Some of the other developing countries like Bhutan, Nepal, Myanmar, etc. have started building the necessary human and technological resources to deploy NTT in education. However, TVET do not yet make full use of these new technologies of training for upgrading its teachers.

As the Delors Report points out, nothing can entirely replace face-to-face tuition. Yet the media revolution is there and we should use it to our best advantage. New technology has created a host of new tools for use in the classroom, in laboratories, at home and on the move:

- computers of all sizes and sophistication;
- cable and satellite TV education broadcasting;
- multimedia equipment;
- interactive information exchange systems, including electronic mail and on-line access to libraries and public data bases;
- computerized simulators;
- virtual reality systems.

Using these tools, both students and teachers are equipped to become researchers. Teachers then coach their students to evaluate and use effectively the information they have gathered for themselves. This is far closer to real life situations than the older styles of teacher transmission of information to students. A new partnership between trainees and trainers is developing in the TVET classroom as well as the non-formal situations.

### **EMERGING TRENDS IN TVET TEACHER-TRAINING FOR THE 21ST CENTURY**

The demands on TVET teachers' competence, professionalism, attitude,

values and work ethics in the context of new and emerging technologies in the region as well as the globalization of the workforce would impose enormous responsibilities on TVET teachers in the 21st century. In many countries, quantitative expansion of TVET has put much pressure on quantity and quality of TVET teachers. Planning and implementation of reforms in TVET teacher training will require effective partnerships among: a) national planners; b) TVET institutions; c) teachers' organizations; d) media experts; and (e) international agencies. The question is how to forge that partnership?

Skills and competencies necessary to meet the challenges of TVET teacher training will not be achieved through the traditional forms of TVET teacher-training curriculum and delivery and its systems. A multi-dimensional approach is necessary to meet the objectives. These will include:

- pre-service and continuing teacher education through formal and open learning systems;
- more broad-based and flexible teacher-training curriculum replacing skill-specific training programmes;
- integration of training and education in cooperation with industries and private sectors;
- life-long and flexible learning to enable the teachers to meet the demands of higher and varied demands of the teaching job;
- knowledge and skills of using new technologies of training and education including the computers;
- development of multi-lingual and communication skills;
- increased emphasis on development of work ethics, teamwork, human values and other non-technical competencies like leadership, time management, environmental awareness, etc.

The question is how do we integrate that multi-dimensional approach in our TVET planning?

The role of technical and vocational education teachers is undergoing a radical change. Teachers are no longer just dispensers of information. They are expected to be curriculum designers, student counsellors, educational and resource managers, internet operators, and vocational practitioners. Some of the countries in the region have opted measures to cope with the emerging situation. These include:

- recruitment of teachers from the world of business and industry;
- providing pre-service and in-service training with greater emphasis on practical skills training;
- establishment of closer links between institutions and industries for skill development of the TVET teachers;
- wider application of competency-based teacher education programmes;
- focus on attitude, values, work ethics and non-technical competencies in TVET teacher-training programmes. The question is how to use *success experiences* for the benefit of all countries in the region.

### **Institutionalized Training of TVET Teachers**

Twenty years ago most of the CPSC member countries did not have specific institutional facilities for training of TVET teachers and teacher trainers. Since the beginning of its inception, CPSC consistently advocated the need for establishing infrastructure for formal and non-formal pre-service and in-service training of TVET teachers and teacher trainers. Over the last twenty years many such institutions have come up in the region.

In Bangladesh, the Technical Teacher Training Institute (TTTC) is one of the first technical teachers training institutes in the sub-continent. India, in the 70's, established four Technical Teachers Training Institutes (TTTI's) in the four regions of the country. In 1978, the Government of Indonesia decided to establish eleven National Teacher Upgrading Centres (PPPG). Six of them were designed to fulfill the needs of technical and vocational education. The rest of the Centres were for upgrading science/mathematics and other teachers. Similar national level technical teacher- training institutions have also been set up in Pakistan, Sri Lanka, Nepal, Malaysia. Many countries have developed facilities for TVET staff development through existing universities and technical institutions. The question is how to introduce Total Quality Improvement program for TVET teacher-training institutions.

### **Distance and Open Learning for Continuing Education of TVET Teachers**

As a result of a careful review of the CPSC member country needs and

priorities, distance education has been adopted as a necessary supplementary mode to meet some of the critical needs of teacher-training in the member countries. The objectives of the distance learning programme will include:

- to update and upgrade a large number of serving technician teachers, teacher educators, and key personnel responsible for management and quality improvement of technical-vocational education and skills-development in the member countries in the Asia-Pacific region;
- to have convenient and continuing access to advance training which are of immediate relevance, cost-effective, and reflective of prime concerns of the developing member countries of the region;
- to contribute towards developing a cost-effective regional model for establishing distance education resource centre for technical-vocational education and skills-development;
- to promote innovations, research, and development for improvement of quality and relevance in technical-vocational education in the Asia-Pacific region;
- to support technical cooperation among developing member countries for designing appropriate methods and materials for distance education;
- to establish a network of international and national organizations for distance education for TVET.

CPSC, in coordination with other organizations like the Commonwealth of Learning (COL), are promoting the concept of distance education for TVET teachers in the region. These coordinating efforts have to be further intensified for efficiency and economy of the programs.

### **Modularized Open Learning for Continuing Education**

Considering individual constraints and job requirements of working teachers, most of the continuing education programs may be given as on-the-job programs. To accommodate variable requirements, programmes should be flexible in nature. The flexibility is provided in selecting the contents, time and duration of study, place of study, strategy (method and media) for study, etc. The learner should have the flexibility in choice of course content according to job requirements. This flexibility helps to motivate the teacher to take part in the

programme.

Since the teacher and teacher trainers often are not located at the same place, the teaching/learning (T/L) package and the modules prepared by specialist experts are such that the learners located at a distance away from the experts can understand the contents of the package through individualized self-study. CPSC has prepared a number of teacher-training modules consisting of self-explanatory concepts/principles and alternative examples of application of these concepts/principles.

Colombo Plan Staff College has conducted a number of flexible modular training programmes for technical teachers of TVET institutions using distance learning print modules prepared by CPSC's experts. It is observed that these programmes have been very well-received by technical teachers. These programmes for the technical teachers of TVET system have considerably assisted in developing a number of teaching competencies.

### **LOOKING AHEAD**

Looking ahead towards the 21st century and in the high tide of the Information Age, it is important to establish:

- a) stronger linkages between technical and vocational education and the world of work;
- b) stronger linkages between technical and vocational education and the general education in basic and secondary education systems;
- c) greater efforts to develop income-generating skills, particularly in rural areas, for poverty alleviation;
- d) greater effort to improve participation of women and other disadvantaged groups in skill-development programmes;
- e) continuing system of curriculum renewal in the context of rapid changes in technology and the challenges of open global market economy.

To meet the demands and responsibilities of the 21st century the TVET teachers also must change and re-equip themselves on a continuing basis with broad based and flexible technical competencies, attitudes, and values as required in a global marketplace. Reforms of TVET



teachers/trainers will include:

- a) provision of formal and non-formal methods of TVET teacher-training using contact and distance modes;
- b) improving the quality of technical and vocational teachers education by placing greater emphasis on industry-oriented teacher training programmes;
- c) recruiting TVET teachers from the world of work and training them through pre-service/in-service programmes; and
- d) providing appropriate financial compensation/incentives to TVET teachers;
- e) raising the public image and status of TVET and TVET teachers.

## CONCLUSION

National, regional and international agencies must work together in a spirit of partnership to strengthen and upgrade the quality and relevance of technical and vocational teachers as well as the general education teachers to have relevant components of technical and vocational education in their teacher education curricula. Leadership for such international and regional partnership programmes may come from UNEVOC/UNESCO. Agencies like COL, ILO, UNESCO, CPSC and other international agencies should meet to draw up regional action plans to develop and provide continuing education for upgrading and updating TVET teachers. Industries, NGO's, and teachers' organizations should be made part of this teacher renewal effort.

CPSC, having a commitment and concern for the improvement of technical and vocational education in the Asia-Pacific region and with its vast network of TVET institutions in the region, is in a position to coordinate these efforts in the Asia-Pacific with other national and international agencies. For its success, a well-planned partnership programme is necessary.

# **Training of Teachers/Trainers in Technical and Vocational Education**

by

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*This paper records a case study related to the pedagogical knowledge and the skills required by technical and vocational teachers and the means for satisfying this need, utilising distance education. It outlines how the project has developed a model to allow transferability of the programme to other regions, accommodating social, economic and cultural differences.*

## **CONTEXT**

To better understand this initiative in Technical and Vocational Teacher Education, it would help to be aware of the context in which it was initiated. The Commonwealth of Learning, (COL), the lead organization in this project, is an International Organization founded by Commonwealth Governments in September 1987.

Member Governments have given COL a mandate to encourage the development and sharing of open learning/distance education materials, expertise, technologies and other resources. Working with and providing services to hundreds of institutions throughout the Commonwealth, COL helps to increase the capabilities of developing nations to meet the demands for improved access to quality education and training.

*“Our long term goal is that any learner, anywhere in the Commonwealth, shall be able to study a distance-teaching programme available from any bona fide college or university in the Commonwealth.”*

In addressing all of the functions and objectives prescribed in the Memorandum of Understanding and working in all parts of the

Commonwealth, COL has consolidated its operations under two divisions - Regions and Programmes. The functions it performs within this structure includes communications technologies, materials, training, and information services. All levels and sectors of education are assisted and technical and vocational education and training (TVET) has become a firm plank in COL's field of endeavour.

## **PROJECT HISTORY**

In 1991 COL hosted an international conference in Hong Kong to platform the notion of Technical and Vocational Education by Distance Education. At this meeting, COL sought guidance in establishing policy and direction in relation to TVET. Significant areas of need were identified by the participants and nominated for action by COL. One of the needs that was seen as consistent across all regions of the Commonwealth was that of training technical teachers. The identification of this need by the conference was acknowledged by COL as it fitted comfortably within the mandate and it was felt that the experience gained and lessons learned would assist in the development of a model that had potential for transferability.

At a subsequent meeting of the COL Tech/Voc Reference Group, in 1991, the Caribbean was identified as the region in which this initiative should be implemented. The proposal was in line with The (Caribbean) Regional Strategy for Technical and Vocational Education and Training, 1990, which had identified technical teacher training as a critical issue in the development of this sector of education.

*“Across the Region there is a need for more trained teachers for TVET. Because of the urgency of the situation, Institutions have been forced to employ teachers who may have industrial experience, but lack the pedagogical skills necessary for effective delivery of the programmes and vice versa.”*

The first stage in establishing a project was a COL sponsored Regional meeting in Nassau, The Bahamas, in June 1992. This meeting brought together Technical and Vocational educators from each of the fourteen Commonwealth countries of the Caribbean as well as representation from the Caribbean Community Secretariat (CARICOM). The meeting resulted in the development of an Action Plan (Appendix 1) to produce

a distance education training programme for technical and vocational teachers that addressed the core pedagogical needs of the four levels of teachers in this field.

### **Rationale**

The meeting defined a fully qualified technical/vocational teacher as one who is certified in their area of expertise, and has an appropriate level of pedagogical skill. It was further defined that being certified in an area of expertise meant demonstrating both theoretical knowledge and manipulative skill to a standard required in that area, as well as having experience in an industry to which it related.

The pedagogical and subject area training needs of technical and vocational teachers and instructors in the Caribbean region are numerous and diverse. It was soon recognised by the meeting that a successful training programme for teachers in this field should be multi-faceted and offer the opportunity for both subject area and pedagogical knowledge and skills. But the logistics of being able to offer a programme of this nature across the region, and across a plethora of subject areas, utilising distance education delivery strategies, were prohibitive, so a decision was taken that the initial phase of fulfilling this need was to address the pedagogical skills.

