



NEXTGEN EDUCON

(Proceedings of the International
Conference on Preparing TVET
Educators for the Next Generation)

NEXTGEN EDUCON

*Proceedings of the International Conference on Preparing TVET Educators
for the Next Generation (NEXTGEN EDUCON)*

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Manila, Philippines, 2013

UNESCO-UNEVOC International Centre
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Pasig City, Philippines
E-mail: cpsc@cpsctech.org
Website: www.cpsctech.org



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EDITORIAL TEAM

Editors-in-Chief

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Dr. Everhard Trowe

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ICT Support

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Preface

The education systems all over the world are facing great challenges in keeping pace with the rapid globalization of the 21st century. The huge impact of globalization in the education systems which include innovations in ICT, international and regional competitions, constantly changing needs of the world of work, etc., calls for the reorientation of the education systems in general and of technical and vocational education and training (TVET) systems in particular. Various challenges, which have brought forth the changing role of TVET educators include: the need to adapt to evolving skills such as Higher Order Thinking Skills (HOTS), green skills, etc; shortage of well-trained TVET teachers; and the growing concern for policy reforms and initiatives in preparing TVET educators for the next generation.

In creating a platform for exchange of ideas and best practices and innovations on preparing TVET educators to face the challenges of the 21st century, the Colombo Plan Staff College for Technician Education spearheaded an International Conference on Preparing TVET Educators for the Next Generation (EDUCON 2011). CPSC jointly organized the program with partners UNESCO-UNEVOC International Centre for TVET, GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit, Germany, and the Department of Polytechnic Education, Ministry of Higher Education (DPE - MOHE), Malaysia from December 12 to 13, 2011 at Corus Hotel, Kuala Lumpur, Malaysia.

The international conference proved to be a major and successful event where 208 key officials and representatives from 25 countries namely, Australia, Bhutan, Brunei Darussalam, Canada, China, Egypt, Fiji, Germany, India, Indonesia, Kenya, Korea, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, UK and USA extensively exchanged, discussed, deliberated and shared expert opinions, creative ideas, valuable information, experiences, research results, innovations and new initiatives on TVET in general and on TVET educators' development in particular.

This proceeding compiles 31 papers presented by leading thinkers, global practitioners, TVET academicians, experts and country-representatives highlighting major areas and concerns needing attention in the enhancement of capacity building programs of TVET educators. Different parts of this book are devoted to the various sessions of the conference which was comprised of two plenary sessions, three panel discussions and four tracks. Plenary Session 1 presented the Emerging Trends in TVET Educators' Development; followed by Panel Discussion 1 which focused on Preparing TVET Educators in the Knowledge Society: Perspectives and Strategies. Plenary Session 2, on the other hand, was devoted to Using ICT for TVET Educators' Development, Panel Discussion 2 ensued which discussed issues on TVET Educators for Green Economy and Panel Discussion 3 provided inputs on Research and New Initiatives in TVET Educators' Development. While Tracks A to D were simultaneously held right after panel discussions 1 and 3, where representative from CPSC member countries shared their experiences, good practices and perspectives on the emerging challenges for TVET educators' development.

It is hoped that this publication would serve as a useful reference and a key resource of information on wide-ranging issues, challenges, innovations and best practices in preparing TVET educators for the next generation. We hope that this publication would be instrumental in realizing the ideals and commitment of all concerned agencies, institutions, organizations and each country represented herein in vigorously pursuing for a more responsive TVET educators' reorientation as declared through the NEXTGEN IMPERATIVES 2011.

Dr. Mohammad Naim Yaakub.
Director General, CPSC

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The publication of this proceedings titled NEXTGEN EDUCON would not have been possible without the collective efforts of various people, organizations and institutions at the international, regional and national arena who actively poured in their contributions and participation in the International Conference on Preparing TVET Educators for the Next Generation from December 12 to 13, 2011 held at Corus Hotel, Kuala Lumpur, Malaysia.

CPSC would like to place on record its profound gratitude, first and foremost, to the co-organizers of the program UNESCO-UNEVOC International Centre for TVET, GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit, Germany, and the Department of Polytechnic Education, Ministry of Higher Education (DPE-MOHE), Malaysia, with special mention of Dr. Shyamal Majumdar, Head, UNESCO-UNEVOC International Centre for TVET, Mejar (K) Haji Md. Nor Bin Yusof, Director General, DPE-MOHE, Malaysia and Dr. Eberhard Trowe, Senior Project Manager, GIZ Germany for their full support to the whole duration of the program.

We convey our highest appreciation to all esteemed speakers, session chairs, facilitators, guests, and country representatives from all the participating countries all over the world, our sincerest thanks to your invaluable contributions to the conference and to this proceedings. Thank you for your abiding support, strong cooperation and committed action towards our advocacy for TVET.

This proceedings is a work anchored on the concerted effort of all the staff of CPSC, led by the Director General Dr. Mohammad Naim Yaakub, the academic team especially Dr. Rajesh P. Khambayat, the late Prof. TJ-Tesoro Gayondato, and all the divisions especially the Projects and Consultancy, ICT, rapporteurs and the CPSC team for EDUCON sent to Malaysia. Our thanks as well to the DPE-MOHE team, to the key officials, academic, administrative and technical staff of DPE for sharing the load with the CPSC team from the arrangements throughout the implementation of the conference.

We acknowledge and pass good wishes to the men and women of CPSC, MOHE, GIZ and UNEVOC who have worked behind the scenes, to those who directly and indirectly contributed in making this International Conference a resounding success and for making possible the production of this proceedings.

Editorial team

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CONFERENCE OVERVIEW

The 21st century poses great challenges in the education systems, which include rapid globalization, advent of information and communication technology, increasing shift towards knowledge – driven economy, and international and regional competitions. In this view, educators and policy makers are facing several challenges on how to bring reforms in the existing system and prepare young graduates to effectively cope with these changes.

With the advent of rapid globalization, emergence of information and communication technology (ICT) and international and regional competitions, significant challenges are faced by the education systems in the changing world of work, calling for the reorientation of Educators' development especially in the technical and vocational education and training (TVET) sector.

The quad-partite organizers including the Colombo Plan Staff College for Technician Education, UNESCO UNEVOC International Centre for TVET – Germany, GIZ Deutsche Gesellschaft für Internationale Zusammenarbeit – Germany, and Department of Polytechnic Education, Ministry of Higher Education (DPE - MOHE), initiated the stimulation of efforts and participation in discussions among decision makers, policy implements, senior administrators, curriculum developments, and academic professional to build awareness and information on emerging issues and cooperation frameworks for TVET educators' development.

CONFERENCE OBJECTIVES

The objectives of the international conference are to:

- Appreciate the significance of global challenges in TVET educators' development;
- Examine the emerging issues and challenges in TVET in training and developing educators;
- Share innovative concepts and models in TVET educators' training and development; and
- Promote best practices and approaches in TVET educators' development through cross – sharing of experiences.

The international conference aimed to convene policy makers, senior administrators, decision makers, educators, lecturers/teachers, representatives of NGOs and civil society to exchange and share their experiences, research results, creative ideas, innovations and new initiatives about aspects of TVET Educators' training and development and discuss practical models, frameworks and best practices including recommendations and solutions adopted.

CONFERENCE PARTICIPANTS

The conference gathered 208 delegates from 25 countries which include: Australia, Bhutan, Brunei Darussalam, Canada, China, Egypt, Fiji, Germany, India, Indonesia, Kenya, Korea, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, UK and USA.

Significant inputs on current trends on TVET educators' education for the next generation were imparted by representatives of the different participating international, regional and national organizations and institutions which include: UNESCO-UNEVOC International Centre for TVET; CPSC; Ministry of Higher Education Malaysia; GIZ, Germany; Labtech International; Regional Cooperation Platform Vocational Teacher's Training and Education in Asia, GIZ – China; University of London, England; Technical and Vocation Education and Training Authority, Ministry of Education, Republic of Maldives; Chung-Ang

University, Seoul, Korea; Technical Education and Skills Development Authority (TESDA), Philippines; Ministry of Youth Affairs, Sri Lanka; UNEVOC Center of Mongolia; Confederation College, Canada; National Institute of Technical Teachers' Training and Research (NITTTR), India; Institute of Technical Education, Singapore; Moi University-Eldoret, Kenya; Alexandria University, Egypt; SEAMEO VOCTECH, Brunei Darussalam; Singapore Polytechnic; Universiti Tun Hussein Onn Malaysia (UTHM); RMUTT, Thailand; Ossietzky University Oldenburg, Germany; Ministry of Science and Technology, Union of Myanmar; Office of the Vocational Education Commission, Thailand; and many others.

CONFERENCE SESSIONS AND DISCUSSION OUTCOMES

Plenary Session 1: Emerging Trends in TVET Educators' Development (TED)

The keynote presentations significantly emphasized the need for preparing TVET educators in the new global economy and realigning their skills and competency in the changing education systems to respond to the emerging global demands such as ICT revolution, sustainable development and the knowledge society. All the three speakers emphasized the changing roles and skills requirements of teachers, thus, the need for a refocusing of TVET teacher training, creating new approaches, structures and strategies in teaching, evolving new paradigms and models and policy reorientation in the education system in adapting to the changing demands of the society.

Proposals, roadmaps, various programs, activities and practices for developing and preparing TVET educators for the next generation were also put forward by the plenary speakers which include: best and most relevant teaching/learning methods; technology adaptation and appropriate integration in TVET classrooms, broadening the role of TVET educators' education; attention to in-service education of existing TVET personnel on new technologies; emphasis on lifelong learning for continual professional development of TVET educators; constant revision of TVET teacher curricula for bridging and providing remedial courses for career development; and an establishment of structured and systematic approaches following international experiences.

Panel Discussion 1: Preparing TVET Educators in the Knowledge Society: Perspective and Strategies

The presentors provided insights and interventions to build the capacity of educators. All three presentors highlighted the need for in-service training especially in the area of information and communication technology (ICT) and using innovative alternative solutions such as engaging students to assist teachers in this field as the youth of today is more adept in using modern technology. One presenter affirmed that strong educators' support and changing the way educators' teach are necessary in building up their capacity, while other speakers emphasized that educators' industrial immersion and public – private cooperation as a whole have big roles to play in the advancement of skills and knowledge of educators. Thus, concerted effort of all stakeholders is the answer to the issue of teacher education.

This session dwelled on important areas of teacher education and training in the knowledge society. These are adjustment and enhancement of curricula, preparing sound instructional resources; conduct of valuable researches, partnership among stakeholders, and generic skills development without compromising technical skills. The session also pointed out that there is no substitute for teachers in providing TVET education.

Good Practices and Emerging Challenges for TVET Educators' Development: Regional Experiences (Country Perspective Presentation) - TRACK A

Presentors for this track shared the emerging challenges, experiences and innovations on educators' development in their countries.

In England a research shows evidence on the gaps in state regulation, policy initiatives and educational reforms on TVET and other general teachers in colleges particularly on in-service teacher training

programs. In fact, all recent policy initiatives to regulate TVET have taken place within a fragmented and impoverished professional culture, which often has a weak work-based culture of supporting trainees and the professional development of its TVET and other teachers. In Korea several good practices in teacher education such as training and development courses, and policy reform measures contributed in the successful TVET interventions. In line with this, Korea is gearing the direction of its national education from obtaining academic degree towards sustaining lifelong education. While, in the Philippines, emerging reforms in its education system underscores the need and importance of training TVET educators. A National Vocational Qualifications system was established in Sri Lanka which has made the expected impact in improving the relevance and quality in TVET in the country. Mongolia's VET system, on the other hand, is beginning to shift from the present supply driven system towards a demand-driven, competency based training approach. This shift will move VET away from too much theory towards more practical training in workshops, labs, and possibly in-company training.

The session reinforced the necessity to uplift TVET as it is still not attractive to students in the countries represented. It is, thus, an imperative to seek solutions to foster more qualified TVET Educators for the benefit of TVET students.

Good Practices and Emerging Challenges for TVET Educators' Development: Regional Experiences (Country Perspective Presentations) - TRACK B

Track B described how each country represented struggled for their TVET systems to be in place and how they have faced such challenges for their TVET systems to fully benefit their industries and economies. All the speakers shared various national policy reforms, strategies and approaches, programs and activities their governments had undertaken to address the quality delivery of the TVET systems including producing adequately-trained teachers for the next generation, in response to the changing demands and needs of the labor market for multi skilled workforce.

In India, various educator preparations schemes had been established such as Pre-Service, In-Service Trainings and Continuing Professional Development; Crafts Instructors Training; Training of teachers of Polytechnics and Engineering Colleges in pedagogy, content, management through short, medium and long term programs; Quality Improvement Program of AICTE; and many others to address teacher shortage, skills mismatch in demand and supply, the need for more engineering colleges and for training TVET teachers in pedagogy and content on emerging technology. The Institute of Technical Education (ITE) of Singapore has adopted the "Hands-on, Minds-on, Hearts-on" philosophy which is the principle behind the "Authentic Learning and Environment that aims to enable "students to learn to be a professional in their trade through applying their knowledge and skills in an integrated manner in environments that are either real world or simulated" (Lombardi, 2007). To achieve this outcome, schools across ITE are encouraged to design their curriculum, learning activities and learning spaces to support technology enabled, project-based and team-based learning. Both Egypt and Africa are struggling for policy reforms and legal framework initiatives for their TVET systems but both expressed hope that with the concerted efforts of various sectors in their countries, TVET will attract the attention it so deserves with particular focus on TVET teacher education.

In the light of all these UNESCO-UNEVOC highlighted their programs and approaches in strengthening TVET systems in the UNESCO Member States and underscored teacher education as among the priorities for action of UNESCO from 2012 to 2013.

Plenary Session 2: Using ICT for TVET Educators Development

Plenary session 2 focused on the impact of ICT revolution in the teaching and learning systems and processes creating major implications in the education systems such as paradigm shifts, active learning, constructivism, change in approach and curriculum.

SEAMEO VOCTECH, in its efforts of supporting efficient use of online digital resources in learning has implemented a number of online solutions to its learner community which include an interactive learning management system that is called EduNET; and the conduct of yearly training programs for selected participants from SEAMEO and ASEAN countries, among others. While, CPSC presented the framework and context within which CPSC's developmental experiences were nurtured to promote ICT through its uniquely-developed web-based teaching learning system for more than 90 courses and programs designed for TVET professionals. However, Singapore Polytechnic emphasized that technology must not replace a good pedagogy and that the focus of learning should be on the learning of that information rather than on the delivery of information.

Panel Discussion 2: TVET Educators for the Green Economy

The session focused on initiatives, innovations, programs, strategies and practices on TVET Teacher education integrating education for sustainable development in the education systems. The speakers also imparted on the reorientation of their countries' perspectives, policies, programs, and activities towards the Green Economy. However, all the presenters pointed out that it is still a long way to go to reach their objectives, whereas a stronger, more focused system and programs must be established to achieve the ideals and full benefits of ESD and a Green Economy.

In Canada all colleges and institutes explore the green programming based on the survey of the members of the Association of Canadian Community Colleges (ACCC). This programming ranges from stand-alone environmental and green energy programs to the infusion of green curriculum and values into a wide array of existing programs. Green campuses have been developed to support green programming, to reduce the environmental impact of campuses and act as exemplars, as well as to provide applied research platforms to further develop green technologies. The vision of Universiti Tun Hussein Onn Malaysia (UTHM) was realigned to have sustainable development objective into it and thus stating: The world Class university in Engineering, Science, and Technology for Sustainable Development (SD). There have been activities and initiatives on SD at every level of the University as early as the year 2000 which include: undertaking issues of SD in its curriculum through individual courses; establishment of Sustainable Campus Unit (SCU); and campus wide campaign for greener campus and technology; and campus-wide initiatives particularly at the faculty level on mapping university directions in implementing ESD Guidelines and Recommendations for Reorienting Teacher Education to Address Sustainability of United Nations Decade of Education for Sustainable Development (2005-2014).

The Korean government initiated ways to unite its society, industry, and the academia to work together in fostering green TVET educators' system in the country. In facing some challenges and concerns in pursuing green TVET educators' system such as weaknesses in the green Research and Development (R&D) Program and Planning; lack of a database on green technology and industrial manpower; and a weak system to foster green manpower, Korea came up with the 2nd Comprehensive Plan for fostering green industry manpower programs which incorporates strategies that are more globalized in content and which are more focused on TVET-oriented industrial fields. Korea also operates the "Green Policy & Education study groups" and "Green Education Centers" throughout its provinces; runs special green education programs for primary and secondary teachers; and supports more than 900 NGOs that are conducting green education. The presenter for Kenya stressed that the millennium challenge for TVET teachers and professionals is for new knowledge and skills to be explored for greening society and economy to ensure a more sustainable future for humanity.

Panel Discussion 3: Research and New Initiatives in TVET Educators' Development

The session delved on new initiatives, institutional thrusts and research projects, undertaken to improve TVET educators' development. The Technical Education for Skills Development Authority of the Philippines, in acknowledging the significance of assuring quality assurance in TVET educators' development, and in pursuit of continuous development, initiated the reformed National TVET Trainers' Certification. The

Department of Polytechnic Education (DPE), Ministry of Higher Education (MOHE), Malaysia shared that in addressing the challenges in educators' development: trainings must be prescribing to sets of criteria and standards towards quality assurance of educators development; exhaustive training needs analysis must be carried out to identify the adequate trainings required; trainings must be properly planned, structured and executed; and impact and effectiveness of the trainings must be continuously evaluated so that desired outcomes of the trainings are achieved. At present, continuous trainings are conducted among the TVET trainers/instructors in the different regions throughout the country to ensure implementation of this new policy. The Research and Development of DPE-MOHE presented the potential contributions of Action Research approach in the development of TVET educators and emphasized that TVET educators must be partners and key actors in change and transformation; and also as change agents or innovators at ground level in the context of action research. Thus, Action Research seems to be particularly adapted and should be used as a tool to empower TVET educators in their endeavors and initiatives for professional self-development and local innovation.

The government of Korea established vocational training teacher education training course to educate the vocational competency development training teacher which include: an educational training course, a teaching profession training course and an improvement training course based on enforced regulation of the Laborer Vocational Competency Development Act.

Presentors from the Rajamangala University of Technology Thanyaburi (RMUTT), Thailand and Germany highlighted the Joint Research on the "Comparative issues on TVET teacher education and training in China, Germany, Thailand and Vietnam" undertaken by the Regional Cooperation Platform (RCP), which is very keen on tackling educational frameworks and related standards affecting the quality of vocational teacher education. The Research came up with some proposals such as: to reform TVET teacher training through Quality Assurance system and national planning of resources; to build and promulgate professional competency standards of vocational teachers through policies, regulations and strategic projects; to improve selection process in finding qualified TVET teachers; to set framework of TVET teachers' qualification; to encourage training not only in TVET teacher education institutions but also in companies; and many others.

Good Practices and Emerging Challenges for TVET Educators' Development: Regional Experiences (Country Perspective Presentations) - TRACK C

Innovative solutions were developed for TVET educators by the Western Visayas, College of Science and Technology (WVCST) Philippines, such as: offering of vertically articulated curricula in industrial technology; Project Intel, and eSkwela Project; development of Alternative Learning System and Livelihood Project; converting instructional materials into interactive module; the I-Schools Project; linkages with associations such as the Philippine Association of Colleges and Universities of Industrial Technology; and establishment of Patent Libraries to strengthen local institutional capacity to access patent information. Realizing the important role of TVE in addressing labor and employment issues in the country, the government of Bhutan is vigorously undertaking policy measures and development plans focusing on TVET including TVET education interventions to address shortage of skilled workers in the country. These include upgrading instructors' qualification, building ICT learning centers in technical institutes and revision of curricula to incorporate environment friendly methodologies. Various efforts and approaches were made by the Training Institute of Technical Instruction (TITI) Nepal with reference to training and development of TVET educators which includes wide-range of services, customer bases, program areas and contexts of institutional operation. In Lao PDR existing potentials and ongoing streamlining of institutions including VTE projects and activities has been explored in the country. Some important reflections about major demands as well as institutional backgrounds and reform requirements of VTE development in Lao PDR were likewise presented. India, on the other hand, stressed that ICT can play a vital role to reform the education and training process by way of professional development of educators of TVET. If designed and implemented properly, ICT-supported education can

promote the acquisition of the knowledge and skills that will empower educators for facilitating lifelong learning among students.

As TVET is still unattractive to majority of students in the countries represented, the session reinforced the necessity to elevate the quality of TVET education and in the process, the level of training of TVET educators.

Good Practices and Emerging Challenges for TVET Educators' Development: Regional Experiences (Country Perspective Presentations) - TRACK D

The representative from the National Institute of Technical Teachers' Training and Research (NITTTR), India, shared three (3) important mechanisms to provide quality training for TVET educators which are Distance and Open Learning, Modularized Open Learning and ICT Applications, and Industry – Institute Partnership. In Maldives some educational policy measures were put in place in supporting TVET educator's development such as enactment of employment sector councils, introduction of occupational standard for skills training, independent assessment process, introduction of national certificates (Trade Certificates), and Introduction of trade testing system including various development interventions in educating and training TVET educators. Fiji's Ministry of Education is focusing on three major areas in its TVET section, these are on: upgrading of equipment and infrastructure, developing a relevant and industry driven curriculum and upgrading teacher qualifications in producing competent teachers. The Cabinet Concession to the Proposal of Education Reform in the second decade (2009 – 2018) initiated by the Office of Vocational Education Commission, Ministry of Education, Kingdom of Thailand was organized in order to develop vocational teachers, promote continued education, develop teaching skills, develop social skills, develop research skill, and develop technological skills. In Myanmar some best practices include cultivating higher competitive engineer and skilled manpower for public and private economic sector and offering advanced science and technical subjects in their native language.

The session also concluded that there are various challenges being faced by TVET at present and one such solution to overcome these is through cooperation and collaboration with regional and international organizations for TVET such as UNESCO UNEVOC, CPSC, and GIZ.

CONCLUDING SESSION - RECOMMENDATIONS AND CONCLUSIONS

The Conference organizers composed of CPSC, GIZ and MOHE, Malaysia facilitated the closing session of the conference. In this session the delegates synthesized the inputs and deliberations during the two-day conference. Significant conclusions and recommendations vital to TVET educators' development were drawn out from the summary of inputs and discussions. Pertinent points and details of the conclusions and recommendations were put forward by the conference delegates through the "Next Gen Imperatives 2011".

The "Next Gen Imperatives 2011" underscores the need for more concentrated efforts on capacity building of TVET educators including teacher qualifications framework; educators' need to prepare graduates for the green economy, using ICT in advancing TVET educators for the next generation, new models of pedagogy to match the emerging learning styles of digital natives and many others.

In the end the delegates shared the view that the conference provided a platform for sharing and deliberations on vital issues, challenges and emerging trends in the education systems in the 21st century with the advent of ICT, rapid globalization and shift towards knowledge-driven economy and the urgent need to look into the readiness of TVET educators in facing such challenges. The delegates examined said premises and exchanged ideas on good practices, new paradigms, models and approaches in teaching and innovations. The discussions also brought to fore proposals for policy review and reforms in the education systems along with strengthening of capacity building programs for teachers in preparing TVET educators in facing arising issues in education in the future.

Conference Conclusions and Recommendations

NEXTGEN IMPERATIVES 2011

The International Conference on Preparing TVET Educators for the Next Generation organized by CPSC, UNEVOC, GIZ and MOHE-DPE, Malaysia on 12-13 December 2011 in Kuala Lumpur, Malaysia with 208 delegates from 25 countries shared and deliberated upon the theme, and considering the importance of the issue:

Appreciates the significance of preparing teachers as agents of change for the next generation through strategic interventions in developing relevant teacher education and training programs;

Understands the emergence of Innovation-led Economy, ICT Revolution and Sustainable Development as the principal drivers of change in the society;

Acknowledges the changing role of TVET educators from mere transmitter of knowledge to facilitator, mentor, manager and coach;

Realizes the importance of generic skills, higher order thinking (HOT) skills, as well as green skills as essential components in the development of next generation TVET graduates;

Recognizes the growing concern for shortage of qualified or well-trained TVET teachers, policy initiatives will have to be formulated and implemented to give priority focus and attention in improving teachers' quality and quantity in the TVET sector;

The Conference concludes on the following points for consideration and further action:

- There is a need for more concentrated efforts on Capacity Development of TVET Educators in preparing graduates for world of work and ever expanding global workplace;
- There is a necessity to formulate Teacher Qualifications Framework and Competency Standards for TVET Educators;
- There is a need to enhance the professional competence of TVET educators through practical skills training, hands-on exposure, simulation and innovative strategies, and industry attachment programs on a continual basis;
- In view of the huge growth and employment prospects for green jobs, teacher educators need to prepare graduates for the Green economy;
- Active involvement and strong commitment of stakeholders is necessary for preparing TVET Educators for next generation;
- Attractive performance-based incentive schemes must be worked out to entice promising professionals into the TVET system by introducing attractive packages schemes;
- Strategic alliances with international and regional organizations for technical cooperation and development;
- Create opportunities for TVET educators to develop Technical and Generic Skills (especially HOT, creativity, innovation skills) through continuous professional development and life-long learning;
- Harness the potentials of using ICT as a tool in advancing TVET educators for the next generation;
- New models of pedagogy have to be evolved to match the emerging learning styles of digital natives.

The Quad-Partite Organizers along with the delegates from Australia, Bhutan, Brunei Darussalam, Canada, China, Egypt, Fiji, Germany, India, Indonesia, Kenya, Korea, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Philippines, Saudi Arabia, Singapore, Sri Lanka, Thailand, UK and USA urge upon policy makers from international and regional organizations, the government and private sectors, non-government organizations to work together in preparing TVET educators for the next generation.

PLENARY SESSION 1

*Emerging Trends in TVET Educators'
Development*

NEW PARADIGM IN TEACHERS' EDUCATION IN TVET

Prof. Shyamal Majumdar, Ph.D.

Head, UNESCO UNEVOC International

Centre for TVET, Bonn, Germany

s.majumdar@unesco.org

INTRODUCTION

The 21st century presents a radically different economy and society, which is likely to have profound implications on Technical and Vocational Education and Training (TVET). TVET systems must adapt to these key features which include Globalization and Knowledge Society, ICT Revolution and Climatic Changes & Sustainable Development [1].

The Second International Congress in TVET organized by UNESCO pointed out that from economic growth to human development, a bridge has to be built through the teachers who are well trained. The most important 'agent of change' in 'knowledge society' is the teacher. This has been highlighted by many development organizations such as CPSC and UNESCO-UNEVOC, arising from discussions on the need for innovations and quality improvement in teacher education in the field of TVET to meet the challenges of the knowledge-based society [2].

UNESCO's former Director General Mr. Koichiro Matsuura at the opening of the World Conference on Education for Sustainable Development in 2009 stated that "There are over 60 million teachers in the world today and countless numbers of non-formal educators. They work at the 'local' level but are called upon to deal with 'global' issues. To make education relevant and real to learners, they must draw upon local inputs, contexts and values [3].

Recognizing the challenges that lay ahead, the pursuit of relevant teacher education approaches is of paramount importance. These approaches build upon general theories and perspectives, as laid out in this paper, to enhance student learning at all levels of education, with particular focus on Technical and Vocational Education and Training (TVET).

FEATURES OF GLOBALIZATION AND KNOWLEDGE SOCIETY

Globalization has introduced transformations. It is characterized by a fully integrated economy, society and culture. Transformations in globalized community generate new demands, structures and systems; new skills and knowledge to adapt to the evolving nature of social and economic processes. These transformations have registered strong impact on the economy, technology, and environment.

As part of economic transformations, the knowledge society has emphasized the value of knowledge rather than material products. Increased value on "intellectual capital" reinforces skilling and creation of workers for knowledge-intensive jobs. The phenomenon is caused by the sudden shift from mere manufacturing economy to service economy in many developed and developing countries around the world. The diagram below (Figure 1) depicts a changing paradigm in a knowledge society. Here, dramatic changes take place in the valuing of output, since the economy has changed from manufacturing to knowledge-based while technology has moved from manual to cognitive in terms of technical orientation. They are seen as positive developments that take advantage of the shift in focus to raise the bar of demands and work output.

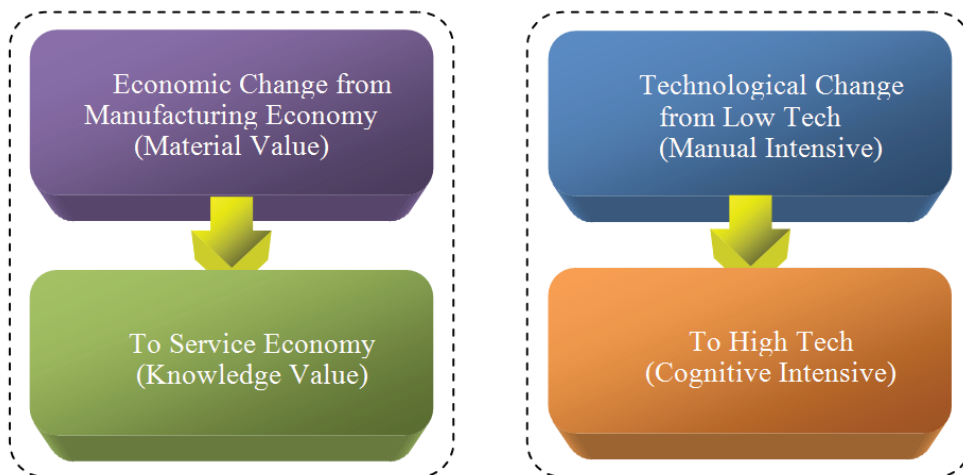


Figure 1: Changing Paradigm in Knowledge Society

New technological trends are sweeping across Asia and the Pacific region. They are virtually reshaping all aspects of work, at all levels, and in all types of industries. Obsolescence and technological advancements are happening at a rapid pace. For example, the major shift in technology is dominated by the move from petroleum-based to bio-based; divergent to convergent. The century now features integrated technologies, such as information and communication technology (ICT), bio technology, nano technology, energy technology, space technology, embedded technology and mechatronics system. These technologies possess common characteristics of being interdisciplinary, oriented to Research and Development (R&D), information-intensive. They usually have shorter life cycles and are globalized. [4]

The rapid development of technologies demonstrates the short lifecycle of technologies so far invented. Continuous improvement and advancements lead from one technological invention to another, making it very difficult to retain skills applicable for one single pattern of computer technology architecture and instructions. To illustrate this, computer microprocessors have evolved from the basic 8085 to 8086, 8088, 80186, to more complex 286, 386, 486, Pentium I, Pentium II, Pentium III and Pentium IV, and so on in such a short period of time.

Technological trends such as this suggest an increasing pressure for educational systems to visualize the types of work that will soon emerge, prepare students for technologies that are not yet invented and equip them with the knowledge and skills that would help prosper in a fast-changing work and life environment.

But the fundamental question is, how can teachers prepare students for the technology that has not yet been invented? Or one may ask, is there any strategy or teaching methodology to address such dilemma?

IMPLICATIONS OF RAPID TECHNOLOGICAL OBSOLESCENCE TO TEACHER EDUCATION

The only way to address the problem is to change the entire strategy of teaching and learning methods. Instead of concentrating students to equip them with the present day technology, there is a need to prepare them for more complex and long-term technology projections and empower them with learning to learn skills that promote self-paced learning through autonomous learning strategy and adapt to the changing needs. The core strategy for this model will be the learning to learn skills, adaptability skills and Higher Order Thinking skills (HOTS) in addition to present day domain knowledge. HOT skills is central to Generic Skills demand to match the requirement of the knowledge society.

HOT Skills

The increasing complexity of work and their characteristics of being more and more knowledge and information-intensive require higher order thinking (HOT) skills set and attributes. HOT Skills integrate critical thinking, creative thinking, innovation and problem solving, abstract reasoning, analytical skills and information processing altogether. Not only do these HOT skills set strengthen mental potential, they also help in framing logical mind. Examples of these HOT skills are analogous thinking, sequential thinking and interpersonal thinking skills.

HOT skills have broad applicability to any specific subject domain. Possession of these HOT Skills help learners face up the challenge in the new workplace using the highest level of cognitive attributes, since the new workplace of today tends to be problem-oriented and flexible.

Improving teacher education requires clear recognition of the dynamic shift in both the roles of learners and teachers. Traditionally, teachers impart academic skills and knowledge using Transmission Model which denotes one-way approach. It is up for learners to absorb them and for teachers to assess if learners meet their expectations. Under the changed context, teaching HOT skills is most effective using the Constructivist Model, where learners construct meanings out of the old and new information through their own set of experiences and interactions [5]; while teachers act as facilitators for providing the right conditions, tasks and situation.

This paradigm shift places learners at the center of an interactive and constructive learning environment; a marked departure from teacher-centred and lecture-oriented approach. Instilling the facilitation role of teachers in teacher education is therefore crucial.

Generic Skills

The development of essential generic skills for the new workplace is an imperative rather than an option. Emerging work place demands a new set of generic skills which leads to the possession of essential Learning to Learn and Adaptability skills. Mayer (1992) defines generic skills or key competencies as those competencies essential for effective participation in the emerging patterns of work and work organizations. They focus on the capacity to apply knowledge and skills in an integrated way in work situations. Key competencies are generic in that they apply to work generally rather than being specific to work in particular occupations or industries. [6]

The information-based technologies used in the workplace have become more sophisticated and the kind of decisions expected of the workers has grown more complex and require integrated skills and competence.

What then is the intervention required from teachers to facilitate this? In as much as learners of the 21st century need to possess adaptability skills to survive the workplace, teachers first and foremost must know how to transfer the generic skills and teach learners how to transfer them in their working environment. For learners, a base-level of familiarity with scientific concepts and processes reduces the time to master new areas where emerging tasks and work processes occur. Generic skills are not just restricted to their usefulness in the workplace but are equally required across the wide spectrum of living experience in today's world. The extent by which these skills must be possessed needs to be determined, for teachers to further guide in developing educational content rich in job-specific and generic skills formation.

Clusters of generic skills in the new workplace are modelled in the succeeding figure to guide teachers in performing this role, namely Work Habits cluster, Interpersonal cluster, Cognitive cluster and Adaptability cluster

The first cluster consists of workplace behavioral patterns and attitudes that contribute to values education and productivity achievements including independence, reliability, time management and basic IT. The second cluster consists of interpersonal skills demonstrating abilities to interact and build camaraderie with other people in the workplace, such as presentation, communication, team work, leadership and cooperation. Cognitive skills cluster, on the other hand, stimulates the use of critical thinking, creative skills and problem solving, application of skills that enable an individual to be innovative within the work environment. The fourth generic skills cluster determines ability to adapt through situations or given tasks using a variety of approaches, knowledge and skills required to accomplish them. [7]

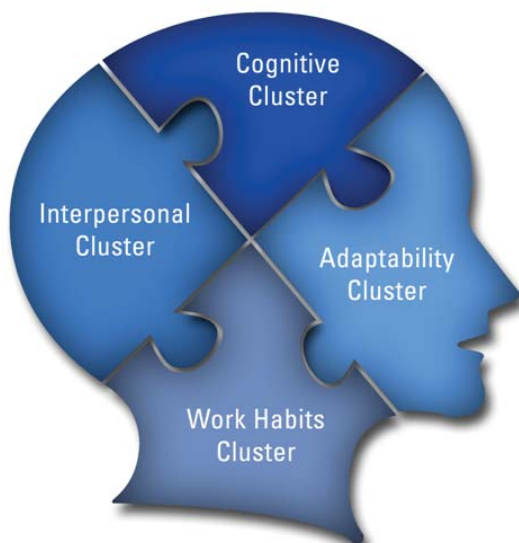


Figure 2. Generic Skills in the New Workplace

Generic skills are crucial to the success of the learners once they are integrated with their work environments. They are mostly essential to ensure learner flexibility, mobility and adaptability to an increasingly competitive global environment, rapid technological changes and to new forms of organizations. These skills will help students move through a series of changes in knowledge-intensive economies.

To summarize, the knowledge-based society requires a new type of Teacher: Able to transfer HOT Skills and soft Generic Skills; and recognizes the facilitation role in an environment that makes learners work together.

FEATURES OF ICT REVOLUTION

Information and communication technologies (ICTs) have changed the way we work, live, play and learn.

In the past few decades, the world has witnessed a phenomenal growth in communication technology, computer network and information technology. Increasingly rapid advances in ICT have profound impact on the way teachers teach and learners learn. It has the potential to transform the nature and process of the learning environment. Interactivity, flexibility, and convenience have become a major consideration in the technology-enhanced learning environment [8]. There is at least one generation gap between the learners and the teachers in the ICT era in the present time. It is also important to recognize that the XXI Century Learners are indeed very different from what we were as students. Most of them have never: wound a watch; touched a typewriter; played a record album; calculated with a slide rule; travelled in a steam engine; hand-written a letter; known a world without computers. "Today's school-age generation knows more about technology than do their teachers. Young kids get bored if they are doing only one function at a time; they need multiple stimuli. For example, new generation of learners watch their computer screens, listen to music through headphones, and carry on conversation; all at the same time. Today's learners have short attention spans, and have the attitude of take-it-all-at-once. They experience a technologically-saturated childhood. Unlike adults, they are not surprised by new technology -- they simply integrate it into their lives. They want and expect to collaborate with their teachers (and bosses), not take orders from them".

There are major differences between four recent generations: the Matures (1900 – 1946); the Baby Boomers (1946 – 1964); Generation X (1964 – 1982); and Generation Y or Generation Net (1982 – Present). Over a period of a century, the Teaching style has undergone a transformation from Lecture,

primarily verbal, and rote, for Matures, to Interactive, even in large classes, and problem-based with feedback via clickers and online software, for Generation Y; and the Learning style from Memorize, Try again and again, for Matures, to Simulations, frequent interaction with faculty and peers, and open-ended, for Generation Y. [9]

That way, today's learners are called Digital Natives while Teachers are called Digital Immigrants.

In many parts of the world, ICTs have substituted the works traditionally rendered by many low-skilled manual workers while innovative technologies are widely used in formal work places. These revolutionary workplace transformations paints an entirely different work environment and processes that must be learned by students.

With the aim of improving education access and making learning flexible, ICT has made an impact to teaching processes. Development of new broadband communication services and convergence of telecommunication with computers have created numerous possibilities to use a variety of new technology tools for teaching and learning system. Along with transitions in teachers' and learners' role is the transformation of the learning environment from traditional instruction to a virtual learning environment.

ICT has the potential to transform the nature of education in terms of where, when, how and the way learning takes place. It supports the smooth transition from teacher-centered to learner-centered paradigm, making skills, knowledge and other attributes within the reach of students through dynamic learning experiences.

IMPLICATIONS OF ICT TO TEACHER EDUCATION

Indeed, the use of ICT in education has challenged teacher education frameworks. Taking advantage of the potentials of ICT in enhancing teaching-learning process has naturally floated new and creative school of thoughts, whereby the development of new pedagogical approaches supported by technology was inevitable.

Some basic principles for the development of effective ICT teacher education programs are adapted from the Society for IT and Teacher Education (2002) by UNESCO [10]. One of the two major principles is that technology should be infused into the entire teacher education program. Knowing a wide-range of technologies that could be applied in education expands technology experience of teachers. The second principle is that technology should be introduced in context. In the case of pre-service teachers, technology literacy must be acquired in the context of their field exposure, in the context of their own learning and in the context of the future teaching models to carry out their teaching practice.

Teachers who are actively using ICTs or any form of technology-supported instruction assume the role of educational designers, who must also understand the full potential of technologies parallel to providing content relevant to the context where learning takes place. Given this, the use of ICT should satisfy the diverse needs of all kinds of learners. Learners, as we know, are molded through various contextual and cultural conditions and are in different stages of intellectual development. Teachers, on the other hand, must supply the applicable learning environment supported by the right tools using the appropriate approach.

The major challenge in designing instruction through multimedia is, therefore, the choice of media and their application in optimizing human learning with respect to learning objectives [11].

Building upon certain pedagogical abilities of teachers, the instructional styles, interactivity and usage of ICT could be guided by the categories of application of computer-oriented approach, as follows:

Table 1. Applications of Computer-oriented approach

	Computer-Assisted Learning (CAL)	Multimedia-Based Instructional Software	Web-Based Instruction
FEATURES	Interactivity, Flexibility, Learner-centered	Interactivity & Multi model Instruction	Interactivity & On-Demand Instruction
STYLES	Drill & Practice, Tutorials, Simulation and Instructional Games	Hypermedia, Hypertext; 2D /3D Simulation & Modeling	Computer-supported Collaborative Learning Environment
USAGE	Self-paced Instruction	Self-paced Instruction	Asynchronous & Synchronous Virtual Classroom
PEDAGOGICAL BASE	Behavioral Objectives	Behavioral Objectives & Constructivism	Constructivism

Today, teachers are expected to create a new flexible and open learning environment in ICT era with interactive, experiential and multimedia-based delivery system. Multimedia combines media objects such as text, graphics, video, animation and sound to represent and convey information. The digital media can play an important role in transforming teaching and learning through the use of animation, simulation, morphing techniques. The major changes in Media Application in Teaching and Learning are as follows:

Table 2. Transition of Media Applications in Teaching

From	To
Single Sense Stimulation	Multi Sensory Stimulation
Single Media Application	Multimedia Application
Delivery of Information	Exchange of Information
Monologue Communication	Dialogue & Collaborative
Analogue Resources	Digital Resources

The integration of technology into teaching and learning always places pedagogy over technology. It is not the only concern to master ICT skills, but rather it involves using ICT to improve teaching and learning. The major emphasis of ICT infusion in pedagogy should be such that it tends to improve learning, motivate and engage learners, promote collaboration, foster enquiry and exploration, and create a new learner centered learning culture: a bold response to knowledge explosion that has taken place and described above. It permits the move from reproductive model of teaching and learning to an independent, autonomous learning model that promotes initiation, creativity and critical thinking with independent research. Learners are expected to collect, select, analyze, organize, extend, transform and present knowledge using ICT in authentic and active learning paradigm. Teachers are expected to create a new flexible and open learning environment with interactive, experiential and multimedia based delivery system. ICT should help teachers and learners to communicate and collaborate without boundaries, make learners autonomous and allow teachers to bring the whole world into classroom activities. It is ultimately important to understand the roles of ICT in promoting educational changes. A basic principle is that the use of ICT changes the distribution and ownership of information resources in the space of teaching and learning and thus changes the relationship among educational participants. While designing any innovative teaching and learning environment using ICT, the teacher should always keep learning at the center of all activities, pedagogy should be at the heart and integration of pedagogy-technology should be the central focus.

FEATURES OF SUSTAINABLE DEVELOPMENT IN TVET

Having discussed the various features of rapid technology, ICT revolution and their implications to teacher education, the interplay between and among elements are relevantly linked with sustainable development (SD), a key agenda in youth and adult education today. SD is about maintaining and improving the quality of life without compromising the ability of future generations to meet their own needs [12]. It is not limited to a concern for the natural environment or is focused exclusively on economic development. Rather SD is a concept integrating sociocultural, environmental and economic considerations. The major challenges in the world today is to find ways of living and working sustainably, so that the reasonable needs can be satisfied without over-exploiting the natural resources.

The growing concern about sustainable development has led present day policy makers, administrators, educators and managers to call for a more holistic and integrated educational approach for sustainable development touching upon environment, social, technological and economic priorities altogether. These priority concerns and issues pose as need-based focus of future educational initiatives. Possessing certain skills set is not enough. Moving towards the goal of sustainable development also requires fundamental changes in human attitudes and behavior--- in our personal lives, in our community activities and in the work place. Such a fundamental changes is only possible through education and training. In the Mid-Term draft review report on Decade of Education for Sustainable Development, one of the critical areas of concerns have been identified as priority is the re-orienting curricula, teaching and learning and capacity building [13].

Education in general and TVET in particular takes on a complex and distinctive character with regard to sustainable development. This is because both directly and indirectly TVET produces and consumes resources, as well as affects attitudes towards sustainability held by future workers. As one of the sectors involved in transformation of resources, TVET has multiple concerns about sustainability and are considered directly related to social, economic and environmental progressive or regressive developments in all parts of the world [14]. Thus, Education for Sustainable Development (ESD) requires deep immersion in the understanding and practices of SD in education. The challenges of education today are to reorient and redirect its curricula towards sustainable development.

Unfortunately, TVET in many countries remain locked up into the role of being a mere supplier of skilled labor to industry and is thereby unable to respond effectively to the needs of sustainable development strategies. TVET professionals need to be called upon to reorient the TVET curriculum towards sustainability while maintaining the principles of 6R that is Reduce, Reuse, Renew, Recycle, Repair and Rethink perspectives [15].

Implications of Sustainable Development to Teachers Education

Limited awareness and understanding of ESD at all levels of education is still a fundamental challenge resulting in a limited societal and governmental support-base for ESD. This limited awareness and understanding may keep teachers from recognizing the presence and value of existing ESD. As ESD-triggered innovations in teaching and learning are still in their early stages, there is a world-wide call for alternative methodologies that can strengthen teacher's education to network, develop and research sound pedagogical practices to support ESD [16]. Educational institutes in general and TVET institutions in particular should be at the forefront of the search and development of these new forms of teaching and learning and the kinds of curricula, learning environments and school-community relationships that are needed to allow for such learning to flourish. At the same time, educational policies and support mechanisms that allow for more integrated forms of teaching and learning should be strengthened.

ESD-related professional development should also focus on how to build the capacities of teachers, managers and facilitators to initiate and enhance new ESD-inspired forms of learning in schools,

universities, workplaces and neighborhoods. Space needs to be created to develop and experiment with these new forms of teaching and learning. Such capacity-building is also needed in non-formal education and informal learning settings. Some of the innovative principles of ESD pedagogy includes (a) Methods for ESD in TVET should promote problem solving skills, creativity and innovative skills.(b) All techniques should be designed to suit learner characteristics, meet their needs and develop their interest and enthusiasm. (c) Methods should focus on real-life problem-solving, i.e., application of principles of science, social science and technology to solve environmental problems. (d) Problem or project-centered approach is usually more appropriate than subject or discipline approach for ESD.(e) Scientific and technological aspects of environmental issues should be supplemented with values and ethical aspects. (f) Teaching approaches should shift away from lecturing towards group-work, self-study and methods which use active involvement in projects and community life. (g) Team-teaching can effectively pool talents of specialist teachers to work in an inter-disciplinary way. (h) Learners should have access to elective subjects suited to their own personal and professional needs, interests and job opportunities [17].

Integrating ESD in TVET requires a massive capacity building of teachers to undertake the challenges to promote SD in all parts of education. The curriculum in TVET is not spared from responding to the up and coming theories and concepts that lead to sustainable practices in the industries and the workplace that will absorb TVET graduates. However, the process of re-orienting TVET towards sustainable development is broader and a more pervasive task than that of revising syllabi and devising new teaching and learning materials that incorporate principles and examples of global citizenship and sustainability. In fact, it gives emphasis on the new role of teachers that also open up new ways of thinking and further shifts in paradigms. The changing role of teachers therefore must be parallel with the changing contents, knowledge structure and skills components envisaged from the above scenarios.

OVERALL IMPLICATION TO TEACHERS' EDUCATION

There is a paradigm shift in teacher education and practices of teaching and learning in the digital revolution, climatic change and knowledge society [18]. This paradigm shift gives learners a completely new role that was not earlier described in the transmission model of teaching. Where learning through facts, drill and practices, rules and procedures was more adaptive in earlier days, now learning through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection is more fitting for the present times. So there is a need to develop a conceptual framework on the pedagogical dimensions of new learning environment. For this purpose, desirable paradigm shift required in each of the pedagogical dimensions are presented below [19]:

Shifting the emphasis from teaching to learning can create a more interactive and engaging learning environment for teachers and learners. This new environment also involves a change in the roles of both teachers and learners. The role of the teachers will change from knowledge transmitter to that of a facilitator, knowledge navigator and sometimes as co-learner. The new role of teachers demands a new way of thinking and understanding of the new vision of learning process. Learners will have more responsibilities of their own learning as they seek out, find, synthesize, and share their knowledge with others.

Table 3. Desirable paradigm shift

Dimensions	Undesirable	Desirable
Teaching Model	Instructive Model	Eclectic Model based on Constructivism
Learning Focus	Content	Learning to Learn
Learning Thrust	Rote	Higher Order Thinking
Development Goal	Traditional	Sustainable

ICT provides powerful tools to support the shift from teacher-centered to learner-centered paradigm and new roles of teacher, learner, curricula and new media. The major shifts [20], [21], [22] have been described in the table below.