The reason for this decision was based on the fact that all technical and vocational teachers required this area of expertise, regardless of level or subject specialisation, and it was one area that could be offered successfully by distance education. Several countries within the region offer technical training programmes for teachers in various technical and vocational fields. It was assumed that these countries would continue to cater to those persons wishing to enter the teaching profession, and who needed subject area upgrading or qualification.

### **Target Group**

In the discussions relating to the target group that this project might address, four levels of technical and vocational teachers were identified. These levels were identified as teachers of:

- pre-vocational courses in secondary schools
- apprentice and vocational area courses

- diploma and technician level courses
- degree level programmes.

The notion of a Core Curriculum, that could provide the basic pedagogical skills that all these levels of teachers required, and developed using a modular approach, would enable it to be utilised in each level with the optimum flexibility. It would provide for the opportunity to add more advanced modules to satisfy the needs of the specific groups, or enable the modules to be completed in any given sequence, to suit individual or institutional requirements.

## **PLANNING**

The Action Plan that was developed at the initial Regional meeting outlined the processes that were required to take the notion of this training programme from the concept stage to implementation of the pilot. The Caribbean Community Secretariat (CARICOM ) and COL shared the Management responsibilities. COL accepting the direct financial responsibility and the provision of a professional member of staff to be responsible for the day to day monitoring and implementation, and CARICOM, by virtue of their strong position within the Caribbean region, effected the elements of the Action Plan that needed to be initiated within the individual countries and across the region.

Establishing and agreeing on the content of the curriculum required a long consultative process. The Action Plan required that each individual country would nominate the elements they believed should be accommodated within a core pedagogical curriculum. Through the medium of National meetings, co-ordinated by CARICOM, countries submitted their identified competencies for amalgamation into a cohesive document. It was difficult to refine the mass of information that was presented as each country had volunteered almost an entire programme, including subject content. It was necessary to focus on the original intent of a core curriculum to address only the pedagogical skills.

The inclusion of Entrepreneurship was an interesting choice. From the perspective of the more developed countries that were involved in the formatting of the Core Curriculum, Entrepreneurship fell into the category of “nice to know”. However, from the perspective of the

Caribbean, where paid employment is limited and self employment is a significant percentage of the GNP, it was a vital inclusion. Young people being trained in technical and vocational areas have the potential to become self employed, but in the past they have not always been given the skills that would allow them to be successful in this type of initiative. The best time and place for them to acquire these skills is as they acquire the actual trade based skills. This assumes that their instructors are knowledgeable in this field and can successfully pass on these skills, but that is an assumption that cannot be made unless it is built into their training programme.

An understanding of the place in society that technical and vocational occupations, and hence the related education and training occupies, was also seen as a very relevant inclusion. If the status of TVET is to be raised, then it is important to understand what place it currently occupies, and why it does so, as only through a recognition of the background and associated problems can a step forward be taken. And this needed to be within the context of the region.

Workshop Management and Practice is particularly pertinent to technical and vocational teachers and the aspect of responsibility and legal implications is an issue not often addressed in general teacher training programmes. With the rise in litigation it would be lacking in vision to train teachers who will be operating in workshops that have a potential for significant personal physical risk, without training them to acknowledge the inherent responsibilities that this imposes and the possible legal implications.

Training in Safety was considered mandatory but also included were environmental concerns. Instructors and teachers in the technical and vocational areas have an ideal opportunity to make their students aware of the impact of their actions and train them in recycling policies and procedures and the safe disposal of materials and chemicals that impact adversely on the environment. Insistence on standards of environmental protection over an extended period of training can leave trainees acutely aware of their responsibilities in the protection of the planet and the multiplier effect of this cannot be over emphasized.

Computer awareness and basic applications operation was seen as an essential tool that teachers today should qualify with. Including this in the Core Curriculum was a unanimous decision, despite the

acknowledgement that it may present logistical problems in delivery.

Educational Theory was identified as a valuable inclusion providing it related to the educational experience that teachers wished to offer their students. It was anticipated that this module would endeavour to provide strong links between the theories and the actual practices that teachers could bring to their everyday operation in the class room or workshop to improve the outcomes of their teaching.

Finally, through a series of regional meetings and modifications over a period of almost three years, the Core Curriculum eventually developed and was sanctioned by the Regional Advisory Committee for TVET and recommended for accreditation. The result was an eleven module curriculum, subdivided into forty two units, covering topics which were considered to be the minimum essential elements of pedagogical skill required by this group of teachers (Appendix 2). During this process it was agreed that it should be formatted in competency terms which clearly defined the learning outcomes, assessment criteria and content. This resulted in a document that can offer clear guidelines to developers of the resource materials and unambiguous statements to both teachers and students of the anticipated outcomes (Appendix 3).

The Action Plan had outlined the processes and procedures that would need to be addressed, but as often happens, other issues arose that required attention. The significant stages from conception to implementation were ultimately revealed as:

- development and approval of the Core Curriculum by stake holders;
- identification of existing resources that could be accessed to support the distance education delivery of the programme;
- development of a Style Guide to which resources would need to be modified or developed;
- contracting of modification or development of units;
- implementation of pilot;
- evaluation of pilot.

The actual implementation of the pilot involved a significant number of processes which have been addressed under that heading.

## **Accreditation**

The issue of accreditation was one that was raised early in the planning and development of the Core Curriculum. As many of the countries within the Caribbean region already have on campus teacher training programmes, and some have technical teacher training programmes, the purpose of the Core Curriculum was not to try to replace these, but to compliment them. It was always anticipated that institutions that do have existing courses may utilise the programme by either adopting it in total to offer as an off campus alternative to their own course, with similar accreditation, or simply utilising the units provided to assist with the on campus delivery.

The Caribbean region has no existing machinery to accredit a regional technical or vocational programme. Processes exist in the academic field to achieve this, but to date this has not been achieved for TVET. In the negotiations that have occurred relating to accreditation between COL, CARICOM, the Regional Advisory Committee for TVET and the individual institutions involved in the pilot, the process that has been identified requires that each institution should accredit it as a programme of their own. When the regional machinery exists, it should be relatively simple to obtain the wider accreditation based on the recommendations of the institutions already involved.

In retrospect, it would have been preferable to have the accreditation issue resolved prior to the commencement of the pilot, but the lack of an existing process made this extremely difficult. In negotiating to offer the programme in the Pacific region, it is anticipated that this will be resolved prior to initiation of a pilot.

## **DEVELOPMENT AND RESOURCING**

Although the costs of actually producing the Core Curriculum were significant, it was always understood that the most expensive element of the project would be the development of the student learning materials, both text based and alternate media. Having established, by virtue of a survey across Canada, Australia, England and New Zealand, which institutions claimed to hold materials to match the curriculum, contracts were negotiated with a number of institutions. As the COL core budget was supporting this initiative, it was a piecemeal approach to the full



resourcing of the curriculum. The Regional Advisory Committee had recommended that for the pilot programme, a range of Units be used, rather than total modules. It was necessary to identify the institutions that would be asked to develop the resources and this was done on the basis of the institutions reputation and the results of the survey. To date, four institutions have been involved, on a contract basis, from Australia, Canada and Jamaica.

The Entrepreneurial Extension Centre of the University of Technology of Jamaica (UTech), then the College of Art, Science and Technology (CAST), had willingly allowed adaptation of their curriculum outlines for Entrepreneurship to become a module within the Core Curriculum. This placed them in an ideal position to be contracted to develop the supporting materials. Given that the programme was initiated in the Caribbean, it was a logical choice to utilise local expertise and experience to support it.

Module 9, Entrepreneurship, is the first total module to be completed, and wholly a product of the Caribbean. Rights to modify the videos to support it have been negotiated with UTech, to allow usage across the Caribbean and in other regions as required. The videos have a strong Jamaican influence, which is acceptable in the Caribbean, but would even benefit this area once they have been modified to be more generic.

Copyright for all resources to support the Core Curriculum rests with COL as this condition was applied to all development contracts. This allows transfer of the programme to other regions within the Commonwealth and the right to modify them to better suit the cultural context in which they are planned to be offered.

## **IMPLEMENTATION OF PILOT**

The objectives of the pilot were to determine the:

- appropriateness of the content of the Core Curriculum;
- appropriateness of the learning materials in an actual field test;
- ability/capacity of the institutions to offer courses by distance education capacity of the teachers in this category to cope with distance education as a delivery mechanism.

The Regional Advisory Committee for TVET nominated the four countries that were to be involved in the pilot, and the Ministries of Education or other appropriate body nominated the Institutions within those countries. This resulted in the following institutions being involved:

Bahamas - the Bahamas Hotel Training College  
Barbados - Erdiston Teachers' Training College  
Jamaica - the Vocational Training and Development Institute  
St. Lucia - Sir Arthur Lewis Community College.

This selection offered an opportunity to trial the programme in four different types of institutions, with the strong possibility of a spread of students from different backgrounds across the target group. The Co-ordinators were encouraged to enrol students from the private sector as well as from public institutions, as it was seen as another opportunity to establish closer links with that sector.

The staff recommended by COL to service the pilot were one Co-ordinator and one Tutor from each institution. This was on the basis that only ten students would be enrolled at each site, and this decision was made to restrict the pilot to a manageable size, given the lack of experience in the delivery of distance education and also in an endeavour to contain the costs. The criteria for the selection of the Tutors recommended that they be an experienced teacher, fully qualified in both their subject area and in the pedagogical skills. Although being a qualified teacher was not mandatory for the Co-ordinator, all sites selected a qualified teacher for this position. The quality of the staff nominated contributed significantly to the smooth running of the pilot and the high motivation of the students.

### **Training in Management of Distance Education**

A workshop was conducted to train the nominated staff in the delivery and administration requirements of the pilot. The areas covered in the workshop included a general introduction to the concept of distance education, the major requirements that would allow an institution to offer a distance education programme, the roles and competencies essential to the distance offerings, and the role, functions and characteristics of good Co-ordinators and Tutors.

The course ware was also presented to enable the participants to become

familiar with the materials. These were still considered to be in draft format as they had not been field tested. Inconsistencies had been identified, particularly in relation to the amount of student input required to complete each unit. As the units were developed by different institutions, there was a lack of conformity with the number of assignments and the work involved. In retrospect it was found that the Style Guide had not adequately addressed the issue of assignments, either in number or in work involved.

Participants were issued with hard copy masters of the learning units for duplication for students. Some sites found it quite expensive to have the duplication done in country, but as this would be a requirement should the programme be continue to be offered after completion of the pilot, it allowed for a real estimation of the potential costs.

### **Maintenance**

The group cohesion that developed during the five day workshop boded well for continued liaison between the sites. To foster this local support network, monthly teleconferences were initiated between the four sites, COL and CARICOM. This enabled regular status reports from each site, discussion of issues related to either the materials, assignments or delivery, exchange of administration pro formas as well as the more personal problems that were experienced by the group as members of their institutions operating in a special project. To date six teleconferences have been held and most have been technically effective. One occasion resulted in individual calls being made to each site.

Seminars for the enrolled students were scheduled to coincide with the return of the first assignment. Whereas in a full offering of a programme, the frequency of seminars would be left to the discretion of the host college, for the pilot, it was necessary to keep each site parallel in the service and support it offered students. As well as the regular mid unit seminars, an Orientation Seminar was held and one additional seminar added for a larger unit.

In the initial stages of the pilot there was little problem with either student attendance at the seminars, or in prompt assignment return. Some sites have been particularly good in motivating and holding their students, and to date the retention rate is 100%. However, as the programme proceeds, this result is requiring more effort from the

Tutors. Apart from the mid unit seminars, Tutors keep close contact with their students via personal telephone calls. Teleconferencing with students has not been utilised as the cost of this to most institutions is prohibitive.