Table 4. Changes in Teachers' Roles

From	To
Transmitter of Knowledge	Guide & Facilitator of Knowledge
Controller of Learning	Creator of Learning Environment
Always Expert	Collaborator & Co-learner
Learning to use ICT	Using ICT to Enhance Learning
Didactic/ Expository	Interactive/Experiential/Exploratory

Table 5. Changes in Learners' Roles

From	To
Passive Learner	Active Learner
Reproducer of Knowledge	Producer of Knowledge
Dependent Learner	Autonomous Learner
Solitary Learner	Collaborative Learner

In order to develop effective curriculum, teachers must be curriculum leaders. Ensuring that teachers are central to the reformation of curriculum will enable the development of pedagogy that provides the most prosperous condition of learning, the highest quality learning outcomes for all students. The major changes in curricula are as follows:

Table 6. Changes in Curricula & Delivery

From	To
Memorizing Facts	Inquiry Based
Artificial Teaching Exercises	Authentic Learning
Rigid Delivery (Fixed Time & Space)	Open & Flexible Delivery (Any Time & Anywhere)
Single Path Progression	Multi Path Progression
Traditional Based	Competency Based

CONCLUSION

The major paradigm shifts presented above, namely globalization and knowledge society, climatic change and sustainable development as well as ICT revolution, paint a big picture of the emerging roles of teachers and learners in an equally emerging learning and work environment. Similarly, it magnifies the growing requirements for building the foundation for higher order thinking skills to cope with the challenges of the paradigm shifts.

Obviously, movements in the economy, emergence of new technologies and increasing models of International Education which may lead to enhancing the benefits of cross-border knowledge and skills

building, create new innovations and expand the scope of opportunities for cultivating 'global students' for the 'global world'. Essential to this is creating the foundation for understanding present sustainability issues, trends and integration in the teaching and learning curriculum.

Knowledge explosion, on the other hand, has set a completely new role that was not earlier described in the transmission model of teaching. Technology and teacher professional development in its use are best introduced in the context of broader educational reform which embraces a shift away from teacher-centred, lecture oriented towards learner centred, interactive and constructive learning environment. ICT can play the role of catalyst for such educational reforms.

Technological obsolescence, on the other hand, have been underscored as principal movers for launching the set of generic skills that need to be possessed by teachers to impart desirable generic skills according to various pedagogical dimensions in teacher education. These skills are expected to strengthen the workforce employability and chances for mobility within the new patterns of work with job-specific skills.

The emerging paradigm shifts in teacher education discussed above demand for a new way of thinking among those in the field to work for the benefit of expanding knowledge potentials, skills formation and survival in the 21st century workplace.

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PROFILE



Prof. Dr. Shyamal Majumdar is the Head of UNESCO UNEVOC International Centre for TVET. Prior to his appointment, he was the Director General of the Colombo Plan Staff College and Professor and Head of Department of the National Institute of Technical Teachers' Training and Research in Kolkata.

Dr. Majumdar has been involved in various programs and projects in the education sector with his strong expertise and background in TVET, Technical Teachers Training, Information and Communication Technology (ICT) and Total Quality Management (TQM).

Dr. Majumdar has published a number of papers for national and international journals and conferences. He has authored, co-authored and edited various books and publications. Dr. Majumdar has been invited as Keynote Speaker in various national and international fora.

He earned his Bachelor's degree in Electronics and Communication Engineering; Master's degree in the same discipline with specialization in Computer Science and Engineering and Doctoral degree in Engineering (Educational Computing).

TVET EDUCATORS FOR THE NEW GLOBAL ECONOMY

Dr. Mohammad Naim Yaakub

Director General

Colombo Plan Staff College for Technician Education

director-general@cpsctech.org

INTRODUCTION

Today, we are living in a transition period to a new age defined by global competition, rapid change, faster flow of information and communication, increasing business complexity, and pervasive globalization. The pace of change has become so rapid that it took a different type of firms to be dominant and entirely marked a new era of business. This new environment is also characterized by “more far-reaching technological advances, and a consumer who has adjusted to this quicker pace”. Thus, the three forces driving the New Global Economy are:

- Knowledge – intellectual capital as a strategic factor; a set of understandings used by people to make decisions or take actions that are important to the company
- Change – continuous, rapid and complex; generates uncertainty and reduces predictability
- Globalization – in R&D, technology, production, trade, finance, communication and information, which has resulted in opening of economies, global hypercompetition and interdependency of business

The rapid development of new technologies requires TVET graduates or engineers and technologists to face new situations in their working environments all the time. The product life cycle has also considerably abridged. There is rising expectations from TVET graduates to coordinate the development, design and manufacture of these products in the most efficient and economic ways, ensuring quality within shorter time frame. In order to meet these emerging needs, TVET institutions need to relentlessly modify and improve the quality of its program and services. Thus, as per Economic and Social Research Council, 2005; “Economic success is increasingly based on the effective utilization of intangible assets, such as knowledge, skills, and innovative potential as the key resource for competitive advantage.”

The global economy through economic integration will also necessitate greater emphasis on global perspectives in education and skills development. The new environment calls for a richer set of educational experiences, with learning that transcends borders. The new global emphasis calls for innovation and expanding cross-boarders alliance in education and research.

In this reference, the International Labour Office (ILO) (2002) has identified a new ‘paradigm’ for TVET that has specific features. Increasingly, TVET is becoming more demand-driven, emphasizes employability, competency standards, lifelong and learner-focused learning, integrated education and training, multi-skilling, flexibility (in terms of entry and exit points) and often involves participatory governance.

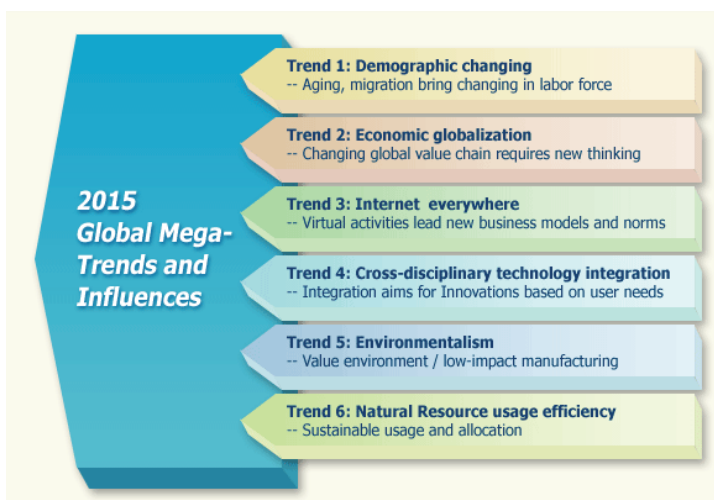
As per Chappel and Johnston (2003), this has had the consequence of diversifying the roles and work of many TVET practitioners, with their work being described as learning facilitator, workplace or industry trainer, workplace assessor, facilitator or consultant, and learning environment manager. Such diversified roles have essentially brought a new focus to TVET practitioners on reflecting on own professional practice and to acquire skills beyond the essential teaching and learning competencies. The

implication of technological, economic and social trends are intervening factors that refine pedagogical strategies, leading to molding TVET as a more effective platform to catalyze pragmatic approaches to prepare the workforce in the world of work (Majumdar, 2009).

Another noteworthy facet is the impact of ICT and the new knowledge economy. It has influenced our learning environment, in turn, to changes in our approaches to teaching and learning. These changes are also influencing our learning paradigms. In addition, global climate change is also influencing the social and economic demographic pattern in the region. It is imperative that the TVET sector and its policy makers need to promptly act in response to the changing scenario. The new graduates from TVET institutions will have to be world class and the quality of education has to be of global standards. This theme paper seeks to discuss new perspectives towards developing TVET educators in preparing the learners for the new global economy in the light of knowledge explosion in the new era that is currently being explored for sustainable development.

NEW DRIVERS OF CHANGE AND TRENDS IN TVET

The present-day era is regarded as vibrant in terms of economic growth and in terms of the nature of society and conditions in the ecological environment. On the global scale, there are six mega-trends which influence the nature of society, namely: Changing Population Structures, Economic Globalization, Ubiquitous Internet Applications, Cross-disciplinary Technology Integration, Agile Manufacturing and environmental concerns, and Efficient Use of Natural Resources. In fact, these six trends have interactive effects and may have varying degrees of influence in different places according to regional or cultural differences. Thus, the combination of these six trends may raise different issues, opportunities, and outcomes for TVET systems in the Asia-Pacific region.



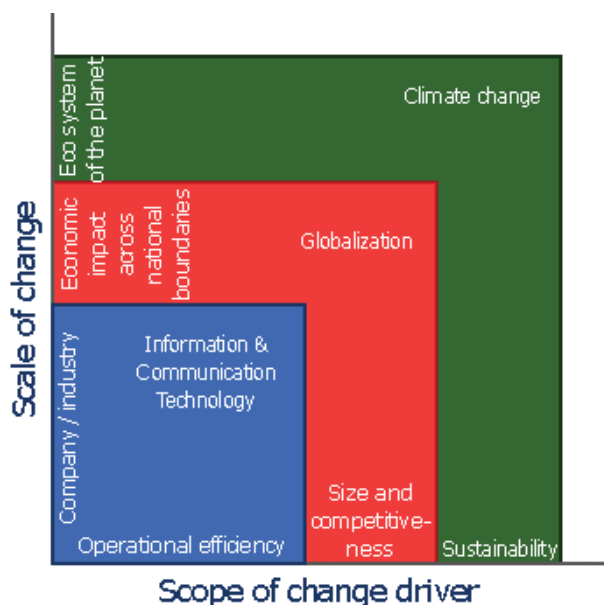
(Source: <http://www.taiwan2015.org/Eng/MegaTrend/>)

The two drivers, globalization and advancement in ICT, continue to fuel change across national boundaries and industries. However, early warnings of arrival of a bigger driver of change on the horizon are already ringing. This driver of change may have a scale of impact, which would be much higher than other drivers of change that the industry and governments had seen in the past. While ICT determines the operational efficiency of a firm, globalization, on the other hand, has largely made an impact on the government's efficiency particularly in creating an environment conducive for businesses to thrive, where competition ensures survival of the fittest. The next driver of change that we are going to face is associated with the very survival of the planet. This change has to do with climate change. Today, individuals differ in the opinion on the significance and time scale before the climate change really manifests itself on earth

in clearly perceptible ways for all of us to come to a common point of view. The scope and scale of impact of these global drivers of change are brought out as shown below:

The new realities viewed are globalized economy and influence of information technology on all spheres of work and life. This has created challenges for sustainable development with the increasing depletion of natural resources and at the same time challenging our workforce for excellence to remain competitive through lifelong learning.

The role of TVET is very vital and significant to boost the economic and social developments in today's world. The emerging trends in relation to TVET being witnessed are outlined below.



(Source: <http://www.alagse.com/cm/cm2.php>)

Knowledge-Based Economy

The rapid expansion of ICT has had enormous impact in many industries, from computer-aided design and just-in-time management of inventories, as well as a range of new and enhanced telecommunication amenities that has required completely new skill sets to be acquired by TVET workforce. This phenomenon has influenced all the sectors especially in developing countries resulting to greater mobility of capital and goods (and, increasingly, services) including mobility of workforce.

Each of these poses distinct challenges for TVET, in terms of acclimatizing to:

- a. Financial restructuring, as Asia-Pacific regional countries adjust to their areas of relative advantage;
- b. Competition in education and training markets as citizens seek the best educational opportunities, especially with entry of foreign education providers in the domestic market;
- c. The need for TVET to adapt to the “changing realities” of increased migration flows through providing easier access through regional qualification frameworks.

As a result, the economic restructuring appeal for the nature of skills is required for the knowledge economy to adapt to the foreseen changes in the workforce environment in the coming years, which encourages the acquisition of relevant skills aside from the technical skills. The knowledge economy necessitates higher order thinking (HOT) skills. Higher order thinking encompasses the learning of complex judgmental skills such as critical thinking and problem solving. Therefore, HOT skills are more difficult to learn or teach but also more valuable because such skills are more likely to be usable in novel situations (i.e., situations other than those in which the skill was learned) (wikipedia.com).

As per Center for Regional Studies, 2002;

“In the New Economy, knowledge, rather than natural resources, is the raw material of business.”

Alvin Toffler (1970) (author of Future Shock) and Daniel Bell with John Naisbitt examined the existing approach to theories of post-industrial societies. They argued that the industrial era is ending, and services and information are succeeding industry and goods. These are expected situations as fallout of the post-industrial society. The rapid technology change demands for a new set of skills, commonly known as Generic skills. Generic skills include work readiness and work habits, interpersonal skills,

enterprise, innovation and creativity skills learning, thinking and adaptability skills. As a result, it demands a new set of skills necessary among TVET educators in preparing learners, as well as the workforce for the rising demands of world of work.

Consequently, TVET in the region needs to be more focused on proper work force planning and human resource development, in favor of a flexible labor market and a framework for nationally accredited skill formation, which promotes the mobility of recognized skills. TVET training providers and educators need to be adequately equipped to deliver the same.

Climate Change & Sustainable Development

The impact of climate variability and change on earth and its life systems, and how individuals and societies respond to them, pose one of the most pressing challenges of our time. There is a growing need to weigh the scientific evidence of human-climate interactions to ensure developing an innovative, scientific and technical workforce that can advance knowledge on human-climate interactions, confront challenges ahead and develop solutions for a sustainable and prosperous future.

Education is an essential tool for achieving sustainability. People around the world recognize that current economic development trends are not sustainable and that public awareness, education, and training are key imperatives to moving society toward sustainability. Education in Sustainable Development (ESD) carries with it the inherent idea of implementing programs that are locally relevant and culturally appropriate. All sustainable development programs including ESD must take into consideration the local environmental, economic, and societal conditions. As a result, ESD will take many forms around the world.

Substantial challenges still exist in trying to achieve the broad goals of developing a climate literate society and a creative climate workforce. Climate science is a highly interdisciplinary, pedagogically challenging subject that does not fit easily into discipline-based present curricula or assessments.

TVET being major resource consumer takes on a complex and distinctive character with regard to sustainable development. TVET, so far, constantly included elements of sustainability, especially in the way scarce training materials were conserved and waste materials were disposed. This historical commitment gives TVET a foundation upon which to build future commitments to sustainable practices. The manner in which production and consumption is managed can significantly contribute either to sustainability or to the current practices and conditions that are not sustainable.

In education and training, the greater the exposure of TVET students to sustainable concepts, practices and examples, the more likely the desired workplace's culture change will take place in the future. Moreover, the delivery of sustainable practices must be universal; that is, encompassing not only pre-service TVET, but also on-the-job learning and worker upgrading and retraining. Enduring TVET will continue to predominate in the future, in order to accommodate both technological and job change.

In this context, the Director-General of UNESCO, Koichiro Matsuura, (2004) also stated in an International Experts' Meeting that, "For TVET programs to be part of the solution and not part of the problem; they must be reoriented so that they contribute to sustainable development worldwide."

The Bonn Declaration (2004), also states that since education is considered the key to effective development strategies, TVET must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help to achieve sustainable development.

Accordingly, ESD carries with it perspectives that are important for understanding global issues as well as local issues in a global context. Every issue has a history and a future. Looking at the roots of an issue and forecasting possible futures based on different scenarios comprise ESD, the same with the understanding that many global issues are interlinked. For example, over-consumption of such consumer goods as paper leads to deforestation, this is thought to be related to global climate change.

ESD is more than a knowledge-based economy related to environment, economy, and society. It also addresses learning skills, perspectives, and values that guide and motivate people to seek sustainable livelihoods, participate in a democratic society, and live in a sustainable manner. ESD also involves studying local and, when appropriate, global issues. Therefore, these five (i.e., knowledge, skills, perspectives, values, and issues) must all be addressed through TVET educators in a formal TVET curriculum that has been reoriented to address sustainability. Reorienting education to address sustainability is something that should occur throughout the formal TVET education system. As a result, a new set of skills are essential among TVET educators to prepare the next generation of TVET alumnae.

Information Revolution

Our society is continuously moving towards a knowledge-based economy: an economy, in which the application of knowledge replaces capital, raw materials, and labor as the main means of production. The synergy of combining new information and communication technologies with human skills has dramatically altered job content and skills requirements at the workplace. Good jobs have become technologically complex and are demanding sophisticated work skills. Simple, routine and low-level functions are diminishing. In the re-engineered workplace, the perception of the role of human interventions in the economic transactions has also changed. The potential contribution that an individual can make in acquiring and applying knowledge for improving processes, products and services is becoming more important than physical labor. The knowledge embodied in a product has become a key element of production.

At present, ICT are adopted by the industry to improve the efficiencies of manufacturing and transactions and with the advent of internet technology, the IT assumed the importance at the global scale. Internet facilitated information flow for integration of businesses across the globe. Advancements in ICT are complementing the industry needs in increasingly global economy and more and more business models are evolving on these advancements to conduct business in an efficient and effective way.

At the same time, ICT is becoming increasingly very important in education and training. New developments in information technology have opened up new prospects in teaching and learning. ICT need to be harnessed to provide more widespread access to TVET. Majority of our teaching and learning is based upon a constructivist-learning paradigm. However, due to the impact of ICT on education, there are a number of issues to interrogate: What will be the impact of ICT developments on our educational practice? Will we experience a drastic change in teaching and learning strategies? Will we adopt a new learning paradigm in the next decade or two? These educational requirements for the workforce of the future are extremely important. In this regard, Charles Darwin' stated that, "It is not the strongest of the species who survive, not the most intelligent, but the ones most responsive to change".

The recent report of UNESCO-UNEVOC highlighted some of the issues that need to be addressed are capacity development, access and connectivity issues, and localization, customization and content development. Our educational practices, due to ICT developments, continually need commercialization and globalization of education, social changes and the pursuit of quality and pursue for sustainable development. In this reference, David Warlick – Connect Learning blog, it states that;

- We are currently preparing students for jobs that don't yet exist . . .
- Using technologies that haven't been invented . . .
- In order to solve problems we don't even know are problems yet.

Today, e-learning and school management information systems are key areas in the use of ICTs in technology education and vocational training and retraining. Adopting relevant technology education needs to be a vital part of modern TVET education and retraining. ICT use in technology education includes both the study of ICTs as a subject in its own right as well as a vital tool for modern education. Integration of these two approaches is an essential factor of the TVET educational system.

DEVELOPING TVET EDUCATORS FOR GLOBAL ECONOMY

The new perspective for TVET educators in the global economy presents a radically different economy and society with profound implication for TVET. Due to innovations in technology, a new set of skills will have to be developed and focused on developing TVET educators so as to prepare the new workforce. The fact is that the new global economy skills are critical. The TVET system in asia and the pacific region needs adaptation to key features, which includes Globalization, ICT Revolution, Sustainable Development, Emergence of Knowledge Worker and Rapid Knowledge Obsolescence. In other words, "Twenty-first century skills combining technology literacy, critical thinking, creativity and mastery of core subject matter are the lifeblood of a productive workforce in today's global, knowledge-based economy."

The broad workforce requirement for global economy is summarized below;

The emerging perspective points out the fact that we need to develop TVET curriculum, which is driven by changes in line with new technology. We have to use technology as a tool keeping in mind the end requirements. Moreover, developing rightful mindset is equally significant over the skills set. These will be the decisive factors in the knowledge era. In order to develop the workforce, TVET educators need to be effective learners, collaborators and creators.

Global
Economy
Workforce

- Capacity For Lifelong Learning
- Adaptability, practical skills
- Awareness @ global issues
- Communication Skills
- Ability to work collaboratively

In order to adopt to the ever changing trends in TVET, including the quality and the type of trainees, TVET teachers should consider assuming greater, student centric roles that will be flexible and at the same time conducive to encourage student development. This role has been suggested by Spottl (2009) for the realization of an "open learning culture" in the region.

Table 1. Comparison on the Emerging Role of TVET Teachers

Old Role of Teachers	New Role of Teachers
Work alone	Work in a team
Structures the learning processes according to time targets	Structures the learning processes in a task and project oriented way
Assign marks based on facts	Assesses based on development and results
Instructs the students and impart facts and knowledge	Advises the students during their work on tasks and their solving of problems
Coordinates his/her work with the dual partner	Co-shapes training modules with dual partner and involves him/her to the instruction projects
Shapes instruction space	Shapes open instruction spaces
Develops teaching material	Develops equipment concepts
Determine the learning pace	Safeguards individual learning pace of students
Is geared to specialize theory and specialized sciences	Is geared to work and business processes and vocational educational sciences
Imparts occupationally oriented theory	Imparts occupationally oriented content of skilled work <subjects, tools, methods, organization and requirements for the skilled work and technology>
Develops theme oriented tasks and confronts students with professional problems	Develops occupationally oriented tasks and confronts students with occupational problems
Considers a differentiation of performance by the grade of difficulty of the tasks	Considers a differentiation of performance by multi-dimensions and complexity of occupational challenges

Develops his/her knowledge with the aid of books and theme oriented seminars and further training courses	Develops his/her knowledge by continuous learning
Determines the work and learning methods	Offers work and learning methods
Is responsible for the learning paths and assigns the students the responsibility for the learning result to the student	Determines the learning result with the with the students and assigns them the responsibility for the learning paths
Takes occupational experiences of the students for granted	Involves the occupational experiences for the of the students into instruction
Is a teacher for his/her subjects and organizes instruction according to them	Interlinks his/her and other subjects with the subjects of colleagues in a comprehensive instruction

In this connection, Majumdar (2010) provides an overview of the major trends that are consequently shifting the content, orientation, delivery and structure of TVET systems. These are technology trends, social trends and economic trends. Technology trends shift educational focus from traditional into new and emerging technologies that tend to expand technical knowledge to adapt with the fast-changing technological environment. It is, therefore, imperative for TVET to introduce higher order thinking skills (HOTS) and strengthen curriculum that stimulates problem solving, critical thinking and analysis and strengthen the students' learning to learn skills to cope with technology changes.

Social trends, on the other hand, shift the focus from merely looking at development on economic terms but also in the context of inclusive development keeping in view sustainability, gender parity and greater accessibility of skill development for the disadvantaged groups. TVET as a tool to empower the people need to develop skills that address the immediate skills requirements and promote their accessibility to the informal sector. Moreover, economic trends tend to place more value on knowledge, hence, the need for more knowledge workers to sustain the emerging knowledge-based economy and create more portable and mobile trade and human resources to meet the needs of globalization.

IMPACT OF GLOBAL ECONOMY ON LEARNING

The future impact for learning paradigm in Global Economy emitting in the knowledge era encompasses need to build the capacity of TVET educators to be enhanced so as to make them aware of the potential of ICT in education and training the learners of tomorrow. The educators will have to learn how to use ICT for teaching and learning. There are varieties of ICT tools that are available and being used in integrating ICT into TVET curriculum such as e-learning, blended learning, m-learning, web-based learning. TVET educators need to develop new ways of approaching teaching and learning situation with specialized ICT tools to be used to explore a variety of real-world problems through innovative practices incorporating quality, flexibility, accessibility and convenience. The development of TVET educator's competence in manipulating and using technology is very decisive.

Rupert Maclean and Ada Lai (2011) stressed that education and training of knowledge workers requires different educational policies, facilities, curricula and, above all, teachers. Educators must be transformed from those who impart knowledge to those who facilitate learning. Curricula must be transformed from mechanisms to deliver facts into mechanisms to promote and facilitate learning and thinking. Some writers assert that a competency- based approach to curriculum development can facilitate this transformation.

A policy encouraging continuous, lifelong learning should supplement the 'basic training' of knowledge workers by the delivery of 'just-in-time' education and training when new knowledge is required at the workplace. Many assert that individuals are likely to have three or more different occupations and/or careers during their lifetime. This necessitates workers learning how to learn in order to recycle them when moving from one position or workplace to another.

REGIONAL PERSPECTIVES TOWARDS DEVELOPING THE FUTURE TVET EDUCATOR

Being the largest region in terms of area and population, the Asia Pacific region poses a great potential towards changing the education landscape by using its vast resources and knowledge pool. This role has placed TVET into an important position to supply the global demand for skilled workers.

The region has realized the great potential of teacher development towards the holistic development of their respective societies. This has been shown in the initiatives of the ministries, departments and the private sector in providing new perspectives towards TVET teacher development.

To enforce its mandate towards constantly improving the level and quality of TVET in the region, the Colombo Plan Staff College for Technician Education (CPSC) is constantly advocating program thrusts towards human resource development by conducting relevant activities such as symposiums, dialogues, member country programs and skills development projects. The College is particularly keen on helping member countries in improving their respective teacher training systems through introducing new perspectives and ideas and by inciting healthy discussions, forging agreements, and strengthening institution to institution cooperation.

According to a regional study on the Challenges of TVET in CPSC member countries; there is a high perception among teachers across the region in developing strategic planning and organization of TVET resource development as a way to place holistic reforms on TVET. Although there are a lot of challenges that lie ahead in terms of teacher's development, policy makers should consider prioritizing the creation of teacher training programs and on-the-job training to facilitate teachers' acquisition of relevant knowledge and experience. Exposure on industrial-related training and initiatives are also important initiatives in providing teachers with updated knowledge and experience.

The Hangzhou Declaration of 2004 called for the increase in the profile and professionalization of education of TVET teacher and trainers, and the formation of an international network. This declaration has been a significant milestone in establishing the need to develop and enhance TVET teacher education and development in the region through a regional agreement. This is one of the initiatives where a regional forum was established that significantly discussed and tackled the development of TVET educators.

The role of TVET teachers towards introducing and promoting concepts such as sustainability is equally important and relevant. This has been emphasized on the International Consultation on TVET Teacher Education towards Sustainability held in Chiang Mai, Thailand. The conference collectively identified issues in TVET Teacher Education, and forwarded suggestions and plans of action such as developing inter-agency collaborations, adoption of service orientations, increasing research and development and adopting workplace orientation, among others.

Although there are established initiatives that will guarantee a long term focus towards TVET teacher development, the region still falls short in terms of synchronizing teacher education systems compared to other regions such as Europe and Latin America. European Programs such as the Erasmus, and networked universities are some of the examples of effective integration towards the development of higher TVET education in the past decade. The Bologna Process, for example, has ensured that the internalization is included in the long-term agendas of TVET institutions and has prompted the creation of a European wide network that is akin to a separate sector for higher education.

Both the Bologna and Hangzhou processes are important in forwarding regional initiatives towards globalization and internalization. What the region needs is a similar initiative that will bring together diverse systems into one accepted standard and framework. This will not only bring enhanced mobility but also create new pathways towards information exchange, emulation of ideas and building experiences towards the betterment of TVET teachers.

DEVELOPING TVET EDUCATORS – FUTURE ROADMAP

The new technological, economic, political, social and educational developments that we have taken into account are having significant impacts on technical and vocational education; TVET educators and policy-makers need to look for the best and most-relevant teaching/learning methods, techniques and practices in TVET for their effective adoption, adaptation and appropriate integration in TVET classrooms.

With respect to changes in the world of work, not only has technology extensively created an impact upon the knowledge and skills needed for employment, but, even more significantly, on the precarious nature of employment. These have profound effects on the type of technical and vocational education programs 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 TVET point to the direction of life-long learning and continuing and recurrent technical and vocational education. Such a direction requires the continuing professional development of educators and trainers.

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 TVET 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 TVET and thus, to the preparation of educators to meet those challenges.

As far as the Asia-Pacific region the existing TVET can be categorized in three groups: fully industrialized nations, developing nations and emerging nations. These varying growth and development in TVET have significant impact on the quality, product and services, price and meeting customer demand and their availability. In addition, there is a regional diversity in terms of program offering and qualification of TVET educators. In view of the above, the following innovative initiatives are proposed:

Capacity Building Programs for TVET Educator

Learning for transformation through TVET requires a shift towards a system that better addresses the emerging needs of the world of work. A transformation of (e.g.) mindsets, educational approaches, structures, technical systems and innovative teaching and learning methods is needed. TVET educators can play a decisive role in this transformation and in the sustainable society if sustainable development becomes a framework for a redesign of the structure and goal of organizations and of pedagogical, research and cooperation approaches and methods. Thus, it is essential to build the capacity of TVET educators for the required transformation.

Some of the focal areas include: (1) Curriculum-based faculty training; (2) ICT Technology Skills Enhancement Program; (3) Pedagogical Training and (4) Sequential Summer Program

Establishment of Worldwide TVET Academy

In view of the regional diversity and rising expectations from TVET, there is a need to set up a Worldwide TVET Academy. The proposed TVET Academy will serve as a model agency for quality improvement of TVET educators in various fields of science, technology, management, architecture, pharmacy and other applied areas of TVET. The academy is expected to provide flexible credit based courses to all registered participants using modern technology. The modern technology will involve: (i) Video courses (ii) Web-based learning material and (iii) live lectures using satellite and Internet based technologies. The endeavor of proposing the academy is to serve as an agency of quality improvement to a large section of TVET Educator serving in various institute/schools of TVET in the region.

Beneficiaries of these programs may include high school graduates, qualified trainers, TVET specialists, bachelors, masters and highly qualified persons from trade and business sectors. The future training system for TVET educators needs to be:

Finally, to meet the demands and responsibilities of the new global economy, TVET educators also need to 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.

CONCLUSIONS

We need to discuss with TVET professional and industry leaders who seek to understand the issues and challenges facing TVET schools, because building competent workforce through TVET educators have become critical factors in determining a nation's competitiveness. We need to engage industry and government leaders in a deeper dialogue with the global TVET community and to strengthen their involvement and investment in shaping the future of industry and society through TVET system.

The new knowledge-based economy demands global standards of quality and ethical values. In order to meet these needs, the engineering institutions need to continuously modify and improve the quality of its education based on the paradigm shift-taking place to enhance benefits to the TVET graduates.

Although there is a growing recognition of the importance of promoting sustainable development in education, especially in TVET, promoting and implementing sustainable development concepts and practices depends on the physical, financial and human resources to be readily integrated into the TVET systems. We need to adopt multi-pronged approaches to implement the spirit of sustainable development.

How effectively TVET educators can sustain emphasis on this next driver of change and tap creative potentials of people to develop technologies, business models and above all passion for inclusive development of societies, will determine, not only the future of their own institutions but also our planet.

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PROFILE



Dr. Mohammad Naim Yaakub is currently the Director General of Colombo Plan Staff College, the first Malaysian to be given the responsibility. Prior to his appointment, he was the Director for Policy Development at the Policy Development Division of the Department of Polytechnic Education, Ministry of Higher Education in Malaysia where he handled strategic policy and management directions of the department. He also had an extensive experience in teaching and training and research and development, where he has been able to develop and manage eight TVET research and consultancy projects.

Dr. Naim, as a TVET expert has shared his expertise and knowledge in numerous international, regional and national conferences, seminars, fora, meetings workshops in and outside the Asia-Pacific region through UNEVOC Regional meetings, APEC Forum, CPSC conferences and many others. He had handled numerous projects as Project Manager and Researcher on various subjects such as information technology, monitoring and evaluation, industry-university-institutions relations, and several topics concerning Polytechnic education. He had written several papers for journals, proceedings and publications on wide-ranging topics on industrial training, web-based learning, monitoring and evaluation, research studies on Polytechnics, computer-assisted instruction in technical education and numerous concerns on technical education.

He graduated with a Bachelor of Science in Civil Engineering in 1983 at the University of Wales, Swansea. He took his Masters' degree in Civil Engineering at the University Technology Malaysia and earned his Doctoral degree in Vocational and Technical Education from the Virginia Tech, USA in 1998.

INNOVATIVE PRACTICES IN TED IN TVET: THE MALAYSIAN EXPERIENCE

Mej (K) Md. Nor Yusof

*Director General, Department of Polytechnic Education,
Ministry of Higher Education, Malaysia
mdnor_kpjpp@mohe.gov.my*

INTRODUCTION

Over the years, most nations have given much attention to the development and implementation of human resource programs in Technical and Vocational Education and Training (TVET). We are facing the challenge of improving human resource to respond to sustainable socio-economic development needs, social and cultural issues, unprecedented changes in the world of work, technology, as well as global competition (Majumdar, 2010; Ball & Forzani, 2010; Desimone, 2009). At the global front, changes and innovation in education call for competent educators who are able to adapt themselves to these changes, as well as deliver quality education (Wan Nooraini & Mohammed Sani, 2010a). Training and development activities for Teacher Educator Development (TED) are considered expensive, nevertheless, they are vital elements to accommodate and shape TVET (TBD TVET Teacher Education, 2008; Wan Nooraini & Mohammed Sani, 2010b).

In Malaysia, University Tun Hussein Onn Malaysia (UTHM) (formerly known as KUiTTHO) has been the pioneer and only faculty of training and vocational education. It serves as an anchor in providing the training for educators who will then serve technical schools, community colleges and polytechnics (Jailani et al. 2006). The polytechnics are under the Department of Polytechnic Education (DPE) jurisdiction. At present, there are 30 polytechnics serving various parts of the country (Quick Facts 2011). DPE has come out with vigorous efforts to ensure that the education and training of these polytechnic educators become a continuous effort and process. This is to ensure that we are able to produce well-trained human resource which is highly receptive to professional development (Glen, 2008; Kennedy et al. 2008). We would like to share with you the activities and programs that we have tailored, adapted and adopted to enhance the knowledge, skills, and professionalism of the polytechnic educators so that they are able to deliver effectively, and most importantly, respond to unprecedented and unforeseen challenges. Thus, we have organized activities to promote professional development, assist educators to be well-informed on professional development opportunities as well as foster better working relationships among educators of different levels and positions. The Training and Career Development Division has been responsible in carrying out specific tasks on promoting professional development (Training & Career Development Division, 2011).

Among the activities that we have formulated are:

E-SIS (ELECTRONIC STAFF INFORMATION SYSTEM)

The system was launched in 2005 to improve the efficiency of data management of staff under the Ministry of Higher Education. Making full use of the facility, a data base on polytechnic educators was then created to provide current information on personal and professional particulars. This also includes courses attended by them as well as courses that are made available for all. The system, which is accessible globally, assists educators to plan and organize their professional development needs.

PPK (SKILLS ENHANCEMENT PROGRAM)

The program was introduced in 2007. It has the objective of training polytechnic technical educators to enhance their skills and knowledge on a variety of courses pertinent to their specialized fields. The program relates to hands-on and high technology skills acquisition (computer trouble shooting, E-commerce, PLC Programming Languages and Application).

CPCM (CAREER PETH COMPETENCY MATRIX)

This program ensures that polytechnic educators are able to perform tasks based on specific criteria, knowledge, skills and behaviors. When there is a gap between what competencies educators need to have and what they have not, this discrepancy needs to be minimized by providing a relevant path via professional development programs (Berry et al., 2009; Wan Nooraini & Mohammed Sani, 2010b). Thus, educators of different professional levels and grades are matched with relevant courses accordingly. CPCM also becomes one of the criteria that educators have to undergo to fulfil their promotion assessment. Among the modules offered for CPCM are Research Methodology, Occupational Safety and Health at the Workplace (OSHA), and Strategies for Lifelong Learning and Curriculum Development.

SIP (EDUCATOR INDUSTRIAL ATTACHMENT)

The industrial attachment program is to enrich educators' class room knowledge to that of the real working environment. Educators are attached to a company or an industry relevant to their specialized area for a period of 3 months. This, in turn, will enable the educators to impart new knowledge to their colleagues as well as benefit the students in the polytechnics on the latest technology, machinery maintenance, workshop management and work ethics practised in the industry.

COACHING AND MENTORING

This exercise is considered vital as it provides a platform in establishing a deep partnership between a superior and his subordinates. It empowers a person to gain courage, capabilities and commitment to achieve the department or organization's goals in the most fulfilling way. Novice educators would benefit most from this exercise, whilst for others it forms a platform for sharing ideas and experience.

ENGLISH ENHANCEMENT PROGRAM

In accordance to policy changes, DPE has decided that by 2008, all Science, Mathematics and technical subjects were to be taught in English (JPPKK 2009). Since a majority of the teaching staff received their education in the Malay medium, the directive to teach in English was found to be a difficult task (Wan Nooraini & Mohammed Sani, 2010b). In 2006 to 2007, the Training and Career Development Division formulated the Training of Trainers Program which requires the technical educators to go through a series of training to enhance their English Language proficiency. This was to prepare them for the Teaching of Mathematics, Science and Technical (PPSMTI) subjects in English. Subsequently, in 2008 the English Enhancement Programme (EEP) was carried out as a rebranding exercise to replace PPSMTI program. EEP has the objective of improving the quality of teaching and learning through periodic improvement of the curriculum, interactive learning methods and broaden the usage of the English language.

RESEARCH, DEVELOPMENT AND INNOVATION

The 10th Malaysian Plan has allocated funds specifically to encourage and promote Malaysian polytechnic educators to conduct more systematic research, development and innovative activities. Conducting research has also been included as one of the criteria to be adhered to for promotional purposes. Polytechnics are currently carrying out in-house courses to train lecturers to initiate research. Along with this, academic experts in various subject areas are sourced from within and outside the polytechnic organization to carry out research seminars. Subsequently, many polytechnic educators are now taking a step forward by participating in local and international conferences.

FEDERAL TRAINING SPONSORSHIP SCHEME

The sponsorship scheme offers scholarships for qualified polytechnic educators to pursue their studies at Masters and PhD. levels (locally and abroad). The program is divided into two categories, namely full and partial sponsorship. Studies indicate that educators who undergo a systematic and formal educational process are more likely to benefit and enhance their professional development (Burns, 2008; Glen, 2008b; Valkanos et al., 2010). Thus, polytechnic educators are strongly encouraged to make use of the opportunities to further develop themselves professionally.

RESEARCH, DEVELOPMENT AND INNOVATION

In the polytechnics, it is a norm for educators to assist students on various projects which eventually lead to invention of products. At the same time, these educators are also actively involved in the invention and innovation of products which enable them to present their products to the general public as well as relevant key players in the industries. In line with the need to get the educators to be actively involved in research and development, DPE greatly encourages its educators to present their findings and products. Now, more and more avenues are made available for the polytechnic educators to present in different platforms such as conferences and also innovation competitions. The Polytechnic has also been successful at patenting products which is hoped to eventually lead to their commercialization. Such products that have been developed by the polytechnic educators are the Smart Heat Therapy Machine, Semi-Automatic Agriculture Auger and Smart Tool Kit (PSA 2011).

KIPA (INSTRUCTIONAL LEADERSHIP AND ANDRAGOGY DEVELOPMENT COURSE)

The task of providing teacher training has been carried out by the Department of Teacher Education (DTE). For polytechnic educators who did not have the privilege to undergo the training, DPE has formulated KIPA to ensure that these educators are equipped with instructional leadership capabilities and andragogy development. In 2009, KIPA was made compulsory to all polytechnic educators to replace the post graduate Diploma in Education program as well as teacher-licensing under DTE.

INTERNATIONAL COLLABORATION and FOREIGN EXPERTISE IMPROVEMENT PROGRAM

At all times, international collaborations are encouraged, which seek to foster knowledge and experience in the management of human capital development. These collaborations strategies on building international relations, creating a borderless learning environment and enhancing the global outlook as a whole. We have been very honoured to have participated in academic platforms organized by the Colombo Plan Staff College for Technician Education (CPSC), Southeast Asian Ministers of Education Organization (SEAMEO), Regional Centre for Science and Mathematics Education (RECSAM), Vocational and Technical Education and Training (VOCTECH), and also the Korean Central Officials Training Institute (COTI).

We also have had the opportunity to be involved in the "In Country Program". To date, the program was jointly organized by the hosting countries such as England, Ireland, Germany, Italy, France, Canada, Australia, New Zealand, India, China, Japan and South Korea. Each year, an estimated number of 60 officers are involved in this program which is carried out for a duration of one to four weeks.

These are some of the activities and experiences of DPE in promoting professional development among our polytechnic educators. It is hoped that the Malaysian experience will be able to provide meaningful insights for all TVET stakeholders to further share, improve and emulate best practices with regard to Teacher Education Development (TED) in TVET. This is the time for us to move on and head for transformational directions, and specifically focus on new efforts to develop human capital and capabilities.

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PROFILE



Mejar Md. Nor Bin Yusof, currently the Director General of Polytechnic Education Department, the Ministry of Higher Education Malaysia, holds a Master of Science in Computer Integrated Manufacturing from the University of Loughborough, England in 1993 and a Bachelor's degree in Mechanical Engineering from the University of Liverpool England in 1980. He has been in the polytechnic education system since 1981. He started as a Lecturer at Polytechnic Sultan Haji Ahmad Shah and Polytechnic Sultan Abdul Halim Mu'adzam Shah in the 80's before being promoted as the head of unit for almost two years between 1988 and 1989. Then, from 1999 to 2001, he became the head of Engineering Department at Polytechnic Ungku Omar. Beginning 1st October 2001 until 3rd April 2010, he was appointed as the Director of several polytechnics in Malaysia including Polytechnic Johor Bahru, Polytechnic Tuanku Syed Sirajuddin and Polytechnic Sultan Abdul Halim Mu'adzam Shah.

PANEL DISCUSSION 1

*Preparing TVET Educators in knowledge
Society: Perspectives and Strategies*

GENERIC SKILLS DEVELOPMENT FOR 21st CENTURY LEARNERS: THE MALAYSIAN SCENARIO

Datuk Mohlis Jaafar

*Deputy Director General, Department
of Polytechnic Education,
Ministry of Higher Education, Malaysia
mohlis@mohe.gov.my*

INTRODUCTION

Profound changes have emerged in the workplace today across all sectors and occupations. According to Callan (2004, p.7),

...“A major challenge is to continue to prosper in a global economy in which individuals are expected to have and an ability to work across a range of jobs”...

This, in turn, has given a rise in the importance of generic skills. Generic skills are the general skills, qualities, knowledge, abilities and traits a person should possess to succeed in one’s studies and career, which include skills in managing information and resources, developing interpersonal skills, communicating ideas and information, solving problems and being tech-savvy. These skills are not specific but are skills which cut horizontally across all industries and vertically across all jobs from entry level to chief executive officer (Bellanca & Brandt, 2010).

The industry needs graduates possessing these generic skills. The various sectors in the industry require skills which can be applied to different situations. Consequently, the growth of generic skills among existing cohorts of workers is moving to a higher level (Dickerson & Green, 2002). Hence, curriculums have been refined to cater to this rising needs of producing highly employable and marketable graduates to meet the demands of the industry. In developing these skills, learners in higher learning institutions are exposed to more than just academic knowledge and technical skills.

These skills have been integrated and accentuated in the present higher education system and incorporated in the National Higher Education Strategic Plan in which the aim is to produce graduates who are

- knowledgeable and competent in their fields
- able to put into practice the knowledge gained
- innovative, possess high cognitive skills (analytical and critical, problem solving and reasoning abilities)
- multi-lingual and could communicate effectively as well as technology savvy
- equipped with soft skills, good values and contribute to the well-being of the society, nation and the global community. (Radin Umar, 2008)

GENERIC SKILLS FOR MALAYSIAN POLYTECHNIC STUDENTS

In line with this, polytechnics across the nation are striving towards obtaining Malaysian Qualification Accreditation (MQA) for their programmes. MQA has come out with guidelines on eight domains of competencies that should be given emphasis by higher education providers. Of the eight domains, six refer to generic skills namely:

- i. Social skills and responsibilities
- ii. Values, attitudes and professionalism

- iii. Communication, leadership and team skills
- iv. Problem solving and scientific skills
- v. Information management and lifelong learning skills
- vi. Managerial and entrepreneurial skills

The inclusion of these skills into the curriculum plus the recognition of MQA certification are vital in assuring the quality of graduates produced by higher learning institutions to be wholesome and industry-ready. We want to produce graduates who are progressive, competitive and marketable – always looking to expand, move forward and striving to reach greater heights. These graduates are able to complete globally and be accepted immediately to fulfil the current market needs.

EFFORTS TAKEN BY MOHE TO ENHANCE THE GENERIC SKILLS OF THE 21st CENTURY LEARNERS

Today's learners, as described by Rodgers et al. (2006), are “digitally mobile, experiential and social and to whom computers are not technology, they are just part of the life experience background”. The world to them is digital, audio and text and similar approach is expected in the classroom. E-learning programmes have been introduced by the Department of Polytechnic Education (DPE) since October 2007. Curriculum Information Document Online System (CIDOS), a curriculum management system application was developed to provide an integrated platform for keeping, sharing, collaborating and evaluating curriculum and teaching and learning materials to be used by polytechnic lecturers and students alike. The use of this application was carried out in phases according to the capacity of the ICT facilities at the respective polytechnics. Starting March 2009, a Proof of Concept project for e-learning using CIDOS has been implemented at polytechnics and 1,444 lecturers were trained to handle this e-learning application.

Apart from that, 60 multimedia Learning Object (learning modules) contents have been uploaded into the system currently used online by the students and lecturers. This application reinforces the teaching and learning process which includes sharing learning materials, academic discussion (forum), evaluation, assessment and observation of students and lecturers performance online simultaneously. These elements in the teaching and learning process are in the form of two-way communication. This application also enables the use of blended learning approach which includes simulation and teaching and learning video to support the various approaches in learning. Furthermore, it allows learning to be carried out in the computer labs in polytechnics and anywhere else as long as there is access to the internet. Until now the CIDOS application has been developed in line with the enhancement of ICT infrastructure in all 30 polytechnics under the Malaysia Ministry of Higher Education (MOHE).

In line with the rising importance of generic skills in the job market, (MOHE) has introduced Malaysian Soft Skills Scale or My3s. The My3s Survey is carried out by MOHE at all public and private higher learning institutions in Malaysia, covering seven generic students attributes (GSAs): Communication; Critical Thinking and Problem Solving; Teamwork; Moral and Professional Ethics; Leadership; Lifelong Learning & Information Management; and Entrepreneurship. The assessment is done three times, namely when students enter learning institutions, mid-term and when they complete their studies. The purpose of this assessment is to ensure all higher learning institutions are able to produce students who are equipped with academic qualification as well as My3s when they enter the job market. Students of local universities will be awarded with not just certificates of their academic achievements but also a Malaysian Soft Skills Scale certificate (My3S).

These soft skills are vital as we would like our graduates to be holistic, excelling not just academically, but also in communication and interpersonal skills. These aspects are part of the most important package they will need to enter the job market and enhance their marketability. The ministry had set a key performance index (KPI) to ensure that more than 85 per cent of students at public higher education institutions fulfil the minimum standard of seven GSAs. The Minister of Higher Education of Malaysia, Datuk Mohamed Khaled Nordin has stressed that we need graduates capable of giving views and ideas on how to develop the country for a brighter future.

The Ministry's latest effort in addressing this issue on generic skills attributes is the Special Projects on Incubation, Coaching and Entrepreneurship or SPICE. SPICE is an outcome from a special workshop known as TIME or Transferring Initiatives to Enhance Marketability and Entrepreneurship. The workshop, held in two sessions, aimed to developing a programme that is integrated and holistic based on input received from Entrepreneurship Program Coordinators from all polytechnics. SPICE cuts across the curriculum and students' clubs and association. It was organized to benefit majority of the students throughout their studies in polytechnic.

SPICE was developed in line with the objectives and transformational plan of DPE and MOHE's Entrepreneurship Policy. It is also parallel with several elements in the Economic Transformation Plan (ETP) and National Key Economic Areas (NKEA). This program takes into account the shortcomings faced by entrepreneurship coordinators at each polytechnic and optimizes support from the industry and polytechnic alumni.

SPICE was developed to achieve the following objectives:

- i) To inculcate and give exposure on entrepreneurship skills to all polytechnic students to enable them to meet challenges, be competitive, hardworking, committed and resilient.
- ii) To reduce unemployment rate among graduates and create an environment of 'job creators' as opposed to 'job seekers'. This allows graduates to become more independent, without having to rely on job opportunities in the market.
- iii) To establish and enhance collaborations between polytechnics and external bodies (government and private agencies, alumni, industries and business-related sectors).

SPICE is implemented in two phases. The first phase or the Pre-implementation is carried out between August and December 2011. The first phase is important and critical in identifying weaknesses in the components of the project in achieving the targeted outcome and to ensure the success of the second phase, which is the Full Implementation Stage. The second phase or the Full implementation stage will be in January 2012 until December 2015.

CONCLUSION

In order to transform Malaysia into a fully developed nation, institutions of higher education must play an important role in generating human capital armed with a wealth of practical knowledge and suitably equipped with adequate generic skills. MOHE has taken several steps in ensuring that this generic skills issue be addressed by our learning institutions as they are among the basic yet essential skills needed by graduates to be employable and marketable in the industry.

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PROFILE



Datuk Mohlis Jaafar is the Deputy Director General of the Department of Polytechnic and Community College Education under the Ministry of High Education, Malaysia.

REGIONAL CO-OPERATION PLATFORM ON VOCATIONAL TEACHERS' TRAINING IN ASIA

Dr. Thomas Schroder

*Project Director, Regional Cooperation Platform
Vocational Teacher's Training and Education in Asia
GIZ - China
thomas.schroeder@giz.de*

INTRODUCTION

The Regional Cooperation Platform (RCP), Initial and Continual Vocational Training of Teaching and Management Personnel in Vocational Schools in Asia is being financially supported by the Federal Ministry for Economic Cooperation and Development (BMZ) of the Federal Republic of Germany until December 2013. The goal of the RCP is to offer a forum to universities and institutions concerned with the initial and continual training of vocational teachers which enables an exchange of pertinent knowledge and experience. Furthermore, joint activities are to be initiated, such as the planning and implementation of transnational research projects, conferences, training measures and capacity building measures which are aimed, above all, at independent vocational education research. The involvement at a policy level in the partner countries is to support and back the introduction of necessary reforms.