## **FINANCIAL IMPLICATIONS**

To date the full cost of this project has been borne by COL. This is from the initial Regional Workshop in The Bahamas in 1992 to the development of the Core Curriculum and the associated meetings, the final formatting of the document, the survey to determine the availability of existing materials, development of the Style Guide and the subsequent contracting for the development of the student learning materials.

The pilot has also been funded by COL and the costs associated with this have been the:

- workshop for the training of Tutors and Co-ordinators, which included:
  - airfares and accommodation for participants in Barbados
  - workshop materials
  - facilitator expenses
  - production and dispatch of print based masters to sites
  - copying and dispatching of supporting videos
  - tutor honorarium
  - seminar costs including student travel
  - institution administration
  - teleconferencing costs
  - continued mailing

COL has also provided a professional officer to manage the project, and covered the costs associated with that, as well as providing for the above direct costs. Although the financial commitment to the project has been significant, The Commonwealth of Learning will ultimately own a fully resourced Technical Teacher Training programme that is free of copyright implication, and has been trialed across a region. Up front development costs are always high in distance education programmes, but the cost effectiveness becomes evident once a programme is fully resourced and can accommodate an expanded student enrolment,

impacting positively on the initial development investment.

COL is interested in piloting the programme in other regions and to date interest has been expressed by Papua New Guinea and the wider Pacific, Namibia and South Africa. For it to be implemented successfully in either of these areas, it will be necessary for local educationalists to modify the Core Curriculum to better reflect the needs of the region, and then to modify the learning materials to reflect any changes made in the Curriculum. However, with the initial curriculum and materials produced and trialed, it will be quicker and more cost effective to identify and incorporate any changes required, than to develop a programme without this base.

The flexibility of the materials, in that they can be utilised in existing on campus programmes to support teacher centred delivery, or used for home study elements within an on campus course, will assist institutions that do not wish to offer the entire programme. The individual units are well placed to be utilised in Staff Development programmes that address particular aspects of technical teaching or are also applicable to teacher training programmes other than those specifically for technical teachers.

## **RESPONSE TO BROADER ISSUES**

The issues identified in the Position Paper give cause to reflect on the implementation of the Core Curriculum and how it can or does respond to these issues. As it was developed to meet a need identified as being very generic across the Commonwealth it accommodated some of the concerns raised in the paper.

As discussed in the Position Paper, there is an increasing tendency to “transplant” programmes and course ware into cultures for which they were not originally intended. COL is very involved in the transfer of courseware and materials and in the process offers assistance to recipient countries to gain expertise in the modification and adaptation process.

In developing the Core Curriculum, it was designed specifically to meet the needs of technical teachers in the Caribbean. But because COL saw the potential for transfer to other regions, the modular approach and competency based format were seen as being conducive to this process. The notion of competency has caused concern in the delivery of the

programme, as neither the students nor the Tutors and Co-ordinators were experienced in this form of assessment. But as it is a concept that industry is embracing, the Regional Advisory Committee deemed that it was an opportunity to allow trainee teachers to experience this system by being actively involved in it.

The structure of the course also allows for additional or alternate modules to be incorporated to keep abreast of new developments that might occur, or might be particularly pertinent to either a specific country or institution within that country. It is not seen as a static document, but one that is dynamic and can be re-structured to accommodate political and cultural diversity.

Given that the Core Curriculum relates to the pedagogical skills only, the impact of new technologies is not as severe as in the actual subject area qualification of a teacher. But technological changes will effect its relevance, particularly in the areas of workshop management and safety. With the modular structure, it is hoped that significant developments can be accommodated and maintain the integrity of the Core Curriculum as a base qualification for technical and vocational teachers.

The module devoted to Entrepreneurship will go some way to addressing the problems changes in the world of work has created. As cited in the Position Paper, the precarious nature of employment evidenced by the extent of both unemployment and the lack of availability of jobs to match the unemployed pool, means that entrepreneurship skills, combined with technical skills, do offer some options for those fortunate enough to possess both.

Life long learning has never been as critical an issue as it is now, but it will become even more essential as technological advances, socio economic developments and globalization impact on the workforce. Traditional education methods will not be appropriate to cope with the educational and training needs of a population requiring continued upgrading and retraining. Distance education is an alternative, and one that has not been exploited in the technical and vocational fields. It is hoped that this small experiment in the offering of a training programme for technical and vocational teachers, utilising distance education as a delivery mechanism, will not only allow a cost effective alternative to the upgrading of technical teachers, but also be seen as a model for delivery that could be extended into at least the theoretical aspects of

many technical and vocational training programmes.

# **Training of Teachers/Trainers in Technical and Vocational Education in Pakistan**

by

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## **FACTORS AFFECTING TECHNICAL & VOCATIONAL EDUCATION**

Pakistan has witnessed tremendous changes in Technological, economical, political, social and educational developments during the last decade. A few having direct bearing on TVE in general and Teacher Education in particular, will be taken up here:-

- Some of the proven traditional technologies have gone into the past history of technology only. In turn, new technologies have taken up and filled the gap. Notable in the list include:

Computers/micro computers, automation and robotics arms; fax & pager service, digital, telecard cordless and mobile telephone, video-phone; widespread use of video games; mobile video photography; colour video display; dish-antenna and related fields, distance education through audio/video broad-cast; extensive use of earth-moving machinery & mechanized material handling, material processing/testing and improved materials of construction, metal extraction/refining, extensive use of plastics, mechanized agrotechnologies and agro-based industries (including food processing), computerized designing of pull-over, to multistory buildings & complete industrial products, extensive standardization using ISO-9000, HVAC, E-mail and other telecommunication services etc. (the list is not exhaustive).

- Greater trend of privatization of all hitherto Government controlled or owned services & industries, resulting in the regulatory control only resting with the Government. This has further resulted into the control and creation of jobs & job-markets in-to the hands of private entrepreneurs, not only thinking but also demanding entrepreneurial training as an



essential ingredient of the training of the work force entering the world of work.

- General as well as technical education facilities have increased many fold with not only Government share as the direct provider having been on the increase, but also the active participation of the private sector. A direct bearing of this is the manifold increase of the literate force but unable to be absorbed in the industrialized economy having no skill. This is no-doubt resulting in the jobless educated youth on the increase but have also given impetus to the diversion of this force to the technical & vocational educational institutes in search of learning skills required by industry. Thus the lust of white-collared jobs having gone and enhanced dignity of labour, learning & re-learning of new skills commensurate with the demands of the world of work, has come as a happy surprise for many private educational providers. This in turn, has implications:
  - i) in that the entrants to the TVE institutions are better educated;
  - ii) with the general level of technology in use being on the rise, a greater awareness of the technological developments;
  - iii) learning and relearning has become a need and in-fact a life-long requirement rather than a single short, age-specific process. This is evident of the waiving of age-limits in TVE institution, and an in-creased enrollment of mature students in several courses especially resulting from the rapid changes in technology;
  - iv) the technologies/trades/disciplines have diversified. In fact the list includes areas once considered a luxury affordable by a few gifted only;
- With the shift from the supply-led model of technically trained huge force coming out of the TVE institutes, to the demand led model, and infact consolidation rather than unplanned growth of TVE offerings, the private sector have seized the opportunity in a negative sense in the form of the mushroom growth of TVE institutes, particularly offering disciplines requiring little investment. This is counter to the policy of consolidation, as the resulting unbalanced growth in some common trades

overshadowing the extreme shortage in some critical areas, particularly the hi-tech, innovative modern technologies. In-plant training by industry is the only solution sought giving the picture of the TVE sector not running in synch with the demands of the job-market.

- With the fluctuating job-market, an increasing awareness and in fact need for the TVE graduates becoming self-employed, coupled with the privatization policies have resulted in the entrepreneurial traits to be incorporated in the TVE curricula. However, the TVE institutes have not been fully responsive to the call. Major hurdle is the lack of training of trainers with the requisite skills/competencies.
- With the social life having an increased proportion of audio & video (entertainment or otherwise) electronic gadgets, coupled with the average family having relatively easy access to many household appliances and other comforts of modern technology, along with electricity, gas, geezers, temperature control, telephone/fax and such other facilities, a whole range of services, & trades with supply, installation (and fabrication) and repairs and maintenances of gadgets as well as services, have come up as a welcome opportunity for a sizeable proportion of work force.
- Another side effect of the above factor has been that the demand is on the increase for a general multi-skilled workforce rather than of narrow specialization. Thus, the trades and disciplines offered as separate have been felt merged into the common 'Installation Technology' or services matching multi-skilled team of trainers is yet to be prepared.
- A major concern and consequent increase in the regulatory provision for the environmental issues, has added another dimension to the offering at TVE, to which the response is still lacking due to the inadequacy of the trainers. Only recently, the issues have been integrated in the TVE curricula.
- With the adoption of ISO-9000 by an increasing number of industrial concerns, consequent demand on the existing work force as well as the new entrants, is not hard to measure.

Again, the lack of competent teachers in this area is the major hurdle in shaping curricula of TVE institutions so that the work - force could be geared to the demands of world-class manufacturing not only conversant with but fully trained for quality concerned aspects.

- With the diversification in the nature of jobs, and traditional trades/disciplines diminishing and giving way to the new emerging trades & technologies, an essential ingredient of the work force is their life-long learnability and not only being fit to the immediate requirements of the job. Thus, the slogan of matching the training at TVE institute to market with the requirements of the job, need slight modification.
- A major issue confronting TVE is that whereas the teachers are expected to impart state-of-the art knowledge & skill and hence demanding their continuous updating through frequent placements with the industrial sector, implying that in the first place they will be recruited on the basis of their work-experience in industry. On the contrary, the dialogue between the TVE institutes and industry has not been established, although the need has been established in all the education policies. The two are virtually operating in water-tight compartments with little interface worth mentioning, at least it has not been formally institutionalized across the TVE sector. In fact the need of the industry to be at the fore front of technological developments and hence having an edge in the market through it, make them responsive to the technological changes adopted literally instantly, through their inplant system of training/retraining, and flexible induction (& lay off) of the work force. On the contrary, the TVE operates with lot of inertia and in fact rigidity in their provisions have made them only a follower of the trends originating in the industrial sector. This has made the courses as well as the faculty redundant and by the time their graduates enter the job market, they are already steps behind the pace of developments taken by industry. This is resulting in the ever decreasing flow of personnel from industry joining as faculty in TVE institution, and ever widening gap of the skills & competencies of the faculty as compared to the latest development in industry. Besides, the TVE institutes having established research and

testing facilities are hidden from the industry and they are unable to take advantage of this potential in TVE. An immediate need arises of the breaking of barriers of the industry safeguarding their so-called trade secrets and the TVE institution sacrificing their sacred boundaries being trespassed by industry. Efforts made in the past regarding enactment for the compulsory placement of TVE graduates with industry, have failed. Persuasion and continuous persuasion could only bring in the industry voluntarily closer to the TVE, if TVE institutions could prove their worth as well as show that they have something of interest to the industry.

- For TVE teachers, the main competition is the industry offering lucrative service-benefits and mobility (horizontal & vertical) as against the tight service structure in TVE institution. Thus, another dimension of the problem creeping up is not only finding the potential teachers, developing them into trained multi-skilled teachers but retaining them particularly during the initial stages, of their career. Again, the necessity for preparing technical teacher-manager (for labs/workshops as well as disciplines and finally institution), is not being felt reasonably. Inadequacy of management of TVE administrative force has been highlighted in several studies.
- Institutionalized research & development in TVE sector (Curricula, Instruction, resource planning, job market interface, evaluation, administration) has been introduced only recently.
- Whereas the entrants to the TVE institutions see a multitude of latest technology in their surroundings, the teaching/learning process, being teacher-dominated, is characterized by the traditional chalk-and-talk approach. Educational Technology becoming so commonly used globally, is alien to TVE trainers. Even in print media, TVE trainer is on a very weak footing as the teaching-learning resource (TLR) material pertaining to the trades/disciplines offered, is just not available, mainly for the reason that the clientele readership is poor in numbers (as well as economically).
- System of selecting and occupational guidance for the aspirants to TVE, through their continuous assessment by the class-

room/lab teacher (or central examining bodies), all is running on traditional make-shift arrangement basis. This is resulting not only in the unsatisfied student but the employer also having doubts about the currency of the credentials produced by the TVE graduates.