The region's "Southeast Asia plus China" is an extremely dynamic economic region. All the countries participating have high growth rates but nonetheless simultaneously feature considerable deficits in their vocational education system.

Amongst other things this affects the quality and quantity of vocational school educators and managers. Working together on the modernization, harmonization and mutual recognition of the regions' national educational system qualifications and most vitally in the certification of vocational college educators is fundamentally imperative. In the ASEAN region including the Peoples' Republic of China we are only at the initial stages. In view of the cooperation in the ASEAN (+3) area the necessity of this work is unquestionable. The further development of such an integration process, however, requires support. This applies to the universities and institutions for the advance training of teachers working and in particular to the reform of vocational teacher training and management training courses.

Adapting to the differing demands has, thus, far concentrated too little on the regional aspects that focus on integration.

A further requirement for integration in the field of vocational education arises from the need for a shared common vocational pedagogical goal-setting. This is to be accomplished by integrating a redesign of the various fields of activity in vocational education. The essential elements of these are: the didactic-methodological orientation as a foundation, the development of the curriculum, equipping the work and learning spaces, the organization and design of vocational and operational learning arrangements, converting the design of the relevant teaching materials and vocational examinations (assessment) and the initial and further education of vocational teachers and vocational training personnel.

COMPREHENSIVE COMPETENCE IN VOCATIONAL ACTIVITIES AS A KEY VOCATIONAL PEDAGOGIC OBJECTIVE

In the last two decades the discussion in vocational pedagogy as a scientific field in Germany, the concept of comprehensive vocational competence as a broader concept compared to the concept of qualifications has become the key objective in the vocational and professional education processes.

While what is defined by the term qualifications indicates specialized knowledge, abilities and skills what arises from real business demands, the notion of competence presents a crucial expansion that places the individual at the centre of the vocational education process.

The goal of vocational competence development is to make a person capable of independent activities in a societal, professional and political context. The competences at stake here are skills, methods, knowledge, attitudes and values whose acquisition, development and implementation will apply to that person's entire life (see Dehnbostel 2001) and also be transferable.

To increase the individual's capacities to act independently in complex work relations is the goal of the vocational education process. As a result the individual sees what work activities are required to make a vital contribution to the success of a task, he is able to think himself into the work processes. The prerequisite for this is to have experienced the work process itself during the educational process.

The competence in vocational activities is transferred through pure expertise. It is defined as a unit of the primary competences -technical, social and personal competences which in turn, are the prerequisites for the development of method competence and teaching competence (cf. KMK 2000, p 9).

Even if the differing competence dimensions are analyzed in many graphic models, in practice the competences are mutually dependent:

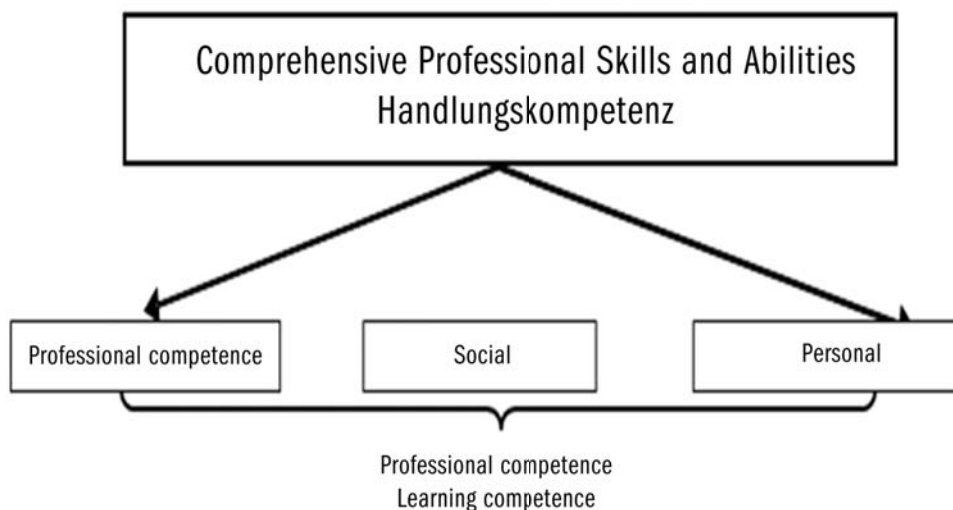


Illustration 1: Model of Comprehensive Competence in Vocational Activities (Schröder 2004a)

In the development of basic curricula "recommendations for the preparation of framework curricula for vocational lessons" the three major competences were defined as follows:

- "Professional competence is the readiness and ability, based on specialist knowledge and ability, to independently assess and solve tasks and problems in a correct, goal-oriented, methodological manner.
- Personal competence describes the readiness and ability as an individual personality to deal with development opportunities, demands and restrictions in family, professional and public life. Furthermore, to think through and assess one's own gifts in order to develop them and accommodate them and progress in one's life scheme. It should encompass personal properties such as independence, critical ability, self-confidence, reliability, responsibility and a sense of duty. To all of these aspects a thought-out vision of the world and a self-determined connection to values are integral and essential.

- Social competence describes the readiness and ability to form social relationships, to show interest and understand tensions and to understand how one makes oneself comprehensible and discuss with others in a rational and responsible way. To all this the development of social responsibility and solidarity are essential. (KMK 2000, p. 9).”

The subject oriented teaching method underlies the idea behind competence development. Competence development is defined as the individual ability for self-directed learning and is founded on a certain structural image of the learning person. Thereby the performance as surface structure will be contrasted analytically with the human behavior regarding perceivable acts of competence as a deep structure which encompasses the levels of thinking, acting and attitude patterns and those that underlie the surface structure. Competence development aims, in this respect, for a long-term transformation of this deep structure by confrontation with the environment (cf. Heursen 1983). With a view to competent dealing at work the activities competence does not just have the potential but also contains a “decision-making competence” to apply a designated competence appropriately (cf. Zimmer 1998).

Competence development as the key objective of vocational education offers the opportunity to anchor activity-oriented, individualized and holistic teaching and development potentials. Thereby competence supporting teaching forms and situations, first and foremost, keep the competences active. This is achieved by means of the activities themselves, they are specifically situational and not to be acquired merely by instruction alone. This method recognizes the fact that individual self-direction and learning from experience crucially influences the intended competence development. This means that for vocational-operational, further training major emphasis has to be placed on experience learning, informal learning and especially on the learning in the work process (vgl. Dehnpostel/Rohs 2003).

In referring back to the fields of activity of vocational education addressed in the introduction the following consequences arise:

- The didactic-methodological organization of the vocational learning process is derived from the respective requirements of the work experience in the light of future development tendencies. Work process orientation and activity orientation in real and holistic activity situations are the constitutive fundamental element of the competence oriented didactic-methodological approach.
- The development of curricula takes real activity fields as their object and implement them in the field of learning. They enable a self-directed and active competence development process in work projects.
- Work and learning spaces whether in formal educational facilities or in enterprises enable access to vocationally relevant practice and theory. The implementation of vocation-specific projects and work tasks must, in the ideal case, be facilitated under real operational conditions and linked to relevant theoretical input.
- Learning arrangements must be formed in such a way that independent learning in ideal types or real operational work tasks is made possible. Through these projects or learning and work-tasks methodologies can be attained.
- Vocational examinations have to be activity and work-process oriented on the basis of holistically real or ideal-typical work tasks in which the appropriate development of complexity for learning progress is reflected.

And finally:

- The teacher training must take into consideration the previously described vocational pedagogic requirements of a modern vocational education. This methodological- didactic focus must also be integrated into university education and mere lecturing at the expense of learning by doing reduced to an absolute minimum.

The demands of modern vocational pedagogical orientation do not only refer to formal educational establishments. The praxis of operational education can actually encash these requirements.

The RCP intends to provide a competence oriented education at the university level of vocational teacher training education.

PRACTICAL IMPLICATIONS FOR THE RCP AND ITS STATE OF DEVELOPMENT AT THIS MOMENT IN TIME

The Regional Cooperation Platform consists right now of six universities located in China, Laos, Vietnam, Thailand and Indonesia. Other universities are aiming for membership. The Ministry of Labour, Invalids and Social Affairs (Vietnam) is also an active participant in the RCP.

The strategic development and focusing of the RCP has been developed as a multi-stage process together with partner universities. Activities for the coming two years have been described in a joint adopted operations plan. The operations plan assembled by the deans of the partner institutions was adopted by the Steering Committee of the RCP.

The RCP Secretariat is responsible for the implementation of the activities and professional consulting for the work undertaken in February 2011, at the premises of the IBBat Tongji University. The position of project-head has been filled by a German as of September 2011 and the position of project-coordinator has been occupied by a female Chinese expert as of June 2011. The RCP Secretariat is responsible for the running of projects. Amongst its tasks, the RCP Secretariat coordinates the work of partner universities, administrates and monitors the carrying of project activities and ensures the quality of research as well as its transfer and adaptation.

A particular emphasis is placed on the implementation of transnational research and capacity building measures. In terms of the capacity building, four different elements are to be addressed. The capacity building approach is to support the research process procedure via elements of monitoring and relevant inputs and workshops:

Capacity Building I: “Technologically specialized inputs and workshops”

In 2012 extensive self-organized inputs and workshops on specialized themes such as the “standardization of Vocational Teacher Training”, “Activity Orientation in the Lesson” and “Strengthening the Orientation to Practice” are to be held at a technologically specialized level

Capacity Building II: “Specialized Coaching“

From the beginning of 2012 a system of specialised specialized coaching is to be implemented in which the research teams will be supported by the maintenance of international scientific standards, advice on research processes, ensuring of quality assurance and, if applicable, enabling a best practice transfer. The concept intends to involve a needs-oriented German scientist by means of selective attendance phases and procedural cooperation through the use of new media in the creation of studies.

Capacity Building III: “Research Methodological Inputs and Workshops”

It is clear that the university staff at the partner universities only possess limited research practice.

- The research capabilities are to be strengthened by a series of workshops on the subject of “Development of Research Proposals” to take place from the beginning of November 2011.
- In December 2011 numerous lectures and workshops on the subject of the “Development of a Research Design within the paradigm of Action Research” are to take place.
- At the end of February, beginning of March 2012, a study tour to Germany will be carried out.
- In June 2012 a one week future workshop at Nanyang Polytechnic will take place. At the end of the workshop the partner institutions are to draw up a development plan based on the thoroughly successful concept of the Nanyang Polytechnic to adapt into their own institutions.
- In August/September 2012 a series of workshops are to be run which covers the methods and procedures of empirical social research.

Capacity Building IV: “project implementation oriented inputs and workshops”

Further capacity building measures pertain to the work at the RCP Secretariat (planning workshop/ beginning of 2012), briefing of the administration employees at the partner universities by the financial officers of the respective GIZ regional branches (December 2011/January 2012) and the training of the Phönix Contact company in Germany on company training equipment.

OUTLOOK

The RCP can only establish itself as a platform for the long term through joint activities and a joint exchange when common goals are pursued and successfully implemented. A common vocational pedagogic target with a solid foundation for the future and an efficient vocational education system can be seen as a vital prerequisite. In chapter 2 a potential vocational pedagogic target will be formulated, which will construct a framework that will provide design scope for national and sector distinctiveness, which will strengthen and focus on the learning individual. It will contrast the existing forms of vocational qualification with a holistic notion of vocational education that places the individual at the centre of the discourse.

For a central goal of the partner universities, the improvement and unification of vocational teacher training education in the partner institutions’ countries arising from a common understanding of vocational education central funding for the joint work is indispensable. The target of partial unification of vocational teacher training education would be generally regarded as difficult and ambitious, but nonetheless could also lead to the desired regional effects of a comparability of education qualifications.

With a view to the end of financial funding by the German government, special attention for carrying out the project should turn to the creation of a financially sustainable basis beyond the funding period. New members are very welcome to the RCP and are invited to contribute conceptually and in terms of content to the RCP’s further development.

PROFILE



Dr. Thomas Schroeder is currently the Project Director of the Regional Cooperation Platform on Vocational Teacher’s Training and Education in Asia (RCP), GIZ in China. He is also a consultant for international cooperation in the field of vocational education and training in Egypt, Albania, Ethiopia, Indonesia, Kyrgyzstan, Kosovo, Montenegro, Sri Lanka and Vietnam

He obtained his apprenticeship degree in Civil Engineering in Lubeck, Germany and Constructural Engineering in English for a vocational teaching certificate at the University of Hamburg. He has been conferred with a Doctoral degree in the field of vocational education and training by the Institute of Vocational Education and Further Training, Helmut-Schmidt-University/University of the Federal Armed Forces in Hamburg, Germany.

Track A

*Good Practices and Emerging Challenges for TVET
Educators' Development: Regional Experiences
(Country Perspective Presentations)*

GOOD PRACTICES AND EMERGING CHALLENGES FOR TVET TEACHERS: REFLECTIONS FROM AN ENGLISH PERSPECTIVE

Dr. Norman Lucas

Head

*Lifelong and Comparative Education Department
Institute of Education, University of London, England
n.lucas@ioe.a.c.uk*

INTRODUCTION

Europe is in itself somewhat problematic given its history, culture and present position within the Euro-crisis. Even without those diverse traditions it is hard to generalize across the region of Europe as the initial training and professional development of teachers of vocational education and training (TVET) are quite different. For example, the training of TVET teachers in Germany or Finland is quite different from Italy or France, to say nothing of England.

England does not provide separate courses for the training of college TVET teachers. They follow the same training as general subject teachers. (This is unlike some other European countries.) TVET teachers in industry are known as ‘trainers’. The focus of this paper is on TVET or vocational teachers in further education (FE) colleges. In the English context these colleges exist somewhere between schools and universities offering a very diverse range of vocational and general courses to a wide range of adult learners. One of the problems in the initial training and professional development of these teachers is that teacher-training courses cannot properly support the diverse subject or vocational expertise of the trainee teachers. Instead the teacher training relies on the workplace to provide TVET and other teachers with specialist support.

What I propose to do in this paper is to outline the position of TVET teachers in England and the government’s attempts at regulation. From this I shall argue that although TVET teachers are treated differently from other teachers, the biggest single challenge arising from my analysis and research is the poor focus and policy emphasis on supporting TVET teachers in the workplace. This weakness I suggest is not only relevant to my own country’s context but can be applied to TVET teachers in many other national contexts in Europe and beyond.

In developing my analysis this paper will draw upon findings from three studies (Lucas and Unwin 2009, Lucas and Nasta 2010, and Lucas, et. al 2011). I shall focus on the extent to which TVET and other teachers in colleges in England are supported by their institutions during the time they spend on in-service teacher training programmes. The paper sets the policy context and situation regarding the regulation of TVET teachers in England. It then proceeds to draw upon theories of workplace learning that can be applied to any national context. The theories are developed as a means of conceptualizing both the nature of in-service teacher training and colleges as workplaces. In particular, it uses a framework to identify the extent to which colleges can be said to provide appropriate learning environments for trainee TVET teachers. Finally, the findings of the research and their implications are presented and discussed. I shall argue that supporting TVET teachers in the workplace remains a major challenge for the sustainable development of TVET teachers.

SETTING THE POLICY CONTEXT IN ENGLAND

The history of teacher training in further education colleges in England is set within the context of the haphazard nature of the growth of FE colleges and their relative neglect, in comparison to schools, by

successive governments (Huddleston and Unwin 2007). This, in turn, reflects the diverse nature of FE, the marginalization of vocational and technical education and the long-held perception of many teachers and managers in FE that vocational or subject expertise was in itself an adequate basis for teaching (Lucas 2004). Such a context produced a culture in further education where many teachers' identity was primarily tied to their subject or occupational expertise, resulting in diverse and fragmented practices and professional cultures (Robson 1996; Lucas 2004). As the FE sector has moved up the political agenda, it has become subject to greater regulation. As far as the training of teachers is concerned, the key changes were heralded by the introduction in 1999 of employer-led national standards for teaching and learning (FENTO 1999), and the mandatory requirement for all FE teachers to gain a nationally recognized qualification in 2001. In its 2003 study of FE teacher training, OFSTED (The Office for Standards in Education, Children's Services and Skills) highlighted three areas of concern: (1) a lack of consistent support given to trainees in the teaching institutions; (2) a lack of systematic mentoring in the workplace; and (3) trainees' progress was being inhibited by insufficient observation and feedback on their teaching. The Government's response to the OFSTED report was the announcement that, from September 2007, all new teachers in the 'learning and skills sector' would be required to take at least one of three new teaching qualifications. Trainees would be given access to subject mentors in the workplace who were to be guided by national standards (sometimes with national subject specifications as well). Alongside this, all new full-time teachers and those qualified from 2001 are required to work towards Qualified Teacher Learning and Skills Status (QTLS). For this, teachers have to provide evidence of 30 hours continuous professional development (CPD) per annum.

These new requirements mean colleges must take the whole question of CPD and workforce development more seriously and embed ITE programmes within their broader workforce development strategies. The thinking behind the recent reforms, however, is still influenced, to some extent at least, by the school ITE model, and, as such, fails to take sufficient account of the more fragmented nature of professional identity and culture in FE, the dynamic changes to curricula, the non-graduate profile of many FE teachers, the changing role of the FE TVET teacher, and the diversity of learning contexts in FE (Lucas 2007, Lucas and Nasta 2010). The onus for CPD and gaining QTLS is on the individual FE teacher, not the employer. In the school context, teachers are all graduate, pre-service trainees with NQT (Newly Qualified Teacher) status that carries entitlements to a reduced teaching load and CPD taking place within a well-established framework of support for trainees (Thompson and Robinson 2008).

Findings from a recent research (Lucas et al 2011) show that after a decade of reform, successive standards and regulatory frameworks have not brought about coherence and in many respects have fragmented the system even further. The overwhelming message from those who have had to design ITT programmes for TVET teachers and others in response to quickly changing standards and assessment requirements is that being forced to play a game of complying with external standards and regulations has diverted attention from addressing more fundamental weaknesses such as developing stronger mentoring support in the workplace and achieving a better synergy between the taught and practice elements of courses.

After a series of standards-led reforms the systemic weaknesses identified in the HMI survey (Ofsted, 2003) mentioned above has not been successfully addressed. The central theme from the findings is that standards and regulatory regimes very rarely have the effects that their authors intended. Indeed the findings suggest that good practice for the professional development of TVET teachers requires a more flexible, less prescriptive approach that allows for specifications to be interpreted within different contexts, actively encouraging variation and innovation both in the taught courses and the workplace to meet the diverse needs of TVET trainees.

Achieving sustainable learning of vocational/TVET teachers by focusing on the workplace as a 'learning environment'.

This section will draw upon some of the major tenants of the work-based learning literature and will apply them generally to the training of further, vocational and adult education teachers. My starting point

to teacher's learning in the workplace is the assumption that learning to teach is a 'situated process' that takes place in and between contexts highlighting the importance of seeing learning as a social process and that the basis for analyzing learning should be the 'community of practice' (Lave and Wenger 1996). This provides a means of understanding learning as 'participation' not to the 'individualized', 'learning as acquisition' (Sfard 1988) that underlines the standards led model described above.

While much of the work-based learning literature emphasizes the social participatory aspects of learning in 'communities of practice', such participatory aspects of learning need to be balanced by reiterating the importance of the disposition or perceptions of individual learners in the process (Hodkinson and Hodkinson 2004). Alongside individual agency another important factor to consider is the different departments in colleges that provide different opportunities depending upon their subject culture and way of working. Engestrom (2000) uses Activity Theory to understand the relationship between learning within and between contexts by conceptualizing workplaces as made up of a series of interconnected and conflicting 'activity systems'. I wish to suggest that in a typical further education college in England, groups that make up departments are best understood as conflicting and interconnected communities. This is what Billet (2002) calls 'workplace cliques' where some workers are restricted to what others are engaged in and where individuals have particular ways of working. In other words, colleges have a whole number of activity systems often based upon vocational and subject cultures (Becher 1989) that reflect distinct ideas about how 'their' subject is best taught and what should or should not be in the curriculum. This is illustrated in one study of teachers that found quite different collaborative and non-collaborative cultures in different subject departments (Hodkinson and Hodkinson 2004). In another study of adult basic skills teachers, researchers found different attitudes towards whole class teaching and group work depending upon a subject area (Lucas et al 2006). In further education colleges, what constitutes 'best practice' in teaching and learning is contested and often differs between departments and subject/vocational cultures.

Seeing colleges as a series of competing and conflicting activity systems has important implications for a trainee teacher learning in the workplace. Fuller and Unwin (2004) using Engestrom's notion of restrictive and expansive learning, distinguish between 'expansive' and 'restrictive' learning environments. Some of the dimensions that are contained in an expansive learning environment are, opportunities to engage in multiple communities of practice at and beyond the workplace, access to a multidimensional approach to the acquisition of expertise and the opportunity to pursue knowledge based courses and qualifications.

While learning environments may not simply fall into expansive and restrictive, it is worthwhile using Fuller and Unwin's distinctions to identify factors in a college-learning environment that could be considered expansive or restrictive for vocational teachers. For example, it could be argued that a learning environment that offers diverse forms of participation provides expansive learning. Or a restrictive one in which vocational or general teachers participate within a narrow subject-focused range. A learning environment that encourages team-work and collaboration compared to one where teachers are isolated in classrooms/workshops or where innovation is discouraged or encouraged and so on. Using these distinctions does connect with concerns raised by a recent study of adult basic skills trainee teachers where many trainees' practical teaching experience was restricted to within one level and one context of teaching (Lucas et al 2006). This finding has been reinforced by a recent report by the inspectors who commented that there were insufficient opportunities for trainee teachers to teach at different levels and in different contexts representing a limited teaching experience both in terms of breath and depth (Ofsted 2009). This would be hard to describe as an expansive learning environment.

According to Billet (2002), what is now needed is a 'pedagogy for the workplace' to help understand and assist workplace learning. In my terms this requires an understanding of how trainee FE teachers can best learn through experience. The key elements in Billet's 'pedagogy for the workplace' comprise of intentional structuring of participative activities, the realization that there are different kinds of workplace participation, and contexts and individuals will need varying levels of support. Success depends upon the planned supported opportunities provided to trainees to participate in activities that are sequenced

from low to higher levels of criticality. Given the diverse experience, backgrounds and qualifications of FE teachers, particularly vocational teachers, (Lucas et al 2004) individuals will engage differently with what is offered, and it, thus, follows that a teacher undergoing 'initial training', particularly given that most trainees are undergoing in-service ITE programs, can be seen as a beginner, competent or expert depending upon the situation and the task.

The analyses developed above have suggested that seeing the learning of teachers against a set of national specifications is a narrow understanding of teacher learning. When this is combined with providing one mentor in the workplace who only meets the trainee once or twice cannot cater for the varied and multiple learning needs of teachers. The emphasis suggested above is to give multiple opportunities for participation and learning with many mentors or 'experts' that can build upon subject specific acts of teaching. Such an approach characterizes the learning of trainee teachers in the workplace as a complex relationship with many people and many communities, which differs according to the individual needs of trainees. Such an approach is reinforced in the research of in-service teachers discussed below.

The learning of vocational/TVET teachers in the workplace: What the research shows

The following points are drawn upon a recent research project (Lucas and Unwin 2009) carried out among a range of mainly vocational teachers undergoing in-service teacher training in further education colleges. This study revealed a picture of the ways in which the demands and pressures that shape the everyday workplace in further education colleges restrict the capacity of trainee teachers to learn and develop their professional expertise at work and also to build from their off-the-job learning. It also reveals how complex learning is in the workplace and the value of providing multiple opportunities for learning and providing many mentors or 'experts' that can build upon and support subject specific acts of teaching.

From the research, four broad themes emerged. The first theme was the dominant identity of trainee teacher as a productive worker both on the part of the college management and the trainees themselves. For example only 10% were receiving remission from their contracted hours to study for their teacher training courses over and above attending the mandatory taught sessions. The majority spoke about how they had struggled to balance their college workload with their studies. The result of this was that trainees felt they were not getting the maximum benefit from their off-the-job learning and spoke of the difficulties faced in preparing their assignments. This was particularly the case with vocational teachers who struggle with the academic requirements of the assessed part of the course. The comments from the teachers reflected how the in-service trainee teachers were perceived by their colleges as productive workers and, hence, did not benefit from the protected status of the dual identity of trainee (learner) and worker. In other words colleges did not respect the important principle of bestowing on trainees, the dual identity of learner (trainee) and worker, with all that entails in providing practical support to trainees from more experienced colleagues and a reduced teaching load to provide time for trainees to benefit from off-the-job learning and to reflect upon and experiment with their learning. The teachers themselves regarded this as a simple fact of life.

The second theme to emerge from the research was the way in which the initial teaching qualifications and professional development of teachers relied on the goodwill and determination of the teachers themselves in the face of little support from elsewhere. Teachers when interviewed spoke of how there was very little their colleges could do to improve matters due to the daily pressures to put teachers in front of students, inadequate funding to recruit extra teachers, and the general problems faced by their managers. The new requirement for FE teachers to acquire their 'license to practice' described above, had not really changed the culture within colleges. The change from a voluntary to compulsory teacher-training system enabled colleges to exploit their trainee teachers, many of whom are willing to accept the fact that they will have to study in their own time and 'survive' the training with little support while doing their contracted teaching because they were keen to make a career in FE teaching.

The third theme to emerge was the extent to which teachers learned in the workplace through informal learning and sharing of expertise as part of everyday practice. This theme emerged because part of the research project asked teachers to keep 'learning logs' (see Fuller and Unwin 2004b) for a number of weeks to provide a record of how and what trainee teachers learn within the workplace. An analyses of the logs showed that teachers learn from and share ideas with a range of colleagues, including fellow trainees, as part of the social engagement involved in their everyday workplace practice. Interestingly the data showed that trainee teachers hardly ever recorded learning as part of an encounter with 'officials' such as the staff development officer or manager. Also none of the logs recorded a learning encounter with their mentor. This is particularly significant because the teacher training reforms described above relies on mentors to give subject specialist support. This is a fundamental outcome of the reforms. The data showed that, whilst the majority of trainee teachers had been allocated a mentor, they rarely had contact with them and learned in more informal ways within departments with other colleagues. There was evidence of some good intentions on the part of managers and mentors but these often did not materialize because of the struggle to find time and space. Effectively this sometimes resulted in trainee teachers getting no subject-specialist mentoring. This was often the result of the fact that teachers and manager come and go through the day and evening, some full-time, some part-time. FE teachers and managers are under pressure from many different directions. Some teachers spend more time out of college; for example monitoring and assessing students on work-based programmes. In other words typically the community of practice of teachers in FE is fragmented and fluid, dissolving and then reforming through the day. Putting all these factors together illustrates how difficult it is to provide consistent and reliable support for trainee teachers in the college workplace.

The fourth and last theme that became apparent from the research was the separation of the initial TVET teacher training from the workforce development and organizational strategy of the colleges. The mandatory requirement for all vocational or general college teachers in England to acquire a teaching qualification means that, regardless of the length of their actual teaching experience, they participate in a form of apprenticeship. This involves a dual mode of formation training comprising of time spent off-the-job attending taught sessions and the development of professional expertise on-the-job in their role as a teacher. It was apparent from the research that initial training provision in most colleges is very much conceived of and practiced as a tightly bounded process that is completely separate from colleges' continuing professional development (CPD) programmes or workforce development provision more generally. In terms of their support of trainee teachers, too many colleges are characterized by restrictive features of job design and work organization.

It became clear from the data that the learning which takes place as part of everyday practice as teachers engage in new learning (with colleagues, students and others) often occurs in spite of the restrictive nature of the workplace environment. The challenge for colleges is to render this learning more visible and, importantly, seek to create conditions that enable this learning to be fostered, sustained and enhanced. This means seeing the workplace as a situated curriculum and to move from a restricted to a more expansive learning environment.

CONCLUDING REMARKS

The challenges for TVET teachers in the English context is complex and is not just the failure of state regulation discussed above. One factor has been the relative weakness of senior college managers and TVET teachers themselves many of whom have been reluctant to be identified with school teachers and have defended their industrial past and differences with other sectors of education (Lucas and Nasta 2010).

This in turn reflects the diversity of further and adult education and the tensions between different subject and vocational specialisms and the divisions between the significant numbers of full-time and part-time teaching staff. Furthermore, all recent policy initiatives to regulate TVET teachers have taken place within a fragmented and impoverished professional culture, which often has a weak work-based culture of supporting trainees and the professional development of its TVET and other teachers.

The findings from the research provides clear evidence of a gap between the rhetoric of recent reforms in England and the reality experienced by many in-service vocational and general teachers in FE colleges. The research shows that college managers need to reconceptualize learning as something that is central to the practices of their employees as much as it is for their students and to help colleges become more expansive learning environments. The content of the reforms outline above has focused almost exclusively on devising standards, competences and other specifications that trainee teachers need to develop. Within the reform framework procedures for subject mentoring has being given some importance. However, due to the frenetic, pressurized nature of further education combined the impoverished professional culture in the further education sector the research shows that very little has actually changed in the workplace for the teacher despite the fact that the requirement for teacher training and professional development was a statutory requirement. The argument developed in this paper suggests that improving and supporting the learning of vocational teachers requires much greater attention to be paid by policymakers and the agencies responsible for teacher training to the way in which workplace practices and the organization of teachers' roles and responsibilities might need to change in order to accommodate their professional development. In other words, good practice taking a more flexible regulatory approach but the most important challenge is giving more consideration needs to be given to the central role of the workplace as the context for sustainable teacher training and professional development. This is currently almost absent from the reform process in England and elsewhere.

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PROFILE



Dr. Norman Lucas was the Head of the Lifelong and Comparative Education Department at the Institute of Education University of London. He was the Director of Teacher Education (post compulsory) and a founding member of the National Research and Development Centre for Adult Literacy and Numeracy (NRDC). Dr. Lucas has been on a number of British Government Committees concerning adult learning and the Executive of University Council for the Education of Teachers. He also served as member of the English National Committee of the Further Education National

Training Organization. Internationally, he worked closely as an advisor and consultant and representative on various UNESCO/UNIVOC bodies and directed European Union funded projects.

His research and publications dealt with wide-ranging topics such as adult basic skills, vocational education, teacher training and professional development, further education colleges and education policy. He had completed two research projects. One on the workplace learning of trainee adult teachers and another evaluating the effectiveness of Government policy concerned with raising the quality of teaching and learning in further and adult education and training.

He teaches MA programmes both locally and internationally, specializing in the teaching and learning of adults and enhancing work-based learning. He also supervises local and international PhD students as well as speaking and attending in many international seminars and conferences.

GOOD PRACTICES AND EMERGING CHALLENGES FOR THE DEVELOPMENT OF TVET EDUCATORS IN KOREA

Prof. Heon BaeJeong, Ph.D.

Professor, Chung-Ang University, Seoul Korea

hbjeong@cau.ac.kr

INTRODUCTION

Korea's per capital GNP has multiplied by 125 times or from \$80 to over \$10,000 over the last two decades. In the background of such a rapid economic development and growth, is an effective technical and vocational education and training (TVET) system that has played a prominent and timely role in employing technical personnel within the industry.

However, today, Korea is facing one of its toughest social challenges including but not limited to youth unemployment and labor shortage among SMEs. This requires Korea to devise new measures within its TVET system. Korean Society retains an old fashioned stance regarding low-level technical positions and this has negatively influenced the fostering of TVET Educators. Many point out to the lack of a TVET educator-fostering program in-line with industrial needs. Therefore, Korea is seeking effective solutions for fostering specialized TVET Educators that meet the industrial needs.

Korea is feeling the need for a more socialized TVET system such as Quality of Working Life (QWL) concentrated among low-income workers. Korea has started four pilot projects for Green Industrial complexes investing more than US\$12 billion for QWL by 2013:

- Worker support: Knowledge Industry Centre, residence offices;
- Company support: business centre, child care facilities, parking, access roads;
- TVET support: an education-industry fusion system,
- Green Industry complex: eco-friendly industrial park, cultural outreach programs. Rapid globalization, the emergence of information and communication technology, increasing shift towards knowledge-driven economy, and international and regional competition have become significant challenges being faced by the education systems.

Advanced teacher education is, thus, very important to prepare educators, especially in the TVET sector in the context of rapid technological change. Korea is very willing to share various innovative initiatives and good practices that it has adopted. These innovations are also being widely embraced by various TVET educators and institutions. This paper will discuss how to best promote and exchange such experiences on novel and inventive practices including discussions on case studies on the development of TVET educators in Korea.

BACKGROUND ON THE DEVELOPMENT OF KOREAN TVET EDUCATORS

The development of TVET educators in Korea is divided into two stages; Training or Education of TVET educators, and developing TVET educators. In addition, the Korean government is preparing innovative TVET programs for the year 2020 and has organized the Presidential Committee on Education Innovation (2003-2008).

Training or Educating TVET Educators (1968~)

Under the enactment of June 1967 Framework Act on Vocational Training in the central government established the Central and Vocational Training Center in 1968 for and training and education of TVET educators through a two-year specialized course. The course systematically trained and produced skilled workers who contributed to the growth of the manufacturing industry during the 1960's.

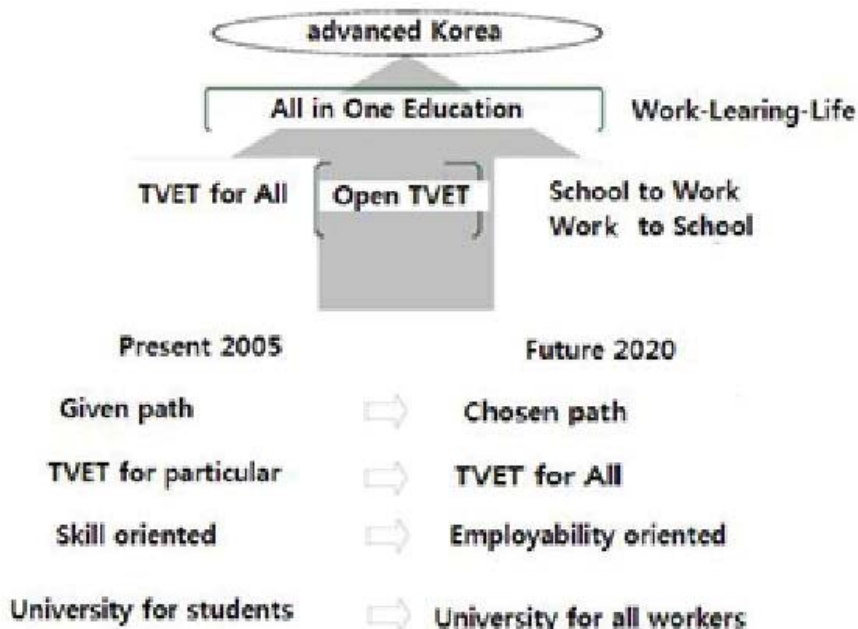
In order to meet the advancement of industrial structure and the rapid progress of technical innovation, the government established a four-year university which is the Korea University of Technology and Education (KUT). KUT has produced TVET educators and strengthened their professional qualities.

Developing TVET Educators (2001~)

Since 2001, Korean industrial society has changed from traditional industries such as the manufacturing, chemical, and construction industry-that require fostering skilled and semi-skilled workers-into a knowledge-based economy society. Korea's new knowledge-based society requires the reorganizing of its vocational training system and advancing the vocational education and training to meet the demands of high-level technicians and engineers. Because it was essential to develop the capacity of TVET educators who were in charge of TVET, the government revised the Vocational Training Promotion Act in 2001, and designated KUT to develop the capacity of TVET educators.

Projected Innovating TVET System (2005~2020)

On July 30, 2003, the Korean government established the Presidential Committee on Education Innovation (PCEI) to build a national consensus and to establish a consistent direction of educational innovation. PCEI prepared and publicly announced an innovative TVET system. However, that system lost its effectiveness by 2008.



Innovative TVET reform for Korea (proposed in 2005)

LEGAL DEVELOPMENT FOR TVET EDUCATORS: APPLICABLE LAWS

The Korean Ministry of Labor reorganized the legal basis on training and developing the capacity of TVET educators. It has also subsidized the professional training of TVET educators under the following two Articles:

- Article 36 (Training TVET Educators) of the Act on the Development of Occupational Abilities of Workers
- Article 37 (Developing the capacity of TVET Educators) of the Act on the Development of Occupational Abilities of Workers

Since its inception in 1967, Articles related to TVET Educators have been revised 9 times. A current qualification for TVET Educator is a law revised in 2004. A TVET educator is classified both as a TVET teacher and an expert who has significant knowledge in a field of expertise.

The Central TVET Institute, Korea's very first TVET institution, was established in June 1968 for conducting two-year professional courses and a short-term license course. Moreover, due to the rising demand for more theory and practice in TVET curriculum, KUT, which is four-year higher education institute, was established.

ORGANIZATIONAL DEVELOPMENT FOR TVET EDUCATORS AND SCHOOLS

KUT becomes the principal institution for TVET teachers' training and education. On the other hand, other institutions may also be qualified to conduct TVET teachers' education, but these institutions must be first recognized by the central and local government, public organizations, and private companies and must also be first acknowledged by the Ministry of Labor. According to Article 18, the development of TVET teachers is composed of three programs: fostering course, teaching course and improving course.

Qualification Category of TVET Educators

The table below shows the 23 main qualification categories of TVET educators according to job classification:

1. machine	1-1mechanical working, 1-2mechanical drawing, 1-3mechanical working design, 1-4factory automation, 1-5industry facilities, 1-6high-pressure gas machine, 1-7vehicle maintenance, 1-8elevator installation, 1-9watch repairs, 1-10train operation, 1-11heavy machinery operation, 1-12mechanical maintenance
2. metal	2-1metal, 2-2surface treatment
3.chemical industryand ceramic industry	3-1high-pressure gas3-2leather treatment, 3-3refining oil, 3-4chemical products manufacture, 3-5glass molding, 3-6paper manufacture, 3-7ceramic industry, 3-8medical supplies manufacture
4. electricity	4-1electricity, 4-2electricity parts manufacture, 4-3signal preservation
5. electron	5-1electron, 5-2electron parts manufacture
6. correspondence	6-1correspondence
7. shipbuilding	7-1shipbuilding
8. aviation	8-1aviation
9. engineering work	9-1engineering work, 9-2underwater construction, 9-3environment
10. building	10-1wood processing, 10-2building construction, 10-3architectural design, 10-4construction, 10-5painting, 10-6papering walls
11. fiber industry	11-1clothing, 11-2woven stuff processing, 11-3spinning and weaving, 11-4knitting, 11-5 fabric design
12. mine(1)	12-1mine
13. information processing	13-1information processing, 13-2multimedia

14.land development	14-1landscape architecture
15.agriculture and Forestry	15-1agriculture and forestry, 15-2food manufacture, 15-3stock raising
16.marine products	16-1marine products
17.industrial art	17-1precious metals processing, 17-2metalwork, 17-3lacquerware inlaid with mother-of-pearl, 17-4ceramic art, 17-5stone working, 17-6woodworking, 17-7bamboo working, 17-8embroidery art, 17-9mounting, 17-10stamp making
18.industrial applications	18-1printing, 18-2industrial design, 18-3interior design, 18-4furniture design, 18-5cigarette making, 18-6shoemaking, 18-7piano tuning, 18-8invention, 18-9photography
19. service(6)	19-1confectionery, 19-2beauty, 19-3haircut, 19-4cook, 19-5sightseeing, 19-6laundry
20.office management	20-1office automation, 20-2commerce, 20-3shorthand, 20-4secretary
21.finance and insurance	21-1finance, 21-2trade, 21-3insurance, 21-4marketing
22.medical treatment	22-1clinical pathologist, 22-2radium therapy, 22-3physical therapy, 22-4nursing, 22-5dental technician, 22-6dental hygiene, 22-7medical business
23.general education	23-1vocational living , 23-2physical exercise, 23-3industrial arts education, 23-4industrial management, 23-5industrial English, 23-6industrial physics, 23-7industrial chemistry, 23-8industrial math, 23-9work rehabilitation

Qualification Level of TVET Educators

The three kinds of Qualification Levels of TVET educators are career, education, or completion of promotion training course. For example, Level 1 qualifies a person who got TVET teacher certification level 2 with a teaching training experience for more than 3 years and upper level training. Level 2 is for teachers who possess TVET teacher certification level 3 and with teaching experience and training of more than 3 years and upper level training. Level 3 qualifies a person who has a Bachelor's degree in skills, with appointment from the Ministry of Labor and more than 3-year teaching and training experience or hands-on-background and has industry engineer certification or higher.

Status of TVET Schools and Educators

The Ministry of Labor recognizes 5,154 TVET schools and it estimates that there are 50,000 TVET educators currently working in Korea.

- Public TVET Schools : these are composed of Korea Polytechnic and has 40 campuses; Korea Chamber of Commerce which has 8 Human Resources Development Centers; including KUT and other TVET schools; totaling to 49 public TVET organizations.
- Private TVET Schools: These schools or organizations which are designated or approved by the Ministry of Labor totals to 943 along with other TVET schools composed of 4,162, campuses thus totaling to 5,105 private TVET schools.

GOOD PRACTICES FOR TVET EDUCATORS' DEVELOPMENT

The Korean TVET system has contributed to the outstanding development of the economy by meeting manpower needs of various industries of the country.

The Ministry of Labor provides the legal basis for training and developing capacity of TVET educators including the budget for such purposes. KUT, on the other hand, handles capacity building of TVET educators which involves training curriculum design, development and course delivery.

Training course

The two kinds of training and education courses for TVET educators comprise a curriculum designed to qualify TVET educators for a 4-year university degree. The other is a certification course entailing an intensive 4-week field work.

level 1	1. TVET teacher with certification level 2 and with more than 3 years of experience for teaching training including higher-level training.
level 2	1. TVET teacher with certification level 3 and with more than 3 years of experience for teaching training including higher level training. 2. A person with an engineer or master's certification and with official training appointment from the Ministry of the Labor. 3. A full time College or University Lecturer with teaching training experience more than 2 years.
level 3	1. TVET graduates with industry engineer certification or higher. 2. With a Bachelor's degree in skills, with more than three years teaching training experience or hands-on-background and with official training appointment from the Ministry of Labor. 3. A middle school teacher, with related office background or teacher certification on practical technique or higher. 4. A person who has a Bachelor's degree in general education or higher and teaching training or experience on practical technique, and with official training appointment from the Ministry of Labor or has middle school teacher certification in general education or higher. 5. A person with certification, more than a year of teaching training experience and with official training appointment from the Ministry of Labor. 6. A person with industrial engineer certification, more than 3 years teaching training experience or practical technique and with official training appointment from the Ministry of Labor. 7. A person who has technician certification or service, with related office background, with more than 5 years teaching training experience or practical experience and with official training appointment from the Ministry of Labor. 8. More than 7 years teaching experience or practical technique skills with official training appointment from the Ministry of Labor. 9. A person fits for standard official appointment from the Labor Ministry or with official training appointment from the same Ministry.

Program	Regular course	Short-term course
Targets	Technical engineers to meet labor demand in industry	Already Qualified as a TVET teacher among workers engaged in a related field
Contents	engineering, teaching cultural subjects having both theory and practical technique for four years	Cultural and teaching subjects for four weeks and passing a test
Certificate	National Technical Skills Qualification(NTQ)	Third-level TVET Teacher Qualification

Section		Details
subject	cultural subject (20%)	1. Trends in vocational training 2. Related laws and regulations on vocational training
	teaching subject (80%)	3. Introduction of training occupational abilities development 4. Method of training guidance 5. Practice of training guidance
training methods	classroom training	4 weeks(140 hours, Mon-Fri)
	Blended(weekdays)	• on-Line learning : 8 weeks(40 hours) • off-Line learning : 3 weeks(100 hours, Mon-Fri)
	Blended(weekend)	• on-Line learning : 8 weeks(40 hours) • off-Line learning : 12weeks(100 hours, every Sat)
education expenses	<ul style="list-style-type: none"> • Free with the government subsidizing the cost • Personal teaching materials, meals, and boarding expenses 	

Course	Section	Detail contents	
First-level and Second-level promotion course	subject	cultural subject (20%)	1. Trends in vocational training 2. Related laws and regulations on the relations between labor and capital
		teaching subject (40%)	3. Practice of educational psychology(I,II) 4. Method of course guidance(I,II) 5. Method of living guidance(I,II) 6. Administration and management of training occupational abilities development(I,II)
		major subject (40%)	Team project having both theory and practical techniques
	training methods	classroom training, 2 weeks(70 hours, Mon-Fri) (courses are delivered during the summer and winter vacation)	
	education expenses	Free with the government subsidizing all costs	

Developing Course

There are two kinds of developing courses to educate TVET educators. One is a legal promotion course to earn a higher-level TVET educator qualification by completing several subjects such as teaching methods and trends in vocational training. The other developing course is to learn a new technology, and to learn teaching and cultural subjects according to individual preferences.

- **Legal Promotion Course**

A TVET educator who seeks to obtain a higher-level qualification must study extensive knowledge of vocational training, understand occupational abilities of workers, learn occupational knowledge and technology, and then pass a test.

First-level Promotion: This requires having at least 3-year work experience after obtaining the Second-level TVET Educator Qualification.

Second-level Promotion: This requires having at least 3-year work experience after obtaining the Third-level TVET Teacher Qualification.

- **Self-regulating Developing Course**

There are various developing courses for TVET educators to improve their new technology guidance ability, advance teaching methods, and cultivate general education. TVET educators should identify their learning needs to sign up for the appropriate course. Classroom learning is offered as blended learning and/or E-learning.

Course	New Technology	Teaching	General Education
contents	Offering more than 150 technical training courses including mechanical engineering, electrical & electronic engineering, mechatronics, information & communication, and multimedia & design.	Offering 12 subjects including teaching methods, practice of counsel method, career path guidance & consultation, and OJT	Offering 21 subjects including planning, presentation, leadership, digital storytelling, negotiating method, and stress management
method	classroom learning(2-5days), blended learning(2days+20 lessons), e-learning(20 lessons)	classroom learning(2-3days), e-learning(20 lessons)	classroom learning(2-3days), E-learning(20 lessons)
expenses	\$75 -\$150 - The government subsidizes 50-100% of the education costs only for TVET Educators	\$100 - The government subsidizes 100% of the education costs only for TVET educators	\$75 -\$150 - The government subsidizes 100% of the education costs only for TVET Educators

Completion Training and Developing Courses

- **The General Training Course Track:**

This track can be completed by obtaining a Third-Level TVET Teacher Qualification through a 4-year teacher training course. This qualification can be obtained by studying 20 units of teaching subjects and by taking the National Technical Skills Qualification (NTQ) for the industrial engineer level while majoring in Industrial Design. Here the trainee earns TVET teacher qualification after graduating from the university.

- **1-year Industrial Field Experience and 5-year Experience at the Private TVET School Course Track:** This track is for the trainee who has worked at an industrial design company for 1 year, and is seeking to become a TVET teacher at a private vocational training school by studying a master's degree. The track requires the trainee to design a vocational training curriculum, teach vocational training, and manage instruction. The trainee must also take a promotion course to earn the Second level TVET teacher, and take various developing courses, which the government subsidizes all costs. The profession of TVET teachers do not only entails teaching technical and vocational education and training, but also taking charge of students' affairs, and management and general administration of operating a vocational training program
- **Taking a Promotional Course and Various Developing Courses after Transferring to a Public TVET School Track:** In this track, the trainee can transfer to a public vocational training school to gain employment. Under the vocational training operating system, the trainee can plan and develop a vocational training curriculum, teach vocational training, and manage instruction. After transferring to a public vocational training school, the trainee can take a promotion course to become a second-level TVET teacher, and then earn a higher salary. The trainee can also fill up a necessary capacity of TVET educators by taking developing courses such as new technology, and teaching and cultural courses at a university during summer and winter vacation.

Reform Measure

- **Establishing Training Method to Easily Access courses:** TVET educators at private vocational training schools prefer taking a training course for 4 weeks, promotion course for 2 weeks, and self-development courses for 2-5 days. This scheduling is difficult because there are no substitute teachers nor any long-term vacation. Training and developing courses are offered through blended learning and e-learning during weekends.
- **Opening and Operating Various Teaching and Cultural Courses:** The duties of a career TVET educator are numerous including planning and developing TVET systems, guiding students, handling post-management, and administrative tasks, and preparing for government evaluation. It is necessary to departmentalize teaching and cultural courses in effectively providing leadership and guidance to students. This also includes post-management of technology and knowledge courses related to teaching curriculum.
- **Conducting Vocational Training and Developing Curriculum Related to an Industrial field:** This refers to appointing experts to an industrial field and allowing them to deliver an in-service lecture to TVET teachers. This measure can upgrade the in-service knowledge and technology of industrial trainees. Also, the trainee participates in an OJT program for in-service work in an industrial field.
- **Establishing an Internet Portal Site to Support TVET Educators:** The government is building an online E-Supporting Center on teaching and learning to support the career development of TVET educators. The internet portal will also allow the sharing of information and knowledge and network educators within related fields.