Should it not be revolutionalized through teacher training?

## **TEACHERS TRAINING AND TEACHER TRAINING PROGRAMMES**

A look at the various aspects of sociocultural and other aspects affecting the TVE scene, shows that the demands on the trainers are not only multidimensional, these are continuously changing. However, it cannot be left to chance that the trainers in TVE system will somehow develop professionally and will be ever updated as far as the state of the art knowledge and skills are concerned commensurate with the technological developments. Planned efforts to keep the faculty and even administrators in constant touch with the latest trends as well as requirements will provide them an edge for preparing the work-force having the right mix of knowledge and skill and fully ground with the right type of attitudes and work-related ethics so that their skills are not redundant over short period.

- Traditionally, the teachers in General Education have been undergoing pre-service teacher-training programmes. On the contrary, for TVE it was felt that the knowledge and skills are the only tools required of the technical teacher. However, it was soon realized that imparting the knowledge and skills to the students had its own demands and there was no substitute for proper teacher training.
- Teacher training for two streams of teachers was thus started when expansion started in technical education in the country. A "diploma in technical teacher education" (spread over about one year full-time studies, covering 40-credit course) was offered to teachers possessing a degree or associate degree in technology. The other stream was offered "certificate in technical teacher education" to the teachers possessing a skill-competency certificate. Both programmes were characterized by the fact that

these were offered as "in-service full-time structured training programmes", offering necessary pedagogy component as well as some foundation in technology courses also. Secondly, the courses were offered under teacher training wings attached with two of the polytechnics.

- After some time, it was realized that training of technical teachers under TVE required due attention. It was made part of the National Education Policy to establish a separate institute, named National Technical Teachers Training College at Islamabad, with the provincial teacher training wings as its extension wings. The institute has since been established and operational since 1987. Besides short courses, workshops, conferences & Seminars as a part of continued staff development activities, the institute offers two types of 44-week in-service full time teacher training course:

- i) "Diploma in technical teacher education" having the three components as:

Pedagogy component for necessary professional development of teaching work-force; subject & skill upgrading and 8-week industrial training. The programme is meant for teachers with an associate degree in technology.

- ii) "Graduate Diploma in Technical Teacher Education" having the three components as:

Pedagogic component for necessary professional development, educational project, and 8-week Industrial Training. This programme is meant for teachers with Degree in Engineering or Masters Degree in Science/Commerce.

The structure of these courses was based on a research-based Technical-Teacher profile incorporating requisite knowledge/skill mix as well as the responsibilities.

- Government has realized the importance of teacher training, career planning, and staff development by the fact that staff development has been declared as the responsibility of the Government for which all expenses are borne by the

## Government.

- It may be mentioned that these in-service teacher training programmes are meant for the teachers working under TVE in Government Sector. Teachers in private TVE institutions are not bound under the regulatory measures for their registration to be properly qualified, nor private TVE sector find any incentive for any staff development programme.
- Vocational Teachers are similarly provided due teacher-training and continuous staff development opportunities but as the vocational education and training is covered under several ministries/divisions and departments, the requisite teacher training programme differ in content, quality and priority. Common feature is that teacher training is recognized as the Government responsibility, in case of public-sector vocational institutes only. Private sector vocational institutes do not yet feel bound for offering teacher training to their faculty.
- Based on need-assessment studies, staff-development programmes are offered for the fresh as well as senior faculty and administrators. New trends and developments identified are also catered through short courses, workshops, seminars/conference with resource persons and course leaders drawn from National as well as International experts in the chosen area. These area include computer applications (General, & Technical, CAD/CAM, Programming languages), latest developments in technology, management and management information system (MIS), student evaluation, instructional planning, environmental issues, ISO-9000 and quality controls, energy conservation, research & development, TLR, industrial placement seminars, continuing education, entrepreneurship, computer-based management and data-processing, project management/monitoring etc. Thus, it can be seen that these staff development programs cater to the wide-ranging interests as well as requirements of the trainers & managers in TVE institutions.
- However NTTTC is aware of the fact that it is unable to cater to the individual needs of the trainees, as well as their career-planning. Particularly, the system of management courses

commensurate with the enhanced responsibilities of the teachers through his/her career offering vertical mobility and increasing efficiency and effectiveness; this system is yet to be developed. Also, the research & development (R&D) is a very weak area and the teacher competencies for this activity need to be further strengthened. Academic Calendar of NTTTC is also not capable of offering even the first cycle of the required staff development programmes regarding critical areas. In fact a scientifically based system of developing an integrated need assessment, career development as well the projected developments in the world of work, is yet to be developed and put to action. Industrial placement and revival of linkage with industry on a strong-footing is yet at the initial stages. Participation of female technical teachers in the staff development need to be increased. TLR development needs our immediate attention, but for reasons, it is low in priority. And above all, the teachers in private sector TVE institutions need to be brought under the umbrella of teacher training and staff development institutions, so that quality of their graduates may not remain a question mark. Even the master trainers at NTTTC need continuous updating and development. Then the outreach programmes of NTTTC to offer training workshops/courses at distant areas, are yet to be tapped to its full potential. Training of Vocational Teachers need coordination through NTTTC or some other similar agency. The image of NTTTC visioned as a real centre of excellence need to become true as well as its role as a professional arm of the Ministry of Education regarding policy planning in technical education.



# **Challenges and Prospects in the Training of Technical and Vocational Education Teachers/Trainers in Africa**

by

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## **INTRODUCTION**

The importance of technical and vocational education (TVE) with regard to individual occupational preparation as well as national development is today well recognised around the world.

UNESCO's efforts in the promotion of TVE since the adoption of the Convention on Technical and Vocational Education by the UNESCO General Conference at its 25th session in October 1989 leading to the current UNEVOC activities alongside national efforts in the recognition and inclusion of TVE in general education have been major promotional catalysis.

In Africa, the regard for technical and vocational has shifted from its colonial relegation to "workers' education" to the respected vocationalisation of the entire school curriculum in the post colonial era.

As we now approach the 21st century, there are even louder calls for the vocationalization of higher education in particular and the entire education system in general.

In order to respond to this demand more effectively, teacher education for TVE must be given more attention and resources mobilized to ensure a continued supply of well qualified and experienced teachers/trainers.

## **CHALLENGES FOR TVE IN AFRICA**

In Africa, despite the popular call for more investments in technical and vocational education and the creation of a favourable environment for

the inclusion of TVE in the general school curriculum, serious challenges emanating from the socio-political, economic and scientific and technological contexts call for immediate attention if any progress has to be made.

### **THE SOCIAL AND POLITICAL CONTEXT**

Over the past three decades, total political independence in Africa has been as illusive as economic independence. Political emancipation simply meant that the replacement of colonial regimes with African regimes that were mere caricatures of those replaced. Today one hears of the second liberation where the majority of the citizens yearn for involvement in their self governance.

The current wave of internal conflicts, most of which are deeply rooted in ethnic and economic differences, continue to threaten even the most promising young democracies.

In this struggle are imbued traditional demarcations between academic and liberal subjects on the one hand and the technical and vocational subjects on the other with the latter always getting lower priority.

Technical and vocational education has, thus, been regarded as largely job specific training and terminal whether in formal or informal learning systems. The lack of further educational and training opportunities has stifled any interests bright and motivated young people may have had toward TVE.

Further more TVE has long been associated with much physical exertion and difficult working environments traditionally viewed as unsuitable for women and girls. This has largely been responsible for the exclusion of nearly half of the population in Africa from contributing to national development.

### **THE ECONOMIC CONTEXT**

The economic malaise so much rampant in Africa is a derivative of both external and internal forces working on any given nation. Under the current stringent structural adjustment programmes imposed by foreign

dominated financial donor agencies, the liberalised world markets, and the phenomenal growth in scientific and technological advancements, Africa is pitted against much more resourceful industrialised nations of the West and the newly industrialising countries from Asia.

This situation has precipitated a rising tide of famines, declines in productivity, dwindling school enrolments and rising unemployment rates.

At home the African states have, for several decades, planned and instituted various policies aimed at developing various sectors of economic and social life. However, these national plans, sessional papers and policy frameworks have often ended up being unattainable dreams and aspirations. There has been a serious lack of political will to implement whatever has been agreed upon. This is why there is famine alongside national food policies, industrial stagnation and at times erosion alongside well articulated industrial development policies.

It is common to find a situation where schools of engineering and other higher level or post secondary technical and vocational institutions exist amidst a critical shortage of middle level technological manpower responsible for the production of essential goods and services. A major criticism that has yet to be sufficiently disowned is that these institutions, despite their mandate, are entirely focused on producing elitist technical manpower who are far removed from real work experience.

In summary, the two most debilitating agents of under development occasioned by economic decline are poverty and illiteracy of which seem to be on the increase as we approach the 21st century. Technical and vocational education is more adversely affected by these afflictions because of its high cost which in the spirit of cost-sharing has been passed on to the beneficiaries.

It is gratifying to note, however, that both governments and the people in most of these African states still have their hopes that TVE is the most likely agent for the delivery of the much needed manpower to turn their economies around.

## **THE CHANGING WORK ENVIRONMENT**

In the majority of African countries, the labour market is dominated by the major economic sectors. These are the modern formal sector and the informal sector. At times these sectors may demand varying sets of qualifications for employment.

The modern formal sector comprises of formally registered and recognizable public and private businesses and or industries. These are often dominated by foreign investors. They deploy manpower from the formal school system with certificates, diplomas and degrees from traditional disciplines adapted from Western educational and training systems.

This sector has been on the decline as investors freely move to more profitable markets in the liberalised world markets. The knowledge and technological skills required to service this sector are fairly modern and workers need constant retooling to keep pace with the knowledge and skills required to operate or maintain modern equipment often imported from the developed countries.

As the formal sector declines, the informal sector has been surviving at a phenomenal rate. In some countries such as Kenya, this sector now caters for over 70 percent of employment opportunities in the economy with a growing labour force of over 500,000 new entrants each year. The informal sector is basically indigenously controlled and offers a wide range of opportunities for either self or salaried employment. It offers goods and services at more affordable rates and thus caters for a large market.

The knowledge and skills needed to function in the informal sector are directly dictated by the demands for the types and nature of goods and service for the surrounding communities. The sector is thus competitive and demand driven.

The above work environments, therefore, demand; the most current knowledge and skills to be competitive in the world liberalized markets, innovativeness in product development, entrepreneurial skills, communication and marketing skills and problem solving techniques in order to meet the needs of consumers of products and service from each sector. This has enormous implications for technical and vocational

education and training.

The social, political, economic and work environment challenges mentioned above have various implications for TVE and teacher education respectively.

In order for TVE to advance and attract more followers in its various careers, its image must change from relegation to parity with general education. TVE specialists must be given due recognition.

Quite often TVE personnel are not given supervisory and managerial positions besides the lack of clear career patterns and schemes of work. This has a dampening effect on the bright youth who may otherwise be inclined to pursue vocational careers.

Technical and vocational institutions are comparatively more expensive to run. Since most equipment, hand tools and to some extent learning/teaching materials are often imported, it is difficult for these developing nations to raise sufficient foreign capital to meet the cost.

Due to this prohibitive costs, Tve teacher education especially at graduate level is almost exclusively carried out overseas. This further causes incompatibilities between trained manpower and the work environment they are eventually bound to serve.

The challenge of serving the businesses and industries that rely heavily on foreign technology is a more serious concern that may, if not adequately addressed, become the most critical barrier to the development of an indigenous industrial and commercial sector in Africa.