Teacher's occupation	Teacher's qualifications requirements
<ul style="list-style-type: none"> • planning learning content of technology & theory • carrying out training according to training standard • dealing with administrative documents • consulting students to adapt to their school life • evaluating training achievement • managing qualification achievement • career path guidance & consultation • career management after graduation • administration related to government evaluation 	<ul style="list-style-type: none"> • teaching ability to lead student's learning motivation • having effective communication skill to deliver classes • having a sense of guidance and leadership to reduce student turnover • having a sense of duty to do their best for students; upgrading their qualification and gaining employment • having a sense of responsibility to take care of management for post-graduates • having administrative ability related to handling school affairs and government evaluation

EMERGING CHALLENGES FOR THE DEVELOPMENT OF TVET EDUCATORS

Fostering excellent TVET educators is one of the most important items on the national agenda for industrial development as well as for HRD. In its attempt to achieve success in its TVET programs, Korea has undertaken measures to face diverse challenges. In the process, Korea has learned much on how to develop TVET educators. However, Korea is now facing new social and economic challenges. This requires Korea to design a new paradigm for building a more effective TVET system that can accommodate the needs of the current generation of information and technology savvy workers.

Policy challenges: In terms of TVET Policy, a paradigm shift is required for TVET program and educators: from subsistence to quality of life, and from simple skills to high technology skills. To this end, the expertise and social status of TVET educators should be reinforced. Especially for small and medium enterprises, the shortage of technical personnel must be addressed with a sustainable solution. In addition, by fostering highly-qualified TVET educators, the demand in industry for other areas of expertise can be accommodated.

Social challenges: Stable employment for TVET educators is very much needed. The demand for HRD experts in business is increasing, but it is still difficult for qualified TVET educators to find employment in certain fields. Therefore, an effective skill-to-job matching system should be established to resolve the disequilibrium of supply and demand for TVET educators.

Industrial challenges: Only several large-scale companies, including multinationals can take advantage of its own to support TVET educators. However, most small companies cannot even dream of it, since they rely on an unstable job market for needed manpower. SME agencies or local authorities should take the lead to resolve these issues by fostering and hiring qualified TVET educators within the regional and local community. SMEs should also explore various measures to save themselves; for example, promoting employees who participate voluntarily in TVET for self-improvement.

Institutional challenges: The variety of Korea's TVET institutes may be too wide. This is a major reason why Korean TVET programs receive criticism regarding specialization and/or differentiation. Consequentially, the demand for TVET educators by institutions is almost in a similar form, in general fields of education, similar profile of personnel, etc. This has become a serious impediment to developing the expertise of TVET educators. A TVET curriculum should clearly identify its educational objectives to increase the effectiveness of the program. Also, the program's learning content should focus on developing advanced technology-skilled manpower. In particular, on behalf of theory oriented education environment, a job-friendly educational environment should be adapted in the field. Accordingly, having highly specialized TVET educators could help resolve these challenges.

TVET Educators' Talents & Motivation: The empowerment of TVET educators is needed. The role of TVET educators in HRD should focus on specialization thru HRD self-development programs, voluntary participation, and improving training conditions. Various incentives systems are also needed to motivate participation in TVET.

CONCLUSION

The era of lifelong education may have already set in. The professional knowledge, skills, and abilities of both male and female workers, regardless of age, are perhaps the most important factors for national competitiveness in this age of globalization. Therefore, the direction of national education should turn from obtaining academic degree to sustaining lifelong education. TVET is positioned at the heart of Korea's General Education System and should be leveraged as a competitive educational advantage. The quality of working life is a major issue within Korean society as well as in every TVET program. To achieve a higher quality of working life, lifelong learning is the most essential element in career development. In practice, no one can achieve a satisfying career without learning what he needs to advance their career. It is certain that the roles and functions of TVET educators will become increasingly important in the future. Proportional to these trends, social demands for TVET educators will also increase and become more diversified. To ensure this, the greater our efforts in fostering eminent TVET educators the greater the number of opportunities will emerge to develop a better society.

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PROFILE



Prof. Heon Bae Jeong is a Senior Professor in Marketing at the Chung-Ang University's College of Management. He manages the university's research centers and graduate schools for over 26 years. He is an advisory member of various Korean Ministries and international public organizations which include the following: Advisory Member; Tax Review Committee for Ministry of Finance; Member, United Nations Center for Regional Development; Advisory Member; Regional Government of Midi-Pyrennee, France; Advisory Member, Korea Fair Trade Commission; Advisory Member, Korea Deregulation Committee; Advisory Member, Korea Youth Protection Committee; Advisory Member; Ministry of Agriculture, Food and Fishery; Chairman, Korea Environmental Management Academy and Presidential Committee for National Competitiveness.

NATIONAL VOCATIONAL QUALIFICATION FRAMEWORK (NVQF) OF SRI LANKA: CONCEPT, DEVELOPMENT AND IMPLEMENTATION

Dr. H. Chithral Ambawatte

Director General

Department of Technical Education & Training [DTET]

Ministry of Youth Affairs, Sri Lanka

chithral1966@gmail.com

EVOLUTION OF THE TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) SYSTEM IN SRI LANKA

The beginning of an institutional form of skills training is marked by the establishment of the first Technical School in November 1893, in Maradana, Colombo, which is named today as the Sri Lanka College of Technology under the Management of the Department of Technical Education and Training. After the youth uprising in 1971, there had been vigorous efforts by the government to expand the TVET system and it resulted in the establishment of the National Apprenticeship Board and the National Youth Services Council. Establishment of the Vocational Training Authority in 1995 is another milestone in the history of TVET system in Sri Lanka as it paved the way to facilitate enhanced accessibility for vocational training in the rural sector. The government's commitment to the development of the country's TVET system was symbolized by the establishment of a dedicated Ministry for Technical and Vocational Education in 2004. At present, all leading public TVET institutions whose primary function is capacity building have been brought under the Ministry of Youth Affairs and Skills Development. Training institutions operated by the private sectors have also expanded mainly in response to the growing demand for skills requirements in the service sector. Further, Non-Government Organizations, including institutions operated by religious organizations, have increased their involvement in TVET system, reflecting humanitarian concerns for socio-economic development of disadvantaged groups, such as the rural poor, women, persons with disabilities and the people who are affected by conflict.

RATIONALE FOR TVET REFORM

The absence of national level planning in TVET development has resulted to lack of uniformity in various courses across institutions and also often lack needed competencies expected by the industry vis-à-vis the emergence of free market economy and the growth of private sector industry which necessitates competent workforce to serve in modern technological environments. Therefore, with the aim of improving the relevance and quality of training, the Tertiary and Vocational Education Commission was established in 1990 by the Tertiary and Vocational Education Act which provided the legislative framework to establish a qualifications framework and to maintain academic and training standards through a quality assurance system.

The decision was taken in 2001 with the operation of the Skills Development Project to reform the TVET sector based on a National Vocational Qualifications Framework under the following broad concepts:

- A vocational qualification system that could assure quality and certify the industry identified competencies and offer unified qualifications across all training providers, both public and private,
- Upward and lateral mobility within the vocational qualifications without any disadvantage to a person, who has missed part of general education in the schools,
- Progressive acquisition of competencies as a person obtains higher qualifications so that he/she

would be able to perform wide range of activities in the chosen field.

- Learning effort at middle technical and degree levels to be quantified through a credit system so that the comparison of vocational qualifications with other qualification systems would be possible.

ROLE OF PRIVATE SECTOR

The private sector was expected to play a greater role in TVET reform as they are the major employer for TVET graduates. The major inputs expected from the private sector were as follows:

- Provide guidance in policy making and planning in TVET development and in quality assurance. The amended technical and vocational education (TVE) Act in 1999 brought strong participation of the industry bodies and employer organizations to the Board of Directors of the Tertiary and Vocational Education Commission of Sri Lanka (TVEC). This arrangement worked well and TVEC led TVET reform process successfully and earned the confidence of the industry, government bodies and the training providers.
- Advice on the envisaged development of industry sectors and consequent manpower demands to be met by the training systems. The industry sub-sectors were expected to project its growth for periods ranging from 3 to 5 years, depending on the type of sub-sector, and to ascertain the manpower demand in different occupation categories.
- Identify the competency needs in respective fields for setting up of competency standards. This process has enabled Sri Lanka to develop competency standards which are currently in demand in the technological context and match the industrial requirements of Sri Lanka.
- Actively engage in the provision of training in accordance with the revised system either through their training centers or by providing on the job training to trainees. Sri Lankan industry mostly consists of Small and Medium Enterprises (SME) with the exception of few large enterprises. While few large companies have established training centers or outfits and deliver training according to the revised system, SMEs are expected to significantly respond for the training effort in the revised form.

DEVELOPMENT OF NATIONAL VOCATIONAL QUALIFICATIONS (NVQF) FRAMEWORK

The National Vocational Framework (NVQF) is to cover qualifications at craft, middle technical and degree levels based on the industry identified competency standards. The number of levels in the qualifications framework was decided to provide sufficient spread of qualifications at each category. The seven levels of qualifications were identified with each level described by the processes to be carried out, level of responsibility for the processes and the learning demand to achieve the competency

NVQ levels 1-4

Qualifications at levels 1 - 4 allows for a trainee to upgrade competencies starting from unskilled stage to reach full or master crafts person stage through the acquisition of competencies specified at each level. Competencies are incorporated into the units of competencies which are packaged appropriately to form the National Competency Standards of a particular occupation. The trainee maintains a Record of Achievement of the units of competency that he/she has successfully completed and once all the units comprising a particular level has been successfully completed he/she is eligible to receive the National Certificate in the relevant occupation at the applicable level. Thus, a trainee is able to upgrade his/her qualification level in a particular occupation through gradual acquisition of competencies as per the National Competency Standards.

NVQ levels 5 and 6

The programs are developed so that persons with NVQ levels 5 or 6 qualifications will have supervisory

and/or process management competencies. These involve an increased percentage of knowledge component compared to competencies at lower levels. It is, therefore, necessary to ensure those entering NVQ level 5 programs already have the necessary hands on skills to embark on a level 5 program. The entry qualification to the Levels Diploma program, is therefore, fixed at NVQ Levels 3 or 4 in a relevant occupation.

Candidates selected for entry to an NVQ level 5 programs may possess different skills and knowledge backgrounds. Even those coming through the NVQ system itself will have qualifications from different but relevant occupations. In order to ensure that all those selected to undergo a level 5 program have the minimum skills and knowledge needed at entry, they will initially go through a Bridging program. This is carried out for the selected candidates after a selection test and an academic counseling session. If there is a skill gap in a particular student that will be identified at the academic counseling session and the student is directed for necessary “Gap-Filling” programs. The “Foundation Studies” program is intended to provide the necessary mathematics, science and English knowledge and computer literacy needed to embark on a level 5 programs.

Level No	Qualification	Generalized Description
Level 1	National Certificate	Level 1 recognizes the acquisitions of entry level competencies
Level 2 Level 3 Level 4	National Certificate	Levels 2, 3 and recognize increasing levels of competencies level 4 qualification provide for full craftsmanship/workmanship
Level 5 Level 6	National Diploma	Levels 5 & 6 recognize increasing levels of competencies of technicians including supervision and process management
Level 7	National Degree	7 recognizes the vocational/technological competencies at Bachelors degree level

NVQ Level 7

NVQ level 7 programs conducted by the University of Vocational Technology, Sri Lanka (UNIVOTEC) allow students to acquire B.Tech. or B.Ed. Tech. degree qualifications. Pathways, from the National Diplomas, will be available to students who have achieved the relevant NVQs at levels 5 or level 6 to proceed to degree programs. Those with NVQ level 6 qualifications are eligible to receive appropriate credit transfer towards the degree program, to be determined by the UNIVOTEC.

The Competency Standard is the basis for awarding a qualification and, hence, strong industry participation was expected for development. The National Apprentice and Industrial Training Authority (NAITA) which that has strong links with the industry developed competency standards through National Industry Training Advisory Committees (NITACs) had been set up for each industry sector. NITACs have strong participation from relevant industries, the Ministry of Labor, TVEC and various training providers. NITACs are also responsible for the development of assessment resources. Competency Standards and Assessment Resources developed and validated by NITACs are forwarded to TVEC for endorsement as national documents. The National Institute of Technical Education of Sri Lanka (NITESL) which became UNIVOTEC in 2009, handles the curriculum development and teacher training body of the TVET sector, and is the body responsible for the guidance of teachers and learners including assessors’ training.

NVQs are offered through accredited courses of study that conduct training in the competency-based mode. Further, at the craft level, qualifications are offered for those who have acquired competencies through industry work practice through the Recognition of Prior Learning (RPL) route.

NVQ system has now been developed and implemented covering 104 occupations at the craft level, 14 fields at the middle technician level and 07 courses of study at the degree level. The occupations and fields covered include Industry subsectors such as Construction, Manufacturing, Automobile, Hotel and Tourism, Hair and Beauty, Apparel, Environment etc.

Categorization of competency Units

I. For Level-4 Competency Standards Occupation Specific Competency Units:

Under this category a set of compulsory competency units are to be offered. These are specific to the occupation of the certificate and are the key competencies in that occupation which the holder of the qualification must possess.

Basic Employability Competency Units:

These are generic competency units which are required by all employees in order to function effectively in the workplace.

II. For Level 5 &6: Competency Standards Sector and Specific Core Competency Units:

Under this category a set of compulsory competency units are to be offered. These are specific to the main area of the qualification and are the key competencies in that sector which the holder of the qualification must possess.

Employability competency Units:

These are generic competency units which are required by all employees in order to function effectively in the workplace. These include those generally referred to as soft skills. For example, problem solving and decision making.

Elective Competency Units:

These units focus on specific areas of the sector or on related areas from other sectors. Option is given to select elective units in order to specialize in a particular area.

Qualification packaging at certificate level

For Levels 1 to 4 qualifications, units shall be clustered into a package to form an occupation according to the industry requirements as well as to include a sufficient learning content. The level of the job (Qualifications package) shall be determined by considering the following factor.

Credit criteria at diploma and degree levels

The units of competence considered for NVQ Levels 5 and 6 are assigned a Credit value in addition to a Level. The degree at level 7 is based on the Curricula prepared in terms of learning outcomes.

The Credit system used in the Sri Lankan NVQ system for NVQ levels 5, 6 and 7 is the European Credit Transfer and Accumulation System (ECTS). Number of notional hours per credit ranges from 20 to 30 in the ECTS, whereas in Sri Lanka 25 notional hours are considered to be one credit. This is a student centered system based on the student workload required to achieve the objectives of a higher education program objectives preferably specified in terms of learning outcomes and the competencies to be acquired. Similar to the ECTS, Sri Lankan credit system is based on the principle that 60 credits measure the workload of an average full-time student during one academic year.

NVQ Level 5 Diploma

The minimum number of credits required for the NVQ Level diploma is 60 of which at least 40 credits must be at Level 5 or above and the remaining (up to 20) credits at level 3 or above.

NVQ level 6 Diploma

The minimum number of credits required for the NVQ level 6 diploma is 120 of which:

- At least 40 credits must be at level 6 or above

- At least 50 additional credits are at level 5 or above
- The remaining 30 (or fewer) credits may be from level 3 or above

A maximum of 60 credits earned towards a level 5 qualification in the relevant technology area can be counted towards the credit requirement of level 6 qualification.

NVQ level 7 (Degree level)

The degree at the UNIVOTEC will meet international norms for first degrees and will consequently be a systematic, research-based, coherent, introduction to the knowledge, ideas, principles, concepts, chief research methods and to the analytical and problem-solving techniques of a recognized major technology subject or subjects.

DELIVERY OF NATIONAL VOCATIONAL QUALIFICATIONS

With the formal launch of NVQ framework in 2004, the courses leading to NVQ are offered by public and private institutions in the following manner:

- NVQ Levels 1 to 4 courses conducted by DTET, NAITA, VTA, NYSC and other public, private and NGO Sector training institutions island-wide and there are 825 accredited courses operating at present.
- Nine Colleges of Technology that have been established in 9 provinces conduct NVQ Levels 5 & 6 diploma courses. However, other public, private and NGO sector institutions will also be authorized to conduct NVQs 5 & 6 courses with course accreditation and establishment of Quality Management Systems.
- The UNIVOTEC offers 7 courses of study at NVQ Level 7, which is the Bachelor's degree level.

TVEC as a qualification authority manages the administration of the NVQ framework and accredit the courses in keeping with NVQ standards at certificate and diploma levels. Private sector training providers have significantly participated in delivering NVQ courses and an Accredited Training Providers (Private Sector) Association has been formed. Over 40,000 NVQ certificates have been awarded through accredited courses and through RPL as in June 2011 and the system is gaining recognition in both Sri Lankan and overseas labor markets.

QUALITY ASSURANCE

Quality underpins all components of the NVQSL. A quality assurance model based on institutional self-assessment and continuous development has already been adopted. Quality assurance requires that all training agencies take responsibility for excellent performance and demonstrate to stakeholders that quality management systems are to the standard required by the TVEC. TVEC is responsible to facilitate and regulate quality assurance and has four clusters of activities to support the NVQSL.

- I. Registration of training providers
- II. Quality Management System
- III. Course accreditation
- IV. Monitoring and auditing

Quality assurance is a prerequisite for regular registration of training providers. Registration of training providers may lead to accreditation of courses and programs. Accreditation ensures that training providers adhere to active internal quality management systems with particular reference to the course for which accreditation is being sought.

COMPETENCY ASSESSMENT AND ASSESSMENT ADMINISTRATION

Competency assessments are done by trained and registered assessors who are either from the industry or instructional staff in the training institutions. The assessor registry is maintained by the TVEC and the number of registered assessors as of July 2011 is 1,050. Each prospective assessor has to satisfy the eligibility criteria and must undergo a training program on assessment techniques which includes simulated assessments. If the assessor is a member of the instructional staff, he/she is not eligible to assess his/her own trainees. Assessments are done by an assessor and a verifier combination. The verifier is also a registered assessor who will verify the assessment through documentation up to NVQ Level 3 and will be physically present at Level 4 assessments, The Assessment Resources validated by NITACs become the basis for assessments, Assessments for Level 5 & 6 are done by a panel of three persons.

Assessment administration in the training networks is done by the assessment units of institution head offices and the assessment results are forwarded to TVEC for the issue of NVQ Certificate. Assignment of assessors and verifiers for the private sector is done by the TVEC and the results are directly received with necessary documentation. As the system grows, NVQ assessment administration need to be re-designed to maintain its credibility and efficiency and assessment units of institutions must be brought under a quality assurance system.

NVQ CERTIFICATION THROUGH ACCREDITED COURSES AND RECOGNITION OF PRIOR LEARNING (RPL)

NVQ certify the competencies acquired by a person and hence the certification is offered to persons who acquired competencies through training courses or through industry practice in employment. Acquisition of competencies through industry practice is recognized as prior learning and the NVQ assessment is given if the person has satisfied necessary industry experience. The award of full qualification through RPL is limited to NVQ level 4.

NVQ Certification issued through accredited courses and through RPL is the same with identical certificates. Accredited courses are expected to issue a separate certificate of participation or any other certificate as proof of attending an accredited course. NAITA and VTA are the two authorized institutions to conduct assessment through RPL, considering the provision built into their legislation (Acts) to test and certify industry personnel.

Proof of experience for assessment through RPL

It was accepted that the way by which the competencies were acquired is not relevant if one has acquired competencies, for the purpose of issuing a competency certificate. This is the argument to offer qualifications through RPL. Further, one may acquire competencies faster and one may be slower. Strictly adhering to this notion, a minimum period of experience was not specified for NVQ assessment through RPL in the initial stages. However, this led to two types of problems; firstly, some candidates, though with very short experience, wanted to try the assessment without necessary preparation and secondly, suspicion had arisen that some candidates may make undue influences to assessors to gain an NVQ certificate. This resulted to imposing experience requirements of ½ years for NVQ 2 or 3 and further two years for NVQ level 4. This is to ensure gradual acquisition of competencies.

PUBLIC ACCEPTANCE OF NVQ AND FUTURE DEVELOPMENT DIRECTIONS

NVQ framework has been accepted as the basis for categorizing employees at the craft and middle technical levels in government recruitment schemes avoiding the ambiguities that existed in defining skill and middle technical levels. Clearly defined levels of NVQF and the avenues for upgrading of qualifications provided the required rationale for this incorporation. Sri Lanka's Ministry of Public Administration issued a circular in 2007 approving NVQ as accepted qualification for government recruitment and assigned salaries for each level from Level 1 to Level 6. Level 7 is to draw the salary assigned to a university graduate. Subsequently, a new Service Minute of the Government Information Technology Service was issued in December 2009 by the Ministry of Public Administration, which is entirely based on NVQs.

The development and implementation of the NVQ system in Sri Lanka has progressed to a sustainable level although there are several areas for further innovation, improvement and consolidation. Countries in South Asia view the developments in the TVET sector of Sri Lanka and have noted the benefits of an NVQF. Notably, Sri Lanka has shared its experience in the development and implementation of NVQFs with countries in South Asia.

The Ministry of Youth Affairs and Skills Development has planned to further strengthen the NVQ system bringing all TVET courses under its purview within the NVQ framework and to provide training in the areas of the labor market demand to larger proportion of students leaving the school system. The development of a competent Human Resource is the main thrust of the government in achieving its socio-economic development goals of the decade.

CONCLUSION

The NVQ system has made the expected impact in improving the relevance and quality in TVET. The Majority of the training institutions in the public and private sectors offer qualifications according to the NVQ unified system, and hence, the complexity and ambiguity of selecting a competent person by the industry has been largely reduced. Prospective trainees can select training courses from the standard courses offered in the NVQ system and receive quality training programs through accredited courses. Trainees see the qualification upgrading pathways and the facilities provided and it has raised the image of TVET sector in Sri Lanka. The system has also facilitated the skill upgrading of craftsmen and award of qualifications through Recognition of Prior Learning. NVQ as a qualification understood by other countries has helped many to seek foreign employment.

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PROFILE



Dr. H. Chithral Ambawatte is currently the Director General of the Department of Technical Education and Training (DTET) in Sri Lanka, where he handled administrative and policy formulation regarding the implementation of TVET in Sri Lanka. Other than the aforementioned, his specializations include Mechanical Engineering, Production Engineering, Automobile Engineering, Solid Waste Management, Renewable Energy, Energy Management and Conservation, among others. He has also made several patents and conducted seminars regarding engineering-related activities.

He obtained his Masters in Mechanical Engineering and finished his Doctoral degree in Technical Sciences, specializing in Thermal Engines and Environmental Protection and the Rational Use of Natural Resources at the Russian People's Friendship University in Moscow, Russia.

GOOD PRACTICES AND EMERGING CHALLENGES FOR TVET EDUCATORS' DEVELOPMENT IN MONGOLIA

Mrs. Bujinlkham Duger

Director

Observatory and UNEVOC Center of Mongolia

dbujinlkham@hotmail.com

BACKGROUND

Mongolia is a landlocked country in East and Central Asia. It is bordered by Russia to the north and China to the south, east and west. Ulan Bator is the capital and largest city. At 1,564,116 square kilometers (603,909 sq. mi), Mongolia is the 19th largest and the most sparsely populated independent country in the world, with a population of around 2.75 million people. The country contains very little arable land, as much of its area is covered by steppes, with mountains to the north and west and the Gobi Desert to the south. Approximately 30% of the population is nomadic or semi-nomadic. The predominant religion in Mongolia is Buddhism, and the majority of the citizens are of the Mongol ethnicity, though Kazakhs, and other minorities also live in the country. Mongolia is divided into 21 administrative provinces (called aimags). Mongolia's political system is a parliamentary republic.

Currently Mongolia has likely become the world's second fastest growing economy in 2010 in terms of GDP growth rate. This is mainly the result of rich mineral resources that are being exploited at an increasing speed. It contributes about 15.9% to GDP. In the first half of 2011, the total industrial output increased by 87.9 bln.tog or 10.4 percent to 936.4 bln.tog compared to the same period of the previous year. The transportation and construction sectors grew at 39.9% and 38.4%, respectively, in the first six months of this year, and retail and wholesale trade grew at 24.7%.

According to the National Population and Housing Census of 2010, around 65% of the total population is identified as economically active population. Unemployment rate is still high which is at 15.3%. Mining sector provides employment to only 3.3% of the total labor force. According to the national statistics of 2010, the estimation of poverty indicators shows that the poverty head count was 39.2%. On the other hand, according to the labour statistics, a total of 30,662 new job opportunities were announced in the first half of 2011.

With the growing economy the demand for skilled labor and urgent need to reinforce the Vocational Education and Training (VET) system has become a significant endeavor.

VET SYSTEM REFORM AND GOVERNMENT POLICY MEASURES

The Mongolian labor market is facing a serious mismatch of labor supply and labor demand. Thus, the Government of Mongolia initiated a new reform in VET sector to address increasing demand for skilled labor force, skills and job mismatch and improve prospects for economic growth and high unemployment in the country. A series of significant measures have been undertaken by the government. First of all, a Law on Vocational Education and Training was amended by the Parliament in 2009 establishing favorable legal environment for both public and private sectors to implement the reform as well as a new financing mechanism was set up for VET. Secondly, in terms of organizational set-up a new structure was established. For instance, the National Council for Vocational Education and Training (NCVET) was established with 50% of private sector representatives and NGOs and another half consist of the government institutions representatives to coordinate the public-private partnership in the VET system. NCVET has 4 sector

councils (namely: mining; construction and road; food production; and transportation) in operation at the moment, which has an objective to determine labor demand in the priority sectors of Mongolia. In addition, an independent Government Implementing Agency for Vocational Education and Training (Agency for VET) was established in the second half of 2009, as an implementing body of the NCVET and responsible for the implementation of the national VET strategy.

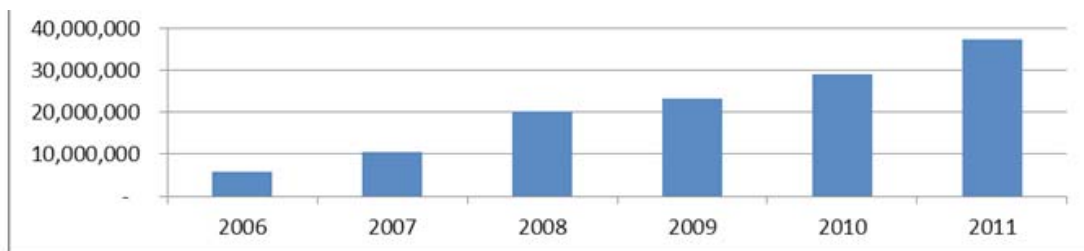
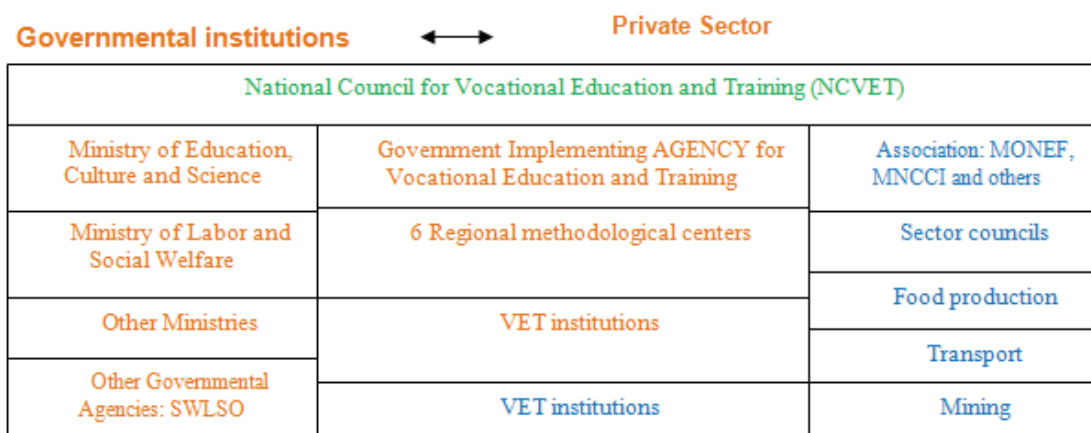


Figure 1: Total TVET Budget Allotted

The State budget distribution to VET sector has been increasing each year and it is allocated from a budget portfolio of the Ministry of Education, Culture and Science (MECS). Around 10% of the total budget of the ministry is disbursed to VET. Since 2006 Government spending on annual basis from the State budget is capital investment with the purpose of enhancing learning environment of Vocational Training Production Center (VTPC). The State has been paying attention to TVET by financing fixed costs of training institutions, and in spite of school ownership types, financing variable cost per student, food and dormitory expenditures, and financing monthly scholarship to TVET students. New proposed amendment of VET Law includes new financing mechanism through NCVET and VET Fund. In this case AVET will have independent position and will work directly under the NCVET.



Currently 64 technical and vocational education institutions are operating in Mongolia, out of which 44 are public and 20 are private training institutions. In terms of location, 26 are located in Ulaanbaatar City and 37 are located in the country side. Approximately 46,100 young men and women are obtaining occupations in VET schools and training centers of which 10,000 are new entrants. The government has a plan to double this number by 2015. On the other hand, current capacity in terms of building, training workshops, teachers and trainers' number, dormitory space etc. already reached the highest potential quantity.

Political parties are really interested to support VET system and currently all stakeholders including private sector representatives' recognize VET development as one of the priorities of the country development policy and strategy formulated in the Millennium Development Goals. Currently, about 24.7% of general education graduates of 9th grade and 8.3% of 11th grade graduates enter VET schools to obtain occupations. While 50% of all GE graduates enter higher education (academic career) in universities, others who enter the labor market without skills and professional orientation turned to be the underpaid workforce or worse unemployed, increasing the number of economically vulnerable group.

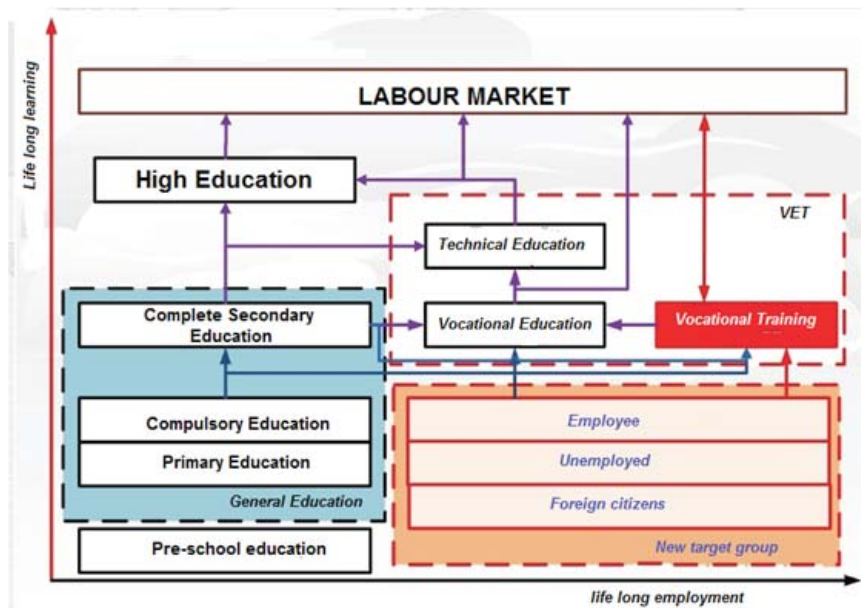


Figure 2. Educational system in Mongolia

To increase enrolment in VET schools, the government introduced a stipend scheme (40 USD per month/per students), strengthening VET institutions by updating the curriculum, providing teachers and instructors' trainings and supporting involvement of the private sector. The following are policies based on future government strategy:

- Millennium Development Goals include GoM strategy to increase the quality and enrolment rate of VET which will decrease the level of poverty, increase employment, improve capacities of skilled workers and finally support the development of production and services, and the economic growth of Mongolia; "Education" a national program for 2010-2021 has the objective of "to successfully develop VET and meet the demands from labour market";
- Education Sector Master Plan (ESMP) 2006-2015, continues to focus on policies and strategies to increase employment opportunities, to reduce poverty and social inequality, to eliminate rural and urban growing difference, and to close gender disparity through further expansion of education services in rural areas and for vulnerable groups regardless of geographical location, to reform and upgrade educational services, to improve education structure and content in line with international standards, and to establish the education system that provides life-long and relevant learning opportunities for learners to be competitive in the labor market;

The Agency for VET developed the Action Plan for Implementing VET Reform (2010-2013) which focuses on the objectives of establishing a demand driven and competency-based training in VET institutions.

The government has been committed to match its reform in the sector by increasing the budget allocated to the sector (and to the AVET), which has doubled since 2008. But the government's funding is still insufficient and does not efficiently address the existing problems such as financial concerns, particularly on MCC funded VET project.

VET EDUCATORS IN MONGOLIA

In the centralized planned economy system (before 1991), vocational school's teachers were prepared and re-trained domestically and abroad, especially in the Soviet Union, DR of Germany, Hungary, etc. During that period most vocational schools specialized in agriculture, construction and light industry. In 1980 the National Technical University and University of Agriculture established a program for engineer - teachers in different professional areas. Branch Ministries have appointed and supplied engineers and technologists to vocational schools as teachers.

During the transition period to the market economy, TVET system in the early 90's faced difficult challenges. The economic crisis during that time brought rampant reduction of many TVET schools and students, which consequently increased opportunities for private businesses to thrive. This also included decline in teachers' salaries, which made highly qualified teachers to leave TVET schools. Majority of the teachers who left schools were master - specialists in carpeting, plumbing, electrical welding and building decorating.

In 1999 the number of handicraft teachers and teachers for preparing professional workers decreased twice in comparison with 1989. In 2000, this number decreased to 1,600. During this period, there was lack of teachers' training and retraining in TVET system, no research work associated with TVET due to limited state financing.

Until 1997, there was no training for VET teachers due to lack of funding. If a teacher or school saw that attendance to some commercial training courses was necessary then either the school or teacher had to pay for it. This was naturally very difficult for vocational schools and teachers, especially those from the countryside.

Current situation of VET educators

The teaching staff of vocational schools are of two groups – lecturers and master-teachers. Lecturers conduct theoretical lessons and must have at least a bachelor's degree in teaching or engineering sciences. Master-teachers run practical training and must have a post-secondary vocational qualification in their specialization.

Starting 1997, VET schools began to organize general training courses for their teachers. MECS also introduced a voucher system for upgrading teacher's skills, in order to use its limited resources effectively. The voucher scheme permits them to attend training courses organized by the School of Educational Development.

In 2004, the newly created National Methodological Centre (NMC) and 6 Regional Methodological Centers (RMC) started to provide teachers' training and re-training activities under the ADB project support.

The data below show the current situation of vocational schools teachers in the country:

- Today, 2,062 teachers and 1,261 administrative staff work in public vocational schools.
- There are 1,020 trainers working in short term training organizations
- Insufficient salary of teachers and lack of established social security support
- 35 % of teachers are teachers of general education subjects
- 52.5 % of teachers have bachelor's degree, 17.7% have diploma, 17.7% have master's degree and 2.2% have PhD degrees

- 41% of the total number of teachers are young, aged under 30 years old, 25% are aged between 30-45, 23% are aged between 45-55 and 11% are aged 55 and above.

The current situation poses more important focus on a resolution addressing teachers' social protection and keeping them in TVET profession more than addressing the concern on preparing teachers. If the government would be able to prioritize such aspect, then preparing them as next generation educators will eventually follow especially that the country has enough resources to prepare them for this and considering increased international co-operation on this aspect. On the other hand, effective distribution of fund could play a big role in increasing teacher's salary by using skill stimulation schemes. Clearly, the current conditions of teachers show that laying off staff does not bring more funds, since doing that only makes teachers' condition worse. In addition, budget distribution mechanism, considering local factors and enrollment, should be used for distributing a government fund for education.

The fact that the provision of pedagogical qualification is divided between university trained teachers focusing on theory and master/ trainers/ instructors, who often have no pedagogical training at all, is a little challenging. The level of education of teachers is high, however, their capability seems to be too academic and traditional and is not linked with the world of work. Almost everywhere, there is a lack of awareness of the fact that the primary social function of vocational teachers and trainers is not to produce "teaching" but to produce the "qualifications" needed in a modern economy. The qualification needs of companies require competent workers who are capable of combining theory and practice. What is needed in the vocational education and training system is a configuration of teaching, learning and practical work experiences. This framework might help to gradually strengthen the individual student's experience-based competence. A good way to further the development of the integrated approach is to support vocational schools' efforts to become continuing vocational training providers.

The lack of up-to-date vocation as pedagogical qualifications of the "master" is a serious problem for vocational schools. The situation is complicated because now there is no any specialized, separate vocational teachers' education institute. We have only Pedagogical University which prepares only teachers on general school subjects, not vocational. There is also a lack of didactical thinking on vocational subjects.

Finally, learning to cope with necessary communication and knowledge resource is a major challenge for school teachers. The older generation were not introduced to this facility in the course of their initial training. The integration of the information and communication technology and internet into the vocational education process is a task that will affect all teachers to obtain new knowledge and skills including social change, change in educational policy and changes arising from the development of technology. However, today most of the students are more adept with ICT than vocational schools' teachers. Moreover, the situation is increasingly improving every year with the introduction of several new projects and undertakings.

The establishment of a better and more comprehensive system for teacher training, re-training, and upgrading, and that which is compliant with the current market conditions, is a major and significant concern that the government of Mongolia should address and focus on.

INTERVENTIONS IN VET

International support for the national reform of the TVET system and sector-specific investments are being provided by a number of foreign organizations and donors.

National level

The USA Millennium Challenge Account (MCA) is the most substantial donor investment in the VET sector in Mongolia (\$47 million), 2008-2013. The following components comprise the MCA-M VET project:

- Reform of VET policy and operational framework activity

- Creation of skills standards and competencies system activity, National Qualifications Framework, curriculum development
- Competency based training system, including training of the trainers and capacity building for the AVET
- Labor market information system and career guidance service activities
- Improvement of learning environment

These activities are of crucial importance for the sustainability of the sector's reform.

VET project of the European Union: Nationwide, Euro 7 million budgets, 2012 – 2015 (with possible extension). EU will focus on macro and meso level, will complement and fill the gaps left by the MCA-MVET project. The EU project will develop institutional and human capacities to deliver vocational qualifications to nationally (and internationally) recognized standards. The need to ensure national quality standards and a uniform assessment system with concomitant need for an effective Quality Assurance system will seek to obviate the present tendency to promote short-term skills development in isolation of a wider national focus.

The Swiss Agency for Development Cooperation (SDC) will implement VET project (7.2 million CHF for 2012-2016) targeted to the Western Region of Mongolia including 6 aimags/provinces. The project will improve the capacity of 6 vocational training schools and Western RMC through curriculum development and teacher training in selected occupations with a strong focus on Dual approach, improving enterprise's practical training.

Regional Economic Development Program of GIZ: Euro 3 million budgets, 2011 – 2013. GIZ will focus on skill development in the Western region.

Government of Canada is interested in investing in VET (CIDA), around 1 million Canadian Dollars per annum, focusing on South and eastern regions of Mongolia.

Australia has also economical interests in Mongolia related to mining and is considering sector interventions in the VET sector.

Other small interventions: **CARITAS CZ** implements a 6-month project to start mid 2011 for 8 schools. The project will train teachers in the use of the new agriculture curricula being developed by the MCA and will provide teaching materials. The project will also provide pedagogic training at the Darkhan RMC.

Institutional level

Teachers re-training

Currently Mongolian VET schools as well as VET programs and formal curriculum continue to be discipline and subject-structured according to the traditional supply-driven model. Competency-based learning modules are at a basic state of development. Classrooms lack essential instructional aides and basic equipment, multimedia and website support and supplementary materials. Training for the real world of work is essential to effective education planning for the VET sector in Mongolia. Mongolia's dynamic economy and labor market requires a modernized VET system with labor market relevant occupational practice in line with regional and international standards though the different VET Project.

However, VET staff capacity is low, and GoM/AVET organizing different training for the VET staffs, teachers and trainers through the different donor activities, English language training, ECT training, pedagogical training and re-training, competency based training capacity, curriculum development methods based on DACUM chart. MECS, AVET implemented CBT training with Singaporean Polytechnic College in 2010-2011 and 1100 teachers and trainers was trained on CBT curriculum development methods, assessment and evaluation capacity, adult training methodology etc. And finally 26 teachers were prepared and selected as national teachers training trainers.

MCA-M TVET project will procure in-service teacher training sub-project activities which will start soon in December 2012-2013 and train VET educators in 28 industry led selected trades (major infrastructure to essential services and service delivery for maintenance and repair activity), energy, extraction industries including long standing activity in mining, energy efficient heating and renewable energy, ICT and service industries (food processing, hospitality and tourism, domestic heating and refrigeration, electrical and plumbing). It will be in-service training based on developed CBT curriculum.

MCA-M VET project provides Competitive Grants Program aimed to encourage and support initiatives from VET institutions, local administrators, employers to strengthen public-private partnership in VET sector, as well as to disseminate best practices of VET schools. Within the first round of grants program, a total of 17 schools, including 9 grant projects in “Employers and Training Institutions Cooperation” and 8 grant projects in “Incubation and Dissemination of Best Practices” were awarded with 1,200,000USD grant. Grantees for the 2nd round: Polytechnic College in UB, TVET School in Sukhbaatar aimag, Orkhon Technological School. The financing for the 2nd round of 7 TVET institutions, which are 45% of the total grants, was started on September 22, 2011.

BEST PRACTICES

Private sector

Oyu Tolgoi Copper mine (Rio Tinto/Ivanhoe Mines), Komatsu, Caterpillar, Toyota, large hotel chains, etc. established their own VET set-ups that annually train highly motivated and skilled staff, such as electricians, mechanics, welders, drivers, logistics, gastronomists and hotel managers. Their training are highly focused, of high quality and include technical and behavioral skills. Oyu Tolgoi providing finance for industry related trades curriculum programs focused on the priority economic sectors: construction, mining. In most instances, VET instructors have poor access to vital equipment, resources and intellectual capital to develop the required competency and skills sets within traditional classroom instruction and activities.

Twinning arrangement of Centers of Excellence (MCA-M VET sub project)

Twinning program arrangements to support three Centers of Excellence have been made. The program is aimed at aligning these schools with the best international practices through establishment of a long-term and mutually beneficial partnership with similar training institutions from highly developed countries. The implementation of this program will assist the colleges to move to a competency-based training and assessment model; professional development of the management and teaching staff in college and campus management, strategic planning processes as well as in instruction and curriculum development.

As for now, the three Centers of Excellence have developed project proposals and work plans with their twinning partners, namely: Nursing School-CoE in Health with Holmesglen institute of TAFE, Australia; Technical and Technology College-CoE in Construction with Holmesglen institute of TAFE, Australia; and Govisumber VTPC-CoE in Mining with Central Queensland Institute of TAFE, Australia, respectively. Signing of Memorandum of Understanding for above projects are in progress.

The “Green Grove Project” is an initiative of the **Arkhangai vocational education school** in Tsetserleg targeted towards boosting employment in the reforestation sector. The project, financed by a \$64,075 grant won from the MCA-Mongolia VET program, promoting public-private partnerships in reforestation activity between the Arkhangai VET school and several local employers working in reforestation (Hasu Mandal, Tansag Trade, and GOST Trade). They developed a practical reforestation curriculum; started to train people and employ them in these companies, as well as the approximately 20 companies doing reforestation work locally and around the country. The grant has enabled the school to establish a tree garden where teachers and students can practice and hone their planting and care techniques, especially how to keep trees healthy in the harsh Mongolia winters.

Vocational students start small businesses through MCA-Mo VET project grant

All it took was 52,000 tugriks (\$39) and a push from an MCA-Mongolia-funded project at her vocational school to launch 18-year-old Byambatseren G.'s first mini business. At the Rajiv Gandhi Production and Art School in Ulaanbaatar, Mongolia, Byambatseren learned to craft dolls from wood – some she dresses in traditional Mongolian clothes, some are more abstract. With the help of a loan from the “Self Employment” project at the school, which is funded by a \$50,000 grant from the VET Project of MCA-Mongolia, she sells her handmade dolls for a small profit. In one month, Byambatseren was able to make enough money from selling the dolls to repay the loan and reinvest the rest in purchasing materials. As part of the program, Byambatseren also had to submit a business proposal and complete a three-day training on self-employment. After getting the opportunity to display her crafts at a local exposition, she has been receiving several orders from private customers. For Byambatseren, the financial help, business skills, and encouragement she gained from the project allowed her to realize a dream of starting her own business. She will complete her education at the Rajiv Gandhi School in one year and hopes to enrol in a university afterwards and also study painting. Byambatseren wants to use the money she makes from her craft business to pay for her university tuition.

MAJOR CHALLENGES AND HOW THE COUNTRY/TVET SYSTEM/ INSTITUTION ADDRESS THEM

Problems in innovation process

With the end of different projects ending a dream, all idea of innovation. Why? The de-ideologisation of teachers and trainers during transition period may have been necessary but has also proved some negative effects on the teacher's identity. This has been compounded by the relatively low social prestige and salary level of teachers. More should be done to build up a new concept of teacher professionalism so that teaching can be made more attractive again.

The fact that the primary function of vocational teachers is to produce well skilled workers with competencies needed in the modern economy, teachers should be knowledgeable and capable to combine theory and practice in teaching. It is really one of the pressing problems in Mongolia. The existing teacher training curricula will have to be changed if a more suitable learning environment is to be created. Many current teacher education programs in Pedagogical University are out of date. Pedagogical University does not also specialize in vocational teacher education, thus, does not maintain close contacts with vocational schools or industries.

VET reform in Mongolia started from the policy and legislation level, and strongly supported by the Mongolian Government and national stakeholders, particularly by the private sector as well as by donors. Many seminars and training, study tours, placement programs are organized with these projects activities but innovations in the institutional level, especially in the level of VET educators are still weak and lacks progress.

The following are challenges facing VET in Mongolia:

- The quality of training in VET schools is weak
- The workshops in VET schools are not well equipped and the students have not enough practical training. Employers complain that VET graduates lack professional skills and miss some other key competencies like problem solving, communication and business / entrepreneurial skills
- The existing practice of funding and planning does actually promote a supply-driven approach rather than demand-driven. However, some positive changes have started to take place
- Training curricula need to be updated
- VET teachers and instructors need to be re-trained, and learning materials and workshops need to be upgraded

- Neither local governments and the private sector are not actively involved in VET planning, implementation and monitoring
- It is intended to emphasize the leading role of the industry in steering TVET.

Strengthening links between education and labor markets, through greater participation by employers in reviewing training courses, setting occupational standards, offering on-the-job training and developing bridge programs between school and work such as through apprenticeships and internships might eradicate the skills mismatch between supply and demand in the labor market.

One of the newest concepts that ensures creation of the real opportunities for participation of the private sector in vocational education and training is through the introduction of regulatory provisions that would enable equal representation of private sector at all levels of management.

Negative sides of the current system

- Poor identification of labor market needs
- Weak partnership in policy level initiatives between private and public institutions, and between employers and schools
- Undeveloped training environment
- Lack of teachers education and re-training system
- Outdated training curricula, programs, teaching methods
- Deficit of human resources in TVET

Positive achievements of the current system

- Growing needs and demand in high skilled workers
- State support is increasing
- Positive social attitude
- Increased number of private TVET providers
- Increased number of students in formal TVET
- Initiation of foreign and domestic investment
- Interest in cooperation from employers and training institutions
- Implementation of new modern training programs in some of the schools

FUTURE PLANS

VET is a high priority of the Mongolian Government, proven by its awareness on the needs of the country to develop its human resources capacity based on market demand to enable people to sustainably benefit from the country's mineral wealth. Furthermore, the active participation of the Mongolian people in economic activities is important for the national security as well as for creating employment opportunities for the people.

The main objective of the Government Action Plan Establish is a foundation of creating management team that meets with the technical and vocational education and training specific characteristics; training and re-training of teachers and human resources. Determine solutions to resolve social issues and problems. The following activities have been planned to achieve this goal:

- Create teacher training and re-training system
- Teacher development support program
- Solve social issues

AVET and “Pearson Australia” agreed to train 1,000 Mongolian VET educators and establish VET teacher’s qualification system within the next three years taking reference from Certification IV competencies of Australia (Pearson Australia).

CONCLUSION

VET system shall shift from the present supply driven system towards a demand driven, competency based training approach. Essentially, this approach aims to improve the supply side through better communication and joint efforts with the private sector; thus improving curricula, teaching and training methods, equipment etc. In practice this will move VET away from too much theory towards more practical training in workshops, labs, and possibly in-company training.

It will be useful to create international vocational teachers education and training standards, and support to deliver modern training materials.

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PROFILE



Mrs. Bujinkham Duger is currently the Director of the Observatory and UNEVOC Center of Mongolia and the TVET Policy and Management Consultant of the ADB TA 7333-MON: Strengthening the Higher and Vocational Education Project. She’s also presently holding the position of Labor Market Information Specialist of the Millennium Challenge Account – Mongolia, TVET Project PIU.

She finished her Doctorate from the Management Academy of Mongolia and earned a Master’s degree in linguistics from the Institute of Foreign Language, Moscow, USSR.

Track B

***Good Practices and Emerging Challenges for TVET
Educators' Development: Regional Experiences
(Country Perspective Presentation)***

PREPARING TVET EDUCATORS FOR THE NEXT GENERATION OF INDIA

Prof. Vijay K. Agrawal, Ph.D.