Ultimately, a modern industrial sector calls for manpower with the appropriate education and training to bring about technological transfer and evolve an entrepreneurship culture.

## **PROSPECTS FOR TVE TEACHER EDUCATION**

### **Recruitment and Training**

The successful implementation of TVE programmes very much depends

on the availability of well trained and experienced TVE teachers. A major constraint in the vocationalisation of curricula in Africa has been due to the lack of such personnel.

Traditionally, TVE teachers have been recruited from artisans, tradesmen, technicians and engineers/technologists whose major training has been concentrated in technical areas but with fewer having been trained as teachers and trainers. Another alternative has been one where both the technical area of specialisation is taken alongside professional teacher education in teacher training colleges.

There have been rare cases of specialists undertaking a diploma in education to prepare for teaching the subject in schools. These modes of recruitment and training have not been without their associated problems.

In several areas, due to low pay, it has not been possible to attract the right teachers to these areas as most qualified TVE professionals often opt for deployment in enterprises or self employment where incomes are more attractive.

As a first step to attracting personnel with the interest and the right qualification and experience to TVE, governments and employment agencies should consider offering attractive and competitive remuneration and other employment benefits to TVE teachers and trainers. This will also be complimented by a selective recruitment strategy where only the best qualified can be deployed.

### **Career Prospects**

Once recruited TVE teachers should be offered opportunities to advance in pursuit of higher education and training and also to periodically take retraining either through enterprises or in specialised institutions to keep current in their technical disciplines.

At present, most TVE programmes, including teacher education, are terminal with limited opportunities for further training. This has left most TVE personnel disenfranchised as they are bypassed on promotions to higher scales and positions of responsibility.

There is an urgent need to link TVE programmes to university programmes either by providing credit for courses taken or even work experience. There is also an urgent demand for graduate TVE teachers and trainers to help advance the field. At present, TVE problems and issues are under researched due to the lack of manpower with the higher level analytical and research skills expected of university graduates.

### **Curriculum Innovation**

The fast pace of scientific and technological development world wide affects the knowledge and skill bases in TVE programmes in Africa as a major consumer of goods and service from the advanced countries.

The changing work environment also calls for a new set of knowledge and skills in order for the trainees to fit in either the formal or informal sectors.

Current TVE curricula are still too foreign oriented and in the majority of cases outdated because they are based on old trades most of which are now non-existent in the Western countries. There is a need therefore for innovations in TVE curricula to make them more relevant to the changing needs of modern African work environments.

Such curricula innovations must begin with teacher education curricula. It is evident that a wide spectrum of the teachers are required for both formal, informal and non formal learning situations. There is a need to design curricula that integrates the liberal, scientific and vocational disciplines in the formal school system while emphasizing the vocational training component in post school programmes aimed at producing artisans, craftsmen, technicians and technologists.

An essential component of the TVE teacher career development should be the requirement for such teachers/trainers to undertake industrial attachment periodically(e.g. after every 5 years) to ensure they keep professionally current in their areas of specialisation.

### **COLLABORATION WITH ENTERPRISES**

In order to keep current with the state of the art practice, there is a need for collaboration between TVE institutions and enterprises to enable

students gain skills and to enable teachers to retool in their own occupations. In this relationship, tangible benefits accrue to both educational institution and the informal/formal sector.

Since enterprises are mostly like to be operating within the state of the art technology, they should be included on curricula panels to participate in curriculum development. They too can be used to inservice the teachers/trainers besides donating some equipment for training purposes.

## **FINANCING TVE**

The costs of TVE are comparatively higher than those for general education. These are often 2 or 3 times higher as unit costs increase due to smaller classes and heavier expenditures on equipment, infrastructures, materials etc.

Today, TVE is financed under various arrangements including:

- public financing;
- enterprise financing;
- private and public sponsored financing and;
- international donor assistance.

Not a single method amongst the above can suffice. Often a combination is recommended. However, it is imperative that public financing be committed to the preparation of TVE teachers/trainers without much dependence on other sources. This is an important state responsibility if a pool of teachers/trainers is to be guaranteed for the future. The government can rally the support of other stake holders e.g. employers, employee unions, parents and trainees to supplement the cost of TVE for the benefit of development at the national level.

The current trend of mushrooming TVE institutions in response to political pressure in response to rising unemployment is counter productive as the scarce resources are widespread without much tangible incomes.

It is advisable for governments to have fewer but more comprehensive and well equipped TVE institutions with more capacity than the existing under-resourced and poorly managed institutions.



## CONCLUSIONS

The role of technical and vocational education and training in the preparation of manpower for national development is well acknowledged in Africa today. However, the potential of this aspect of education has not been fully exploited due to a wide variety of constraints. This has left the majority of the potential work force unprepared for the world of work.

An important step forward in addressing this problem must begin with teacher preparation. Without qualified and well experienced TVE teachers and trainers to plan for and execute TVE programmes not much can be realised at the grassroots.

There is a need for higher level trained TVE experts to provide the professional academic and research leadership in the field to support policy formulation, planning, development and implementation.

While recognising the current financial constraints many countries face, it is important, however, to point out that despite its prohibitive cost ignoring TVE is most likely to be more costly in the long run as no nation can expect to increase its productivity and become competitive in the long run as no nation can expect to increase its productivity and become competitive in the modern liberalised markets without such technical manpower.

# **Training of Teachers and Trainers in Technical and Vocational Education in Jamaica**

by

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## **INTRODUCTION**

The HEART Trust was established by the HEART Act of 1982 to provide employment and training opportunities for skilled and semi-skilled persons for the labour force. In 1992 it was updated by amendment to the Act to become the National Training Agency, mandated to coordinate, facilitate and enable the development and growth of Technical Vocational Education and Training (TVET).

The Agency by way of its policies and objectives endeavours to have developed and maintained a TVET delivery system that is industry-led and quality-focused in its operational processes and its products/services.

In order to be responsive to the demands of industry and to sustain quality throughout the TVET System, the organization's policies dictate that standards will be a central mechanism that will help to guide the development and delivery of its TVET programmes and support services.

HEART Trust/NTA has spent the past several years laying a foundation for a more consolidated training system by bringing under its umbrella most of the *non-formal* training programmes operated by the public sector. This process is essentially complete; in 1970 the Vocational Training Development Institute (VTDI) was established with assistance from ILO/UNDP to train and develop instructors and administrators for vocational training programmes. In 1991, it was incorporated into the HEART Trust/NTA and has since undergone substantial upgrading and expansion in order to respond more appropriately to the professional staff needs of the revitalized National TVET system.

In keeping with its new mandate, the VTDI was accorded tertiary status

by the Ministry of Education in 1992. With this new status, the VTDI has been upgraded and expanded to become the centre of excellence for TVET professional staff development, while still providing advanced technical training opportunities for senior workers to upgrade their skills for high level certification.

The mission of the VTDI, as the professional staff development institution of the HEART Trust/NTA, is committed to influencing, promoting and sustaining a high standard of professionalism and performance in the TVET system, by example, and through the timely supply and support for competent, qualified and highly motivated TVET professionals (instructors, administrators, etc.), who are committed to the task of building and maintaining a competent and productive workforce to meet the needs of the labour market. Its objectives are:

To monitor and keep abreast of the professional staff demand/supply situation within the TVET system through studies, survey and research.

To introduce new strategies and techniques to ensure the most efficient and cost effective means of training and development for TVET professionals to maintain currency and respond to new demands.

To train, develop and ensure an adequate supply of quality professionals to operate in the TVET system.

To foster and maintain a high professional standard among TVET professionals through collaborative initiatives with local, regional, international professional bodies and institutions.

## **FOCUS ON INSTRUCTOR TRAINING AT THE VTDI**

The vocational instructor is a learning facilitator. He/she functions between the inexperienced trainee and the body of **Knowledge, Skills and Attitudes** which is to be acquired/developed. He/she performs the functions of the catalyst in the learning process in facilitating change and development of the students/trainees.

As a facilitator and change agent, the vocational instructor performs the following primary functions:

- Analyzes jobs and job related problems;
- Analyzes the training curriculum for relevance, completeness, etc.;
- Analyzes/defines instructional objectives;
- Plans learning activities, projects, etc.;
- Assesses learning styles and plans instructional methodology and strategy;
- Plans, organizes and develops learning resources/aids;
- Plans and organizes testing and evaluation activities/strategies;
- Plans, organizes and manages the programme including workshop/laboratory and other related facilities;
- Prepares and conducts demonstrations and makes short technical presentations;
- Assesses and evaluates students performance/work;
- Supervises and monitors students' progress;
- Develops problem-solving skills by confronting students with new problem situations;
- Encourages intellectual disciplines;
- Inculcates desirable habits, attitudes and values (an example, a role model).

### **Technology**

Technological issues impacting on the Caribbean economies have put new pressures on technical and vocational teacher education in terms of challenges to update their mandate in order to remain relevant to the real needs of the communities and people whom they serve.

There is increased competition on a regional and global scale in the race to keep up with the latest technological innovations, as well as, having the ability to adapt quickly to new technology. The rapidity of change in information technology is evident. Information technology, when considered as the convergence of computer technology and telecommunications opens up a new world of opportunities within vocational Teacher Education in that it:

- Enriches the content of education and training, and facilitate the transfer of technical knowledge from the more advanced world;
- Improves and render more effective the delivery of that content;
- Motivates learners;
- Facilitates individualized instruction;

- Maximizes the use of skilled personnel who are scarce, by facilitating the distance delivery of instruction.

The VTDI as a leading institution in Instructional Technology has responded to the need for technological content within TVET teacher education by constantly investigating and experimenting with appropriate innovative technology.

It recently commissioned a state-of-the-art Autotronics Laboratory for providing advanced training in automotive technology. Other innovative initiatives are being planned as a means of influencing the moves to appropriate technology in the process of training and development as well as industrial business practices.

The VTDI also has on its premises a Computer Laboratory which came into being in September 1996 to respond to the needs of training instructors as part of their course requirement, and employees of HEART Trust/NTA through evening and weekend classes.

One of the greatest threats posed to vocational teachers is the risk of poor quality or a lack of information technology equipment for use after training.

### **Distance Education**

The VTDI is currently piloting a distance teaching programme for instructor training and development. This programme is a part of the regional programme sponsored by the Commonwealth of Learning (COL). The COL programme commenced in October 1996 and includes thirteen candidates, i.e. seven females and six males. It uses technological facilities such as teleconferencing and regular multi-media workshops.

### **Curriculum**

The HEART Trust/NTA as part of its technical services has its own Curriculum Development unit which services the VTDI with its curriculum and supporting materials. The Instructor Training Programme at the VTDI is Industry-led. The curriculum is generated from the occupational standards specified for each technical area identified for instruction in particular skill areas. (See Appendix II).

**The curriculum for the Instructor Training Programme, covers general education, technical occupational studies, pedagogical studies, communication, methodology and work ethics. A full curriculum covering Knowledge, Skills and Attitudes - has been approved by the National Council for TVET for the certification of vocational instructors, covering a total of three thousand, five hundred and sixty four hours of instruction including teaching practice and industrial attachment.**

There is a constant evaluation of the Curriculum in an attempt to keep in line with the occupational standard for each area and continually develop and improve for the sake of delivery. (Refer to Appendix 1 & 2).

### **Itinerant Training Programme**

Due to the geographic spread from which the VTDI would draw trainees and the demand for field training, the VTDI runs instructor upgrading courses in centres across the island for instructors both within the formal and non-formal sectors.

It is consistent with the general Diploma programme. Centres are strategically placed and tutors deliver instruction on a regular time-table basis in the evenings. Skills upgrading and computer studies are conducted at the VTDI during the summer semester (July to August).

## **INTERNAL SUPPORT SYSTEMS TO THE VTDI**

### **Certification**

The certification of individuals is a function carried out by the recently formed National Council on Technical and Vocational Education and Training (NCTVET). Its main function is that of accreditation of programmes and institutions, with the intention of streamlining the variety of certification being offered by agencies and institutions operating in TVET.

### **Accreditation of Prior Learning**

Historically, in Jamaica, the people within the educational system who

were considered not to be '*academic*' or very bright, were directed to go and learn a '*trade*'. Over the years, these people have gained a wealth of experience and have become experts in their skill areas. However, many of them lack the basic academic entry requirement for entry into training as instructors.

The NCTVET is presently in the process of introducing an Accreditation of Prior Learning (APL) system which should allow recruiters at the selection and recruitment stage to give credit for entry according to the level of work experience, identify the potential for successful training and as a basis for the certification of appropriate competency based skill levels.

### **Training Regulation**

To ensure that TVET customers, both internal and external, have a common understanding of the requirements for training in specific occupational areas, the Agency has developed a system of Training Regulations for each skill area to guide the development and delivery of training. These regulations serve to advise the inputs as they relate to materials development, administration, instruction, training provisions, assessment, recruitment and placement as part of the training requirement. (See Appendix III).

### **Media Services Centre**

The Media Services Centre is the information service facility that provides a variety of resources to support the development of Technical and Vocational Education and Training. The department further provides a comprehensive training database and information retrieval system to meet the needs of its users. It plays a pivotal role in the development of library documentation facilities in the TVET system and in the promotion of the work of HEART Trust/NTA.

It is fully resourced with up-to-date materials and resources for the benefit of trainee instructors. The resources include instructional support materials, library, CDs, graphic/audio-visual. Instructors are exposed to the process of establishing and managing a Media Services centre.

A primary purpose of this facility, therefore, is to provide the service

of information management and dissemination in the TVET system.

### **Professional Guidance and Information Services**

The Professional Guidance and Information Services (PROGIS) was established in 1994 as a project aimed at developing vocational guidance material and upgrading the skills and development of counsellors, instructors/teachers and trainers to use these materials. Out of this project grew the PROGIS Department whose objectives are:

- To establish and maintain effective working relationships with agencies, entities and individuals that are integral to the labour market.
- To maintain adequate organizational arrangements for research and evaluation, information management, administration and related support services.

The programmes and services offered by this department are:

- Workshops and seminars for counsellors and teachers
- Assistance in establishing career information centres
- Research and development of materials
- Working with parents through PTAs
- Staff development seminars

Each instructor is a counsellor by nature of his/her job and in this light it is very important that in training, the instructors are exposed to the basic skills and other components of guidance and counselling. It is as a result of our belief in this idea that the professionalism and career development programme has been introduced at the VTDI.

In the instructor's personal life, there is need for planning and personal development and through exposure to occupational information, and labour market information (eg. changing world of work or changes in the workplace), instructors can have a clearer picture of where they are going and what plans they need to put in place for themselves and so become more focused. This can enhance self concept/esteem and result in more efficient instructors.



Instructors who are more aware will give better directions to those they instruct thus, creating a more aware workforce.

### **Articulation**

The tertiary system in Jamaica has never been properly articulated because it includes a number of institutions with varying degrees of autonomy and differing in mission, purpose and philosophy. These institutions have at various stages in their history developed courses in response to the perceived needs of their constituencies and over the years very little has been done to ensure that articulation takes place within and between the different levels of the system. In some cases, programmes are even duplicated from one institution to the next. Articulation is therefore, necessary not only to facilitate the transferability of students from one level of the system to the other, but also to reduce wastage, thereby making the system more cost-efficient.

Various initiatives have begun in order to address this issue. While the recent National Industrial Policy recognizes the fledging efforts at articulation between the University of Technology and the Community Colleges, it demands the creation of appropriate mechanisms and measures for articulation between **all** tertiary institutions. Seminars have been held to focus on some of the related issues and a working group has now been established to spearhead the articulation process.

HEART Trust/NTA has recognized the need for articulation within the Jamaican system as a whole and more specifically, as it relates to VTDI trained instructors to allow for smooth and clear progression from one level of training to the next.

HEART Trust/NTA and the University of Technology (UTech) have begun the process of formalizing articulation between both institutions and also to be part of the process involving the University of the West Indies (UWI), the community colleges, teachers' colleges and other institutions within the tertiary system, specifically as articulation relates to Instructor training and progression.

### **Evaluation**

The Vocational Training Development Institute (VTDI), is the professional centre responsible for the on-going training and

development of instructors and trainers for the system, continually assessing quality of its output in order to make appropriate adjustments and fine-tuning of its programme and arrangements.

To this end, Instructor Evaluation is regularly conducted as well as annual evaluation of VTDI trained instructors in the field. The trained instructors are evaluated against the four areas of competency for which they are trained and certified.

## **INSTRUCTOR TRAINING**

### **Issues Related to the Jamaican Experience**

#### **Profiles of an Instructor - Competence**

The National Council on Technical and Vocational Education and Training (NCTVET) of the HEART Trust/NTA has responsibility for ensuring that the Instructors who are certified to operate/practise in the TVET system are competent. Therefore, the training is competency-based. Competence relates to four specific areas:

- (a) Technical or Occupational Competence;
- (b) Academic Competence;
- (c) Pedagogical or Professional Competence;
- (d) Personal qualities or Attitudinal Competence.

#### **Recruitment**

We are experiencing recruiting problems due to a lack of the availability of sufficiently qualified technical workers to train as Instructors.

#### **Salary**

We need to be able to offer better salaries to attract and keep vocational Instructors.

#### **Quality**

The Instructor Training Course at the VTDI started as a six (6) months programme. During this time the training attracted high quality skilled

people who only needed the instructional skills. This was soon to change and it was found that on the whole, applicants were younger with a stronger education base but quite weak in the skill areas. The programme was then extended to a three (3) year Diploma programme in an attempt to meet the needs of the type of trainee instructors coming into the system.

### **Training & Development**

If the programme is to be made more relevant for training purposes the training needs of each applicant must be assessed at the pre-entry stage so that the competency gaps can be identified and addressed rather than the individual covering the whole three year programme and repeating areas in which they already have high competency levels. This will also allow for training to be completed in shorter periods. The new modularized system within the VTDI should accommodate this process. The VTDI is presently working on the development of such an instrument in collaboration with the NCTVET.

### **Categories of Instructor Trainees**

There are three categories of Instructor Trainees:

- (a) Full-time Pre-service;
- (b) In-service - Itinerant, Summer - In-service training takes place through the itinerant programme and includes summer workshops at the VTDI;
- (c) Pre-service/In-service Mix.

### **Certification**

- (a) Testing and Assessment - There is the need to collaborate more closely with the NCTVET, who is responsible for testing and measurement, to set guidelines, vet, monitor and administer tests;
- (b) **Certification Body** - Need to devise some strategies/procedures;
- (c) **APL Model** - A mechanism needs to be established.

### **Career Development**

- (a) **Image** - Technical vocational education has always suffered from

a stigma -not good enough, etc. Instructors were graded differently from academic teachers. The VTDI's mandate is to move vocational training from a backward world to the future; not to be satisfied with mediocrity, but with the kind of excellence which will move vocational training from its relegated second class position to being on par and beyond academic education.

(b) **Compensation** - As our training is industry-led, there is a need to continually assess whether the output matches the requirements of industry.

~ **Alignment with Industry v. Alignment with education** - We need to ensure that Instructor training programme includes relevance of school to work - preparing people for industry awareness.

## CONCLUSION

The VTDI as a respectable Institution which produces quality products is mission critical by nature. To this end, it believes that despite the recent developments in TVET Instructor training through the VTDI and the technological advancements in the Computer Laboratory and Autotronics state-of-the-art equipment, the VTDI remains committed to providing the avenues to pursue excellence and to develop the TVET instructors upon whom we are dependent to deliver quality instructions to produce the calibre of workers required for participation in the global market place and the subsequent Economic Development of Jamaica.

The TVET system will only be as good as the instructors who implement the programmes. At present, there are growing concerns regarding the quality and sufficiency of instructors in the system. The formal part of the TVET system accounts for the greater number of these instructors.

This is a prevailing area of concern for the VTDI and the Jamaican TVET system as a whole. However, a range of programmes are being instituted to address this concern.

# **Recent Innovations in the Training of Teachers/Trainers in Technical and Vocational Education and Training in Asia and the Pacific**

by

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## **INTRODUCTION**

On the eve of the transition of humanity to the next millennium, the world continues to experience an unabated and incessant change. There are unprecedented upheavals in the political, social and economic domains in the various regions. Internationalization, globalization, the revolution in information and communication systems and astonishing technological advances are increasingly influencing all major decisions and directing new developments. These trends are likely to continue uninterrupted well into the 21st century everywhere including the vast and diverse region of Asia and the Pacific which still houses about 625 million of the total of around 885 million illiterates of the world.

As countries in the region rapidly approach the “dawn of the next century”, many of them are undertaking a critical reassessment of their education systems. The reason is that education systems do not exist in isolation but function to serve the changing needs and evolving priorities of the societies in which they are located. As these needs and priorities change adjustments to the education systems of the countries concerned also become necessary.

Some of the emerging social and political issues in Asia and the Pacific as identified by a UNESCO-ACEID International Conference on “Partnerships in Teacher Development for a New Asia”(December 1995) can be summarized as follows:

By the Year 2000,

- *a more interdependent Asia will emerge, thanks to the apparent flourishing growth triangles, the networks of roads and highways and the transition to market-oriented economies of many of the*

*formerly socialist countries in the region;*

- *the paramount role of science and technology especially in the areas of telecommunications and the media industry will increasingly pre-empt and dominate further developments;*
- *a more urban and middle class Asia will become predominant, increasingly requiring a middle class orientated education to grapple effectively with the problems of the urban poor and the need for the establishment of a regional regime for the protection of transitional workers;*
- *there will be a growing inter-relationship between economic, social and political reform in many countries and continual transition to globalization and co-operation in the international finance sector;*
- *there will be a paradigm shift in economic development to a more social and human based development with implications for investments in research and development, and the human side of development;*
- *There will be an imperative need for the international community to agree upon the management of environmental problems having adverse effect on the region;*
- *There will be an increasing need for compromises for both Asia and the West to find common universally accepted values;*
- *There will be a growing concern for the involvement and empowerment of the private sector in the countries economic development.*

It is evident that the new global society that will be emerging will have new priorities, new partnerships and new articulations. There is absolutely no doubt that the priority of this new global society will be education of a type that both passes on the existing stock of knowledge, skills, values and experience that have been built up over many years. At the same time, there will be the need for the society to educate people in ways which may enable them to adapt to the rapidly evolving info-technological era and the universal inter-dependent socio-economic and

political framework.

As a follow up to the World Conference on Education for All (1990) and the last Ministerial Conference on Education in Asia and the Pacific (1993), fortunately universal attainment of primary education, a precondition for TVET, appears to be at least in sight for the region by the year 2000 except for a few countries. Most countries are now making significant provision for secondary and tertiary education, including the provision of TVET at secondary level or post-secondary level. There is a growing realization in the countries that their competitiveness increasingly hinges on their ability to absorb, process, and ultimately generate scientific concepts and products. And since these are outcomes of education, in particular with regard to technical and vocational education, the countries are placing renewed emphasis on the development of TVET systems.

TVET in Asia and the Pacific, as everywhere else in the world, is in transition, and going through a period of intensive change and reorientation. Current trends in the workplace indicate that businesses and industries are investing heavily in information technology. In some cases, this investment is as much as three times the level of expenditure that occurred about 10 years ago. There is absolutely no doubt that the workplace of the 21st century will be radically different from the workplace of today. The only key to success in this less and less predictable workplace will be education in the new information technologies, preparedness of the countries and their willingness to retrain for changing jobs with the changing technologies.