*Director, National Institute of Technical Teachers' Training and Research, Bhopal, India
Professor & Head, Dept. of Civil and Environmental Engineering, NITTTR Bhopal
director@nittrbpl.ac.in, apsvka@yahoo.com*

INTRODUCTION

India has a population of over 1,155 Million and a workforce of around 510 million. To be able to provide employment to such a large number of people is more than a daunting task. Education and training remains the key to meet this challenging task. Improved education, training and skill development is critical for providing decent employment opportunities to the growing youth population and necessary to sustain the high growth momentum. The Educational and Training Enterprise in India which operates at all conceivable levels from pre-school to post-doctoral is of a monumental size. In the formal education system, the preschool years range from 1 to 3 followed by 10 years of high school and 2 years of higher secondary. The tertiary education is of mostly 3 to 4 years for under-graduate studies followed by Masters, M.Phil and Ph.D. degrees. There are also many universities and institutions for the post-doctoral research and training in the country. On the non-formal side the age group address 9 to 40 under two separate programmes for school age children and adults, respectively. The educational structure in India is generally referred to as the Ten + Two + Three (10+2+3) pattern. The first ten years provide undifferentiated general education for all students. The +2 stage, also known as the higher secondary or senior secondary, provides for differentiation into academic and vocational streams and marks the end of school education. In some states, the plus two stages is located in intermediate, junior or degree colleges but is not regarded as a part of the tertiary stage of education. Besides, the technician (polytechnic) educational program of 3 years duration and one year or two year programs of the Industrial Training Institutes exist after the ten year of general education.

TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING SYSTEM IN INDIA

Industrial workers in India are developed through a system of publically financed training and education institutions, private institutions, informal sector apprenticeship type training arrangements, and the in-plant training programs conducted by public and private sector enterprises. The formal technical education system operates at three levels.

Formal vocational education (VE) in India is implemented at a senior secondary school level, and funded by the Ministry of Human Resource Development (MHRD), Government of India. There are 9,583 schools offering 150 vocational courses of two-year duration in broad areas of primary, secondary, and tertiary sectors of the economy. In addition, National Institute of Open Schooling (NIOS) also imparts VE in 80 courses. Total enrolment in VE courses of all these schools is roughly 6,00,000.

Vocational training broadly refers to certificate level crafts training and is open to students who leave school after completing anywhere from grades 8-12. Roughly 150 trades catering to agriculture, manufacturing and service sectors are being conducted under two principal schemes, viz., Craftsmen Training Scheme (CTS) and Apprenticeship Training Scheme (ATS).

Certificate level programs produce skilled workers and are operated at more than 8,687 (2010-11) Industrial Training Institutes (ITIs/ITCs), 2,189 in the government sector and 6,498 in the private sector

having annual seating capacity of about 1.2 million in about 116 trade areas and the entry requirements to these programs are 10 years of basic education. Vocational education certificate level courses are offered in agriculture, business, commerce, health and paramedical and home science, in addition to engineering trades.

Diploma program producing middle level supervisory staff who are designated as technicians, are operated at over 3716 Polytechnics with admission capacity of 5,00,000. Admission to this program requires 10 years of basic education, and courses are of three-year duration in the conventional disciplines of civil, mechanical and electrical engineering and diversified areas. Trend in polytechnics is to offer diversified courses and service sector oriented courses. Many institutions conduct post diploma and advanced diploma programs in selected areas. Degree level institutions in engineering can be divided into three groups these are the Indian Institutes of Technology (IITs); National Institute of Technology (NITs), State Engineering Colleges (SECs) and Private Engineering Colleges. There are about 3,400 degree level institutions having intake capacity of about 1.5 million annually.

There are four National Technical Teachers' Training and Research (NITTTRs) which train teachers of technical institutions. These institutions have, over the years developed as resource institutions for the technical education system. Apart from offering in-service teacher training programs and long-term degree awarding programs, they also undertake projects in areas such as curriculum, media, and management development, educational research, measurement and evaluation, laboratory instruction, policy analysis, and research and computer education. They also offer consultant services to the central and state governments, industry and other organizations in the country.

Teacher requirement for TVET system

As can be seen from the enrollment capacity in TVET at various levels, the requirement of adequately trained teachers at various levels is huge. The shortage of teachers is one of the major reasons of skills mismatch in demand and supply.

Faculty to students for polytechnics is prescribed by AICTE is 1:20, whereas the same is 1:15 for undergraduate engineering programmes and 1:12 for post graduate engineering programmes. Similarly, student-teacher ratio in ITI/ITc is around 10.

This means that we require about 4 lakh teachers for engineering colleges and about one lakh teachers for polytechnics, which itself a huge demand. The training of such large number of teachers in pedagogy, content and new and emerging technology is a daunting task. This paper describes major policy initiatives in TVET system in India and changing requirement of teachers in the changing environment.

MAJOR POLICY INITIATIVES IN TVET SYSTEMS IN INDIA

Some of the major policy initiatives of the Government of India which would affect teacher-educators of TVET are given below:

National Skill Development Policy (2009)

The Government of India has declared the Skill Development Policy to Create 500 Million skilled persons to meet the needs of the economy by 2022, i.e., to add capacity of training 15 million persons annually. Objectives of the National Policy on Skills Development

The objectives of the national policy on skill development are to:

- a) Create opportunities for all to acquire skills throughout life, and especially for youth, women and disadvantaged groups.
- b) Promote commitment by all stakeholders to own skill development initiatives.

- c) Develop a high quality skilled workforce/entrepreneur relevant to current and emerging employment market needs.
- d) Enable establishment of flexible delivery mechanism that respond to the characteristics of a wide range of needs of stakeholders.
- e) Enable effective coordination between different ministries, the Centre and the States and public and private providers.

The coverage of the National Policy on Skill Development includes the following:

- a) Institution-based skill development including ITIs/ITCs/ vocational schools/ technical schools/ polytechnics/professional colleges, etc.
- b) Learning initiatives of sectorial skill development organized by different ministries/departments.
- c) Formal and informal apprenticeships and other types of training by enterprises
- d) Training for self-employment /entrepreneurial development
- e) Adult learning, retraining of retired or retiring employees and lifelong learning
- f) Non formal training including training by civil society organizations.
- g) E-learning, web based learning and distance learning.

The policy envisions the establishment of a National Skill Development Initiative with the mission: “National Skill Development Initiative will empower all individuals through improved skills, knowledge, nationally and internationally recognized qualifications to gain access to decent employment and ensure India’s competitiveness in the global market”.

VISION FOR THE NATIONAL SKILL DEVELOPMENT INITIATIVE IN INDIA

- Scale of ambition: The 11th Five Year Plan envisions an increase in that capacity to 15 million annually. India has a target of creating 500 million skilled workers by 2022.
- High inclusivity: The skill development initiatives will reduce divisions such as male/female, rural/urban, organized/unorganized employment and traditional/contemporary workplace.
- Dynamic and demand-based system planning: The skill development initiatives support the supply of trained workers who are adjustable dynamically to the changing demands of employment and technologies.
- Choice, competition and accountability: The skill development initiative does not discriminate between private or public delivery and places importance on outcomes, users’ choice and competition among training providers and their accountability.
- Policy coordination and coherence: The skill development initiatives support employment generation, economic growth and social development processes. Skill development policy will be an integral part of comprehensive economic, labor and social policies and programs. A framework for better coordination among various Ministries, States, industry and other stakeholders will be established.

To achieve the above mentioned vision, the following operational strategies are proposed:

- Folding the future in: If we start from our current position, we are likely to extrapolate. Folding the future in allows us to innovate. Innovation is, therefore, an important element of the strategy.
- Skills framework must move to a system of equivalence to diplomas and degrees: National Vocational Qualification Framework (NVQF) will be created with an open/flexible system which will permit individuals to accumulate their knowledge and skills, and convert them through testing and certification into higher diplomas and degrees. NVQF will provide quality assured various learning pathways having standards, comparable with any international qualification framework. NVQF will support lifelong learning, continuous up gradation of skills and knowledge.

- Skills must be bankable: The process of Skill acquisition especially for the poor and needy persons will be made bankable. The effort would be to complement public investment with institutional/bank finance.
- Co-created solutions and forging partnerships: Partnerships will be consciously promoted between Government, industry, local governments, civil society institutions and all potential skill providers. Institutional mechanism and standing platforms will be created to ensure sustainability.
- Game-changing delivery/innovation: Availability of public institutions above the high school level, after class hours for skill development by the Private Sector, without disturbing the normal working, will be explored. Necessary regulations would be brought in by the local management authority of the particular educational institution.

NATIONAL VOCATIONAL EDUCATION QUALIFICATION FRAMEWORK (NVEQF)

The HRD Ministry has unveiled the National Vocational Education Qualification Framework (NVEQF) that allows students to earn graduation level degree while working and makes way for easy entry and exit provisions. This is a step towards creating a pool of skilled workforce in India with the help of a national vocational university with regional centers throughout India.

The All India Council for Technical Education (AICTE) has identified seven certification levels of knowledge and skill, in which first four levels are considered equivalent to class IX to XII of school-level education and can be learned through the Central Board for Secondary Education (CBSE) schools or schools affiliated to state boards.

Each level of education comprises of 1,000 hours of education and training to be completed in a year. Those who will complete all seven levels of education will get a degree in vocational education. At a certification level, the vocational content or skill modules may comprise a single skill or a group of skills to be learned. The proposal also states that a student should have the freedom to move to and fro from vocational stream to conventional stream at various stages.

The system will also allow student to have multi-level entry and exit system, allowing student's flexibility to seek employment after any level and then rejoin education when feasible to upgrade his or her qualification and skill competency. After class XII level of certification, students can seek employment in this system which is to be operationalized from 2012.

Principles

- **Localized approaches:** his looks at assessing local needs and using local frame work to address the needs. This is to identify local needs for skills that also allow for local employment stemming the need for migration to urban centers.
- **Maximum Impact Skills and sectors selected:** skills identification is done keeping in mind skills that allow for the largest number of people to get meaningful employment. Subsidized Fee Structure to provide accessibility.
- **Skills for Women:** (Hair Dressing, Beauty Therapy, Teaching, Driving, etc.) Centrally administered "Train the Trainers to ensure quality of delivery and consistency.
- **Placement assistance connecting candidates to jobs:** This would be done by accessing the reach of various association bodies across its member companies and at the same time building a database of skilled manpower for potential employers to access.
- **Building pathway for international progression:** The framework also recommends that certification should bring to the table the international recognition of various global organizations as they adhere to performance quality that they stand for.
- **Recognition of prior learning:** If one has the skills or knowledge required for entry to, or credit towards, a qualification, but no degrees or qualification as proof, one can undertake a personal assessment. If successful, the person would be granted credit towards the qualification.

Features of the Framework

Across sectors and across the country. The initiative addresses skills in all sectors and areas.

- Short duration, focused and modular programs allow for quick and effective delivery of skills training. This allows a person to become productive relatively quickly at a younger age i.e. XII Pass. The modular approach also means that he can add on to his portfolio of skills for vertical and horizontal progression. At the same time the content is focused to allow for dissemination of only relevant skill. The duration is decided taking into account the objectives and content of the constituent programs. Amongst other things it would be based on Employer Employee needs, availability of infrastructure and equipment, characteristics of the training content, etc.
- To address these varying requirements of industry and as mentioned above, the training programs would be of varied duration ranging from short courses (to more protracted ones (up to a year) depending on the skills and the requirements.
- Practical hands on focus with minimum theoretical input. The theoretical input is only in so far as is required for effective practice of the skill. This effectively circumvents the disadvantage of illiteracy in many cases and provides open access to individuals with limited or no schooling with some bridge courses in the English language, etc.
- The practical hands on skills also allow for delivery in the local language, thereby allowing for provision of local trainers, congenial and effective delivery. This also means that as candidates become proficient they can become trainers to further cascade training to other candidates allowing for scalability.
- The delivery of the program is flexible it could be full day, half day or week and programs. This would again be decided on availability of candidate's spare time, availability of training infrastructure and spare capacities, etc.
- Training could be delivered through a network of centers that could include Technical and Non-Technical Schools and Colleges industry centers, training organizations, services. In addition, for practical training, laboratories of industries could be used as training sites for skill enhancement, where required

Right to Education Act of 2010

The Rights of children to Free and Compulsory Education Act has come into force from April 1, 2010. This is a historic day for the people of India because beginning that day, the right to education will be accorded the same legal status as the right to life as provided by Article 21A of the Indian Constitution. Every child in the age group of 6-14 years will be provided with 8 years of elementary education in an age appropriate classroom in the vicinity of his/her neighborhood.

Any cost that prevents a child from accessing school will be borne by the State which shall have the responsibility of enrolling the child as well as ensuring attendance and completion of 8 years of schooling. No child shall be denied admission for want of documents; no child shall be turned away if the admission cycle in school is over and no child shall be asked to take an admission test. Children with disabilities will also be educated in the mainstream schools. The Prime Minister Shri Manmohan Singh has emphasized that it is important for the country that if we nurture our children and young people with the right education, India's future as a strong and prosperous country is secure.

All private schools shall be required to enroll children from weaker sections and disadvantaged communities in their incoming class to the extent of 25% of their enrolment, by simple random selection. No seats in this quota can be left vacant. These children will be treated at par with all the other children in the school and subsidized by the State at the rate of average per learner costs in the government schools (unless the per learner costs in the private school are lower). All schools will have to prescribe to norms and standards laid out in the Act and no school that does not fulfill these standards within 3 years will

be allowed to function. All private schools will have to apply for recognition, failing which they will be penalized to the tune of Rs 1 lakh and if they still continue to function will be liable to pay Rs 10,000 per day as fine. Norms and standards of teacher qualification and training are also being laid down by an academic authority. Teachers in all schools will have to subscribe to these norms within 5 years. The impact of RTE will be that TVET can only start from IXth onwards, as 8 years of compulsory elementary education is mandated under the act. Therefore, Level I of NVEQF starts at class IX.

SKILL REQUIREMENTS AND SKILL GAPS IN THE EDUCATION SECTOR

The following table presents the skill requirements and gaps across various functions and hierarchical/reporting 'levels' in a typical educational institute.

In summary, the skill requirements of TVET trainers/educators are:

Level	Skills required
Principal	<ul style="list-style-type: none"> • Responsible for the overall functioning of the institution • Ability to hire qualified teachers • Ability to handle the required legal aspects related to the institution -complaints, audits, reviews • Ability to formulate strategic plans for building infrastructure for the institution • Ability to build the 'brand' of the institution. • Ensuring availability of Information and Communication Technology (ICT) to smoothen the teaching and learning process. • Ability to increase the enrolment and out-turn • Ability to appraise the performance of faculty on a regular basis. • Ability to coordinate with the external authorities / government officials and liaison with them. • Ensuring the safety of students • Ensuring discipline inside the campus.
Head of the Department	<ul style="list-style-type: none"> • Responsible for the overall functioning of the department • Allocating of work to faculty / teachers/ trainers • Preparation of timetable for various theoretical and practical sessions. • Ensuring adequate quality of teaching and pass percentage • Facilitating industrial visits • Handling classes • Reporting to the Principal periodically, on the performance of the students • Assisting the principal in identifying qualified faculties / teachers.
Teachers/ Professors /Lecturers	<ul style="list-style-type: none"> • Adequate knowledge of principles of teaching • Strong theoretical knowledge of subject • Ability to communicate the knowledge of the subjects to students in a manner that can be understood • Ability to deliver the content in a simple way to facilitate understanding • Good communication skills • Ability to empathise with students • Observation skills to understand the ability of the students to grasp a particular topic and to plan the teaching methods accordingly. • Ability to address doubts patiently • Ability to use computers in teaching (Microsoft PowerPoint presentation, Microsoft Excel, other ICT tools) • Industry exposure, especially in case of faculty handling technical courses. For example, a faculty handling modeling course in a fashion technology institute should have experience in ramp walk, conducting events, etc.
Placement Officers	<ul style="list-style-type: none"> • Ability to run the Placement Cell • Maintaining the list companies that needs to be invited for campus placements • Understand requirement of students and demand from industry • Coordinate with industry players, to track their requirements • Scheduling the Placement Week and interview slots based on industry demand and skill sets available in the institution.

1. Knowledge of subject and subject specific teaching skills
2. Pedagogical skills
3. Soft skills
4. Aptitude and attitude for training
5. Industry Experience

TRAINING FACILITIES / SCHEMES FOR TVET EDUCATORS

Craft Instructor Training

Training of Craft Instructors is the responsibility of DGE & T in the Ministry of Labor & Employment. The Craft Instructors' Training Scheme is operational since inception of the Craftsmen Training Scheme. The first Craft Instructor's Training Institute was established in 1948. Subsequently, five more institutes namely, Central Training Institute for Instructors (now called as Advanced Training Institutes (ATI), ATI at Ludhiana, Kanpur, Howrah, Mumbai and Hyderabad were established in 1960s by DGE & T.

The objective of the Craft Instructor Training is to train instructors in the techniques of transferring hands on skills, in order to train semi-skilled/skilled manpower for industry. Under the program, Instructors from State Government ITIs & ITCs and Training Centers established by industries under the Apprentices Act are provided training. Training in 29 Engineering trades is offered in these institutes. Total seating capacity in the Engineering trades in operation in the above stated six institutes is 1,600.

The following types of Craft Instructor Training Courses are offered at the above institutes for instructors of ITI/s/ITCs:

- i. Trade Technology
- ii. Engineering Technology
- iii. Training Methodology
- iv. Refresher Courses for Advanced Modules of Multi Skill Courses.
- v. IT – Literacy courses
- vi. Module on Quality tools and Quality concepts.

The NVTI at NOIDA and RVTIs at Mumbai, Bangalore, Thiruvanthapuram, Jaipur, Allahabad, Indore and Vadodara are also providing instructor raining Course exclusively for women in non-engineering trades like Secretarial Practice (English), secretarial Practice (Hindi), Electronic Mechanic, Dress Making, Computer Aided Embroidery & Needle Work, Fashion Technology, Architectural Assistantship and Beauty Culture & Hair Dressing. Total 540 seats (120 in NVTI and 60 in each RVTIs) are available for instructor courses in above institutes.

Craft Instructor Courses are offered with a view to provide comprehensive training both on skill development and training methodology. To make instructor training more flexible, Modular pattern of Craft Instructor Training in place of conventional one year training has been introduced in CTI and ATIs with effect from session started from August 2009. For engineering trades, the training program has been divided in following four modules each of 3 months duration. Under the modular concept, multi entry and multi exit provision has been made to make program flexible so that instructor can take up training in any of these modules at any of the institutes as per his convenience. Module of Engineering Technology is common for trades covered in a group.

- I. Training Methodology (TM) common for all trades.
- ii. Engineering Technology (ET) – common for similar trades in a group.
- iii. Trade Technology I (TT – I) trade specific
- iv. Trade Technology II (TT-II) trade specific.

For non-engineering trades, training is being offered in following three modules each of 4 months duration:

- Training Methodology
- Trade Skill – I
- Trade Skill – II

Refresher training is provided to update and upgrade the knowledge and skill of the instructors of ITIs upgraded as CoE, to keep them abreast of technological developments in industry so that they can be imparted in advanced modules of multi skill courses.

Training of Teachers of Engineering Colleges and polytechnics

NITTTTRs run various short-term and long-term programmes for teachers of Engineering colleges and polytechnics. These are given below:

Short-term Programmes

- Induction Training Program Phase I& II for Polytechnic Teachers of two weeks duration.
- ITP (An AICTE supported program) of two weeks duration for newly recruited engineering college teachers.
- Induction programs of two week duration for other clientele.
- Core teaching skills of one week duration for various clientele.
- Industrial Training of Teachers from two to twelve weeks duration.
- Content updating programs of 3 days to 8 weeks duration.

Institutes also offer Short Term Training Programmes of one to two weeks duration in the following areas:

- Curriculum Development, Student Evaluation, Learning resources Development, Education Technology, Education Research
- Content Updating, Laboratory Management, Industrial Liaison
- Management Development, Soft Skills development
- Appropriate Technology and Rural Development
- Continuing and Distance Education

In addition, post graduate programs are offered by these institutes.

Quality Improvement Scheme (QIP)

The Government of India launched the Quality Improvement Program (QIP) in 1970 with an objective of upgrading the expertise and capability of faculty members of the degree level engineering institutions in the country. The program is being implemented and monitored by AICTE, a statutory autonomous body of the Government of India. Under this scheme of QIP, only sponsored teachers are eligible for admission to either Masters or Doctoral degree program, with the aim to imbibe in them the culture of research and better teaching capability by exposing them to the environment and training in premier institutions of technical education.

The program was launched to improve the overall quality of technical education in AICTE approved institutions. The scheme anticipated that training the faculty members in some of the institutions where the facilities, infrastructure and the faculty are of the international standards, would provide them an opportunity to get involved in an environment of sophisticated research and development activities.

This would eventually lead to building quality infrastructure and improve the standard of technical education in their parent institution. The scheme was further extended to other discipline as well, such as Management, Pharmacy, Architecture and Town Planning, Hotel Management and Catering Technology. Now AICTE has extended the QIP scheme for polytechnic teachers for M.E/M.Tech. and Ph.D. degree programs in all the disciplines. The scheme has been named as QIP (Poly). The aim of the scheme is to strengthen the competency of the faculty of Polytechnics and to expose them to emerging areas of technical education.

Other Schemes

There are many schemes such as travel grant, seminar/ conference participation, cumulative professional development allowance are also in operation to encourage faculty development in India.

CONCLUSION

Teachers/educators remains to be the back-bone in producing skilled workforce for any economy. Unless active efforts are taken to prepare TVET educators for the next generation, India's vision of becoming a developed nation by 2020 will remain a dream. The Govt. of India has taken major initiatives for creating 500 million skilled workforces by 2022. These include Skill Development Policy, setting up necessary institutions to implement the policy, creation of National Vocational Education Qualification Framework and a host of other initiatives for development of TVET educators. A prosperous future waits ahead for India's two thousand year journey from rich to poor nation and then again a prosperous world power.

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PROFILE



Dr. Vijay Kumar Agrawal is currently the Director of National Institute of Technical Teacher's Training & Research (NITTTR), Bhopal, India. He has vast teaching and research experience for more than 30 years. He is a recipient of the UNESCO fellowship in 1990 and visited Japan for higher research where he received his Doctoral degree in Chemistry and Chemical Engineering.

He was awarded with two research projects by AICTE and other three projects by the UGC related to computer aided drug design and QSAR studies. He had been a distinguished invited speaker of the International Conference on TOPMOL 2006 held in Romania. He had delivered more than fifty lectures for UGC refresher courses organized by different national universities in India. Dr. Agrawal has published more than 150 research papers, and worked with the most renowned scientists of the world. He has organized various national and international seminars and conferences, which include "Washington Accord-India's Preparedness", "Building Quality Assurance in TVET-Trends & Perspectives" jointly with CPSC Manila, "Wind Energy: Trends & Issues", NBA Accreditation Workshop for AICTE, and many others.

INNOVATIVE AUTHENTIC LEARNING PRACTICES FOR TECHNICAL EDUCATION

Ms. Theresa Thang Tze Yan

*Deputy Divisional Director
Educational Design and Technology Division
Institute of Technical Education, Singapore
theresa_t_y_thang@ite.edu*

INTRODUCTION

Globalization and rapid advances in technology have direct implications on the pedagogy we use to train the new generation of knowledge workers and prepare them for employability and lifelong learning. In the past, students only need to learn about the technical knowledge and then apply their knowledge by learning to do through practice, typically in the classrooms, workshops or laboratories. The authentic learning pedagogy takes this further by enabling the students to learn to be a professional in their trade through applying their knowledge and skills in an integrated manner in environments that are either real world or simulated (Lombardi, 2007). To achieve this outcome, schools across ITE are encouraged to design their curriculum, learning activities and learning spaces to support technology enabled, project-based and team-based learning. This paper will share two such projects to illustrate what it takes to achieve the desired outcomes of authentic learning.

BACKGROUND: ABOUT ITE

As the principal provider of technical education in Singapore, ITE is responsible for developing national-level certification and standards to ensure that Singapore's workforce is competitive locally and globally. It was also established as a post-secondary institution under the Ministry of Education (MOE) in 1992, and hence, caters to 25% of the secondary school leavers.

ITE's mission is to create opportunities for school leavers and adult learners to acquire skills, knowledge and values for employability and lifelong learning in a global economy with a vision to be a Global Leader for Innovations in Technical Education.

To achieve this mission, ITE adopts the "One ITE System, Three Colleges" governance and education model, for policy consistency and quality assurance while empowering the three colleges, namely, ITE College Central, ITE College East and ITE College West, to have the autonomy to implement programs that support their respective niche areas of excellence.

The various program options offered by the Colleges are:

- Full time programs offer National ITE Certification (Nitec) and Higher Nitec certification.
- Part-time programs will lead to a Master Nitec, Higher Nitec, Post-Nitec or Nitec qualification. These are in addition to short courses for skills acquisition and upgrade.

Industry-based Training (IBT) is provided by ITE Approved Training Centers (ATC), Approved Training Providers (ATP) and Certified On-the-Job Training Centers (COJTC). International programs at Higher Nitec and Nitec International certification and customized programs are also offered with overseas partners.

ABOUT AUTHENTIC LEARNING

Authentic learning is a means to connect classroom learning to workplace task performance. In this pedagogy, lecturers have to facilitate various stages of “learning to be” so that students can be transformed from amateurs to professionals.

To design quality authentic learning experiences for students, lecturers should consider the following nine design elements that can provide (Herrington & Oliver, 2000):

- 1) Authentic tasks as they occur in real life that are ill-structured and encourage a multitude of solutions
- 2) Authentic contexts that reflect real workplace operations
- 3) Access to professionals who can demonstrate expert performances and model the right processes
- 4) Interactions with others for multiple perspectives
- 5) Collaborative activities to construct knowledge with peers
- 6) Timely coaching and scaffolding by the lecturer
- 7) Opportunities for reflection to consolidate learning
- 8) Opportunities to articulate what they have learned
- 9) Authentic assessment of competences based on evidences of task performance

EDUCATIONAL POLICY MEASURES IN PLACE TO SUPPORT AUTHENTIC LEARNING

The traditional method of training delivery has many limitations that constrain learning outcomes. For example, the layout of training facilities may not align with industry practices. Moreover, students lack the exposure to acquire life skills necessary to respond to dynamic circumstances in real world environment.

For industrial attachment, there are difficulties getting sufficient meaningful placements for all students. For these reasons, ITE Colleges have decided on a paradigm shift to the authentic learning pedagogy.

To embark on this new initiative, the ITE Authentic Learning Framework shown in Figure 1, was conceived to guide all stakeholders including management, specialists and lecturers in their implementations. Workplace requirements dictate the design of the curriculum, training environment and assessment strategy. When these foundational elements have been set up, the lecturer can then proceed to design a learner engagement plan that will help students to progress from the basic stage of “learning about” to the next stage of “learning to do”, and eventually to the final stage of “learning to be” the professionals in their trade (Drake, 2007).

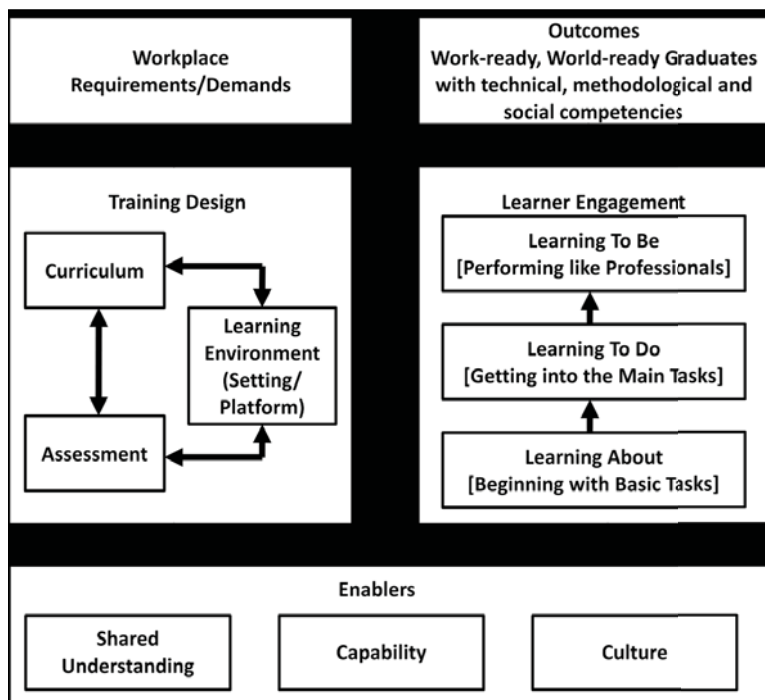


Figure 1: Authentic Learning Framework

For authentic learning practices to become pervasive throughout ITE, a shared understanding can be reached through lecturer capability development and proactive discussions with the lecturers at various communication platforms so that it can become part of ITE's culture. Current practices are being reviewed and new authentic learning approaches are recommended so that innovations continue to drive excellence in the design, development and delivery of ITE courses.

INITIATIVES IN TEACHING STAFF CAPABILITY DEVELOPMENT

The Total System Capability (TSC) initiative provides an integrated approach to develop ITE's human capital through industry projects or consultancy work (Grant, Malloy, Murphy, Foreman, & Robinson, 2010). Under the TSC scheme, there are three levels of competencies:

- Level 1 (Know): Lecturers have the knowledge and skills to fulfil their roles in the organization;
- Level 2 (Do): Lecturers have the capability to apply their knowledge and skills in industry projects or consultancy work;
- Level (Lead): Lecturers have the capability to lead others in industry projects or consultancy work.

The case studies below illustrate the TSC in implementation.

Case Study 1: IDEALAB

The School of Design & Media (SDM) at ITE College Central, set up the IDEALab within the Design Excellence Center to develop lecturer capability and student portfolio by immersing them in real-world projects (Tan & Teo, 2011). "IDEALab" is the acronym for "Innovation & Design for Enterprise Applications" and "lab" represents the authentic learning environment of the Design Studio in which interdisciplinary teams collaborate on industry assignments. This authentic learning approach fosters the design thinking process (Discover Opportunities, Define Outcome, Develop Ideas and Demonstrate Solutions) as it seeks to develop in students the ability to systematically arrive at solutions to meet client requirements.

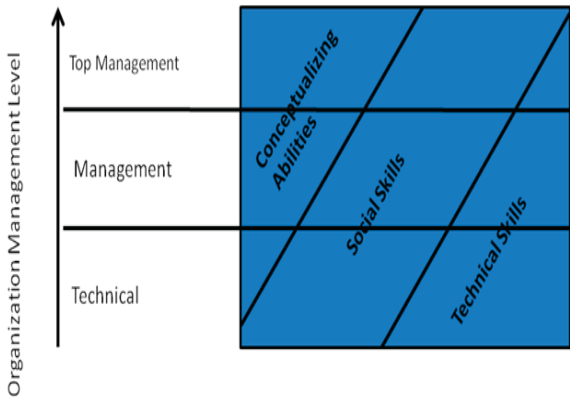
The rationale for IDEALab is to immerse students in the authentic workflow of industry practices, giving them an experiential understanding of the real workplaces and the opportunities to develop industry relevant portfolios (Cambridge, 2010). By working alongside their students, lecturers also have to deal with the complexities of real world problems such as deadlines and resource constraints. This process will develop in them technical competencies that will keep them updated with current industry practices and standard, as well as pedagogical competencies that will enhance their effectiveness in curriculum delivery.

The Design Excellence Center has a layout that reflects the Design Thinking Pedagogy of "Discover, Define, Develop and Demonstrate" (See Picture 1):

- (1) Discover Area is a Resource Space with books, materials for design works and computers for online research.
- (2) Define Area has three unique spaces:
 - Design Pods for students to brainstorm for ideas and discuss design trends, etc.
 - Immersion Studio for Interdisciplinary Design and Business programs
 - Consumer Research Room with two way mirror to observe how consumers interact with the prototypes
- (3) Develop Area is dedicated for commercial design and media production works for external companies.
- (4) Demonstrate Area consists of Galleries to showcase high quality projects from Foundation Studies, Final Year projects and Design Thinking for Innovation. It has both permanent and seasonal exhibits (e.g. campaign-based exhibition, product designs)



Picture 1: Design Excellence Center at the Tampines Campus, College Central



Picture 2: Discover Area

Global Economy Workforce

- Capacity For Lifelong Learning
- Adaptability, practical skills
- Awareness @ global issues
- Communication Skills
- Ability to work collaboratively

Picture 3: Define Area



Picture 4: Develop Area



Picture 5: Demonstrate Area

Key features in the curriculum include group and project assignments to create end products that are needed by real clients (Soares, 2010). These features mirror how design teams work in the industry and help students to hone their research, communication and interpersonal skills as well as commitment to create quality products. Projects undertaken by DEC include logo and collateral designs, illustrations, website development as well as prototypes of conceptual designs for lifestyle products or services. Besides providing meaningful context to learning, such industry partnerships also provide suitable resources for innovative curricula design and open doors to internships and placements.

IDEALab started in 2011 with projects that aim to build lecturer capability in the following four Capability Clusters: Product & Industrial Design, Architecture & Space Design, Communication & Interaction Design, and Media & Broadcast Design. The current focus is on three growth areas, namely, Urban Solutions, Health & Wellness and Lifestyle Product & Services.

An example of such industry collaboration is the Pink Ribbon Experience at the Breast Cancer Center in Kangang Kerbau Hospital. Six lecturers, together with 41 students, are commissioned to develop the conceptual designs in the redesign of the treatment center to aid patients' recovery. The design was satisfactory and the team was further commissioned to design the center's website and launch video for an opening ceremony. Lecturers from the Interactive Media Design department set the design direction and led the student teams to complete the design work for the website. Lecturers from the Visual Effects department led student teams to create the scripts and storyboards for the launch video. The development work is then passed on to third party vendors.

Case Study 2: Mobile Device Technology Center (MDTC)

Authentic learning within an authentic context brings with it the complexity and unpredictability of the real workplace. Hence, traditional assessment methods are no longer suitable to equitably assess the competences of students. With this realization, lecturers in the Nitec in Electronics (Mobile Devices) department have developed a World-ready Authentic Assessment Methodology (WAM) framework that incorporates peer assessment and real customer feedback as part of the overall assessment of every student (Ng, 2011).

The WAM framework is applied to two specialization modules conducted within the Mobile Device Technology Center (MDTC), namely, Mobile Devices Technology Module (MDT) and Mobile Devices Management Module (MDM). The MDTC, residing in the School of Electronics and Info-Comm Technology at ITE College East, was set up based on ITE's training specifications and incorporated the new authentic assessment metrics. See Pictures 6 and 7 for the layout of MDTC.



Picture 6: Entrance to Mobile Device Technology Center



Picture 7: MDTC set up that resembles a commercial service center

Each of the two modules has 15 hours for mini projects that will be replaced with WAM (Technical Excellence) and WAM (Customer Excellence), respectively. This 30-hour experience at MDTC is equally distributed among four zones (see Table 1) and every student has to take turns to apply their knowledge and skills in each zone to fulfil the WAM assessment requirements.

Module	Zone
MDM	Entrepreneurship Capability Building
MDM	Supervisory & CRM Capability Building
MDT	Mobile Device Servicing Capability Building
MDT	Repair and Test & Measurement Capability Building

Before students proceed to the MDTC, they would have covered foundational knowledge through classroom-based activities. At the MDTC, students are exposed to authentic practices with real customers and more complex tasks. Hence, they have to think on their feet, work well with other team-mates, and be effective in their communication. Students are given opportunities to reflect on their performance based on peer and supervisor feedback. (See Pictures 8 and 9 for training in progress)



Picture 8: Supervisory & CRM Capability Building



Picture 9: Mobile Device Servicing Capability Building

To ensure valid, fair and reliable authentic assessment, appropriate instruments with clearly defined performance criteria must be communicated to the students and applied consistently. Table 2 below compares the instruments used in traditional assessment strategy and world-ready authentic assessment methodology.

Academic Assessment (Learning about / Learning to do) Theory & Practical Assessment	WAM Competencies Components (Learning to be) Authentic Assessment
1. Assignments 2. Class Test 3. Phase Test 4. Examination	1. Constructivist Assessments 2. Peer Assessments 3. Report Writing 4. Performance-based Evaluation

The WAM framework consists of the following components:

1. **Constructivist Assessments:** Clearly defined taxonomic levels and rubrics are used to grade student's ability to select an appropriate solution and complete the necessary tasks in order to resolve the problems presented by the customer (Dannelle & Antonia, 2005).
2. **Peer Assessments:** Peer evaluation encourages active discussion among a community of learners and can be a powerful social motivator for students to perform well (Roberts, 2006).
3. **Report Writing:** Evaluation is based on how well the student has thought through his/her choice of solution to a problem by carefully considering the various options available to him/her. Students are encouraged to reflect and make recommendation for improvement where applicable.
4. **Performance-based Evaluation for Self-directed learning:** Evaluation is based on observations that include student's commitment to the group goals, participation in discussions, meeting deadlines, providing and receiving feedback, quality of work and number of complaints received (Burke, 2005).

Initial feedback from students who have undergone training at the MDTC was encouraging. Students who were surveyed agreed that WAM has benefited them because the assessment design and criteria actually gave them a clear understanding of the learning objectives and in turn determined their performance at the center. They also felt that they were better prepared for the workplace than before and appreciated the opportunities for reflections, feedback and recommendations for areas for improvement.

MAJOR CHALLENGES TO AUTHENTIC LEARNING PRACTICES AND HOW ITE ADDRESSES THEM

Several challenges confront the implementation of authentic learning practices, one of which is mindset change, especially among older lecturers who are used to the traditional mode of training delivery. Another is the huge investment in over hauling existing training facilities, so utmost care has to be taken when conceptualizing the design for the set up to ensure positive learning outcomes. Lastly, for real changes to take place, specialists from cross-functional divisions, namely, curriculum, assessment, educational development and learning technology support, must take up the challenge of working hand in hand to provide a holistic and systemic solution.

To address these challenges, a cross-functional committee comprising of representatives across academic divisions conduct periodic reviews of ongoing authentic learning projects. These reviews provide critical learning points on the effectiveness of particular authentic learning approaches and the relevance of particular authentic learning environments. The critical success attributes of exemplary projects are highlighted so that academic departments in the Colleges will gain insights and possess the know-how to further extend authentic learning practices to other courses.

Furthermore, review exercises when conducted with external experts; provide opportunities for lecturers to keep abreast with the latest development and requirements in their respective industry. An example is the case for nursing where METI mannequins provide simulations that require nursing trainees to respond appropriately to the different medical conditions of their "patients". Doctors from Changi General Hospital participated in the peer reviews of all the scenarios developed for the training sessions for validity and clinical accuracy. The doctors' feedback is a form of knowledge transfer to ITE lecturers.

Besides building up their domain capability, lecturers also have to consider how authentic learning pedagogic approaches can be better organized to achieve optimal learning outcome. Examples of good practices implemented as a result of such consideration include the reflective learning approach adopted by the nursing and aerospace courses to support deep learning and authentic assessment.

FUTURE PLANS

The journey for implementing authentic learning practices in ITE has only just started. There are variations in the quality and scope of current implementations. It is instructive for ITE to continually document and share best practices learned from successful projects to inculcate shared understanding and promote a culture that can sustain the application of the authentic learning pedagogy.

Future plans include formalizing the Authentic Learning Framework as ITE's unique pedagogy that guides all academic processes. A support system consisting of professional development courses, consultancy, help resources and evaluation tools will be set up to assist academic departments to design and implement authentic learning in their courses. Concurrently, specialists from the curriculum and assessment divisions will review existing curriculum and assessment strategy for better alignment to the new pedagogy.

Sharing sessions on best practices and knowledge transfer will be promoted by a community of advocates at various platforms such as ITE's Annual Teachers' Conference and International VTE Conferences. Training courses with authentic environments can also be showcased to the public, starting with the new HQ and College Central campus by 2013. Such showcases can inspire both lecturers and students to be engaged in this innovative method of teaching and learning.

CONCLUSION

ITE believes that the authentic learning pedagogy not only motivates students to learn but also provides a way to adequately prepare them for their industrial attachment. When interns are ready and can contribute right away, this creates a positive impression of ITE students and paves the way for future placements.

Authentic learning approaches are more holistic, enabling students to gain technical, methodological, social and personal competences. These competences will help ITE students to graduate successfully and be assured of employment and subsequent career upgrades through lifelong learning.

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PROFILE



Ms. Theresa Thang Tze Yan is currently the Deputy Divisional Director of the Educational Design and Technology Division at the Institute of Technical Education (ITE). She leads a team of specialists in conceptualizing and implementing enterprise-wide learning technologies such as authentic learning with 3D virtual world in Second Life and a media-rich integrated platform that supports learning communities.

She started her e-learning journey at Nanyang Polytechnic in 2000 where she supported fellow lecturers in developing multimedia courseware for self-directed learning. After completing her Master in Instructional Design and Technology, she joined a commercial education provider in 2003. As the Head of the e-Learning Academy, she designed programs for total online delivery for its international students. She brought this rich experience to jumpstart e-learning in the Singapore Management University.

REORIENTING TVET TOWARDS SUSTAINABLE DEVELOPMENT: THE ROLE OF TEACHER PROFESSIONALS AND THE UNEVOC NETWORK

Ms. Naing Yee Mar

*Program Officer, UNESCO UNEVOC International Center for TVET
Bonn, Germany*

naing.yee.mar@unevoc.unesco.org/ ny.mar@unesco.org

INTRODUCTION

This paper intends to present issues facing TVET vis-à-vis educational change and the role of teachers and the UNEVOC Network. The paper highlights on going debates in the literature concerning contemporary patterns of educational change with regard to the role of both organizational culture and socialization processes in Education for Sustainable Development (ESD) initiatives. These debates have been critical of the formation of an organizational culture so as to whether it has the flexibility and effectiveness necessary to be meaningful during the United Nations Decade of Education for Sustainable Development. (DESD)³. Some academicians assert that the changing organizational culture can be imperialistic, and its application can sometimes lead to social inequity and exclusion. In response, the systematic process of socialization has often been offered the prospects of making needed changes in education. As a result, conflicting discourses have arisen, which state that the society's culture has reinforced the validity of organizational culture to determine and dictate what 'educational change' should mean to learning communities, in particular to teacher education during the DESD.

This paper proposes to engage with these debates by reviewing the research and related literature relevant to ways of conceptualizing the organizational culture to see how such cultures are formed, maintained and changed, with regard to providing an appropriate remedy for education reform and development issues. This theoretical orientation aims to look at the ways in which cultural interfacing and socialization processes are possible ways of dealing with this broadside against education reforms.

Moreover, the effect of the developments of industry and technology has created an impact upon the diversity of the ways in which TVET training is practiced in countries. The paper, thus, concludes by addressing the issues related to how these programmes have been designed to meet the needs of the industries; are these TVET programmes oriented in school-based provisions or apprenticeship type programmes; what are the basic ingredients of a contemporary model for TVET programmes; and how teachers perceive their role and their collaborative learning process in TVET reform initiatives. To this end, it is envisaged that this paper may help deepen our understanding of the multiple roles of teachers as change agents, as learners, as well as educators, in coping with constant changes in the educational field, particularly those in the UNEVOC Network.

CONTEXTUAL BACKGROUND

Why study educational reform in TVET?

There are several important interrelated reasons to explain why the study of reform processes warrants critical attention in TVET.

There are several important interrelated reasons to explain why the study of reform processes warrants critical attention in TVET. The international concerns of TVET for achieving life-long, skills development and employability related areas is long-standing, and has taken into account the notion of TVET for

Sustainable Development, since the 1990's. The recommendations of the UNESCO Second International Congress on TVET proposed a new orientation of 'TVET for all throughout life' so as to meet new emerging demands for achieving the objectives of a culture of peace, environmentally sound sustainable development, social cohesion, and international citizenship of the world (UNESCO, 1999). Owing to an ongoing emphasis on TVET for achieving Sustainable Development, the International Experts Meeting in Bonn (2004) formally adopted a statement, the Bonn Declaration, which argued that 'TVET must be the master key that can alleviate poverty, promote peace, conserve the environment, improve the quality of life for all and help achieve sustainable development.' (UNESCO, 2006)

An important outcome of this meeting was the development of a draft action plan to guide UNESCO, as lead agency for the decade. In this regard, the UNESCO-UNEVOC International Centre, where I am working as a programme officer, is concerned with catalyzing and supporting the orientation of TVET towards Sustainable Development during the Decade. It can also be demonstrated that in this draft action plan, and in the draft International Implementation Scheme (IIS) for the Decade (UNESCO, 2005), the role of TVET is to help bring about changes within education systems that will shape the knowledge and skills of future generations with regard to education for the world of work.

Nowhere is the need for TVET for sustainable development greater than in the vast and diverse developing world, which is home to approximately 80% of the world's population. In these countries, many millions of young people will never have the opportunity to receive conventional education at school, while many working adults are unlikely to have the opportunity to recoup the education and training denied to them when they were young. In addition, 60% of the population in developing countries still live in rural areas and earn less than US\$1 per day. Thus, the challenge is for TVET to help facilitate rural transformation and overcome poverty.

As a result, governments are trying to mobilize innovative, alternative approaches to providing TVET programmes through improvements in content, pedagogy, modes of delivery and teaching/learning processes. Increasingly, the critically important role of TVET has been emphasized and many countries have begun to undertake far-reaching reforms in legislation, policy, curriculum and pedagogy and in professional development necessitated by the imperatives of Sustainable Development.

Thus, identifying approaches to educational reform, and developing a suitable balance economic and social progress which addresses cultural differences, and conforms to global, national and local needs, while at the same time respecting ecological values and limits, is key to Sustainable Development (UNESCO, 2006). In that regard, the International Implementation Scheme (IIS) has suggested that the goal is to create a locally relevant and culturally appropriate values component to ESD that is informed by the principles and values inherent in Sustainable Development (UNESCO, 2005).

In view of this, the study of educational reform in TVET also assists me to understand how managing transformation in relation to social and economic development is possible, because finding new or improved ways of using resources and capacity helps explain how the TVET system is able to create value and so improve returns to the society in question. William Bennett (1967), in referring to a new model of education investment and economic growth, stressed that data from UNESCO on the educational level and economic development of 69 nations shows that economic development was only slightly related to general secondary education but more closely related to the level of vocational education. Thus, this historically implied that finding approaches to quality improvement in TVET can be a good indication, in broad terms, of harmonizing economic and social progress, and for conforming to global, national and local needs, which are correlated with Sustainable Development concerns.

Some scholars have argued that there is a need to move beyond such dichotomies (or ideologies). Before this can be done we need to understand the socialization of teacher professionals in the cultures of different societies. For all the reasons outlined above, the study of educational change in TVET is an area of considerable importance, and reflects the author's interest in both theory and practice, as it relates to this area.

Background to educational reform and the process of managing change

Educational change management, organizational culture and socialization are terms that appear frequently in the contemporary literature on education reform and in the development discourse. These ideologies broadly advocate an active and integrated role for those individuals whose livelihoods may be altered by changed behavior, to quality improvement in education or to the research in question.

They form part of an 'educational change' ideology defined as: "schools (to) be treated and developed as learning organizations, which do not pursue fixed plans in pursuit of set goals. Instead they structure and develop themselves so that they and their members can continually learn from experience, from each other and from the world around them, in order to solve problems and improve, on a continuous basis" (Mulford, 1998).

The focus of this paper will be upon a limited but important part of the change literature. The main argument is based upon the discourse of change and organizational culture debates. However, before venturing into these debates, the political dynamics of the language of change itself will be discussed.

The interest in educational change, improvement, reform and educational innovation related areas is long-standing and has existed since the beginning of the mid-nineteenth century. For example, since the 1960s researchers like Matt Miles, Per Dalin, Lou Smith, Neil Gross, Lawrence Stenhouse and Seymour Sarason studied and introduced innovative approaches to school improvement, which have been translated back into a rational science by educational systems (Hargreaves, 2000). Many policy makers heralded these words as signalling to provide a context for opening multiple domains of educational innovation and developments, but in reality these efforts were caught up in the proverbial tidal wave of educational change, innovation, and reform (Smith, 1998).

Smith (1998) has labelled these "domains of educational innovation and reform" and has depicted that some of these domains were quite specific, others quite general, some were organizational and structural, others were more substantive and programmatic, and others had to do with new methods of inquiry.

In the 1990s many scholars such as Fullan, Miles and Sarason et. al. began to question the extent to which accelerated education reform was actually helping nations through the theoretical and practical problems of adverse socioeconomic conditions. It was argued that far from alleviating the poverty of individuals living in the 'third world', economic growth had compounded their continued marginalization and poverty. Increased environmental destruction and degradation also hindered socioeconomic growth. Coupled with these increasingly self-evident truths was a growing body of literature critical of the hegemonic discourse of education reform and practice.