If the current export slump among some of East Asia's "tiger economies" is any warning or pointer, it is likely that many of the countries may be losing their competitive edge. It is, therefore, absolutely essential that the countries prepare themselves to take advantage of the new possibilities of emerging information technologies to improve their competitiveness. Economists in the region are viewing this transitory phenomenon as a wake-up call for the industries to benefit from the new possibilities by investing in the human development initiatives aimed at continuously upskilling work place personnel.

There is a growing realization in the region that our industries must move up the ladder of value-added production lest they perish, as the great waves of GNP growth that averaged more than 10 per cent during the

1980s may soon be gone forever. The countries, therefore, have of necessity to begin to compete on innovation and quality - not on cost. The name of the game no longer would remain *economies of scale*, but flexibility and innovativeness - with the virtues of quality and smart management. TVET has to meet this big challenge.

In order to enable the countries to go upscale, they must be facilitated through appropriate TVET to carve out new competitive niches for themselves in the emerging global market as TVET can provide the needed higher skills through adequate investment in more intensive TVET research and development. In this endeavour, TVET teachers/trainers will have the most crucial role and responsibility. In the first instance, they themselves would need continual upskilling and updating on changes and new requirements of the work place so that they could continue to adapt to rapid changes.

Fortunately, there is recognition in the countries that in the end only technological innovations can really deliver real gains in productivity as productivity comes essentially from higher-skilled workers; from good management and, ultimately, from a better education system. Another byproduct of the new technological revolution is that we the educators should immediately start worrying about making a distinction regarding the division of workers into "skilled" and "unskilled" in the new technologies. It is a truism that there are simply fewer and fewer jobs for people without special skills. It is in this new era that the world is entering, that competitiveness will truly depend on what UNESCO and the new International Commission Education for 21st Century call "lifelong education". The process of learning can never stop - whether for the individual or for the nation or state.

As in other regions, in Asia and the Pacific also many countries have demonstrated considerable innovation to cope with the fundamental issues of the changing demands of the labour market in responding to significant economic, social and continuing technological change, by developing and implementing a number of significant policy issues. Policy formulation, strengthening co-operation between TVET and its immediate beneficiaries, regional co-operation and adequate programme delivery of TVET are areas which have undergone and are still undergoing the most rapid transformations, to make use of the possibilities provided by information superhighways and communication technologies.



Some current trends in TVET in the region indicate:

- *A growing collaboration between technical and vocational education and industry and the market for updating curriculum, equipment and facilities;*
- *Ever greater realization in the countries of using the new information technologies to improve the efficiencies and the outreaches of their TVET systems;*
- *Continual updating of the content of the TVET curricula for technologies of the future;*
- *Pronounced emphasis on the interfacing of education and enterprises in curriculum planning and implementation;*
- *Provision of contextual learning, entrepreneurship and life-long learning in TVET courses;*
- *Greater emphasis on preparing a multi-skilled work force and providing the job experience required for upskilling;*
- *Creating mechanisms for the recognition of prior learning and credit transfers;*
- *Introducing competency-based training and promoting retrainability;*
- *Training for job clusters and for a transfer to jobs from related areas in business and industry;*

Some country specific initiatives are also particularly discernible. These are:

- *Development of National Competency Standards and National Qualifications Framework (Australia and New Zealand);*
- *Recognition of Prior Learning (RPL) (Australia and New Zealand);*
- *Introduction of Secondary Vocational Certificate Examination and*

*National Skill Standards (NSS) (Bangladesh);*

- *Use of DACUM and introduction of Competency-Based Education (CBE) and the dual-system using adaptation(s) to the German model (China, Indonesia, Philippines, Thailand);*
- *Operation of TVE school managed enterprises, run in conjunction to educational programmes (China and Indonesia);*
- *Centrally directed but locally administered TVET systems with a significant provision for vocational education within the framework of secondary education (India);*
- *Establishment of a system of secondary TVE colleges linked to a network of polytechnics (Indonesia);*
- *Increasing the flexibility of upper secondary education (Japan);*
- *Introduction of multi-skilling and on-the-job upskilling (Australia, New Zealand and the Republic of Korea);*
- *Introduction of a shift in TVE infrastructure towards demand-related training, away from supply-based training (India, Pakistan, Sri Lanka);*
- *Reconstruction of the TVE system to meet the needs of a changing society towards market economy (Viet Nam);*
- *Encouragement of the private sector to undertake a major role in providing technical education and training (Thailand, Philippines, India).*

There are still a number of issues in the development and improvement of TVET in the region so that it can play a crucial role in the development of new skills, new practices and new structures of economies and their regionalization and internationalization. There is, in every country, a big potential for new work, new activities, new employment and job creation through relevant education and specially TVET. Some possible strategies, based essentially on the study of some current issues in several countries and the recommendations of the International Commission on Education for 21st Century, could relate to:

Preparedness for Information Society The most important singular issue for TVET is to take advantage of the possibilities the new information and communication technologies are increasingly making available for introducing information society technologies in all the countries. TVET through new information society technologies can facilitate the speeding up of technological change particularly at the work place and for employment and job creation;

Alignment of Curriculum with the needs of industry, market and business;

Articulation of TVE with general education to improve its role and status;

Recognition of Prior Learning (RPL) to promote retention, retrainability and higher skills; and

Broad Based Training for improving mobility of trained personnel in the globalizing economies.

All these issues have very significant implications for the training of technical teachers/trainers. The fact that “good education requires good teachers” is a truism. This is much more so and relevant in TVE where it is the most crucial factor in the sharing and transfer of know-how and skills, which depends solely on the quality of the interaction that occurs between the teacher and the student.

TVET teachers must have a first-hand knowledge of real world of work and processes within their fields of teaching. They have always to be at least as knowledgeable as shop floor supervisors and managers so that they can continue to provide the best of the know how and skills to work place workers. This really requires an interactive partnership, co-operation and collaboration between work place managers and technical teachers/trainers so that both these groups can stay current with latest advances in technology. It also requires the inculcation of an attitude and willingness in the teachers as well as work place supervisors and managers to interchange their roles whenever required. Teacher’s salaries and emoluments therefore need to be comparable to emolument in industry so that their induction and retention could be ensured in the teaching profession and their substantial leakages to more lucrative jobs in industry could be prevented.

The training of technical teachers/trainers again assumes a new dimension which is both vulnerable and crucial when it comes to changing existing practices and structures so that they can remain responsive to the changing context of the work place. The most critical component of this new context relates to trying new philosophical beliefs employing in larger measure the fast revolutionizing new technologies to solve pedagogical problems. Educationists can certainly do a great service to the future generations if some of these new philosophical beliefs could convince them to accept the repudiation of some of the current practices, as indicated below, in favour of the new context in transition in work education:

## Transition in Work Education

Students under the control of a teacher	Learning to be as independent as possible
Schooling carried out in specialized structures for learning	Learning carried out in contexts where most applicable
More group activities and less individual activities	Individualized learning as far as possible
Learning centred around traditional subject areas	Learning is best done in context, curriculum areas are artificial
Teacher-student relationship of knowledge given to knowledge taken	Learning pupil centred and pupil directed
Teaching considered as act of transmitting knowledge	Learning directed at discovering information
Knowledge is contained to information provided in a book	All information that has been acquired and retained is knowledge
Schooling conceived as gathering information in all subject areas	Schooling provided to assist a learner to develop skills to empower learner to apply them independently
Twelve years of education considered necessary to make students productive citizens	Productivity becomes function of maturity, skills and independence
Secondary schools considered preparing students for college	Every student prepared for work; those going to college should prepare independently
Vocational training considered appropriate for students not going to college	Every student must possess basic vocational skills

This analysis demonstrates clearly that a new model for pedagogy particularly for technical and vocational education is an emerging immediate need which the TVET systems should attempt to address boldly. This new model must of necessity include technological access and put the kids first. The model should aim to assist the children to learn and retrain so that they can remain responsive to the changing needs of their work places in their changing contexts. It goes without saying that the training of technical teachers/trainers will also have to take cognizance of this new pedagogical necessity so that they could also continue to remain current.

Alongside this new pedagogical model, the training of technical teachers/trainers must also distinguish clearly between the past and the future contexts as follows:

	<b>THE PAST mainly had</b>		<b>THE FUTURE will progressively have</b>
(a)	A supply-driven based on a large social demand	→	A demand-driven system guided by labour market signals
(b)	A formal school-based system providing "diplomas" upon examination	→	An education and training system providing "competencies" needed by national economies
(c)	A school-based system with a fixed "study programme" orientation	→	A flexible education and training system oriented towards needed profession and trades
(d)	Education and training focused on formal schooling		Education and training for the formal and informal sectors
(e)	No official recognition of prior learning	→	A system recognizing skills and "competencies" within national frameworks
(f)	A school-based system with no flexibility in delivery	→	An education and training system with multiple entry/exit points and flexible delivery
(g)	Complete separation between education and training		Full integration of education and training
(h)	Centralized system of administration	→	Decentralized system of management
(i)	Education and training fully supported and run by the government	→	Self-supporting and self-managing institutions or organizations with little/partial support from the government/state

Rapid technological advances can only benefit us if we are able to derive benefit from the revolution in information and communication technologies. As people are the real building blocks to industrialization and development, there is an urgent need to invest generously in people by all nations of the region so that this biggest asset of manpower could be harnessed for region's development. It is now quite clear that hence forth, it will be the quality of intellectual capital alone that will count in

achieving development in the times to come.

There is also the need to innovate, co-operate and build partnerships with industry at large especially in the training of teachers/trainers for TVET. Basic existence in future will of necessity require essential skills and knowledge as key tools for renewing and supplementing knowledge throughout the entire life time. Technology offers excellent opportunities of involving students in learning and providing them access to more information and to using it more creatively and usefully than ever before. It is, therefore, extremely important that we prepare our teachers and trainers to be more enlightened and technologically literate in an increasingly technology influenced world. Telecommunication networks will be continually changing the nature of teaching and learning by providing a community-wide learning resource. Let us take full advantage of these possibilities and assist institutions which still lack access to these resources through innovative modes of co-operation under UNEVOC to harness the full potential of these opportunities.



# **Training of Teachers in Technical and Vocational Education in Poland**

by

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## **VOCATIONAL EDUCATION AND TRAINING SYSTEM IN POLAND: THE PRESENT STATE AND THE REFORM**

The vocational education and training system in Poland is essentially school-based and is placed under the main authority of the Ministry of National Education. The structure of the system used to be remarkably stable for more than 25 years despite several reforms that were implemented. The most important components of the vocational education scheme after eight years of primary school are:

- basic vocational schools;
- secondary vocational and technical schools;
- post-secondary schools.

In terms of structure, a significant and, in fact, the only innovation is a new type of school, a four-grade technical lyceum (since 1994). Technical lyceums prepare highly qualified workers and other medium level professionals. They also ensure general secondary education. The graduates either pass final examinations and receive an appropriate certificate allowing them to apply for admittance to higher education institutions or do not pass matriculation exams and receive a secondary vocational school certificate which does not authorize them to enter higher education. The new type of school trains in 12 broadly designed profiles. However, its role should not be overestimated. Since the school year 1995/1996 no more than 8 thousand students have been studying in the total number of 137 technical lyceums in the whole country.

Current and ongoing changes focus mostly on the curricula and the teaching contents. These modifications reflect the new context of the economy in transition and respond to labour-market requirements, as far

as the adapting of skills is concerned. The ability to meet the transforming socio-economic needs is the crucial objective of the reform that was outlined already in 1990. The outcomes that are worth listing are as follows:

- The number of students of basic vocational schools, training qualified workers for narrow sectors of the economy, has been considerably reduced. In the early 1990s, approximately 50 per cent of all primary school leavers continued their education in basic vocational schools. At present they are below 40 per cent, with the persisting tendency to shrink. The most visible symptom of the backwardness of the VET system has been diminished;
- The profiles of training show the responsiveness to the labour-market needs. The priority is given to the fields of management, enterprise organization, finance and accountancy, administration, banking business. All of them give particular emphasis on computer skills;
- The cancellation of narrow vocational streams and specialization's, and the adoption of wide fields of study brought as a result a new classification of occupations. In 1982 schools provided training in 527 occupations and over 2000 specialization's, while since 1993 the total number of occupations has been reduced to 138 and specialization's have been canceled. Broad-based curricula and teaching contents became the most characteristic sign of the reform;
- Innovative institutions dedicated to practical training began to operate. So-called Centres of Practical Training are financed from the state budget and well equipped in modern devices assembled for a specific purpose of training. Centres provide training in practical skills for students and teachers (upgrading of skills and in-service training).

## **THE QUALIFICATIONS OF TEACHERS AND THE NEW TASKS**

The sector of vocational and technical education in Poland employs currently nearly 120 thousand teachers who equal to 18 per cent of the total number of teachers working throughout the country (approximately

670 thousand).

The VET system comprises three categories of teachers, each group of a different proportion:

- 54,4 per cent are teachers of vocational subjects;
- 43,1 per cent are teachers of general subjects;
- 2,5 per cent are teachers whose work is of a tutorial nature.

Present statistical data show that the above-listed groups of teachers work with over 1 800 thousand students in 9655 schools spread all over the country. The staff is not as much dominated by women as it is in the institutions offering general education, but, still, the profession is strongly female particularly in the sector of secondary vocational and technical schools ( nearly 68 per cent ). Teachers continue to be extremely underpaid. Their monthly salary does not exceed 80 per cent of the average wages in the country.

The following general trends can be observed:

- proportionally large numbers of teachers are full-time employees;
- the education of teachers of basic vocational schools is usually low and it rarely goes above the level of secondary school;
- nearly one third of the total number of teachers without any professional qualifications in pedagogy, understood as methodological and psychological principles of teaching, is employed in vocational and technical schools; in most cases they are not hired on a full-time basis;
- every second teacher of vocational subjects does not have complete higher education;
- a low percentage of teachers enters institutions of higher education; members of the staff of basic vocational schools do it extremely rarely; only one third of teachers who begin higher education study fields of knowledge that correspond with the subjects they teach in school.

The training of teachers in Poland is focused on two main objectives: the didactic preparation for teaching separate vocational subjects or groups of these subjects, and the pedagogical preparation comprising knowledge of principles, methods and psychological aspects of teaching that enable to fulfil didactic tasks during the teaching process. Teachers of

vocational subjects may acquire knowledge and skills in the fields of didactics and pedagogy in separate training institutions, and never under one roof. It explains why so many of them do not have professional pedagogical background.

An urgent need to restructure the system of teacher education is out of question. Reorientation in teaching skills, in general terms, should aim at being independent in thinking, analyzing and synthesizing problem situations in the process of solving them. Perceiving global matters, such as environmental issues and understanding how they can contribute to achieving a higher quality of life, became a new strategy.

In more specific terms, teachers of vocational and technical schools are expected:

- to educate students for the work in a given occupation but, at the same time, to enable the adapting to other occupations of similar characteristics;
- to equip students with broadly conceived general vocational knowledge and skills both for the purpose of specific occupations and the upgrading in the future;
- to build in the students motivation to work and comprehensive identification with the job and the work environment;
- to train highly responsible and committed employees who have good knowledge of the entire activities of their place of work and who can combine individual and social goals in a given environment;
- to train people ready to live and work in the world of a free-market economy, to teach them how to respond to competitiveness and risk, to provide them with managerial skills.

#### **The training and retraining of teachers: institutions and model patterns**

Training teachers of vocational and technical subjects at the higher university level takes place in the following educational institutions:

- colleges of technical instruction, such as polytechnics, engineering colleges, academies of mining and metallurgy, academies of technology and agriculture;
- commercial academies;

- medical academies;
- colleges of agriculture.

The above-listed institutions train future teachers of separate vocational and technical subjects or groups of these subjects. Pedagogical qualifications can be acquired through facultative studies offered by the same schools during courses of minimum 270 hours plus 150 hours of practical pedagogical training. Pedagogical studies are usually extramural and tuition for the instruction must be paid. Unfortunately, special faculties for teachers that used to operate on the market of higher education between the years 1964-1975, do not exist any more.

The training of teachers of vocational and technical subjects offered at the secondary level, and addressed mainly to teachers involved in the instruction of practical skills, is canceled. The process of closing down 30 so-called Post-secondary Technical Study Centres has continued since 1992 and no alternative centres have been set up.

Additional training aimed at the acquisition of higher qualifications, and leading formally to a diploma or certificate, used to be offered in the past by different types of postgraduate studies in a form of evening courses or extramural programmes. Their general objective was to up-to-date knowledge and skills or qualify for teaching a second subject, for example computer science. When the 1990 Act on Higher Education decided that evening courses and extramural programmes run by the institutions of a university rank are subject to tuition, teachers' interest in these forms of training became marginal.

#### **In-service training of teachers of vocational and technical schools**

According to the Teacher's Charter, that was put into effect in 1982, everybody who graduated from either teachers college, university or any other higher education institution and has pedagogical preparation may be employed for a one-year trial that may be prolonged to a 3-year contract and after this period upon favourable assessments by school inspectors and the school principal may get a tenure appointment for an indefinite period. The teacher on tenure may be dismissed after two negative evaluations, within a year. In this case he or she is given a three-month notice with three-months salary if he or she was employed for a shorter time than 10 years or six-months salary if employed for a period of time longer than 10 years.

Teachers' salaries consist of a basic salary and supplements. The basic salary depends on the level of education and number of years of teaching. Supplements depend mainly on the post (full-time or part-time job), position, conditions of work (urban or rural areas). Every teacher is upgraded every second year of duty on his or her salary-level. The highest wages are usually reached after 30 years of teaching. The Charter assumes that the average teacher's salary must not be lower than the wages of the engineering and technical staff employed by the national economy. Unfortunately, it often happens that it does not match up with them and it remains much lower.

The teaching load in secondary schools is set at 18 hours a week for theoretical subjects and 22 hours a week for practical subjects.

According to the same document, every teacher during his or her professional career should successfully complete at least two institutionally approved in-service training courses. Even though they are widely recommended, they are not compulsory.

The in-service training of teachers in Poland is run by the following institutions:

- main Centre for In-Service Training of Teachers;
- local Superintendents' Offices;
- so-called centres of creative pedagogy;
- universities and other institutions of higher education;
- centres specialized in particular branches of industry or trade.

In general, the educational offer provided by all the above-mentioned institutions is very limited, as far as in-service training of teachers of vocational and technical subjects is concerned. There is very little interaction among local centres spread throughout the country. They do not have at their disposal sufficient financial resources or modern infrastructure.

However, it is worth mentioning some of the activities of the Main Centre for In-Service Training of Teachers that was set up in 1991. It replaced the former services co-ordinated by the National Institute for In-Service Training of Teachers which had its branches in all the provinces of Poland and which was closed down in 1990. At present, on the strength of a legal document of 1992, the responsibility share regarding

in-service training of teachers is either with the central authority of the Ministry of National Education (the case of the Main Centre) or with local Superintendents' Offices.

The Main Centre for In-Service Training of Teachers established a separate department exclusively for training teachers of vocational and technical subjects. Yet, the educational gap is covered only to some extent because of insufficient funds and a very small staff. The first priority of the Centre is to train 43 national consultants who work in vocational and technical education in the country and 243 advisers specializing in vocational and technical subjects, as well as teachers of advanced technologies. Since 1991, the Centre has rendered educational services to approximately 8200 people and disseminated information in a form of brochures that have been published in nearly 25 000 copies. As far as teachers are concerned, the Centre's offer is addressed in the first place to the staff of commercial schools. Another group constitute instructors of information technology employed by the schools in which computer science is a priority in the curriculum. The Centre also imparts knowledge and skills in the field of active methods of teaching. Among the receivers of this type of training are teachers involved in the PHARE/MOVE, UPET and IMPROVE programmes, as well as teachers of technical lyceums. In-service courses held by the Main Centre are of 5 days duration, during which 40 hours of training are provided. Certificates are given upon completion. The questionnaires that are distributed among the participants show that the demand of training is much higher than the offer. For 81 per cent of teachers courses taken at the Main Centre appeared to be the only form of in-service training during their professional career which sometimes has been longer than 20 years.

#### **TECHNICAL LYCEUM: A CHALLENGING SCHOOL FOR ITS TEACHERS**

This new type of school has adopted broad fields of study, such as environmental issues, mechanics, energetics, electronics, commerce, just to mention a few. However, each profile of study includes training in entrepreneurship and information science based on the computer technology. The new and ambitious curriculum requirements faced by the technical lyceum, as a part of the school reform, can hardly be fulfilled without a comprehensive programme of training and retraining of

teachers. In spite of the fact that the level of teachers' education is high (93,9 per cent are university graduates or have diplomas of other institutions of higher education; 4,7 per cent have incomplete higher education and 1,4 per cent have secondary education) there is a great need to retrain the employed staff by supplying them with more appropriate knowledge and skills. Yet, the general shortage of efficient organizational structures to provide good quality courses is a serious obstacle. The study shows that, on the one hand, nearly 40 per cent of the teaching staff remained without retraining, on the other hand, teachers' participation in various forms of in-service courses (offered at the central and local levels) is very disproportional. The courses that were demanded most frequently concerned organization of the teaching process within the profiles of study, methods of teaching and computer science. The opinions about the level of training are positive, but the access to the courses is insufficient. There are at least two recommendations raised by the school principals; more courses focused on specific fields of study and the teaching contents, and unlimited access to all forms of training under the patronage of the Ministry of National Education.

### **FINAL REMARKS**

The system of training teachers in technical and vocational education in Poland needs to consider some contextual elements that design the background of the school reform. Three of them seem to be particularly important:

- the progress in technology, organization and information;
- new approaches in the fields of pedagogy and psychology;
- the perspective of the unification of Europe.

Trends regarding growth in the service economy and information processing are being accompanied by accelerating emphasis on high technology involving computers, automation and robotics, introduction of new media, and other aspects of work based on advanced scientific knowledge and methods. Computerization is „deskilling” some jobs, but increasing the skill requirements in many fields. Jobs with relatively high pay and status will require higher levels of skill and knowledge, if not even mastery of increasingly more complex and abstract information and skills. At the same time a huge part of the work force would have to be absorbed in new jobs, lower in pay and status. The status of teacher



preparedness for how to cope with this situation is unsatisfactory. Within the framework of every form of training designed for teachers in vocational and technical education at the secondary and post-secondary levels, greater stress should be placed on providing students with broad learning and problem-solving skills in order to prepare them for a range of occupational possibilities in the future.

The principles and the practice of modern teaching that take into account psychological aspects of pedagogy give a special importance to interpersonal relationships and communications. Teachers are expected to be prepared for using individual methods of teaching, based on their own intellectual and emotional background in order to fully involve students in the process of individual problem-solving work in the classroom or workshop. This approach should help students to face changing and unexpected situations in the world of work.

From a global perspective of the unification of Europe Polish teachers in the vocational and technical sector of education need to be aware of the requirements of the economic partnerships. It is not only the issue of international standards and occupational classifications, widely recognized diplomas and certificates, but also quality standards. Teachers will play an important role in building in their students attitudes in favour of a high quality work.

It is very difficult, however, to create a uniform system of teacher training. Teachers of vocational and technical subjects do not form a homogeneous group; they differ in scope and level of didactic preparation (knowledge and skills for teaching given subjects) and pedagogical preparation (including principles and methods of teaching, and psychology). Even though significant changes are implemented in the curriculum within the context of a free-market economy, a long-term plan for the development of vocational and technical education is missing. Limitations in the degree of responsiveness of the VET system to labour--market demands result from a vague perspective of the country's economic strategy. A more precise official state policy in this regard would be necessary.