In his article 'Pushing the Boundaries of Educational Change', Hargreaves (2000) argues that educational change theory has taught us much over the past quarter century about how to manage (and not manage) the change process; and that as our knowledge deepens and the world inside and outside schools become more turbulent, it is time to revisit some of the fundamental issues in the field.

Others such as Robert Merton and E. O. Wilson, Smith (1998) were describing, reinforcing and even recreating the 'reality' regarding such matters. Hargreaves further argues that organizational structures and processes contained complexities, and needed further discussion on sociological and functionalism, and especially latent dysfunction conceptions and almost sociobiological notions regarding the degree of malleability of human nature.

Sociologists of education, who have mainly been keen so far to study education from the perspective of constructivism, and who have been increasingly attentive to the ways in which education can be political tools, have not as yet studied the integration of ESD concerns into existing education programmes. This study wishes to fill in these gaps, both at the empirical level, and at the level of theory.

Professional development in TVET teacher education

It is postulated that one of the main objectives of planned educational reform is to find new or improved ways to increase quality in education. As such, it can be said that teachers are the main resources to implement changes and are also essential to enhancing skills development in the workforce, and so they can be catalysts and assume the responsibility for managing transformations to reach desired goals. Sachs (2003) proposes that learning which leads to change, should be at the core of a platform for rethinking teacher professionalism, as a means of developing a socially responsible, active professional community.

Professional development and cultures in TVET teacher education are important and complex phenomena, yet in spite of this the study of professional development patterns, values and culture has received relatively little recent sociological study. As indicated in my previous study at the IOE (Foundations of Professionalism), those studies that have been undertaken mainly investigate occupational groups such as doctors and lawyers, and business professional development (Rueschemeyer, 1983; Larson, 1977; Eraut, 1994). The studies that examine professional development in TVET teacher education, in relation to organizational culture and practices that underline Sustainable Development are limited, especially with regard to the UNEVOC Network in developing countries.

Despite the large number of TVET institutions involved in the UNEVOC Network, and the fact that it is widely recognized that the notion of sustainable development is both complex and varies from context to context, network members have (until recently) provided surprisingly little knowledge about their contribution to the Decade.

As a result, the extent of the available resources to integrate the principles, values, and practices of Sustainable Development into all aspects of education and learning, as an overall goal of the DESD, is currently rather meagre. It is anticipated that the findings of this study will help assist UNEVOC member countries in this regard, by adding to the theoretical and empirical knowledge available about educational change through a study of creating added value in TVET teacher education.

Further, the paper may help enhance our understanding of the ways in which education systems operate towards achieving ESD, but also their organizational learning culture towards achieving a sustainable future.

The role of organizational culture

Hellriegel, et al. (1998) spoke about the way in which the organizational culture is used to reinforce and perpetuate the position of both individual and group processes. Organizational culture represents a complex pattern of beliefs, expectations, ideas, values, attitudes, and behaviors shared by the members of an organization. They argue that an organizational culture emerges when members share knowledge and assumptions as they discover or ways of coping with external adaptation and internal integration issues. External adaptation involves organizational strategy to cope with its constantly changing external environment. Internal integration relates to the establishment and maintenance of effective working relationships among the members of the organization.

An interesting question is thus: how do organizations socialize individuals into their particular cultures? In any situation there will be individuals/groups/social movements with varying degrees of power. The way in which these different teachers and educators influence educational reform and legitimization is paramount to understanding the impact of a society's culture on the organizational culture operating in that society, or how discourse coalitions may be formed. At the institutional level, stakeholders decide which quality of education and which programs to promote.

Socialization and learning networks

Socialization is the process by which older members of a society transmit to younger members the social skills and knowledge needed to function effectively in that society (Hellriegel, et al.,1998). In this context,

the notion of TVET for Sustainable Development differs from one country to another and between communities. Each country (and community) is represented by their own unique set of environmental forces such as: socio-cultural, political-legal, technological and economic forces. Each of these has a strong impact on the educational environment. These variables in societal environments may not compromise the educational activities of the nation in the short term, but can, and often do, affect its long-term developments (Hellriegel, et al., 1998).

In addition to these societal considerations, governments, local communities, education suppliers, learners, and trends in labour markets directly influence the effectiveness of education and, in turn, are affected by it. These are multiple, contextual variables that need to be taken into account in order to best understand human intentions and interactions in different culture settings (Sirotnik, 2000, p. 184).

According to this perspective, the task of the researcher is to develop concepts which will assist in an improved understanding of the organizational culture into the specific learning environment, and the possible relationships between organizational culture and performance within it (Hellriegel, et al. 1998). So the study of educational reforms in TVET is of importance if this is to be realized.

The UNEVOC Network acts as a unique facilitator for sharing knowledge and experiences regarding all aspects of TVET, in particular supporting TVET reform processes in developing countries, countries in transition and those in post-conflict situations, with reference to promoting best and innovative practices in TVET. The UNEVOC Network can be considered as being a major pathway to serve professional development and mobility, though other useful characteristics shared among education networks. These, as described by Parker (1977), are:

- a feeling of shared purpose;
- a sense of being an alternative to established systems;
- some mix or sharing, and psychological support;
- an effective facilitator;
- an emphasis on voluntary participation and equal treatment.

It can also be demonstrated that networks, as a vehicle for educational reform (Keating, 2000), are vital for enriching learning environments and for facilitating members to interact. As such, specific networks serve opportunities for learning and socialization, and the necessity for building a professional community has become a recurring theme in the reform literature (Lieberman, 1988; Little, 1993).

Although the main focus of this study is on the learning process carried out by TVET teachers to implement changes in education for the world of work, within the UNEVOC Networks, the research findings may also help deepen our understand of the multiple roles of teachers as change agent, as learners, as well as educators, to cope with constant changes in the educational field.

CONCLUSION

Through this literature review, a key question arises in this paper regarding the role of organizational culture and socialization processes in influencing educational change ideology and practice: how does an effective organizational culture impact on change? Although an investigation of this matter is beyond the scope of this study, this question does highlight the role of TVET teachers in educational reform practices. For example, to what extent is a society's culture valued as integral to the success of school-based research and experimentation? Moving beyond this, what place is there for culture interfaces and socialization process; and at what point does education reform become knowledge exchange when TVET teachers' experimentation is integral to socialization success? This leads on to a broader consideration of how teacher perceive their role in such reform and what effect this has upon their adoption of the new ESD initiatives training programmes. In essence: how are these educational reform ideologies and practices actually involving the TVET teachers and educators for promoting TVET for sustainable development.

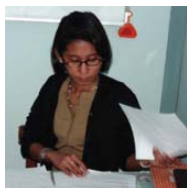
In conclusion, through these broad questions, the paper shall augment the role of the UNEVOC Network to support the work of TVET Teacher Professionals and set a context from which to develop these ideas further in the future.

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PROFILE



Ms. Naing Yee Mar is a Programme Officer at UNESCO-UNEVOC. Her work mainly focuses on project initiation, development and implementation. She coordinates and manages several ongoing UNESCO-UNEVOC activities, and is the focal point for TVET for sustainable development, HIV/AIDS and TVET, TVET teacher education, and public private partnership in TVET. She also works closely with other colleagues on the development of the UNESCO-UNEVOC website and online services.

Naing Naing has research and work experience in state of the art, innovative web-based technology projects in the corporate sector since 1993. Before joining UNESCO-UNEVOC, Naing Naing worked at Busnesstales and Glocorp as Senior Project Manager in collaboration with Capgemini, Computer Science Corporation (CSC), WorldCom and other leading media companies in The Netherlands. She also used to be a secondary teacher (for 10 years) in Myanmar, where she originally comes from. She holds a B.Sc. in Physics (Myanmar) and an MBA in General and Strategic Management in Technology and Innovation (Netherlands). Naing Naing is currently pursuing a doctoral degree in education at the University of London, specializing in TVET system development, particularly in developing countries.

TVET EDUCATION FOR GREEN SOCIETY AND ECONOMY AND THE DEVELOPMENT OF TVET EDUCATORS IN AFRICA: GOOD PRACTICES AND EMERGING CHALLENGES

Bonaventure Wanjala Kerre, Ph.D

*Full Professor of Technology Education, Department of Technology Education,
School of Education, Moi University – Eldoret, Kenya
bonaventurekerre@yahoo.com*

INTRODUCTION

In Africa, the development of Technical and Vocational Education and Training (TVET) Educators has come a long way from the dawn of independence in the early sixties to today. During the Colonial rule in most parts of Africa, education was reserved for white minorities whereas technical and vocational training was reserved for the natives. Vocational training was taken up by the natives for purposes of maintaining the colonial regimes. After independence, there was much scramble for liberal arts education to train for clerical and office administration jobs. This was the genesis of the lower status syndrome toward practical/vocational training.

However, soon after independence it was realized that, besides political emancipation, the young nations needed skilled manpower for their economic liberation.

RECOGNITION OF THE ROLE OF TVET IN AFRICA

African leaders at an education conference in Addis Ababa in May, 1961 recognized that education was a basic factor in economic and social development and in particular observed that:

“..the African countries, in a century characterized by technological progress, should embark on a very broad expansion of technical and vocational education and specialized training in the interests of their own development and especially for their industrialization.”
(ECA/UNESCO 1961:9.37)

For three decades following the above declaration, Africa was thrown into turmoil as political coups, famine, environmental degradation, civil strife and tribal wars reigned. The impact on education and economic growth was debilitating.

THE UNESCO-UNEVOC PROJECT

From the 1990s, the debates on TVET worldwide, and in Africa in particular, were initiated through UNESCO's International Project “UNEVOC” established in Berlin, Germany in 1992. It created forums for TVET scholars and planners to meet and exchange views and ideas at regional and sub-regional levels. Major issues on TVET Policy Frameworks, Curriculum and TVET Teacher education were discussed (UNESCO-UNEVOC, 1992; Kerre, 1996). In May 1999, The UNESCO Second International Congress was held in Seoul, Korea. At this forum major recommendations on the development and improvement of TVET were agreed upon. This effort resulted in the formulation of the UNESCO TVET Normative Tools and Joint recommendations with ILO in the development of TVET in Member States.

With increased knowledge and appreciation of TVET's role in national development, UNEVOC's role has increased, over the last decade, in the promotion and development of TVET systems in both developed and developing countries. It has carried out this important mandate through its network of 279 UNEVOC Centres currently established in 166 of UNESCO's 193 member states.

In the African region, UNEVOC has sponsored and facilitated several seminars and meetings of TVET stakeholders through the UNEVOC centres network in which major issues and concerns pertaining to TVET policy, curriculum, teacher education and teaching methodologies and materials have featured. The UNEVOC Networks are one of the major strategies that UNESCO uses to provide assistance to member states, particularly those developing and in transitional status, towards the development and implementation of TVET and to engender collaborative learning, building and sharing knowledge.

Today, Many African states have embraced TVET and despite the limitations confronted, have structures in place to provide technical and vocational education in the school curriculum. The most important aspects of TVET including: policy frameworks, financing, curriculum review, teacher education, links with industry and gender equity have to some extent been addressed.

Those countries that have developed national TVET networks and have put in place legislation to guide TVET development include: South Africa, Kenya, Ghana, Nigeria, Tanzania, Botswana and Malawi. Besides Kenya, these countries have established national bodies (TVET Authorities) to oversee the development and financing of TVET institutions. Uganda and Rwanda have more recently established their national policy frameworks and await legislation.

The African Union Embraces TVET for Member States

In its Plan of Action for the Second Decade of Education (2006 – 2015), the AU recognizes the importance of TVET as a means of empowering individuals to take control of their lives and recommends therefore the integration of vocational training into the general education system. The AU also recognizes the fact that vast numbers of young people are outside the formal school system, and consequently recommends the integration of non-formal learning methodologies and literacy programmes into national TVET programmes. (AU, 2008)

With a few exceptions, the socio-economic environment and the contextual framework in which TVET delivery systems currently operate on the continent are characterized, in general, by:

- Weak national economies, high population growth, and a growing labor force;
- Shrinking or stagnant wage employment opportunities especially in the industrial sector;
- Huge numbers of poorly educated, unskilled and unemployed youth;
- Uncoordinated, unregulated and fragmented delivery systems;
- Low quality;
- Geographical, gender and economic inequities;
- Poor public perception;
- Weak monitoring and evaluation mechanisms, and
- Inadequate financing, poor management and ill-adapted organizational structures.

It is within this framework that the African Union Commission is spearheading the development of a new strategy to revitalize TVET in Africa. The objectives of the strategy are:

- To revitalize, modernize and harmonize TVET in Africa in order to transform it into a mainstream activity for African youth development, youth employment and human capacity building in Africa;
- To position TVET programmes and TVET institutions in Africa as vehicles for regional cooperation and integration as well as socio-economic development as it relates to improvements in infrastructure, technological progress, energy, trade, tourism, agriculture and good governance;
- To mobilize all stakeholders in a concerted effort to create synergies and share responsibilities for the renewal and harmonization of TVET policies, programs and strategies in Africa.

National Visions

Most African countries have national visions and strategies for development. For example Kenya and Nigeria have the following:

Kenya:

Kenya's Vision 2030 is the country's new development blueprint covering the period 2008 to 2030. It aims to transform Kenya into a newly industrializing, "middle-income country providing a high quality life to all its citizens by the year 2030" (Kenya, Government of, 2007 p.1)

Nigeria:

The Vision 2020 represents Nigeria's Economic Transformation Blueprint and long term development agenda aimed at repositioning Nigeria to become among the top twenty largest economies in the world by the year 2020 (Nigeria, 2011)

In order to achieve the objectives of these scenarios, a critical component will be the availability of a workforce with prerequisite, knowledge, skills and attitudes to drive industry. In Nigeria, for example, Dike (2005) observed that the design of Nigeria's educational system is flawed and the neglect of technical education is an obstacle to national development and further observed that technical degrees are regarded as inferior to regular academic degrees.

THE NEED FOR TVET CURRICULA REVIEWS

There is a dire need to embark on serious curricula reviews in order to effectively respond to the ever changing demands for new knowledge and skills in the modern workplace. Most TVET curricula are still traditional in content and in presentation.

The growing realization that society is advancing faster than its understanding of the technologies that have allowed it to achieve these new heights demands that we have a rudimentary knowledge of its function and potential impact on other systems in society (Hall, 2010).

We, thus, have an obligation to provide all students with a fundamental understanding of what technology is, how it is used, and how it may affect their future. The incorporation of technology in the classroom requires more than using computer-assisted instruction (Center for the Enhancement of Teaching, 1998). It also requires that the student develop an appreciation for technological concepts and an understanding of what technology is as a discipline (Lewis, 1991).

Knowledge workers need to develop critical thinking skills to define problems in complex, overlapping, ill-defined domains; use available tools and expertise for searching, formulating the problem, analyzing, interpreting, categorizing ideas and finding alternatives, and choosing the best solution.

Even as most developing countries struggle with basic needs, the global economy demands more technical and behavioral skills, especially those formed during the ages 15–24. Competition has driven up the demand for skill-intensive technological innovation and the trend will continue as the competition grows (World Bank, 2007).

Effective curriculum review must involve stakeholders from business and industry who will be the end users of TVET graduates/products. This must be done on a regular 5 year period to cope with changes in technology and skill demands in the workplace.

There is a need to determine what ought to be taught at various levels of learning. For example can TVET be effectively taught at basic levels? Can Technology education be taught at that level as is the case with the UK and USA? If so, what curriculum should be taught?

TVET TEACHER EDUCATION

It is now a well-known axiom that the quality of TVET is inextricably linked to the quality of its teachers, instructors and tutors. Unfortunately, for the most part of Africa no meaningful attention has been given to the development and training of TVET teachers. Besides, due increased technological innovations and the demand for higher education and skills in the modern workplace, much more is demanded of a TVET teacher today than ever before.

National reviews of education and training reveal that almost 90% of vocational teachers and instructors working in the public vocational training system require continuous upgrading of training skills (Kerre, 1999).

The shortage of appropriately trained trainers in the Sub-region is, therefore, critical. There are several other underlying causes of such a state of affairs:

- Poor conditions of service and low levels of remuneration as compared with other tertiary institutions
- Lack of staff development programmes
- Lack of appropriate career opportunities
- The low value accorded to vocational as opposed to academic education

Regional Forum

From the 15th to 17th of July 2009, a conference on Reforms and Development of Technical and Vocational and training (TVET) and Strategies for Developing TVET Teacher Education with reference to Mozambique was held in Maputo under the sponsorship of UNESCO-UNEVOC in collaboration with Magdeburg University.

The purpose of the conference was to enable participants share the latest experiences and practices in TVET in the Eastern and South African Sub-region and to discuss the issues and the necessary reforms required to bring the TVET practice in line with the current demands for knowledge and skills in the modern work place.

The conference in particular examined TVET practice in teacher education as a major prerequisite for any quality system. It was found that the lack of sufficient numbers of qualified and competent TVET teachers and instructors was a common feature hindering the development of TVET in the sub-region.

The need to address the issue of TVET teacher education emerged as the most urgent of all the needs discussed in the conference. At present, most TVET teachers and instructors in Africa are drawn from artisans, craftsmen and technicians with varying degrees of technical or vocational competence without the prerequisite pedagogical training to effectively design, develop and deliver TVET programs.

In Africa, there are relatively fewer universities offering degree programmes for TVET educators. These include: Moi University in Kenya, University of Nigeria- Nsukka, University of Malawi, and the University of Botswana.

Moi University has had a TVET teacher education program at undergraduate and masters degree level over the past 20 years and has established and launched a Doctoral program this academic year. The department of Technology Education at Moi University has the largest number of highly qualified TVET lecturers in the African Region - seven PhDs and six with Masters degrees. They are highly specialised in both technical disciplines as well as pedagogy. The major areas of specialization or teaching options are:

- Building and Construction Technology,
- Computer Studies
- Electrical/Electronics Technology,

- Mechanical Technology
- Power Mechanics Technology

There are other TVET areas that are not covered at Moi University. However, they are offered in other universities. These include: agricultural education, business studies education, family and consumer services education, health education and music education.

The production of graduate TVET teachers demonstrates the need to open up for TVET graduates to proceed with further higher education unlike previously when opportunities were very limited.

EMERGING CHALLENGES

While TVET teacher education challenges have been to come out of the colonial regimes' traditional curricula and adapt to changing demands of the work place, today, the challenges are multi-faceted.

- The majority of the youth in Africa are not meaningfully engaged in the workplace. There is an apparent disconnection between the knowledge and skills demanded of these youth in the job market and the knowledge and skills they have. There are two types of out of school youth. One is the type that had some primary education or secondary education and joined the labour market without any vocational training. The other is one that completed one or two levels of education and proceeded and had vocational training. The major problem with the former is a double tragedy of insufficient general/basic education and lack of preparation for any occupation. The problem of the latter is inappropriate training or mismatch of training with occupational skill requirements.
- Modern curricula demand greater capacity for scientific and technological literacy to provide an edge in innovations and inventions in the modern global market. Science, technology and mathematics are essential subjects that must be introduced in the school curriculum right from early childhood learning. However, technology has not been developed as a discipline for study.
- The current drive toward green society and economy is just as relevant if not so more needed in developing countries, most of which are already major victims of environmental degradation. This calls for more new knowledge and skills for a modern workforce.
- Current efforts to provide free primary education and to some extent, secondary education has led to a new surge for higher education amidst scarce resources. The major challenge has been to offer technical and vocational education at lower levels due to its relative cost compared to general education. However, at primary or elementary level, the curriculum should be one of awareness creation while at secondary level emphasis should be on exploration.
- In most countries, there weren't enough policy initiatives and legal structures to put TVET in the mainstream education sector. This practice often denied TVET the requisite financial support to make it accessible to all.

All these call for a review of TVET curricula with special emphasis on TVET teacher education. TVET teachers have a dual role to play in their profession. One is to provide education that includes all aspects of general education and preparation for lifelong learning leading up to higher education given the demands of modern society. Secondly, to introduce learners to common valuable knowledge, skills and attitudes demanded of the modern workplace and at postsecondary level prepare them for their future chosen careers in the technical and vocational occupations from lower to higher technical skills levels.

It is, therefore, obvious that any meaningful curriculum change and innovation must begin with teachers who will ultimately be responsible change agents.

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PROFILE



Prof. Bonaventure Wanjala Kerre is currently a Full Professor of Technology Education in Moi University, Kenya. He is also the Lead UNESCO Scholar in Technical and Vocational Education and Training (TVET) and a Visiting Professor of Education (Tech and Voc. Ed.) and Ag. Dean, Faculty of Education, Kenya Methodist University. He was an International Lead Consultant for the Establishment of Rwanda Workforce Development Authority (RWoDA) from Nov. 2007 – Feb. 2008. Prior to this, he held numerous positions in the government and universities in Kenya.

As an experienced consultant, researcher and author, his interests are technology education in the school curriculum, teacher education for technology education, technical and vocational education in Africa, and elements of curriculum design for the 21st century.

Prof. Kerre is a member and former Vice President for the Africa Region (1986-1990) of the International Vocational Education and Training Association (IVETA). He was awarded by IVETA and Iowa State University Foundation with the 2004 Silvius – Wolansky Award as an Outstanding International Leader in Technical and Vocational Education and Training. He also obtained the 2001 Presidential Award for Service in the Jua Kali Sector in Kenya.

He obtained his Doctoral degree in Vocational and Technical Education in 1984 from the University of Minnesota, USA and M.Sc. in Vocational and Technical Education in 1980 and B.S. in Trade and Industrial Education in 1979 from the Oregon State University, USA.

GOOD PRACTICES AND EMERGING CHALLENGES FOR TVET EDUCATORS' DEVELOPMENT: EGYPT EXPERIENCES

Dr. Khaled El-Saadany

*Key Expert in TVET reform, Alexandria University
Elsaadany12@hotmail.com*

BACKGROUND

Egypt is by far one of the largest economies by population (approximately 91 million) and it has the largest education system in the Middle East and North Africa (MENA). TVET is widely recognized as a major challenge to reduce unemployment, create social equality and enhance the country's global competitiveness. Work on 1,600 industrial, commercial and agricultural secondary schools with more than 2.2 million students. Most TVET graduates are obliged to enter the labor market directly. A total of 646,000 students, almost two-thirds of the total number of students enrolled in secondary school, are currently engaged in technical and vocational education. Furthermore, an estimated 1.1 to 1.6 million new entrants to the labor market per annum will present an additional challenge in terms of their employment and training needs. The Government of Egypt intends to create 750,000 job opportunities per annum while retraining 100,000 workers annually.

The TVET system also includes a number of industrial education colleges (IECs), to train technical teachers for technical secondary schools. Basic technical and vocational education and training (TVET) in Egypt is provided through secondary education in technical and commercial schools and post-secondary education in training institutions.

Vocational training is an investment in the future, it has two main goals: pave the way to successful career for young people, and to guarantee a skilled work force for the economy. Egypt will not be able to beat global competition unless it develops its industry. One way to do that is through upgrading vocational education and training, as it reflects on the country's industrial capacity.

TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) PROJECT IN EGYPT

The TVET Reform Program is designed to assist the reform of the technical and vocational education and training (TVET) system in the Arab Republic of Egypt from 2005 until 2011. It was established following the conclusion of a Specific Financing Agreement (SFA) between the Arab Republic of Egypt and the European Community.

Three Components of TVET Reform Program in Egypt

Component 1: Development of decentralized and demand-driven TVET institutions: Designed to support the establishment of Enterprise-TVET-Partnerships (ETPs) in selected economic sectors and localities/regions, activities involve the implementation of reforms at the micro/operational level. These activities centre on linking the services of private and public TVET institutions to the human resource needs of private sector enterprises.

Component 2: Improvement of the quality of TVET delivery: Designed to develop and provide high quality, demand-driven, competency-based training, activities focus on reforms at the meso/organizational. These activities centre on the improvement and modernization of skills development in TVET institutions

and private sector enterprises, and the introduction of alternative forms of training including cooperative education.

Component 3: Development of national regulatory and support institutions for a decentralized and demand-driven TVET system: Designed to ensure that the experiences, expertise, and human and institutional capacity developed by the TVET Reform Program are capitalized upon and mainstreamed into the national TVET system reform process.

SUMMARY OF THE QUANTITATIVE ACHIEVEMENTS OF THE TVET REFORM PROGRAM

- 37,000 students, workers, and job-seekers trained and certified
- 2,600 trainers trained
- 1,100 audits and training needs assessments of private sector enterprises and TVET service providers
- 160 skills standards for skill levels 1 to 3 developed
- 110 training packages developed
- 100 in-company training centres established
- 40 trainers participated in 8 study visits to 65 TVET institutions in 10 countries
- 30 curricula developed
- 30 occupational profiles developed
- 29 training workshops received new equipment
- 27 TSSs received new equipment
- 12 sectoral Enterprise-TVET Partnerships established
- 8 local Enterprise-TVET Partnerships established

Impact of TVET reform project on TVET environment in Egypt

National TVET System Policy

The TVET Reform Program has focused efforts at the macro/policy level upon agreement to a harmonized national TVET system policy and the definition of a regulatory framework and complementary support systems. To this end, the TVET Reform Program regularly participates as a member of H.E. the Prime Minister's TVET Reform Technical Committee, which has a mandate to define TVET system policy and strategy for the next 25 years. In this capacity, the TVET Reform Program has delivered technical assistance and proposals for a National TVET System Policy Platform based upon its unique knowledge of and experiences in the TVET field.

Centers of Competence: Beacons of best practice

The innovative pilot measures of the TVET Reform Program extend at the micro/operational level to the transformation of existing public or private TVET institutions into Centers of Competence (CoCs). The upgrading of institutions into CoCs is not merely cosmetic – CoCs are designed to turn fragmented, centralized TVET institutions into sector-specific, semi-autonomous TVET service providers that are strategically located near geographical concentrations of relevant industries. Each sectorial ETP has adapted the original CoC model proposed by the TVET Reform Program to the needs of its respective sector.

Demonstrating alternative approaches to TVET

Alternative forms of training, including cooperative education, apprenticeships, integrated coaching and tutoring were introduced through the project. Further integration of theoretical education with practical and competence-based learning is encouraged with the piloting of various methods to recognize prior learning and/or work experience, assist job-seekers with career and vocational guidance and counseling, and promote lifelong learning initiatives in private sector enterprises.

Sectorial Enterprise-TVET Partnerships

12 sectorial ETPs and eight local (cross-sectorial) ETPs created by the TVET Reform Program to date serve as permanent institutions for the TVET environment. Analyses of the needs of Egyptian industry, TVET institutions, and the country's modernization agenda led the TVET Reform Program to develop ETPs in 12 sectors, namely: Ready-Made Garments; Industrial Engineering; Building and Construction Materials; Food Processing Industries; Woodworking and Furniture Industries; Printing and Mass Media;

Leather and Leather Tanning Industries; Chemical Industries; Building and Housing Construction; Civil Engineering; Tourism (Travel Agents, Diving and Commodities); and Hotels and Restaurants.

With clear and specific mention made in the agreement of Enterprise-TVET Partnerships as decentralized partnerships between enterprises and public and private TVET service providers, PPPs have been explicitly recognized as a legal organizational structure, opening the possibility for other organizations to be developed based on the precedent set by the TVET Reform Programme.

Enterprise-TVET Partnerships (ETPs), as service providers, provide their member clients with a variety of value-added products. These include: For private sector enterprises: assessing training needs, establishing in-company training centers, training master trainers, trainers and teachers directly and/or coordinating their training, training workers directly and/or coordinating their training ad-hoc consultancy/technical assistance services, drafting demand-driven curricula, occupational standards, training packages/modules, and skills standards, arranging work placements for students in private sector enterprises, developing and sourcing training materials, inclusive of training aids and equipment, awareness raising workshops on value-added training, and creating manuals of implementation and procedure. For TVET service providers: auditing TVET service providers capacities, comprehensive upgrades of Technical Secondary Schools and Vocational Training Centres, training master trainers, trainers and teachers directly and/or coordinating their training, orientating TVET system trainers and teachers to partnerships with private sector enterprises, drafting demand-driven curricula, occupational standards, training packages/modules, and skills standards, arranging work placements for students in private sector enterprises, Developing and sourcing training materials, inclusive of training aids and equipment, curriculum development, occupational standards, training packages and skills standards.

Through sectoral ETPs, the TVET Reform Programme has breathed new life into the development of curricula in Egypt’s TVET institutions. Drawing private sector enterprises into the curriculum development process has introduced a degree of relevancy previously unseen in TVET service provision. Consequently, the TVET Reform Programme has begun to create a paradigm shift from supply-led, syllabus-based curricula to demand-driven, holistic educational processes. Cooperative education, in which students complement their theoretical school-based education with practical enterprise-based training, has now become a central feature of the revised curricula and related training packages for upgraded Technical Secondary Schools (TSSs).

The quality assurance process in formal education as a positive feedback loop.

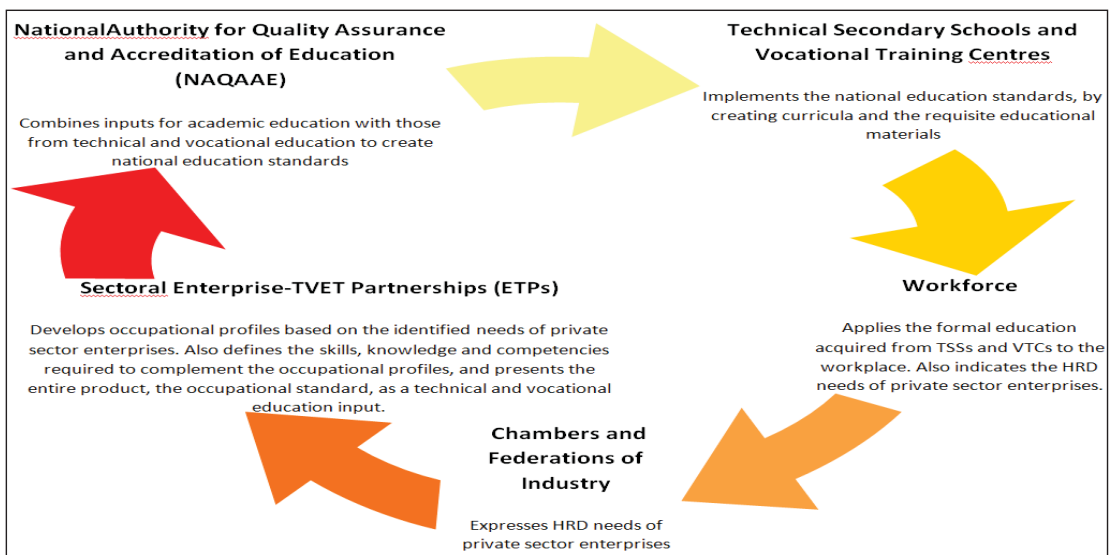


Figure 1: The positive feedback loop

TRAINING OF TRAINERS

Naturally, the development of new curricula, occupational standards, training packages, and skills standards necessitates the training of trainers in order to successfully implement reform activities. Furthermore, the TVET Reform Programme, at its heart, seeks to build the human capital of trainers as well as that of students, the workforce, and functionaries, in order to ensure sustainability for the reforms undertaken. Thus, didactical and technical skills training of teachers, tutors, trainers and master trainers have been central to the work of the TVET Reform Programme.

Since 2005, a total of more than 2,600 trainers have received didactical training with sectoral and cross-sectoral themes from the TVET Reform Programme through ETPs, as well as through the TVET Reform Programme's Training Sessions Programme. More specifically, sectoral ETPs trained in excess of 980 teachers and tutors and 1,430 trainers and master trainers, all of whom received certification from the National Quality Institute (NQI).

Taken together, the activities of the TVET Reform Programme have been designed and implemented to propose demonstrated alternatives for the reform of the current TVET environment in Egypt. The wide application of pilot interventions has accorded the TVET Reform Programme a considerable a body of consolidated evidence to inform the basis of a national TVET system reform policy. In order to encourage the further sharing of experiences, the following sections are offered as an insight into particular challenges and the lessons learnt by the TVET Reform Programme from the commencement of its activities until the midterm of its implementation.

Monitoring and evaluation

The TVET Reform Programme's experimental approach to project implementation has incorporated diverse inputs and unique outcomes, and has required continuous documentation, monitoring and evaluation throughout the project cycle.

ETP Boards consists of 2/3 from Private sector enterprises and 1/3 from Public/Private TVET Providers; ETPs are Sectorial at the National level & Cross-sectorial at the local level.

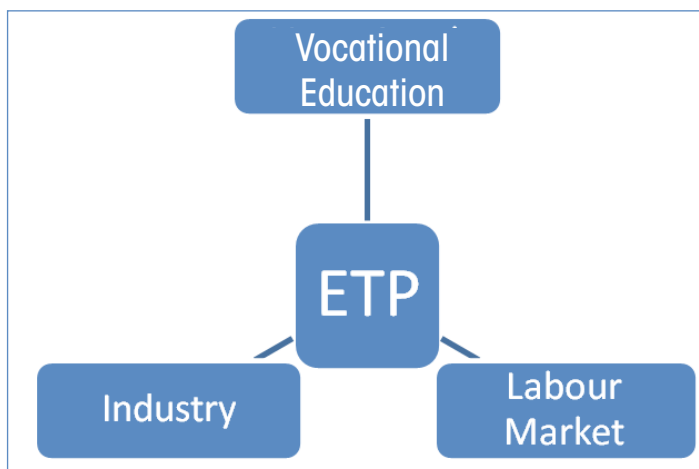


Figure 2: Relationship of ETP with the different TVET Stakeholders

ETP'S ROLE

Why we need to prepare TVET Educators for Next Generation

TVET prepares individuals for the world of work through the acquisition of knowledge, skills, and competencies in an occupational field. Teaching and learning processes must adapt to the changes demanded by transformations in the world of work along with work-related competencies and the culture of learners and teachers. New thematic areas in the national and global trends have great impacts on teacher education including renewable energy, information and communication technology (ICT), climatic change and sustainable development. This improvement in vocational skills for employability depends on the quality, effectiveness and relevance of teaching.

In many occupations, the nature of work in the 21st century will be quite different from work in the prior century. Workers today need solid academic, technical skills, ability to think critically, solve problems,

and communicate. Occupational standards and certification can help guide any system of workforce preparation.

The aim of TVET teacher education is to equip the teacher with the necessary knowledge and skills to guide the learning process and provides methodological competences which are needed to keep up-to-date with the changing world of employment.

The delivery of quality TVET is dependent on the competence of the teacher; competence measured in terms of theoretical knowledge, technical and pedagogical skills as well as being abreast with new technologies in the workplace. A high-quality teacher with regularly upgraded knowledge and skills in the teaching subject is essential to the transfer of relevant skills to students.

How to increase the competence of TVET Educators for Next Gen:

- TVET-teacher-training programs should be closely linked with the particular demands of local, regional and national services, and labor markets
- Build relationships between education, the job market and community depends on occupation and National skills standard
- Able to develop curriculum based on Occupation and National Qualification Standard, research concerning teaching and learning methods
- Utilize competition-based learning to develop student skills and interest.
- Develop demand-driven contents and forms (courses, programs, modules) of TVET programs

The objectives and trends of teacher training have to be orientated toward the functions of the TVET-system. These are the following:

- Provide marketable and employable qualifications for students to enable them to work;
- Upgrade and adjust students' skills in order to fit with the changing and current demands of the labor markets;
- Create new jobs by fostering entrepreneurship concept;
- Provide motivation for self-reliance and
- Independent life-long-learning.

NATIONAL STRATEGY OF VOCATIONAL EDUCATION 2011-2015

The Ministry of Education developed the National Strategy of Vocational Education in Egypt for 2011-2015. The strategy highlights the strategic objectives as follows: develop and improve the quality of the educational process; raise the professional competence, educational and social level of the teacher; improve the efficiency of the technical education teachers to suit with the technological development in the field of knowledge and skills; develop training programs with upgrading and modification according to technological development to improve the skills of teachers; identify effective strategies for improving teacher training programs providing them with up-to-date resources and tools; provide, training of teachers on the use of technology in education and continuous improvement in methods of teaching and learning for all types of technical education; encourage teachers to obtain higher scientific degrees in their fields.

In terms of Quality Assurance and Accreditation, the teachers will be prepared to have the ability to prepare the course specification, the course report and recognize the occupational profiles, design of training programs and curricula which are developed according to the needs of students/trainees, industry, and society and analyzes labor markets are needed in order to develop appropriate course offers in TVET.

GOOD PRACTICES OF VOCATIONAL EDUCATION IN EGYPT

There are many lessons learned and good practice from several projects and initiatives in Egypt which will be highlighted in this section.

Develop competition-based learning on Vocational Education which motivate the students and increase their learning performance. Utilizing competition-based learning to develop student skills and interest in course content, developing students' communication skills, increasing their retention of the new material and developing the critical thinking skills that are necessary to solve everyday problems is one of the good practices in Egypt. (K. Willard, M.W. Duffrin, (2009))

A project led by Elsaadany, 2011 funded by USAID focused on training the teachers on competition-based learning techniques. Educators who have studied project-based learning indicated that the learning model as being a constructive and multidisciplinary collaborative model is driven by student inquiry is aimed at deep understanding of content.

Project-based learning assists the student in applying skills learned in the classroom into real life situations outside of the classroom by placing the student in a situation that is similar to one that they would encounter in real life (Furger 2003).

Education for sustainable development

This project led by Swelim, Achen University, Germany-2010 and funded by EU-TEMPUS aimed to establish seven centers inside EG universities which will be models for other universities to follow. These Centers bring together universities, schools, NGOs and SMEs; develop Teaching ESD Resource Kits for Schools; and Resource Kits that will provide information for students and teachers on sustainable development.

The project prepared educators to develop innovative ESD teaching methodologies; physical models, demonstrations, outdoor experiments and field work. In addition to developing School Teachers' Training Program (STTP) to enable teachers to use the developed materials and techniques. Teachers can play an immense role in addressing and redressing the social, economic, environmental and cultural problems that face Egypt today.

The TOT program is composed of the following modules; the main aim of this module is to equip school teachers to implement and manage ESD programs to enable long-term change in their community. This module includes the following courses:

1. Think Global – act local
2. Formal Education for Sustainable Development
3. Learning societies, Innovation for Sustainable development
4. Equity, Economy, Climate Change

Learning outcomes: teachers will develop an appreciation of the concept of future-oriented thinking, understanding of the commonly-accepted principles of sustainable development and living sustainably, and develop skills to critically analyze tools and resources for sustainability education, skills to facilitate dialogue (discussion/debate) on sustainability issues.

Teaching Kit Training

The main aim of this module is to prepare teachers to use the prepared kits for teaching the students in/out of the classrooms. The courses included under this module are:

- Teaching Environment Kits
- Teaching Water Kits
- Teaching Energy Kits
- Educational Technology in Vocational Training: training of teachers to enable them to use educational technology, particularly the Internet, interactive multimedia materials and audiovisual aids
- Promotion of Teachers self-learning

ICT-based Development of Teaching: Professional preparation of TVET teachers should include

- a) training in contemporary teaching techniques and aids, including information/ communication technologies
- b) training in how to create and produce appropriate teaching materials, including modular and computer-aided instructional materials, whenever such materials are in short supply

CHALLENGES FOR TVET IN EGYPT

Lack of information, duplication and repetition of actions in Government Ministries and other Governmental Agencies involved in TVET; engaging community and industry as significant players in TVET

There are many challenges for TVET in terms of systematic professional development of instructors/ teachers demands. Instructors/teachers are posed with problems on how to use new technology and keep up with teaching methods of various vocational training.

The system needs to have a unified National Qualifications Framework. Failure to identify real training needs, resulted in a wide gap between the skills produced within the TVET framework and those needed in the labor market. All of these factors lead to high rates of unemployment, and below average qualification of the workforce.

Priority TVET areas in Egypt

Agriculture

The agricultural products supply chain is one of the main productive economic activity in Egypt. It accounts for 54 billion EGP worth of production in 2009/10 (between public and private sectors). There are over 8.000 private companies operating in the agribusiness production, which represents 12% of Egypt's exports. Agribusiness represents around 30% of the country's workforce.

Food Processing

The food processing sector is one of the most dynamic sectors in Egypt. It is driven by the large domestic market's high growth potential which has attracted multinational investors who both supply the local market, and export to other countries - primarily the European Union and Arab countries (Egypt ranks fifth in terms of exports of processed food to the Arab market).

Food processing as a whole has registered an annual growth rate of 22% over the past 10 years, mostly in response to the sustained increase in domestic demand

Textile industry

The textile industry covers the whole value chain, from the cultivation of cotton to the production of yarns, fabrics and Ready Made Garments (RMG). The textile industry is one of the key economic sectors of Egypt. It accounts for 3.5% of GDP, 27% of industrial outputs, and 14% of non-petroleum exports (2009).

Tourism

Tourism is a major contributor to Egypt's economy. It represents close to 20% of foreign exchange earnings, and has both a direct and indirect impact on many activities and employment (12.6% of direct and indirect employment).

ICT

The liberalization of Egypt's ICT sector has been a key factor to the development to its strong growth during the past years (14.1% in 2008/09 and 13% in 2009/2010). Its contribution to real GDP was 3% in

the third quarter of 2010. There were a total of 3.972 companies operating in the ICT sector with a total of 205.280 employees.

Cement Industry

The Cement industry is composed of 13 large companies (one of them public), out of which 9 of the cement companies are controlled by 6 leading multinational companies (e.g. Lafarge), which entered the Egyptian market through the privatization of the public owned cement companies.

Pharmaceutical industry

The Egyptian pharmaceutical industry was, until 2005, protected by a series of regulations (special intellectual property right regime,...)

Egypt's pharmaceutical market is the largest in the region, with a strong potential for development based on the country's large population which still spends a low per capita expenditure on pharmaceutical products estimated at 15 US\$ per year. The market is expected to grow at a rate of 9% per year. The public companies control approximately 10% of the market, the multinational companies 22.5%, and the local private companies 50% (mostly generic products).

CONCLUSION

We believe that well executed human resource strategies ultimately bring success to the people and the community resulting to highly competent workers for the country's industries. In order to approach or sustain excellence in TVET teacher education, innovation is needed.

TVET Educators can play an immense role in addressing and redressing the social, economic, environmental and cultural problems that face Egypt today.

Skills and competencies necessary to meet the challenges faced Egypt 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. (C. K. Basu, 2010), (Furjer, R. 2003).

Considering the rapid change in technology and open competitive global market demands, it is necessary that the TVET teachers also change and re-equip them with broad-based competencies/capabilities. Emergence of information and communication technology, increasing shift towards knowledge-driven economy, and international and regional competitions, significant challenges are faced by the education systems.

To face the new occupations, the needed skill standard and the revolution in the information technology- Twitter, Facebook & Linkdn- TVET training institutions will have to play a big role by preparing their technical teachers to undertake continuing education program; implement the methodology of project-based learning; develop innovative ESD teaching methodologies; use the developed materials and techniques.

The government's cooperation, with the and private sector, universities along with national agencies and NGOs, will be essential to develop and create competent and professional teachers and teacher trainers in Egypt.

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PLENARY SESSION 2

Using ICT for TVET Educators' Development

EFFECTIVE USE OF DIGITAL INSTRUCTIONAL RESOURCES FOR TED: A SEAMEO VOCTECH EXPERIENCE

Awang Alias Haji Abu Bakar

Centre Director, SEAMEO VOCTECH

Brunei Darussalam

alias@voctech.org.bn

INTRODUCTION

Instructional materials refer to all materials designed for students and teachers as a source of learning. These materials can take the form of printed or non-printed; this may also include textbooks, technology-based materials, test, web based and electronic text books. Technology-based materials are basic or supplemental instructional materials that require the availability of electronic equipment in order to be used as an instructional resource; these include software program, new media, lesson plans, and databases (Sdcoedimr, 2010).

Digital resources, including digital libraries, have the potential to transform vocational and technical education by providing access to innovative curricula, stimulating applets and simulations, and other hands-on resources. These resources hold the promise of providing teachers with new ways to engage students; introducing students to digital coursewares; and infusing LMS with student-focused balanced pedagogy and practice. Such engaged teaching would bring the students—in all their diversity and needs—into the centre of the curriculum as teachers would focus on the individual student and her or his social context and needs (EDC, 2005).

Digital instructional resources can be used by teachers to develop an efficient tailor fit experiences for their students by introducing new media, materials, and resources to improve student's understanding of the subject matter. The use of textbooks, for example, has been used for decades in the classroom and we know the benefits it brings to the students. In digital media, in addition to using textbooks we now also use eBooks. eBooks can bring an interactive experience to the students, not only it can incorporate sound and video, but students can actually ask questions and search information at the tip of their fingers as well. Tablet computers, handheld devices, eBook readers, and smart phones will change the way we engage our students; this is the future of learning. Browsers, web applications, and phone applications are the new tools of teaching and learning. These changes brought about by the technology changes our teaching pedagogy. We must now change our curriculum to cope with the rapid expansion of knowledge and skills brought about by globalization. We now consider in our curriculum the characteristics of future workforce. We now ask the question of whether our present curriculum can match the industrial needs of the 21st century. Teaching approaches have been revolutionized by technology. We now have what we call Distance learning, Hybrid learning, and Mobile learning; all of these approaches employ the use of the internet as a medium of instruction

DIGITAL INSTRUCTIONAL RESOURCES

Many digital instructional resources are made available on internet; most of them are free, and some are offered for a cost. What we need is a system or software that can effectively help teachers deliver lessons and the learners to be engaged in the process of learning. One good example is the Online Instructional Resources of Michigan State University, which can be found in <http://fod.msu.edu/OIR/index.asp>. This website contains teaching and learning resources. There are many platforms that can be used to organize

such resources, e.g. content management system, learning management system, or an institution that can create their own platform. SEAMEO VOCTECH use a learning management system (LMS) called EDUNET, which can be accessed via the website <http://edunet.voctech.org>. EDUNET stands for Education Network wherein course participants and alumni logs on and access training resources; the foundation of the embarked on an open source platform. The Centre ventures to seek an alternative repository of its learning resources and after an extensive search it was decided to use the Moodle platform. Moodle is an open source software freely available and downloadable from the internet. The data shown from Moodle website (<http://moodle.org/sites/>) there are 70,381 currently active sites that have been registered from 222 countries worldwide, in Brunei there are 9 registered websites using Moodle including SEAMEO VOCTECH.

SEAMEO VOCTECH has been using Moodle for more than five years now with the main purpose of EDUNET providing an avenue wherein students and lectures meet virtually. All training resources can be found and downloaded in this LMS, including activities, notifications, SCORM packages, and courseware. SEAMEO VOCTECH uses Instructional Design as a system approach for teaching and training. This means that in training programme everything that the participants do is a part of an integrated training system-a system that includes all activities from the course description, training activities, and post-training support.

Developments in pedagogy, which is moving away from transmissive, behavioral models and more toward the constructivist or socio-cognitive models, place the active learner at the heart of activities. This can also be viewed that the socio-cognitive adds that learning takes place in a social context (Rogers, 2002). The forming and re-forming of concepts does not need to take place only at the individual level but rather in a collaborative group work and sharing with peers can be an effective way of understanding an individual's own perceptions contributing to the need to reorganize a learner's scheme, therefore learning can be perceived as much about communication as it is about content (Taylor). Some innovative pedagogical approaches goes further and posits that a learning material is the starting point of training programmes wherein the group themselves decides what current LMS is WebCT. In 1999, SEAMEO VOCTECH conducted an extensive research in identifying a suitable LMS for hosting the digital instructional resources for the centre's ICT programmes. For a year WebCT was chosen and used to host the Centre's digital learning resources because the platform's original developers were university faculty from the University of British Columbia, Canada (UBC) offering a teaching enhancement approach to deliver their courses. They will be learning, how they will learn it, and anywhere they can learn it.

Online Journals

Online journals, also known as e-journals or electronic serials, are scholarly journals or academic magazines that can be accessed through an electronic transmission. In practice, this means that they are usually published on the Web. They are a specialized form of electronic document; they have the purpose of providing material for academic research and study, and they are formatted approximately like journal articles in traditional printed journals. Being in electronic form, articles sometimes contain metadata that can be entered into specialized databases, such as DOAJ or OACI, as well as the databases and search-engines for the academic discipline concerned (Wikipedia). Many of the Online Journals which are commercially distributed are subscription based whereby the users will pay to download the full paper or pay-per-view, or free open journal that requires no subscription.

Some journals are online-only journals while others offers both printed and online version. In SEAMEO VOCTECH it offers printed publications, digital publications, and searchable Online Journal System. The website for the digital publications can be accessed via <http://digipub.voctech.org> and the searchable Online Journal System through <http://ojs.voctech.org/>. Digital publications contains all the printed version of the SEAMEO VOCTECH journals e.g. journal, training info guide, newsletters, etc. This website is presented in a way that it looks and feels like a bookshelf so that users may find it easy and enjoyable to use. It points the users to the location of the Centre and its corporate video. Some pictures are also

published depicting the activities of the Centre. The searchable Online Journal System however is more academic which uses the standard format of an Open Journal System, an open source journal platform that is free to use and modify to suit the needs of the organization. In this website a user needs to register to view the full paper; an unregistered user or a guest can only access and view the abstract. This Online Journal of SEAMEO VOCTECH is free for everybody to access and download. There are two publications namely; the SEAMEO VOCTECH Journal which contains all the Centre's journals and the SEAVERN Journal, a collection of research from the Southeast Asian Vocational Education Research Network funded by The Netherlands government.

Digital library

A digital library is a library wherein the collections are stored in digital form and are accessible online or offline. The content can either be stored locally or inside the computer, remotely via the internet. A digital library can be considered as an information retrieval system wherein information is searched within the documents and for metadata about documents (Wikipedia). A lot of academic libraries are involved in creating institutional repositories of books, papers, theses, or any other works that can be digitized or are created digitally. Most of these repositories are available for free to the general public; however, there are few academic institutions that implement access restrictions, meaning the users can view but not download. A large scale digitization projects are being conducted by Google, Million Book Project, and Internet archive with the advent of new technology such as Optical Character Recognition (OCR) and ebooks--this digitization project will go a long way.

Most digital libraries have a search interface that will allow users to find resources which are typically deep web or invisible web, which your search engine cannot find. These digital libraries communicates with each other using Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) to make their metadata available to other digital libraries, which means that all digital libraries over the internet are interconnected to each other using this protocol, an example of this is Google Scholar, Yahoo, and Scirus. Some of the advantages of digital libraries includes fast and easy access to books, archives, images, video clips, and many more of academic publications.

New media

New media is a very broad term which was introduced on the late 20th century for media studies, for example new media contents are accessible 24/7/365 or on-demand access anytime, anywhere, and on any digital devices. It also can hold user feedback, creative participation and community formation around the media content (Wikipedia).

Example of new media:

- File sharing
- Podcast
- Videocast
- Collaborative software
- Blogs
- Forums

The emergence of new media has vastly increased the communication between people all over the world and the application of this in education is immeasurable. It allows students to express themselves through blogs, forums, websites, pictures, videos, and other user-generated media. New Media has been used extensively by social movements to educate, organize, share cultural products of movements, communicate, coalition build, and more.

"If it were possible to define generally the mission of education, it could be said that its fundamental purpose is to ensure that all students benefit from learning in ways that allow them to participate fully in public, community, [Creative] and economic life." — New London Group (2000, p. 9)

According to a recent study from the Pew Internet & American Life project (Lenhardt & Madden, 2005), more than one-half of all teens have created media content, and approximately one third of teens who use the Internet have shared content they created. In many cases, these teens are enthusiastically involved in what we are calling participatory cultures. A participatory culture is a culture with comparatively low barriers to artistic expression and civic engagement, strong support for creating and sharing one's creations, and some type of informal mentorship whereby what is known by the generally experienced is passed along to novices. A participatory culture is also one in which members believe their contributions matter, and feel some degree of social connection with one another (Jenkins, et.al.). An increasing body of scholarship suggests possible benefits of these forms of participatory culture, including opportunities for peer-to-peer learning, a changed attitude toward intellectual property, the diversification of cultural expression, the improvement of skills valued in the modern workplace, and a more empowered conception of citizenship. Access to this participatory culture functions as a new form of the hidden curriculum, shaping which youth will succeed and which will be left behind as they enter school and the workplace.

EFFECTIVE USE OF DIGITAL INSTRUCTIONAL RESOURCES IN TRAINING PROGRAMMES: INNOVATIVE TRAINING SYSTEM (ITS)

To be able to cope up with the advantages and disadvantages of traditional and online education, an Innovative Education is formulated. It is a combination of traditional and non-traditional education, which can be referred to as Hybrid Education as well. This solution takes out the best method from both approaches.

Traditionally SEAMEO VOCTECH has four types of training; Regular Training Programme (RTP), Customized Training Programme (CTP), Specialised Training Programme (STP), and In-Country Training Programme (ITP). With the mission to be the leading centre in ICT and in line with the United Nations' programme Education for All (EFA), SEAMEO VOCTECH is introducing the Innovative Training Systems. ITS is designed to be a non-traditional method of training; this encompasses Hybrid Training Programme (HTP), Distance Training Programme (DTP), Mobile Training Programme (MTP), and Home Study Training Programme (HSTP). This will employ both Distance Training and Hybrid Training, using the technology of handheld devices SEAMEO VOCTECH will offer training to participants who constantly moves from place-to-place via Mobile Training. For those who are constantly at home or have no steady internet connection a self-paced programme is designed to provide skills and knowledge using Home Study method.

SEAMEO VOCTECH hopes to expand its Training Programme to the whole Southeast Asian Region and beyond reaching those who cannot travel to SEAMEO VOCTECH, those who are not able to attend formal face-to-face courses, and those who want to enhance their skills and knowledge. This will also support the goal of UN, which is Education for All, by way of reaching individuals who are not able to have formal courses in an institution and, thus, depriving them of opportunity to enhance their talents and information helpful to their well-being. By acquiring skills and certificate to prove those skills, an individual will have a better chance of being employed or use their acquired knowledge to be of assistance to their organization.

- a. **Distance Training Programme (DTP)** – designed for individuals or a group who cannot travel to SEAMEO VOCTECH, the delivery is purely distance method, employing the use of internet technology, participants will log on to the ITS website and follow the instruction of the program coordinator in the modules.
- b. **Hybrid Training Programme (HDP)** – developed for participants who are able to travel to SEAMEO VOCTECH but does not have the time to stay in the whole duration of the course. The delivery method is a combination of distance and face-to-face methods. Course preparation is done via distance method and workshop is done face-to-face, the last part will be the post training evaluation which will be done in distance mode.
- c. **Mobile Training Programme (MTP)** – harnessing the power of handheld devices, this is designed for participants who are always travelling, a mobile application is available for download which

will be installed in the handheld device to be able to access learning website of SEAMEO VOCTECH suited for mobile use. Software will be used to enable a constant communication to the program coordinator to facilitate learning.

- d. **Home Study Training Programme (HSTP)** – for individuals who either work at home or not constantly connected to the internet, a self-paced study kit is available for downloading or mailed to the participants via post, the kit will contain modules and self-paced learning materials instructing the participants on the activities that needs to be done. After finishing the modules the participants may either e-mail the content of use postal mail to send to the program coordinator.

FUTURE AGENDA

SEAMEO VOCTECH is introducing Innovative Training System (ITS) this year. ITS is a new and modern way of delivering courses of SEAMEO VOCTECH, the traditional way of face-to-face method of delivery is enhanced through the application of ICT tools. The traditional training programme will still be offered, however an alternative will be provided to all the clients of SEAMEO VOCTECH. The courses offered in this program are tailor fitted for alternative mode of delivery as mentioned in the objective. Existing courses, if applicable, will be retro fitted to be delivered via this innovative system. New courses will be developed and offered to the general public; the courses will also be marketed outside Brunei through the help of the SEAMEO Secretariat (SEAMES) in Bangkok and other SEAMEO centres.

SEAMEO VOCTECH Digital Library

This digital library is being constructed using Koha. Koha is the world's first open source Integrated Library System (ILS). Integrated library system provides libraries with a variety of integrated computerized functions for managing Cataloguing, Circulation, OPAC, Acquisitions, and Serials Control.

SEAMEO VOCTECH eConference

SEAMEO VOCTECH will make use of Open Conference System for its future International, Regional, and Local conferences. Open Conference Systems (OCS) is a free Web publishing tool that will create a complete Web presence for our scholarly conference. The main features of the eConference are:

- a conference Web site
- compose and send a call for papers
- electronically accept paper and abstract submissions
- allow paper submitters to edit their work
- post conference proceedings and papers in a searchable format
- post, if you wish, the original data sets
- register participants
- integrate post-conference online discussions

With these future agenda of SEAMEO VOCTECH and the help of all Centres, the Centre hopes to create a repository of Instructional Resources which in turn make an impact on VTET policies and practices in Southeast Asia and beyond.

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16. Awang Alias bin Haji Abu Bakar is the Centre Director of SEAMEO VOCTECH as of 15 December 2009. He was the former Principal of the Jefri Bolkliah College of Engineering, (MKJB), Kuala Belait, Brunei Darussalam.

PROFILE



Awang Alias Haji Abu Bakar His significant work experiences include a dynamic and proactive Deputy Principal on Education and Training at the Sultan Saiful Rijal Technical College, alongside his earlier posts as Mathematics Instructor, Assistant Head, and Head of the Mathematics Department, Registrar, Examination and Quality Assurance Officer. He also performed government functions, as Member of the Department of Technical Education Committees on Program Development Evaluation, Exhibition 2005 -2006, Protocol for 39th SEAMEC, and the ASEAN Skills Competition 2006.

When he was the Principal at the MKJB, efficiently and effectively, he initiated MOUs signed between MKJB and Brunei Gas Carrier Company (BGC), and with the Brunei Methanol Company (BMC). He also spearheaded "The Staff's Skills Development Programme towards Realizing Excellence in Technical Education;" led the ISO 9001:2000 QMS internal audit and eventually obtained the standard recognition for the Marine Course as the first school in Brunei to be awarded with ISO 9001:2000.

He has a Master of Science in Applied Mathematics in Mathematical Modeling from the University of East Anglia, United Kingdom, 2002; a Post Graduate Certificate in Education from the Universiti Brunei Darussalam, 1997; and a Bachelor of Science (Hons), in Mathematics, Statistics and Computing degree at the University of Greenwich, UK, 1994.

USING ICT FOR DEVELOPING NEXT GENERATION TVET EDUCATORS: CPSC EXPERIENCE

Prof. Rajesh P. Khambayat, Ph.D.

*Faculty Consultant, Colombo Plan Staff College
khambayat@cpsctech.org*

Prof. TJ Tesoro - Gayondato†

Manager, Projects and Consultancy Division, Colombo Plan Staff College

BACKGROUND

Information, communication and technology are the new forms of wealth and are the driving forces for development. The flow of information has changed the way we live in today's world. The extraordinary expansion of knowledge brought about by ICT, make it possible to generate, store, transmit, retrieve and process information at vastly augmented speeds. All these have implications for education and training because educators now recognize its impact in the formal, non-formal and informal education systems. Critical challenges for TVET educators are how to ensure equal access by all to this global knowledge, and how to equip next generation graduates with the necessary skills for the new global socio-economic environment.

Educational practices are continually subjected to renewal, mainly due to (1) developments in ICT, (2) the commercialization and globalization of education, (3) social changes and (4) the pursuit to quality and excellence. Of these, the impact of ICT and the new knowledge economy are the most significant. Changes in our educational environment lead, in turn, to changes in our approaches to education and training system. These changes also influence our education and training paradigms. As per ADB (2004), ICT applied to education offer huge potential to stimulate and realize the human capital inherent in the enormous number of young people in Asia and the Pacific. The potential for using more innovative, cost-efficient, and user-friendly ICT solutions in education, and for reaching all groups of society—including the poor, those in remote areas, and other disadvantaged groups has become increasingly feasible in the regional countries.

Another influence is accelerating ICT change, as an increase in the rate of technological progress in the recent past, which may suggest faster and more profound change in the future. Today, ICTs are becoming increasingly very significant in education and training. New developments in information technologies have opened up fresh prospective in teaching and learning. ICTs need to be harnessed, the research finding in this field are very encouraging.

The integration of ICT into TVET systems offers the potential to increase the quality of education and the effectiveness and efficiency of education delivery, as well as the potential to facilitate greater access to information and services by diverse stakeholder groups and communities. As affirmed by UNESCO (2008), Information literacy is the sustaining force of a knowledge society. Information literacy is recognized as "a basic human right in the digital world" as it empowers individuals "in all walks of life to seek, evaluate, use, and create information effectively to achieve their personal, social, occupational, and educational goals". Responding to the growing needs to improve the quality of technician education and training of the Member Governments of the Colombo Plan, CPSC aims to be the Lead HRD Inter-Governmental Organization for sustainable TVET in emerging global knowledge-based society. Thus, harnessing of this potential is seen by CPSC as a means of contributing to the promotion of access and development of TVET system and to the reduction of the Digital Divide.

CHANGING PERSPECTIVES AND ROLE OF ICT FOR TVET EDUCATION AND TRAINING

As in other areas of world, information and communication technologies are playing an increasingly significant role in education and training. This is reflected in the priority given to ICT implementation and development in national policies and reforms across Asia-Pacific region. In this regard, ADB (2004) also recognizes that, regional economies are rapidly embracing higher technology and provision of services. The information technology revolution requires changes in the way knowledge is acquired and transmitted. Education can no longer be targeted mainly at children and youth; continuing education and lifelong learning are needed by everyone to acquire new knowledge and skills.

The effects of the ICT technologies is seen in most areas of TVET education and training policy development, including curriculum, institutional development, pedagogy and the changing roles of TVET teachers and trainers. In reference to UNESCO (2010), the term ICT, embraces the many technologies that enable us to receive information and communicate or exchange information with others. We can see ICT comprises many technologies (both devices and functions) as shown in Figure 1.0.

Changing work organizations, new occupational profiles and the implementation of new technologies to the work process need the continuous updating of skills and knowledge. The rapid introduction of information and communication technologies is posing a major challenge to established forms of education and training. This challenge takes different forms.

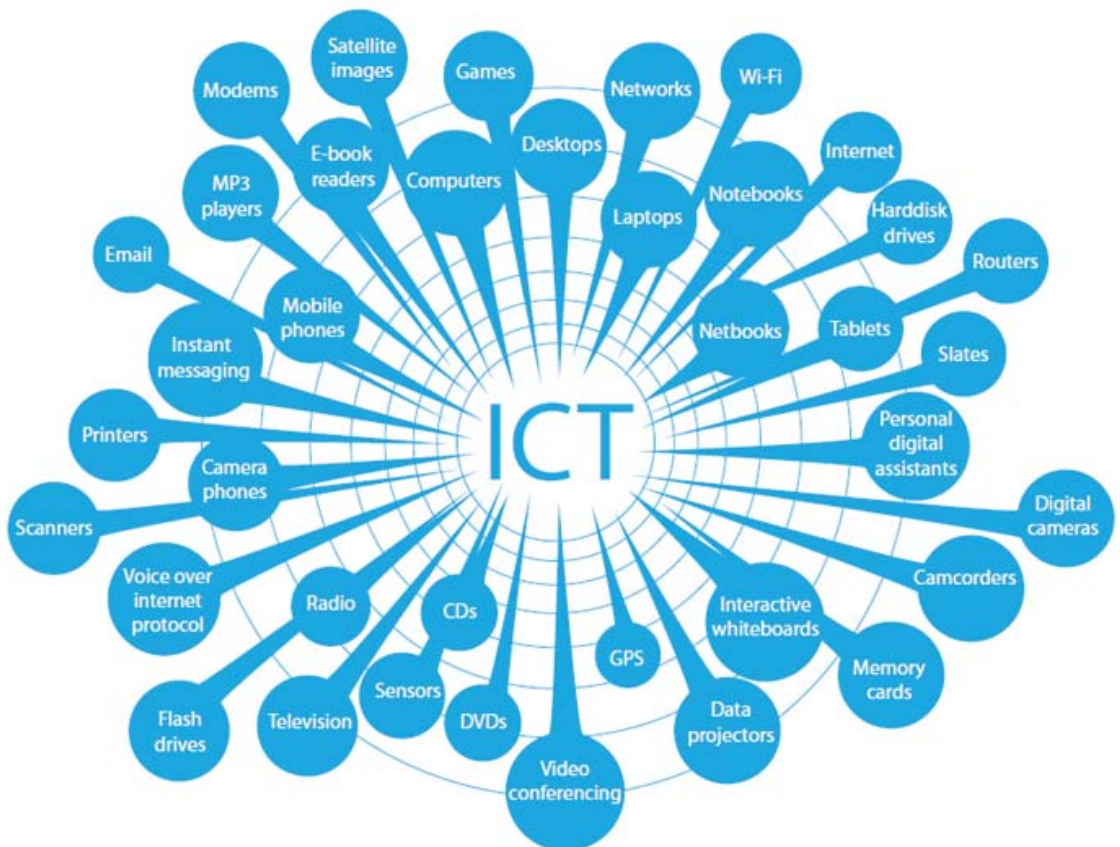


Figure 1: ICT comprise many technologies for capturing, interpreting, storing and transmitting information

Source: ICT TRANSFORMING EDUCATION: A Regional Guide UNESCO 2010

Changing work organizations, new occupational profiles and the implementation In quite a short period of time, ICT have had a positive effect on schools, on teaching and on learning. At the institutional level, schools have similar needs to any small business and use the same kinds of computer software for such tasks as accounting, inventory control, communicating, document preparation and printing. Schools also use specialist software for tasks like time tabling, electronic reporting, behavior tracking and student profiling, monitoring attendance and library management. In number of ways, then, ICT tools are proving indispensable in making school administration more efficient and responsive to community needs.

Enhancing TVET educational quality is a constant process and is top priority in the region. TVET systems work to prepare the next generation for a successful future in a changing world, the knowledge economy of the 21st century. Today, it is necessary to help students develop the intellectual skills they need for a higher order of thinking and to assist them to realize their abilities and potential. As per ADB (2009), investments in ICT for education in the area of technical and vocational education and training (TVET) further support the demand for a skilled, "ICT-capable" labor force, which is the hallmark of a country transitioning to a knowledge economy.

CPSC'S STRATEGIC RESPONSE TO PROMOTE ICT FOR TVET SYSTEM

With the new developments in ICT, it has created many new forms of media in instructional system. There are many forms of digital media entering into the education and training systems. Currently many TVET institutions are on a swift path to integrate learning technologies into classroom practice. Many individual TVET schools are increasingly making digital media and technology as a top educational priority. CPSC adopted the subsequent model in promotion and use of ICT in its operation as shown below.

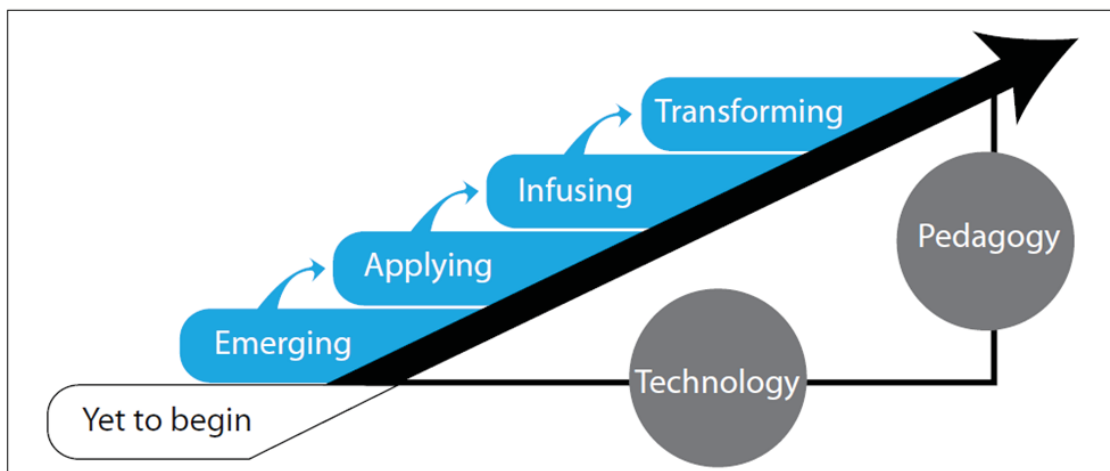


Figure 2: Stages that schools typically pass through in adoption and use of ICT
 Source: Based on Anderson and van Weert (2002) and Majumdar (2005).

CPSC is currently stimulating ICT across Asia-Pacific region, with the six focus areas in mind, the ICT in TVET programme has been designed and is implementing a number of specific projects. These projects are listed in the table below.

Focus area	Ongoing and New Projects
ICT Policy	a) ICT in TVET Policy Project
Training of Teachers	a) Training and Professional Development of Teachers and Other Facilitators for Effective Use of ICT in Improving Teaching and Learning system b) Establishing the Effective Use of ICT in TVET for All in c) Asia-Pacific region d) Training of Teachers in Information Technology to Meet the Emerging Needs of the New Learning Environment e) Next Generation of TVET Teachers (NET) Project
Teaching and Learning	a) Improving Management and Delivery of Technical and Vocational Education & Training (TVET) through the Application of Information and Communication Technologies b) Developing Next Generation Web-based TLS
ICT for Poverty Alleviation	a) ICT for Poverty Alleviation through CPSC-India Skills development Project
Monitoring and Measuring Change	a) Performance Indicators on ICT Use in TVET system
Research and Knowledge-Sharing	a) Regional Clearinghouse in Support of the ICT in TVET Programme b) Meta-survey on the Effective Use of ICT in TVET

Based on the above project framework and focus areas, some of the major interventions undertaken by CPSC to promote ICT for TVET system are briefly outlined in succeeding pages;

Organize International Conferences & Workshops, Seminars

CPSC organizes a series of international conferences and workshops, seminars with active participation of leading experts in the field, to promote advocacy for ICT in TVET system. These efforts and other initiatives help member governments to ensure that pre-requisites for ICT in education are in place, namely:

- a) Assist to formulate a national plan for ICT in TVET education and training;
- b) Guide and facilitate in creating adequate Infrastructure;
- c) Formulate strategies and funding for developing TVET school capability;
- d) Develop and train TVET teachers for ICT; and
- e) Prepare a vision for ICT in TVET education.

Conduct Capacity-building for ICT integration in TVET System

CPSC organizes a series of capacity building interventions for member countries in the region. In addition, CPSC organizes programs to build internal capacity of faculty and staff for improving its delivery in program offerings. Today, CPSC enjoys 100% computer literacy among its staff.

Assist MCs' in formulation of ICT Policy in TVET

CPSC organizes a series of planned interventions with the help of leading ICT experts through mutual dialogue which ultimately facilitate its member countries in formation of ICT policy in TVET system.

Linking to TVETpedia UNESCO-UNEVOC Forum

In recent years, CPSC joined hand with UNESCO-UNEVOC forum by linking with their innovative project known as TVETpedia. It is similar to Wikipedia, where all the information and updates related to TVET are posted and made available to TVET professionals across the region. This new initiative greatly facilitated in developing deeper understanding about various aspects of TVET system.

Develop Digital Learning resources

With the growing usage of ICT for education and training CPSC started developing capacity building programs on ICT as well as digital learning resources in various TVET sectors. In the near future, CPSC aims to act as a clearinghouse for digital media in the emerging TVET sectors in the region.

MAJOR CPSC ACCOMPLISHMENTS IN ICT

As the only regional institution established specifically to enhance the quality of TVET, CPSC provides leadership by designing and conducting various programs and courses in different levels, particularly with the innovative and blended use of F2F and computer-based teaching methodologies, demonstrated in over 85 web-based teaching and learning modules developed in the fields of management, skills development, ICT, curriculum development, accreditation and certification, and TVET-demanded areas.

These programs are primarily intended to equip TVET personnel in the member countries with up-to-date knowledge and skills in various areas of interest. They are likewise trained to develop analytical and problem-solving competencies that are necessary to meet the demands of fast-moving technological changes in a global market economy.

The capabilities of the CPSC have been shaped by its 38 years of serving member countries in the area of human resources development. Since its inception in 1973, CPSC has trained a total of 25,000 TVET trainers, policy makers and professionals. Being a lead organization of TVET in the region, 100% CPSC staff are ICT literate.

CPSC has consistently worked towards strengthening its core competency in training, web-based teaching and learning system development, standardizing human resources development systems and consulting services; instilling among its professional and local staff a dynamic quality culture; and building strategic partnerships and linkages for expanded human resources development.

The inter-governmental cooperation among 20 member countries has contributed much in laying strong foundations for synergies in region-wide approach in achieving sustainable HRD. Sustainability considerations permeate CPSC's efforts with the aim of contributing to long-term development goals for its member countries.

CPSC recognizes that the Asia Pacific Region is consisted of developing countries that are in their initial stages of embracing innovative ICTs like Afghanistan, Bangladesh, Bhutan Cambodia, Myanmar, Fiji, Lao PDR, Maldives, Nepal, Sri Lanka and Vietnam.

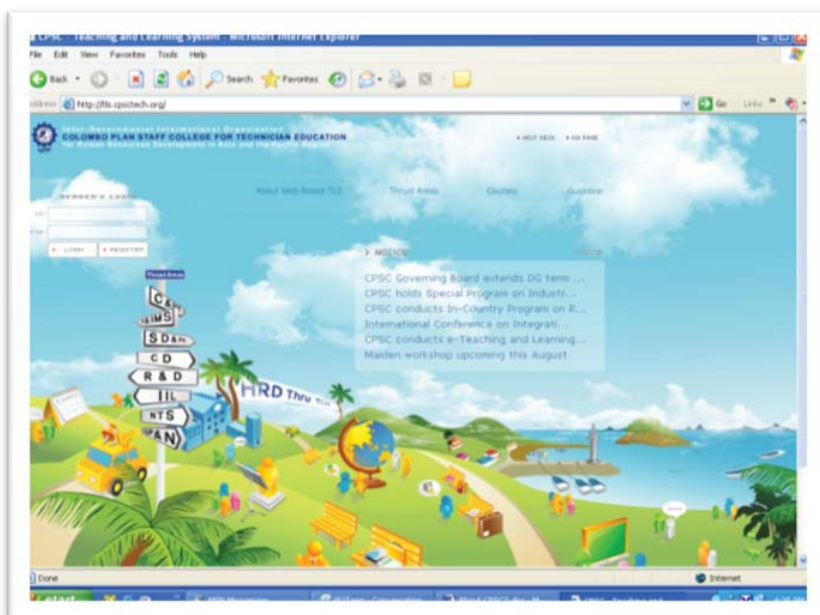


Figure 3. CPSC Wireless Campus

CPSC has established in 2009 an Innovative Wireless Blended Learning Campus at CPSC to provide a unique learning environment that makes available anytime, anywhere, flexible, seamless, blended, and multi-model learning. This project was aimed to showcase the real strength of the use of ICT in Education in a demonstrative way by integrating ICT to improve teaching and learning system.

The features of this Innovative Wireless Blended Learning Environment at CPSC are as follows:

- a) Provides anytime, anywhere flexible blended learning environment
- b) Offers interactive multimodal learning
- c) Offers simulation and virtual environment
- d) Offers synchronous and asynchronous learning collaboration
- e) Provides RFID and location based services
- f) Connects with global knowledge
- g) Integrate Kiosk based information services
- h) Services oriented intelligent building
- i) Offers truly lifelong learning resources
- j) Encourages learners to create their own learning
- k) On-line testing and evaluation
- l) Foster critical thinking and innovation
- m) Multimedia based curriculum – simulation, animation and virtual reality
- n) Use of hand-held devices
- o) Asset tracking (RFID) system

In the second part of the project, the same platform will be utilized to deliver Technical and Vocational Education and Training (TVET) throughout Asia and the Pacific Region by utilizing Internet-Based Asia Pacific Online Network. Using this delivery mode, the project will promote competencies of TVET trainers and educators whose learning opportunities for upgraded ICT skills are interrupted work schedules, geographical location, age, financial difficulty, physical in-capabilities. Beneficiaries on online -TVET can take lessons from one's home, office or any e-community center.

INNOVATION CENTER PLATFORM

The innovative blended learning environment at CPSC is planned to have a state-of-the-art training systems that will provide teaching and learning programs and information service at CPSC as the center, connecting to all the CPSC member countries.

The project will implement the 85 web-based and teaching modules as well as innovative curriculum (i.e. IBM curriculum on ICT leadership for SSME – Services, Sciences, Management, and Engineering) in web-based modes via conferencing and broadcasting techniques. This platform will interconnect with the networks in member countries from the CPSC as the central hub where major protocols and activities in delivering learning and teaching embracing modern techniques will take place. The connectivity will be sustained using a hypermedia at multimedia levels enriched with audio-video features. The learning resources and environment will be web-based mode and will be delivered by TEVT professionals or experts.

With this group oriented, people-to-people, synchronous and asynchronous learning collaboration, learners will get altogether a new and professional environment for learning. This technology enhances productivity because it minimizes the turnaround time for decisions, reduces travel costs, improves mutual understanding –through the observance of the body language and injects fun to the communication process. It is also used as on-line interaction, review sessions before and after classes.

This could operate in a room-to-room, room-to-classroom, and classroom to classroom mode. This will involve several individuals or groups of individuals engaged in a dialogue or a meeting between two or more remote participants. In most cases it is multiparty and implies a bi-directional communication. It provides for audiovisual communications as well as document sharing, including text, table, and images.

This innovative blended learning environment will be a concrete TVET reform for the 21st century that will address learning delivery in a more interactive, relevant, facilitating, and state-of-the-art approach. To be able to crystallize this project concept, a strong Public-Private Partnership Model is hereby proposed.

Areas of cooperation will be in the areas of:

- Hardware and software support
- Technical cooperation and exchange
- Research and development
- Customized program resource sharing
- Infrastructure development and establishment
- Innovative curriculum development

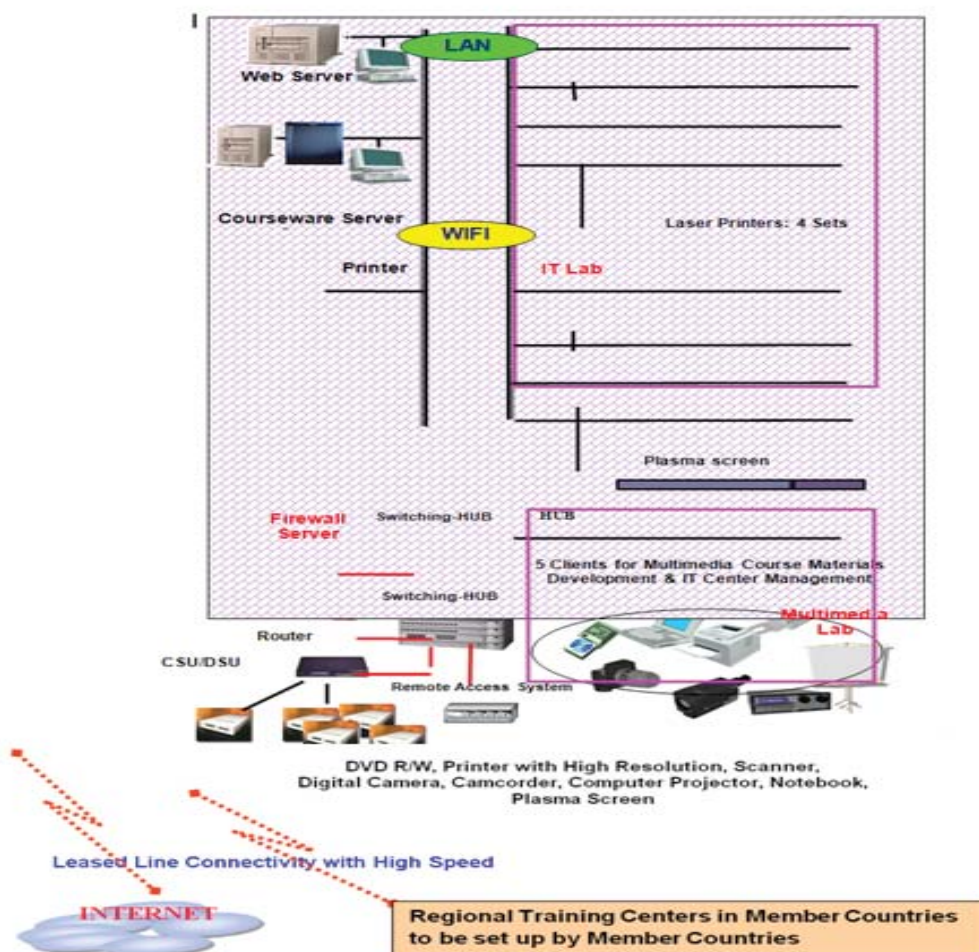


Figure 4: The CPSC Innovative Center System

CPSC'S WEB-BASED TEACHING-LEARNING SYSTEM

CPSC started its pioneering efforts to promote use of computers in classroom as early as in 1970-80, the era when computers just made their entry in the education world. Based on its early success CPSC started advocating its member countries for using computer in TVET system. Considering the diverse challenges faced by the member countries in the region and pattern of uneven growth of ICT, in 2000, CPSC developed its first proto type learning system. After many initial operational intricacies and impediments, CPSC continued its journey to develop compact web-based TLS. In 2005-06, CPSC finally succeeded in launching its first complete next generation of web-based TLS.

The next generation web TLS was designed by CPSC keeping in view four board aspects as shown in the following diagram;

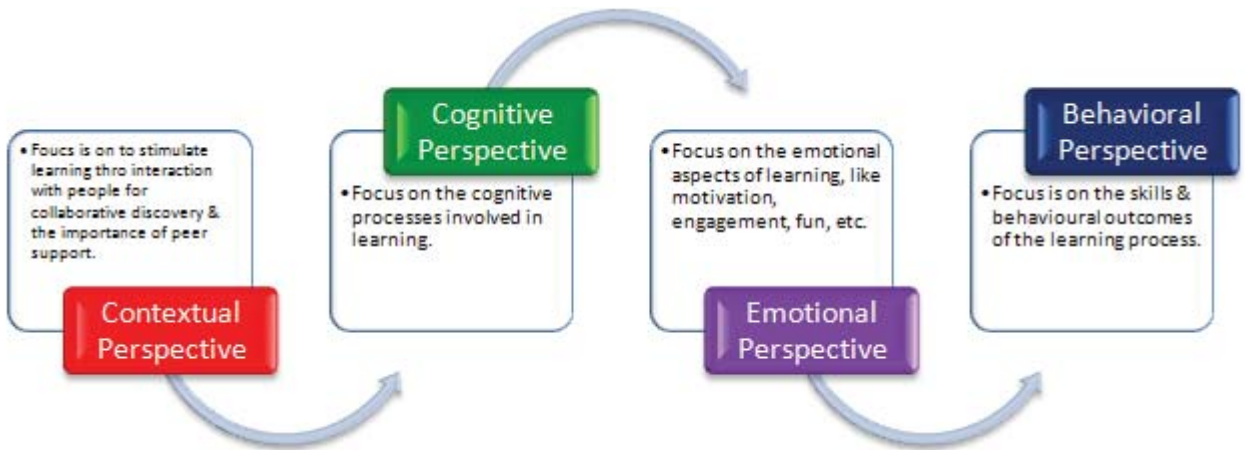


Figure 5: CPSC's Next Generation Web-based TLS

Following major considerations were kept in view while designing this system

- i. Learner Characteristics & Learning Style
- ii. Users Computer Proficiency/Skills
- iii. Available Resources
- iv. Learners Desired Outcomes
- v. Prior Learning Experiences

The overall development of CPSC web-TLS involved three phases as revealed in the following figure:



Figure 6: CPSC: Web-based TLS Development Process

Components of CPSC Web-based TLS

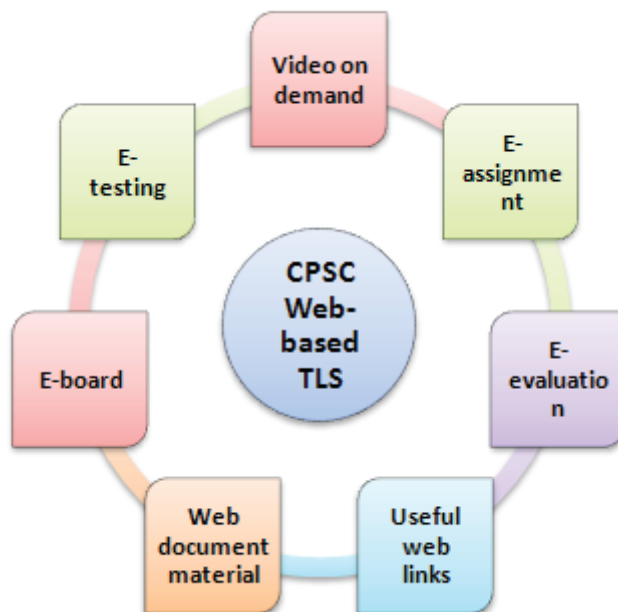


Figure 7:Key Components of CPSC Web-based TLS

Summary of features of Web-based TLS

- i. New Version started in 2005/2006
- ii. Total 90 Programs on Emerging TVET Areas
- iii. Cost-effective in bringing expertise to CPSC member countries
- iv. Useful in introducing new and emerging trends in delivering technology-based and ICT-enabled education and training
- v. Anytime (24/7), Anywhere Accessible and useful in promoting own-pace learning
- vi. Customized to cater to emerging needs and local conditions
- vii. Saves on material reproduction and printing costs

CPSC Next Generation Web-TLS: Major Cluster of Emerging Areas of TVET

- i. Computer and Network Technologies
- ii. Projects and Institutional Management Systems
- iii. Sustainable Development & Poverty Alleviation
- iv. Curriculum Development
- v. Research and Development
- vi. Industry Institute Linkages
- vii. Non-Technical skills
- viii. Global Partnership & Networking

Major Softwares used in CPSC Web-TLS

In developing Next Generation web-based TLS include use of following softwares. The details components and tools used for building web based TLS is shown in the following table.

Table 1: Software Requirements of the Web TLS

Components	Tools	Remarks
Website design	Adobe Photoshop & Adobe Illustrator	Website Layout
Web documents a) Instructional Materials; b) Online guideline; c) Introduction	Namo Web Editor	Editing web document
VOD/LOD	CBI Tool	Recording lecture Editing Video
AE-boards; a) Assignment; b) Question and answer,	PHP, MySQL & others	Linux system
On-line examination	PHP, MySQL & others	Linux system
On-line evaluation	PHP, MySQL & others	Linux system

(Source: MyongHee Kim and Man-Gon Park, 2009)

FUTURE ROADMAP

CPSC will continue its journey and efforts in promoting use of ICT for TVET system of member countries on the following aspects;

Drive to Strengthen Capacity Building in Member Countries

CPSC will continue its drive and efforts in sharing its expertise to expand and enlarge capacity of member countries on using ICT to improve quality of TVET delivery system.

Moving to Open Source Platform

Keeping in view the diversity in the regional member countries and ICT growth pattern CPSC will shift its operation to using Open source platform. In the near future, CPSC will embark its efforts to move open source Learning Management System (LMS) or a Virtual Learning Environment (VLE) e.g. Drupal, Moodle as an alternative to existing web based TLS system. This is expected to create synergy in using ICT for TVET system across Asia-Pacific region.

Conduct Online ICT Researches

CPSC wish to undertake ground level research study to determine effectiveness of its efforts in using ICT for TVET system. In coming days CPSC will undertake a series of online studies with active participation of leading ICT experts from member countries in the region. The findings of such studies will greatly facilitate CPSC in streamlining its corporate strategy for improving its effectiveness and enhancing image of TVET in the region.

Capitalizing Social Media Networks to Promote TVET in the Region

CPSC recently started using Facebook, the most rapidly expanding social networking site on the planet, boasting more than 500 million users as social networking platform that focuses on building and reflecting social relations among its stakeholders e.g. who share interests and/or activities." Being web-based, it allows the users to share their ideas, activities, interests and events within their individual networks. It is also expected to be adopted in education as it enables users to post profiles, send messages about

themselves and exchange photos as well as information. Moreover using twitter, CPSC utilizes it by sending tweets to their stakeholders concerning updates of their blogs, assignment, important activities etc.

The popularity of these social networking sites is a good strategy to attract the attention of TVET professionals in a certain topic or interest. Since it focuses on forming one's own network to collate their own individual interests, these can also provide avenues for intellectual discussions and sharing of ideas.

Endorse use of Podcasting, Blogs, Wikis

CPSC will initiate necessary drive in member countries to promote use of alternative systems of reaching out to diverse audiences by using new forms of delivery such as Podcasting, Blogs, and Wikis etc.

Shifting to M-learning leading towards u-learning

With growing popularity of use of mobile phones across Asia-Pacific region, CPSC will soon start diverse programs using the concept of M-learning. Using leading TVET experts in the region, CPSC will develop new programs so that more and more people can take the benefits of technology for improving their knowledge.

CONCLUSION

The digital era through ICT has opened new horizons for innovations, especially in the field of TVET. More efficient and creative ways of transmitting knowledge from the start to the end user will usher a new generation of individuals who are more knowledgeable, creative and capable of creating newer and more efficient methods in the quest to make life more simplified and make information more accessible to everyone in the planet.

The foregoing discussion has shown the significance of ICT for education and training, the myriad of ICT delivery options available for TVET educators to enrich their training. Web-based teaching and learning system, when carefully selected and integrated, can ensure interaction between the educators and learner and assist learner to develop the right approach toward-instructional content.

Furthermore, TVET educators need to realize that the ultimate goal is to create a learning environment in the institution. The next generation educators will have to be creative and innovative in managing web based TLS, developing the relevant instructional materials, and selecting the appropriate media. In general, a TVET teacher should use the digital media in his or her best judgment. It can facilitate learning or increase understanding of the instructional resources. Of course, communicating to facilitate learning can be a challenging process, often requiring creative efforts to achieve a variety of implicit instructional goals.

Finally, in the age of rapid technological change, there is one thing that is certain: TVET educators will need to adopt to changes if they are to survive and keep pace with new methods and technology. It is moreover emphasized that the professional development of educators and administrators is the key to successfully integrate ICT into TVET systems.

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PROFILE



Prof. Dr. Rajesh P. Khambayat was a Faculty Consultant of the Colombo Plan Staff College for Technician Education (CPSC). He has acquired professional experiences through his various engagements in human resources development, academic consultancies, implementation of innovations in Technical Institutes, establishing strong linkages with various client systems including industries and in planning, conducting, administration, monitoring and evaluation of programs and projects.

He completed his Bachelor's degree in Engineering in 1986 from the Karnataka University, in India; Master's degree in Engineering (Civil Engineering) from Birla Institute of Science and Technology, Pilani, India, in 1989; and another Masteral degree in Business Administration, Major in Marketing, from the University of Poona, Pune, India in 1992. He earned his Doctoral degree in Technical Education from Barkatullah University in Bhopal, India in 2003.



The late **Prof. Theodora J. Tesoro-Gayondato** was the Chair of the Projects and Consultancy Division and Research, Publications, and Information Division of the Colombo Plan Staff College for Technician Education (CPSC), where she worked for seventeen (17) years in various capacities and international assignments. She acted as the Head of Administration, Corporate Services Manager, Specialist for External Relations and Faculty Member.

Her areas of specialization include Human Resources Management, Project Management, Change Management, Organizational Development, Quality Management, Monitoring and Evaluation of TVET Programs and Strategic Management Systems.

Prof. Gayondato earned her Master's degree in Public Administration from the Philippine Women's University; Master of Laws and Bachelor Laws from the Manila Law College where she graduated valedictorian and magna cum laude; Master's degree in Business Administration from the Ateneo Graduate School of Business; Post Graduate in Transport Engineering, Management and Planning from the UP Transport Training Center (class topper) and Bachelor of Science in Business Economics from the University of the Philippines-Diliman.

ENHANCING TEACHING AND TEACHER EDUCATION: A SCIENCE OF LEARNING APPROACH INCORPORATING ICT

Mr. Dennis Sale

Senior Education Advisor, Department of Educational and Staff Development
Singapore Polytechnic
dennis_sale@sp.edu.sg

INTRODUCTION: THE IMPORTANCE AND CHALLENGE OF QUALITY TEACHING

Rivers and Sanders (2002), from extensive overview of the research literature concluded that:

The effect of the teacher far overshadows classroom variables, such as previous achievement level of students, class size as it is currently operationalized, heterogeneity of students, and the ethnic and socioeconomic makeup of the classroom. (p.17)

Furthermore, it is increasingly recognized that the range of competencies and skills sets required in the modern teaching role are becoming both more extensive and specialized (Turner-Bisset, 2001; Hargreaves, 2003). To develop such competence, there will be significant implications for the professional development of teaching faculty. Darling-Hammond's (1995) analysis is still very pertinent today stating that:

If teachers are to prepare an even more diverse group of students for much more challenging work—for framing problems, finding, integrating and synthesizing information: creating new solutions; learning on their own, and working cooperatively—they will need substantially more knowledge and radically different skills than most now have and most schools of education now develop. (p.154)

This paper will firstly argue for a paradigm shift away from traditional perspectives underpinning teaching and learning towards a more 'science of learning approach' to the design of learning experiences, irrespective of mode or medium. Secondly, this will offer a frame on the key competencies (both functional and generic) that are most pertinent for the development of teachers as effective and creative designers of learning experience. Finally, based upon the pedagogic framework presented, I will offer a frame on the significant role that ICT can play in enhancing teaching effectiveness and teacher education.

MOVING OUT OF AN EDUCATIONAL JURASSIC PARK: TOWARDS A SCIENCE OF LEARNING

For those who have spent some 30 plus years in the profession, there is likely to be affinity with Sallis and Hingley's (1991) assertion that "education is a creature of fashion" (p.9). We have seen shifts from traditional to progressive education and, more recently, the teachers' role allegedly changing from 'sage on the stage' to 'guide on the side'.

What constitutes highly effective teaching has long been contested in the educational literature (Tuckman, 1995; Ornstein, 1995; Darling-Hammond & Bransford, 2005). There is even debate as to whether teaching is best conceived as 'art', 'craft', or 'science' (Eisner, 1995). Indeed, creative teaching is often presented as something almost ephemeral – as illustrated by Peter Drucker (1999) who argues that teaching is:

...the only major occupation of man for which we have not yet developed tools that make an average person capable of competence and performance. In teaching we rely on the "naturals," the ones who somehow know how to teach.

The contested nature and periodic radical reframing of what constitutes good teaching does little to convince anybody that teaching is truly a profession with well constituted bases of professional

knowledge, as in the case of medicine or engineering. Much of the confusion, it is argued here, stems from education being largely driven by dominant paradigms in psychology or pedagogy – the present vogue being constructivism. Paradigms, by containing both premises and methodologies relating to particular domains of reality, limit both the effective and creative capability of working within that particular domain. The potential consequence of limiting practice largely to one dominant paradigm is well captured by Pratt (2002):

Perspectives are neither good nor bad. They are simply philosophical orientations to knowledge, learning and the role and responsibility of being a teacher. Therefore, it is important to remember that each of these perspectives represents a legitimate view of teaching when enacted appropriately. Conversely, each holds the potential for poor teaching. (p.14)

Essentially, the point is this - if pedagogic knowledge is as anything akin to that of other professional disciplines, educators must transcend paradigmatic allegiance and consolidate a knowledge base that is firmly grounded in empirical research and professional practice. Anderson et al (1998) capture this sentiment when they argue that:

What is needed more than a philosophy of education is a science of education. Modern attempts at educational improvement point back to theorists (Piaget, Vygotsky, and Dewey) whose theories are vague by current psychological standards and lack the strong connection to empirical evidence that has become standard in the field. (p.237)

Mayer (2004) puts it even more bluntly when he asserts that we need to:

...move educational reform efforts from the fuzzy and unproductive world of ideology - which sometimes hides under the various banners of constructivism - to the sharp and productive world of theory-based research on how people learn. (p.18)

Fortunately, despite much of educational discourse still being centred around paradigms and related theories of learning, there is increasing recognition of a substantive and validated research base that is beginning to constitute a 'science of learning'. For example, Marzano (1992), over a decade ago, argued that:

...over the past 3 decades, we have amassed enough research and theory about learning to derive a truly research based-model of instruction. (p.2)

More recently, Darling-Hammond & Bransford (2005), from surveying the research findings, concluded that:

There are systematic and principled aspects of effective teaching, and there is a base of verifiable evidence of knowledge that supports that work in the sense that it is like engineering or medicine. (p.12)

Unfortunately, there is still a very significant mismatch between what we actually know about human learning, and the potentially beneficial pedagogic implications of this knowledge, and actual practice in many schools and classrooms. As Perkins (1992) noted:

...we do not have a knowledge gap - we have a monumental use-of-knowledge gap. (p.2)

Bridging this 'use of knowledge gap' is challenging. In the following sections, I offer my frame on 'moving out of educational Jurassic Park' – so to speak.

CORE PRINCIPLES OF LEARNING: THE BASIS OF PEDAGOGIC LITERACY

The science of learning approach outlined in this section is an attempt to synthesize the various knowledge bases relating to human learning into key heuristics that can be easily and practically used in the design of learning experiences, irrespective of mode or medium. It is hoped that the evolving pedagogic framework can eventually constitute an essential pedagogic literacy for teaching professionals, irrespective of subject domain and context.

An analogy is to be found in Martin's (2009) conception of the "knowledge funnel" in which he depicts a process in which phenomena in the world can move from being a 'mystery' (experienced in some way but not understood) to a 'heuristic' (understandable in good part) and finally to 'algorithmic' (fully understood, predictable and controllable). From a science of learning approach, it is argued that teaching is now best seen more in terms of heuristics than a mystery. While the paradigm debate still perpetuates a situation in which many (both within and outside the teaching profession) are still rooted in various genres of mystery, the real challenge now is to critically refine and validate these heuristics through empirical study and reflective practice.

A science of learning approach does not advocate a specific approach or strategy to use as a 'teaching methodology' per se. Good teaching will increasingly become an exercise in creative heuristics; though unlikely ever to be 'algorithmic'. The objective is to provide empirically based frames from which teaching professionals can consistently design and deliver effective (even creative) learning experiences.

The following summary of the Core Principles of Learning, which underpin the Pedagogic Framework, have been derived from an extensive review of the literature on human learning and studies on effective teaching professionals in a range of educational contexts. They are not meant to be exhaustive nor summative, and they are always mediated by the situated context in which learning occurs.

It is also important to bear in mind that while each of the principles focus attention on a key area/process relating to effective pedagogy, they are not discrete or separate in that they should be considered independently of each other. In fact, they are mutually supporting, interdependent and potentially highly synergetic. As Stigler & Hiebert (1999) highlight:

Teaching is a system. It is not a loose mixture of individual features thrown together by the teacher. It works more like a machine, with the parts operating together and reinforcing one another, driving the vehicle forward. (p.75)

As more of the principles are thoughtfully addressed in both the planning and enactment of teaching strategies, the more engaging and effective the learning experience is likely to be for students. Furthermore, as teaching professionals achieve a full understanding and fluidity in using the core principles – Pedagogic Literacy - it will support their own continual professional development towards becoming effective and creative designers of learning experiences.

Core Principle 1: Learning goals, objectives and expectations are clearly communicated

Clearly communicated goals and objectives, with identified performance standards provides students with a solid structure from which to plan and monitor their learning. A very obvious, though often neglected principle of learning in many teaching contexts.

Core Principle 2: Learners' prior knowledge is activated and connected to new learning

Students' prior knowledge is the lens through which they perceive and react to new information. If it is inaccurate, incongruent or limited, it is likely to interfere with the meaningful integration of the new knowledge presented. Prior knowledge is an essential source of information from which to design and focus teaching and learning strategies. Ausubel (1978) went as far as arguing that:

If I had to reduce all of educational psychology to just one principle, I would say this: the most important single factor influencing learning is what the learner already knows. Ascertain this and teach him (sic) accordingly. (p.163)

Core Principle 3: Motivational and Attentional strategies are incorporated into learning designs

Motivation initiates, directs and maintains learning behaviour. Motivated learners will give better attention and put more effort into the learning process. The design of effective learning, therefore, must consider

more than the subject knowledge involved, but also ways to generate and sustain learner motivation and attention. As Wlodkowski (1999) points out:

...if something can be learned, it can be learned in a motivating manner. (p.24)

Core Principal 4: Content is organized around key concepts and principles that are fundamental to understanding the key structure of a subject

Understanding is about making personal meaning of knowledge and seeing how it is used in real world application and problem-solving. When students have developed a good understanding of a topic, they will have acquired an accurate representation of the concepts and principles involved, which will facilitate effective and efficient retrieval, and subsequent application of knowledge. As McTighe & Wiggins (2000) argue:

...an education for performance, based on understanding applied, is of the highest priority. (p.93)

Core Principles 5: Self-directed learning is encouraged through facilitating the development of good thinking

Good thinking is essential to the development of understanding and what is often referred to as 'Deep Learning' (Marton, 1984). As Richard Paul (1993) so richly captures:

Thought is the key to knowledge. Knowledge is discovered by thinking, analyzed by thinking, organized by thinking, transformed by thinking, assessed by thinking, and, most importantly, acquired by thinking. (vii)

Core Principle 6: Instructional methods and presentation mediums engage the range of human of senses (e.g. visual, auditory, kinaesthetic)

Mental activity is stimulated through our five senses, with the visual sense being the most powerful. As the old saying goes, "a picture paints a thousand words". Research shows that the greater the combination of our senses that are stimulated in learning, the more successful the learning is likely to be (Dale, 1969).

Core Principle 7: Learning design takes into account the working of memory systems

While human brains have potentially unlimited storage capacity by means of long term memory, all new learning must firstly negotiate working memory, which has a very limited capacity of around 7 plus or minus two bits of information. As Clark & Lyons (2004) point out:

...it is in working memory that active mental work, including learning, takes place. Working memory is the site of conscious thought and processing. (p.48)

It is essential, therefore, that information is presented in manageable chunks and learners are given the necessary time to make meaning of it, transfer it effectively from working to long term memory and periodically review it in order to consolidate long term memory.

Core Principle 8: Learner competence is promoted through active and experiential learning

The development of competence involves more than memory and understanding, but the critical synthesis of related knowledge areas, skill sets and attitudes orientated to a specific performance area. In order to develop competence in a performance area, students need to actually do real world activities or performance-based tasks that facilitate such critical integration of knowledge, skills and attitudes. As Chickering and Gamson (1987) highlight:

Learning is not a spectator sport. Students do not learn much just by sitting in class listening to teachers, memorizing pre-packaged assignments, and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, apply it to their daily lives. They must make what they learn part of themselves. (p.4)

Core Principle 9: A psychological climate is created which is positive, success- oriented and promotes self-esteem

Learning is as much a social and emotional process as a cognitive one. Significant aspects of the learning environment, especially interactions with tutors and peers can play a significant part in how learners feel psychologically and their orientation to learning. As Ornstein & Behar (1995), from research, concluded that:

...the most effective teachers endow their students with a "you can do it" attitude, with good feelings about themselves, which are indirectly and eventually related to cognitive achievement. (p.86)

The end product of highly productive learning climates is good rapport between teachers and students and between students. The benefits of such rapport have been famously captured by Robbins (2001) when he wrote:

Rapport is the ultimate tool for producing results with other people. (p.231)

Core Principle 10: Assessment practices are integrated into the learning design to promote desired learning outcomes and provide quality feedback.

Assessment is not simply a means to measure learning that has already occurred, but is a major facilitator in the learning process itself. Well used assessment methods and processes will direct learning towards the desired learning outcomes, specify performance criteria and standards and provide regular feedback to learners on performance. Assessment, therefore, is not separate from the instructional process but an integral part of it. As Perkins (1992) suggests, in effective practice:

Teaching, learning, and assessment merge into one seamless enterprise. (p.176)

USING CORE PRINCIPLES THOUGHTFULLY: THE FLY FISHING ANALOGY

For the uninitiated, fly-fishing involves a fairly sophisticated fishing technique in which an artificial fly is cast to catch trout. However, whether or not the fisherperson catches trout, involves much more than this. The types of fly, the environmental conditions, species of trout, and how deep to let the fly sink and at what pace, are some of the critical considerations in catching trout.

The expert fisherperson negotiates these almost intuitively and catches fish regularly. Suffice to say, a novice fly-fisherman caught few trout and never reached any great heights of expertise.

Fly fishing is a useful analogy for modelling the design of effective teaching strategies, in that both are based on solid knowledge bases relating to the design and conduct of the respective activities. Similarly, they are also mediated by the situated context in which they are enacted in that both the fly-fisherperson and the teacher have to deal with the here and now situation as it is framed, select methods and resources, and create strategies to try to produce good results - whether defined in terms of 'trout caught' or 'students taught'.

It is important to understand, then, that the core principles of learning require a thoughtful application to relevant situated factors in the construction of effective teaching and learning strategies. These situated factors include such considerations as:

a. Learning Outcomes and Subject Content

Different types of learning outcomes require different learning designs. For example, outcomes that require primarily the acquisition of factual content knowledge for procedural use will require a design quite different from that which seeks to promote a range of types of thinking. Similarly different subjects content will require contextualization in terms of the types and organization of knowledge - what Shulman (1991) referred to as 'pedagogic content knowledge'.

b. Learner Characteristics

Learners can differ in many ways, most noticeably in terms of motivation and competence levels. They may also have differing orientations and preferences in terms of how they learn. Certainly learners with little intrinsic motivation and limited underpinning knowledge in a specific area will pose different pedagogic challenges than highly motivated and competent learners.

c. Learning Context and Resource Availability

This refers to the learning context and the range of resources available. A good design on paper will not work if the learning context cannot accommodate it (e.g., equipment/resources necessary are unavailable, etc.).

In short, whether or not to use a strategy for meeting certain learning outcomes may be as much a resource availability issue as it is a pedagogic one.

What this all means in practice is that the effective and creative design of learning involves a thoughtful consideration of both core principles of learning as well as the relevant situated factors involved. As Darling-Hammond & Bransford (2005) point out:

...teachers not only need to understand basic principles of learning but must also know how to use them judiciously to meet diverse learning goals in contexts where students differ in their needs. (p.78)

DEVELOPING TEACHING COMPETENCE

In the previous section, a pedagogic framework was outlined, which constitutes a 'core pedagogic literacy' for teaching professionals. In this section professional competencies (functional & generic) are identified, which frame the more specific applications of sound pedagogic practice.

Key Functional Competences

These competences relate to the 'technical' or functional requirements of the modern professional teaching role:

- Designing, planning and producing effective and creative learning designs for a range of learning contexts (e.g. face-to-face, blended, e-learning)
- Producing a range of interactive ICT based learning resources to support teaching and learning
- Teaching effectively and creatively (incorporating methods, activities and resources) based on sound pedagogic principles
- Facilitating learning, employing a range of active learning methods and process tools
- Producing valid, reliable and resource-effective assessment systems (e.g., assessment plans and instruments)
- Conducting assessment in a valid, fair and flexible manner to both support the learning process (formative assessment) and measure desired outcomes accurately.

3. Key Generic Competences

These competences support the key functional competences but are not specific to the profession of teaching per se (e.g., they are equally important in a range of other professional and occupational contexts). In the context of teaching, key ones include:

- Communication skills underpinning high levels of competence in presentation and interpersonal communication (e.g., observation, listening, asking and answering questions, etc.) in a range of contexts (e.g., face-to-face, online, etc.)

- ICT literacy and skills in using a range of technologies that support teaching and learning (e.g., presentation and rapid development software, using LMS and related e-tools, integrating Web 2.0 tools, etc.). NOTE: this is a rapidly changing competency area – hence designated skill sets and levels of expertise are subject to ongoing review.

To the above list of broad competency areas, there should be added an equally important component relating to values and attitudes. Bain (2004), for example, emphasized that:

...the best teaching can be found not in particular practices or rules but in the attitudes of the teachers.
(p.78)

Defining the specifics of such values and attitudes may be contested, but a number of exemplars would surely find approval from both teaching professionals and learners. For example, the picture of excellent lecturers in higher education portrayed by Andrews et al, (1996) is probably consistent with many conceptions of a values driven approach to teaching excellence:

...excellent teachers seem to want to facilitate a meaning approach (deep) to learning rather than a reproducing (surface) approach.

Moreover, they tend to engage in instructional processes that are congruent with their preferred approach and have values and beliefs, and characteristics (for example, honesty, integrity, genuineness and respect for self, students, material and the process of teaching) that are considered foundational to a meaning approach to teaching. (p.101)

Given the range of competences that are needed – or at least desired – there will be a constant challenge on how best to support the professional development of teaching professionals in such areas, especially in the present context of ever increasing demands and workloads. It is unlikely that such needs can be adequately met through participation in traditional workshop settings. While such settings provide useful induction to new knowledge and foster understanding of different practices, they cannot possibly develop the competence and its fluid application in the wider practice of situated teaching.

THE AFFORDANCES OF BLENDED LEARNING

In this section the potential of blended learning, both as a mode of enhancing teacher effectiveness and efficiency, and its application to teacher education and ongoing professional development is explored.

Blended Learning: Operational Definitions

As with most things relating to teaching and learning, there are different conceptions of blended learning and any one particular definition will lead to contestation. Indeed, it could be argued that most learning designs are blended in the sense that different methods and resources are typically combined in the creation of teaching and learning strategies. As Littlejohn and Pegler (2007) point out:

Blending is an art that has been practiced by inspirational teachers for centuries. It centres on the integration of different types of resources and activities within a range of learning environments where learners can interact and build ideas. (p.1)

In the context of this paper, the following conceptions are acceptable pertinent frames:

Blended learning is the combination of different training “media” (technologies, activities, and types of events) to create an optimum training for a specific audience (Bersin, 2004, xv).

The goal of blended learning is to synthesize training media into an integrated mix – one you can tailor to create a high impact, efficient and exciting training program” (Bersin, 2004, xvi).

The notion of blended learning is attractive, but raises key questions such as:

- what learning outcomes, in which contexts, are best delivered primarily through face-to-face mediums (including blends)?

- what learning outcomes, in which contexts, are best delivered primarily through online platforms (including e-tool blends)?
- how is the complete learning event (e.g., course, module, unit, etc.) appropriately structured and managed to maximize the total learning experience for the particular student cohorts?

A Design Framework for Blended Learning

The following design framework contains heuristics that, when effectively negotiated, facilitates the effective and efficient design of blended learning events:

- Irrespective of the platform or software used, the learning event must be based on 'good' learning design
- Good learning design is always grounded on core principles of learning
- Core principles of learning must be thoughtfully (and creatively) applied in relation to specific learning outcomes, learner characteristics, learning environment and resource availability
- ICT is incorporated to enhance specific aspects of the learning process
- The completed blended design maximizes the affordance of a range of learning modes and mediums.

The pedagogic framework outlined earlier addressed the notion of what constitutes a 'good learning design' (e.g., the 'thoughtful' application of core principles of learning). The following sections identify and illustrate the particular contribution that ICT can make to enhancing aspects of the learning process.

ICT is incorporated to enhance specific aspects of the learning process

There is little dispute that ICT can contribute significantly to the student learning experience, enhancing the effectiveness and efficiency of learning. However, this is not because the technology in some way alters the way we learn, changing our cognitive capabilities so to speak. The technology makes possible a variety of organized resource avenues and enhancing the sensory experience in learning. Therefore, in designing blended learning, it is firstly necessary to be very clear about the ways in which ICT (including online affordances) can enhance the learning experience for the students we teach. In general terms they have been typically identified as:

- Anytime, anyplace access to online resources
- Hyperlinked multi-modal, dynamic content
- Global social networking and building 'communities of learning' (Garrison & Vaughan, 2008)

For example, the hyperlink enables the capability for multiple global networking of resources. As Hamilton and Zimmerman (2002) illustrate:

...the hyperlink ...is practicably without counterpart in the physical world of traditional academics. Within an internet document, hyperlinks are used to bring multisourced information into the primary text or to give the reader a path to alternative media. In essence, this eliminates the physical separation of material messages that are logically connected. In addition to text, hyperlinked messages may be pictures, sound files, animations, or video clips. External links can refer students to other information-rich Internet sites, including personal Web pages, specialized bibliographies, and professional specialists. (p.270)

Similarly, asynchronous text provides certain significant advantages over the typical face-to-face situation. In face-to-face learning there is often too much information to absorb and too little time for reflective thought and the kind of synergetic knowledge building that comes from good collaborative learning over time. Online text provides an opportunity to model such synergetic activity and help build deep learning. Pelz (2004) argues that while face-to-face interactivity which requires listening and talking is 'good',

asynchronous interactivity, which necessitates reading and writing, is even 'better'. Learners have time to reflect and think about what they want to say.

Secondly, it is then necessary to focus in and evaluate specific technologies (and blends) in terms of potential for enhancing the learning process for given learners and learning outcomes. In that an e-tool supports any of the core principles of learning, there are possible enhancements to aspects of the learning process. The emergence of rapid development software such as SoftChalk Lesson-Builder, Articulate Presenter, Camtasia Studio and VoiceThread provide faculty with easy to use e-learning platforms that can quickly organize a range of text, graphic and multi-media resources in user-friendly formats. Similarly, social networking tools such as Skype, MNS and the new Web 2.0 tools enable easy synchronous and asynchronous global communication mediums. For example, a blog has good versatility in terms of utilizing many of the core principles identified earlier (e.g., connecting new knowledge to prior learning, multi-modal resource integration, and promoting thinking, etc.) As Richardson (2006) points out:

Being able to connect ideas and resources via linking is one of weblogging's most important strengths.
(p.19)

Also, the ease of use and familiarity of the blog with young people is highly significant. Blogs are now an everyday part of the communication channels for most students, albeit more of a social rather than educational orientation. The blog, therefore, is a powerful communication medium to exploit for purposes of teaching and learning in the educational context.

The completed blended design maximizes the affordance of a range of learning modes and mediums.

Essentially, this boils down to the question of what curriculum components are best delivered in the face-to-face context or in the online environment – the balance of the blend so to speak? From the standpoint of this paper the answer is primarily pedagogic and situated rather than numeric. The pedagogic and situated decisions relate to what best enhances significant aspects of the learning process for particular learning groups in particular contexts. Boyle (2005) advocates for a pedagogically driven model where every element of the blend is justified according to the course outcomes and needs of learners. However, while this may be an ideal scenario, in practice the “right blend” will depend on many criteria, including the following:

- Programme type and focus (e.g., cost reduction, high impact, etc.)
- Learning group (e.g., prior competence, motivational level, cultural factors, etc.)
- Resources (including budget and technology infrastructure)
- Content stability (e.g., enduring, relevance, etc.)

Within this context of constraints, it is not a question of how much online learning versus how much face-to-face learning; rather about how the face-to-face learning context can be enhanced through ICT and vice-versa, in any situated context. Garison and Kanuka (2004) frame this accurately when they argue that the real indicator of blended learning is not the amount of face-to-face or online learning but their effective integration within a course.

IMPLICATIONS FOR TEACHER EDUCATION

The conflation of a 'science of learning' approach to the design of learning experience, clearly articulated teaching competences and the affordances of ICT offers exciting possibilities for a blended approach to teacher education and ongoing professional development.

Firstly, the use of increasingly user-friendly and interactive e-tools makes the delivery of key underpinning knowledge relating to all areas of professional competency both pedagogically effective and practically expedient. Secondly, the use of blogs, video conference and chat tools (both synchronous and asynchronous) makes possible anytime, anyplace communication. Furthermore, the online environment

enables the building of a community of learning well beyond that of the traditional classroom. Through the use of such communication platforms, including the use of the e-portfolio, there is potential for a wider sharing of ideas, practices and critical dialogue.

This does not negate or reduce the benefits of the face to face learning context. However, it reduces the time needed to attend so many classes at specified times. Face-to-face contact time, then, can focus more on the analysis and evaluation of practice rather than traditional classroom learning. As Darling-Hammond & Bransford (2005) suggest:

Emerging evidence suggests that teachers benefit from participating in the culture of teaching – by working with the materials and tools of teaching practice; examining teaching plans and student learning while immersed in theory about learning, development and subject matter. They also benefit from participating in practice as they observe teaching, work closely with experienced teachers, and work with students to use what they are learning. (p.404)

CONCLUSION

In summary, there is now a convergence or ‘singularity’ of pedagogy and technology in terms of learning design. Infusing a ‘science of learning’ approach with the affordances of ICT can now empower teaching professionals with the competence to create effective and efficient blended learning events. The same is equally true for the professional training and ongoing development of teachers. Blended learning is unlikely to be just another “creature of fashion”, but a really useful educational frame for the design and delivery of learning events. It is here to stay - at least for the foreseeable future.

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PROFILE



Mr. Dennis Sale is presently the Senior Education Advisor at Singapore Polytechnic. He has worked across all areas of the British educational system and provided a wide range of consultancies in public and private sector organizations, both in the UK and in several Asian countries. Over the past 20 years Mr. Sale has been extensively involved in training, coaching and assessing teaching professionals.

His special areas of research include 'creative teaching', 'promoting thinking in the curriculum', 'blended learning' and the 'science of learning'. Dennis has developed original and practical frameworks in all of these areas, which are increasingly being adopted in educational institutions in Singapore and other Asian countries. He has conducted numerous workshops in many countries, presented papers at international conferences and published his papers in a variety of journals and books.

PANEL DISCUSSION 2

TVET Educators for Green Economy

KOREA TVET EDUCATORS FOR A GREEN ECONOMY

Prof. Heon Bae Jeong, Ph.D.

*Professor, Chung-Ang University, Seoul Korea
hbjeong@cau.ac.kr*

BACKGROUND

Korea's Green industry has achieved high growth rates since the end of the 1990s and it will continue to grow during the next decade. The global Green market is forecasted to grow from USD518 billion in 2005 to USD1.1 trillion in 2015. This means that in 2015 the global Green market will be larger than the USD218 billion BT market and the USD482 billion semiconductor market. In line with this growth trend the Korea green market is forecasted to grow from USD38 billion in 2010 to USD47 billion in 2030 and to USD60 billion in 2030. To be sure, the rapid growth of the Green market will influence and change the needs and importance of green manpower in Korea.

Therefore, key areas in Green industry such as water quality, waste, and air pollution will be regarded as critical compliance issues that cannot guarantee the competitive advantage of the industry. Of course, global issues that are beyond compliance such as climate change, carbon market, Green products, Green consulting and, eco-tours can strengthen and perhaps create a country's competitiveness. These trends require the diversification and improvement of today's Green manpower in Korea.

Today, Korean industry still requires a supply of diverse green TVET manpower even though Korea has continuously invested in the TVET field for many years. In addition, the demand and supply of Green manpower is in disequilibrium while the quality of Green labor needs to be improved. For this reason, Korea keenly monitors the balance between TVET and the field problem of companies promoting field-oriented TVET reform.

The paradigm of Green growth differs according to country, industry and company. Success in the green market, therefore, can be achieved not only through a classical TVET approach, but also through a more interdisciplinary approach with the bending of law, management, IT, and culture. These trends of Green manpower require not only a quantitative but also a qualitative increase of Green manpower in Korea. To meet those industrial demands, Korea has already started various Green TVET fostering programs for the Green industry.

CURRENT STATUS AND PERSPECTIVE

During the 1st Comprehensive Plan (2003~2007) Korea invested USD2.4 billion (Government: USD1.7 billion; Civil: USD0.7 billion) in fostering green industry manpower programs. Thirteen ministries including the Ministry of Environment (MOE), the Ministry of Knowledge & Economy(MKE), and the Ministry of Science & Technology (MOST) initiated 75 projects of MKE (33%), MOE (31%), and MOST (20%) which comprised 84% of the total projects.

From the 1st Comprehensive Plan, in spite of heavy investment in green R&D, Korea failed to accomplish its intended goal of attaining international competence in terms of Green R&D. The failure was due to Korea's weak infrastructure needed to support the Green technology development and a deficiency of global green R&D planning. Overall, these results stem from a lack of a database on Green technology and

industrial manpower and a weak system to foster Green manpower. For example in 2005, only 25% of college graduates were employed in their academic field

Currently, the 2nd Comprehensive Plan (2008-2012) for fostering the green industry manpower programs incorporates strategies which are more globalized in content and which are more focused TVET-oriented industrial fields.

VISION, OBJECTIVES AND STRATEGIES FOR GREEN MANPOWER

The vision of Korea's Green manpower is to accomplish a Green technology based 'Eco-Utopia' that strengthens the Green economy on the one hand, and recovers nature on the other hand. In order to accomplish this vision, Korea is acquiring world-class green technology and promoting competitive Green corporations. Furthermore, Korea is also planning to develop and apply a sustainability index to measure progress in its social and natural environments.

Among Korea's core strategies for Green growth, developing infrastructure that will support Green manpower is a major HRD program. Within this program, Green manpower and Green jobs are regarded not just as industrial employees, but they are regarded as the persons who work in the Green industry. Within this concept, Green manpower consists of employees who work to improve the environment. For example, a professor who lectures on environmental management can be regarded as Green manpower.

FOSTERING STRATEGIES FOR GREEN TVET EDUCATORS

The fostering system for Green TVET Educators in Korea is based on the construction and exploitation of demand-oriented TVET. In addition, the system is supported by the government, society, industry, and academia. However, the government's role in driving Green programs and special TVET institutes should be gradually scaled down in line with the diversified TVET demands in industrial fields, while the role of the industry should be increased. In lieu of the government, Green TVET programs can be more efficiently operated by the industry using their in-house TVET educators.

The role of the Korean academia in fostering Green TVET educators remains to be very important in developing new green technologies. While supporting green experts fostering programs at various institutions, Korea is planning to broaden TVET fields and to foster more TVET educators who can manage global Green issues such as global warming, product stewardship, and responsible care including environmental service sectors.

Through academia and industry collaboration, Korea is preparing cooperative programs such as expatriate green expert programs, research forums, and Green manpower DB for fields (Water, Air, Waste etc), for target (Manager, employee, expert, student).

Korea operates "Green Policy & Education study groups" and "Green Education centers" throughout its provinces. The country also runs special green education programs for primary and secondary teachers, and the country develops their teaching materials. Moreover, Korea is supporting more than 900 NGOs that are conducting green education.

CONCLUSION

Korea has been trying to strengthen and to promote green technology strategically and systematically at the national level. The intensive fostering of Green TVET educators is a key issue to accomplish these goals. In Korea, 30% of the national investment is being used for basic Green technology development and education. In addition, as other countries are heavily investing in the Green industries, Korea should also endeavor to gain technological competence in global IT, BT, and NT. A new green TVET could be also a strategic investment for Korea.

The companies, beneficiaries and suppliers of Green TVET could be directly involved in fostering Green TVET Educators via an in-house system. They could also train qualified TVET Educators to meet their manpower demands, disseminate their knowledge, and operate field-oriented Green TVET. Furthermore, they can contribute to the development of Green technologies and the commercialization of Green products through TVET green programs.

First and foremost, Green companies having best practices and global competitiveness should be selected in promoting and building capacity of Green TVET educators. This is Korea's core strategy for becoming a sustainable country and for fostering green TVET educators.

PROFILE



Prof. Heon Bae Jeong is a Senior Professor in Marketing at the Chung-Ang University's College of Management. He manages the university's research centers and graduate schools for over 26 years. He is an advisory member of various Korean Ministries and international public organizations which include the following: Advisory Member; Tax Review Committee for Ministry of Finance; Member, United Nations Center for Regional Development; Advisory Member; Regional Government of Midi-Pyrennee, France; Advisory Member, Korea Fair Trade Commission; Advisory Member, Korea Deregulation Committee; Advisory Member, Korea Youth Protection Committee; Advisory Member; Ministry of Agriculture, Food and Fishery; Chairman, Korea Environmental Management Academy and Presidential Committee for National Competitiveness.

TVET EDUCATION FOR GREEN SOCIETY AND ECONOMY: INTERNATIONAL PERSPECTIVES ON REORIENTING TVET CURRICULUM FOR A SUSTAINABLE FUTURE

Bonaventure Wanjala Kerre, Ph.D.

*Full Professor of Technology Education, Department of Technology Education,
School of Education, Moi University – Eldoret, Kenya
bonaventurekerre@yahoo.com*

INTRODUCTION

The universal recognition of the important role that TVET plays in the economic and social well-being of a nation is no longer questionable. TVET has a pervasive influence on the nation's productive capacities through technical and vocational skills in the available human resources and the technological innovations and processes used in the production of goods and services needed. TVET fights poverty at the individual level as it empowers one with the productive capabilities to meet the challenges of everyday life. The knowledge, skills and attitudes gained through technical and vocational education and training can, when appropriately used protect and sustain the environment.

However, the challenges of advanced scientific and technological development have the tendency to usher in new knowledge, skills and methodologies that constitute a moving target that requires retooling and new approaches every so often in order to keep abreast with the changing demands of the workplace. To do this, we must reform our TVET systems and institute a regular review process if we are to remain competitive in the global village.

GLOBAL TRENDS AND CHALLENGES

Today, there are global trends that transcend national boundaries and societies in our global village that critically impact on education and more particularly on TVET (Park, 2009; EU, 2009).

Amongst some of the trends include: demographic and economic trends, the emergence of a Knowledge Society, emerging technologies, the ICT Era, Sustainable Development and Workforce Mobility.

- Demographic trends:
 - o Rising populations which will bring the world population up to 8 billion by 2020,
 - o Aging populations particularly in industrialized economies where the demand for higher technology capabilities and dependency will increase,
 - o International migrations increased across regional borders,
 - o Massive and rapid urbanization.
 - o Increased workforce mobility within countries and across borders in regions and internationally.
- Economic trends:
 - o Worldwide economic decline
 - o Rising poverty levels particularly in Africa. Declines are most evident in Asia and Europe with increased economic activity.
 - o Increasing unemployment
 - o New Industrial Revolution
- Emerging technologies:
 - o Information & Communication Technology
 - o Bio Technology

- o Nano Technology
- o Energy Technology
- o Space Technology
- o Embedded Technology
- o Mechatronics Systems
- o Unequal access to ICT within countries and across countries marginalizing poor communities especially in developing countries.
- Climate Change and Environmental concerns:
 - o Resources depletion- the need to look for new resources e.g. energy etc.
 - o Environmental pollution and degradation-need to use technology to remedy situation.

GREEN TECHNOLOGY: THE NEW INDUSTRIAL REVOLUTION

There is a new industrial revolution unfolding in our era today (NSW, 2007). It is based on the realization of our rapid consumption of non-renewable resources and the degradation of our environment. It is a green revolution based on alternative sources of energy and innovative ways of production, preservation and conservation.

Training for green jobs will form an important part of the skills policy response to climate change in the future. There is job growth in renewable energy technologies, waste management and recycling, water and waste water treatment, land remediation and treatment of hazardous waste. 'Green jobs' will be created in the new 'eco industries' of solar, wind, bio-fuels and other renewable power sources.

The supply of qualified labour will be vital to the growth of renewable energy and recycling systems that are an essential part of a low-carbon economy. A shortage of skilled workers in these industries would be a significant barrier to any country's adaptation to a carbon sensitive global economy. The technical and vocational education and training sector will play an essential role in ensuring a supply of skilled labour that can support renewable energy technology and other environmentally-friendly technologies.

TRAILBLAZERS OF THE NEW GLOBAL INDUSTRIAL REVOLUTION

We have some countries already positioning themselves to be competitive in this new revolution. Below are few examples of what some pace setting countries are doing.

The European Union

On 10 January 2007 the European Commission announced a series of measures which it hopes will "set the pace for a new global industrial revolution". The key proposal is a target to cut the EU's greenhouse gas emissions by 20% in 2020 compared with 1990 levels. The Commission stated that the proposal should be pursued unilaterally if there is no international agreement on emission reduction when the Kyoto targets expire in 2012.

Other specific proposals include:

- a 20% target for renewables in the EU's overall energy mix
- an obligation for each member state to have 10% bio-fuels in their transport fuel mix by 2020
- saving 20% of total primary energy consumption by 2020
- aiming towards "a low CO2 fossil fuel future" with support for 'clean coal' technology, using carbon capture and storage deep underground
- developing a European Strategic Energy Technology Plan to focus R&D efforts on low carbon technologies.

The United States of America (USA)

The world's largest economy is moving closer to mandatory emissions capping with several bills addressing global climate change announced so far in 2007 and more predicted.

The State of California will set up a state-based emissions trading scheme by 2012. The emissions trading scheme is part of the state's wide-ranging plan to reduce greenhouse gas emissions which includes: targets for significant reductions in greenhouse emissions include cuts in emissions by 25% by 2020 and cuts up to 80% by 2050. The State has stringent vehicle emission standards introduced in 2009, to be fully implemented by 2016 (Sydney Morning Herald 2007).

China

China is working with the United Nations to set up a carbon trading exchange in Beijing, which could position the city as an important centre for the international trade in carbon credits. The exchange would be the first in the developing world and would compete with private sector carbon exchanges in Europe and the US. The UN expects China to account for 41% of all carbon credits issued by the UN in 2012 (Financial Times, 2007).

Climate change and energy efficiency were the focus of the first round of talks in January 2007 on an agreement to expand co-operation between the EU and China. The EU wanted to help China reduce its carbon dioxide emissions by offering clean coal and power plant technology.

China plans to more than triple its wind power generation capacity by 2010, becoming the world's largest wind power producer by 2020 and make existing buildings more energy efficient by 2020. In addition, it will also subsidize solar power, bio diesel and ethanol projects.

Germany

In September 2006 the German government presented the results of a research study on employment in the renewable energies sector (Germany, 2006). The study showed that renewable energies would provide a lasting impetus for exports, economic growth and employment. The positive impact of renewable energies on the job market should outweigh any possible negative trends. The German Federal Environment Ministry also highlighted the increasing importance of renewable energies for energy markets and the economy. The share of renewable energies in total electricity consumption in Germany increased to 10.2 percent in 2005, compared with 9.5 percent in the previous year. The renewable energy sector also currently provides in excess of 170,000 jobs, a figure that is expected to rise.

Australia

As a relatively small economy in a geographically isolated location, Australia has often relied on innovation to maintain a competitive advantage and match or exceed the productivity growth of much larger economies (such as the USA and the EU). Just as carbon emissions are a by-product of the last wave of technological change, the adaptations needed to address the carbon challenge will also require technological change and innovation (NSW, 2007).

CHALLENGES IN THE DEVELOPING WORLD

Besides facing the above global trends and challenges, many countries have yet to overcome shortages in the provision of the basic needs for their growing populations. Structures for political, economic and social reconstruction are yet to be streamlined to favour meaningful economic growth and social development. The recently promulgated new constitution in Kenya is one of those important achievements towards this direction. However, Kenya's development projects identified in vision 2030 will require a substantive amount of energy. This will not make her industrialization process competitive because of

the unpredictable high cost of energy on the global market. New sources of energy will have to be found through exploitation of geothermal power, coal, and renewable energy sources (solar & wind) which Kenya is well endowed with.

The EAC comprising of 1.82 million sq. km with a population of 126.6 million has a GDP of US\$ 73 billion and an average GDP per capita of US\$506. The Community with vast endowments of natural resources has the potential for growth into a formidable economic block.

Another major challenge for fast growing economies as experienced by China recently (Guo and Lamb, 2010) is the accompanied rapid industrialization and urban growth causing a crisis in human resource supply. Such rapid growth exacerbates the demand for higher skilled workers in every vocation and profession. This problem falls squarely on the existing TVET system of education which is the major supplier of skilled labour.

Since most innovations in technology are in areas underpinned by technical and vocational skills, there is need therefore, for high quality, practical, flexible training of engineers, architects, technicians, trades people, builders, sales people and the users of such renewable energy.

A closer examination of TVET in Africa (Kerre, 1996; Atchoarena and Delluc, 2002) revealed that even though considerable progress has been made in TVET legislation and planning at national level, most systems were still rooted in the western models of the early sixties. Most TVET systems are still dead ended without clear paths for advanced education and training. Due to financial constraints, TVET institutions lack sufficient and modern training equipment and facilities to effectively prepare trainees for direct occupation entry or further education and training.

TVET teachers/trainers subsequently lack the pre-requisite experience and technical competence to prepare youth for the dynamic 21st century and TVET is still male dominated and gender stereo typed. Kenya is not an exception.

Industrial growth entails increased production with optimal resource utilization at a sustainable level. Technology is a powerful tool that can be used to achieve sustainable growth. However, the user must have the knowledge to understand its value and potential to make informed choices on its use or application. The user must also have the skills to apply technology in solving practical problems. It is, thus necessary to have understanding and capability. These are products of education and training.

THE TVET CHALLENGE

From the above trends, it is obvious that the global community is in favour of the green environment and hence the green economy both of which must be sustainable. This can only be possible with an adequate supply of a greened workforce. The responsibility for training such a workforce to a greater extent lies on the TVET sector. A new role for TVET graduate is well articulated by the UNESCO-UNEVOC forum:

“TVET graduates will play a crucial part in inventing and implementing practical solutions to sustainability problems such as poverty, environmental degradation and access to safe water and hygienic sanitation. Working as they do at the interface between nature, technology, economy and society, they have a key role to play in helping society respond to environmental and development issue” (UNESCO-UNEVOC: Orienting TVET for Sustainable Development, 2006).

A pertinent question is: What new knowledge and skills are demanded of the above TVET graduates in order to be adequately prepared for their new roles in the green society and economy? However, an even more pertinent question for this forum arises: What new knowledge and skills are required of the current and future TVET educator/trainer to be able to produce the above TVET graduate for the green economy and society?

The need for the orientation of the TVET curriculum to the trainees' future needs for employment and further education was pointed out in the Wolf Report on the Review of Vocational Education in England (Wolf, 2011).

The findings of this report revealed, amongst other findings, that many of England's 14-19 year olds do not, at present, progress successfully into either secure employment or higher-level education and training. Many of them leave education without the skills that will enable them to progress at a later date and as a result between a quarter and a third of young people between the ages of 16-19 are, right now, either doing nothing at all or pursuing courses which offer no route to higher levels of education or the prospect of meaningful employment (Wolf, 2011).

The Secretary of Education agreed with these findings and commented:

"This waste is a special tragedy because we know that encouraging genuine, high-quality, vocational education can guarantee access to further and higher education and rewarding employment. The kind of courses which lead to a passionate understanding of, and commitment to, the joy of technical accomplishment are immensely valuable" (Michael Gove MP, Secretary of State for Education).

This was further corroborated:

"To deliver economic growth with all that means for standards of living and communal well-being we must prioritize vocational learning, promote apprenticeships and so produce a new generation of craftsmen and women capable of building Britain's future" (John Hayes MP, Minister of State for Further education, Skills and Lifelong Learning).

THE NEED FOR SCIENTIFIC AND TECHNOLOGICAL LITERACY

At the heart of TVE is the study of technology. Unfortunately, this aspect of education has not gained the prominence of Science education. There is an urgent need, thus, for us to become scientifically and technologically literate if we must be a part of the emerging global village of the 21st Century (Thiam, 1996). Technology education must, thus, be an integral aspect of the general school curriculum right from early childhood education into secondary or high school level education.

The principal aim of introducing technology education as a subject of study in the school curriculum is "to impart technological literacy and capability". Technological literacy means having the ability to use and manage, assess and understand technological products and systems.

In an articulated technology education curriculum for all, the following domains of technology education should be incorporated:

- To develop an understanding of the nature of technology and how it relates to modern society,
- To develop an understanding of, and ability to create a design,
- To develop an understanding of, and abilities for a technological world

At the tertiary/post-secondary level, a wide variety of TVET programmes are offered in both the formal education sector and the informal sector. They range from short term certificate programmes to long-term diploma and degree programmes in TVET institutions.

While the central focus of TVET at this level is to prepare individuals for job or occupational entry, the demand for new knowledge and skills dictates that opportunities for higher education and training be made available. The concept of lifelong learning is now more relevant than ever before.

TVET and Skills Improvement for Higher Productivity

A report from the International Labour Office on "Skills for improved productivity, employment growth and development" has the following observations in support of the vocationalization of higher education:

“While developed countries are pushing the technological frontier, developing countries are moving towards that frontier. Technological and industrial advancement requires the broad availability of high-quality secondary education and vocational training. Finally, the ability to innovate as well as to adopt more complex and sophisticated technologies requires technical and vocational education and training at the tertiary level, and particularly skills in research and development” (ILO,2008 Report V).

ILO has further noted that skills shortages curtail the expansion of higher-productivity sectors and the expansion of local production into higher value added activities and that there is no single model of an effective national response to the challenge of upgrading skills development and bridging skills gaps.

However, improving coordination between prospective employers and education and training providers is an effective and feasible way to reduce the mismatch between education and training outcomes and employment opportunities. Employer involvement at the local or industry level is most important in three ways:

- First, employers’ involvement in the management of training institutions helps to keep institutions abreast of changing technologies, the kind of technical and ICT equipment used at the workplace, and which industries, occupations and skills are declining or rising in demand. The development of competency-based standards in close cooperation with industry can help training become more relevant so that the skills acquired improve trainees’ employability.
- Second, employers can provide experiential learning by accepting interns or apprentices – sometimes with agreements of later employment – that enhance the systematic and classroom-based knowledge learning through practical application.
- Third, feed back mechanisms through which employers and the trainees they hire can systematically inform training providers of whether the quality of training matches on-job expectations. Sometimes this is organized directly within the labour market area of training institutions, and in other places it is coordinated through local employment offices of the national employment service.

The World Development Report of 2007 acknowledged that there was increased demand for higher order skills in industry and this subsequently calls for improved relevance of upper secondary and tertiary education. It further pointed out that:

“Countries like South Africa are trying to respond to employers’ demands for quality and relevance by revamping upper secondary curricula to emphasize practical thinking and behavioural skills and offering more of a blend of academic and vocational subjects and that policies that link educational institutions with prospective employers from the private sector through regular consultations and joint university-industry research projects help, as in China.” World Development Report, Chapter 3, 2007.

In responding to the challenges posed by the global financial crisis and consequent economic downturn, the 2923rd Education, Youth and Culture Council meeting of the European Union adopted the following key messages and recommended to the Spring European Council for consideration in the field of education and training:

“Now, more than ever, education and training systems across Europe need to be responsive to current and future labour market requirements and to the challenge of promoting equity, social cohesion and active citizenship. Various forms of cooperation and partnership between education and training institutions on the one hand, and employers and other relevant stakeholders on the other, should be encouraged as a means of enhancing the long-term employability of all citizens through the acquisition of key competences and skills in a lifelong learning perspective.”(EU, 16th February 2009).

As part of the Green Jobs Initiative, the ILO Skills and Employability Department defined a global research project to investigate skill needs for greener economies. A series of 21 country studies was conducted in partnership with the European Centre for the Development of Vocational Training (Cedefop), a European Union agency located in Thessaloniki, Greece (ILO, 2011).

The analysis of countries' experience revealed that skill shortages already constrain the transition to a greener economy, in terms of preparing for some new occupations and in terms of changing the skill profile of a large number of occupations. The research also documented the need to provide opportunities for acquiring new skills to those who are at risk of losing jobs in high-emission industries. Countries' experiences in adapting training provision to meet all of these needs vary. Some countries are developing innovative strategies and policies to proactively anticipate and address emerging skill needs; others adjust existing mechanisms and systems on a more ad hoc basis. The report has assembled case studies across a wide spectrum of challenges, documenting a broad array of approaches to promote the transition to greener workplaces with sustainable, productive and decent employment.

A number of examples of good practices demonstrate that public policy together with private initiatives can foster the green transformation and job growth. These policies focus on equipping young people entering the labor market and older workers mid-way through their careers with the ability to learn the skills required for adopting new technologies, meeting new environmental regulations and shifting to renewable sources of energy. National efforts are placing increasing emphasis on the core skills that enable workers to adapt to changing technologies, and are also focusing on building up competencies in mathematics, engineering, technologies and science. Many countries and communities target training and employment measures to disadvantaged groups out of concern that the green transformation also be a socially just one.

NEW AND EMERGING OCCUPATIONS

An important report prepared for the Occupational Information Network (O*NET), of the US Department of Labor (Dierdoff et.al, 2009) identified 12 sectors as the locus for occupations that increase in demand from greening the economy. These 12 are: Renewable Energy Generation; Transportation; Renewable Energy Generation; Transportation; Energy Efficiency; Green Construction; Energy Trading; Energy and Carbon Capture; Research, Design and Consulting Services; Environment Protection; Agriculture and Forestry; Manufacturing; Recycling and Waste Reduction; and Governmental and Regulatory Administration. Within these sectors, the report identifies three categories of occupations: Green Increased Demand Occupations (64 occupations); Green Enhanced Skill Occupations (60 occupations); and Green New and Emerging Occupations (91 occupations).

Examples of new and emerging occupations include: Air Quality Control Specialists, Biofuels Processing Technicians, Energy Auditors, Recycling and Reclamation Workers, Solar Thermal Installers and Technicians, Weatherization Installers and Technicians, and Wind Turbine Service Technicians.

COMPETENCY BASED TRAINING FOR TVET

The concept of competency has traditionally meant one's ability to perform prescribed occupational or job related functions. Competencies relate to those skills, knowledge, attitudes and experiences that enable one to perform satisfactorily in employment. However, changes affecting the structure of the market, technological innovations and new ways of organizing work have required new knowledge and the development of areas of competency that hitherto only very rarely formed a part of vocational training systems. Also, as a result of the demand for new professional positions and the higher-level qualifications these call for, vocational training systems have obviously had to be modified in order to adequately cater for the new requirements.

Different views of competency

The functionalistic focus

The functionalistic focus, which originated in the United Kingdom, is essentially concerned with the evaluation of performance, in accordance with established norms (functional analysis): "Competency refers to the group of skills and knowledge which are applied in order to carry out a task or function, in accordance with the requirements imposed by the job."

The holistic integrative focus

In Germany, the debate over competency is closely linked to “global professional definitions which place greater emphasis on the improvement of the training process”.

As seen earlier, (see the didactic unit entitled “The Dual System), the German Dual System provides to the trainees initial training for different occupations. The modular systems employed in the UK, however, prepare students or apprentices for a group of occupations or positions too diverse as to be limited to one single profession. This conceptualization of initial vocational training as a system of occupations that leads young people to a global professional qualification – rather than a series of partial qualifications it forms the basis of the holistic competency-based training focus.

Technical competency

The assimilation of the cognitive capabilities and motor skills inherent to an occupation, as regulated by legislation or the demands of the post. The two aspects that need to be emphasized are:

- the normative aspect: in the specific case of Germany, technical competency is defined and validated by means of the corresponding Training Regulations.
- the demands of the post aspect: an occupational or activities analysis is used to define how technical competency can be attained, which then forms a standard that can be applied to a variety of professional or workplace situations (this is the very same procedure used to prepare occupational profiles through the DACUM method).

Professional competency

According to G. Bunk’s definition (1994) “A person has professional competency if he or she has the knowledge, skills and abilities he requires to carry out an occupation, if he or she can solve tasks independently and flexibly and is both willing and able to plan ahead in his working sphere and within work-organizational structures”.

However, in the development of competencies for any given area, it will be necessary to combine the fore-mentioned generic skills with other technical and professional skills in order to adequately prepare one for the modern workforce.

Today, we live in a world often described as a global village bound by close information and communication technologies and an emergence of economies characterized as “knowledge based economies”.

A knowledge-based economy means an ever-increasing demand for a well-educated, knowledge-based skilled workforce in all parts of the economy. All aspects of the way we live and work, produce and consume are in the midst of a profound transformation as a result of the revolution in information and communications technologies and the rise of the global knowledge-based economy.

Products, firms and industries that were unheard of a decade ago are now significant sources of wealth. This is true in both the developed world and the developing world. The skills required for many conventional occupations are changing rapidly and many skills are quickly becoming outdated as new jobs, new technologies and new industries emerge. The use of emerging technology is transforming the way we work and do business in all sectors and in every place. Shorter product cycles, a fast expanding knowledge base and the rapid obsolescence of existing knowledge are all putting tremendous pressure on nations to develop knowledge-based skill workers at an accelerated speed.

Many countries have begun to undertake important reforms in all aspects of technical and vocational education to produce large number of knowledge workers to meet the challenges of the twenty-first century. New emerging generic skills embedded with sustainable life skills need to be developed to cope with fast-changing technologies. Many new industries and employment opportunities are also being developed, such as in eco-tourism, environmental monitoring, sustainable community development, eco-design. Recycling, land rehabilitation, pollution control, waste water treatment and reuse.

All require knowledge-based skilled workers who have the knowledge of and commitment to sustainability as well as requisite technical knowledge.

These changes are creating new roles and courses in TVET. While there could be a difference in the nature and details of generic skills that need to be included in the curriculum, among nations, in the context of the development stages, policies and priorities, there can be no disagreements about integrating higher order generic skills embedded with the sustainable development concept.

While learning through facts, drill and practices, rules and procedures was more adaptive in the past, learning through projects and problems, inquiry and design, discovery and invention, creativity and diversity, action and reflection is more fitting in the present to develop a knowledge-based skilled workforce at an accelerated speed for sustainable employment in the knowledge economy.

In the future many knowledge workers will work from home in small businesses and will generate their own work. Because of this, entrepreneurial skills need to be added to the generic skill set outlined below.

NEW INDEPENDENT GENERIC SKILLS

Critical thinking and problem-solving skills

Knowledge workers need to develop critical thinking skills to define problems in complex, overlapping, ill-defined domains; use available tools and expertise for searching, formulating the problem, analyzing, interpreting, categorizing ideas and finding alternatives, and choosing the best solution.

Creative thinking skills

Knowledge workers need to develop creative thinking to generate new ideas for solving problems, discover new principles and new processes and products. Diagnostic and design skills will play an important role in this.

Information handling skills

Knowledge workers need to develop the capacity to acquire, locate, search and find information for effective decision-making. They need to evaluate the information and know-how to use and communicate it.

Communicating skills

Knowledge workers need to develop communication skills in a variety of media for diverse audiences, using variety of modern tools, particularly the Internet.

Teamwork skills

Knowledge workers need to be able to work in a team to solve complex problems, create complex tools, services and products, collaboration, co-ordination and teamwork will be the key for success.

Technology application skills

The capacity to apply technology, particularly computing technology, with physical and sensory skills is essential in the knowledge. Knowledge workers need to operate equipment with an understanding of the scientific and technological principles needed to explore, acquire, adapt and operate systems.

Autonomous learning skills

Rapid technological changes require an ability to diagnose and prescribe one's own training needs. Knowledge workers will have to manage their own career paths and their own continuous learning of new skills. Learning to learn and lifelong learning will be the key parameter of survival in this era.

Cross-cultural understanding skills

In the era of globalization, knowledge workers will have to work in multicultural society. They need to have the cross-cultural understanding for effective teamwork.

Entrepreneurship skills

In the future many knowledge workers will work from home in small businesses and will generate their own work. Because of this, entrepreneurial skills need to be considered an important aspect of these generic skills.

Besides the possession of the above generic skills, knowledge workers will be expected to be particularly prepared to contribute to sustainable development through life skills economic, environmental and social sustenance.

SUSTAINABLE DEVELOPMENT LIFE SKILLS

Economic sustenance

Economic sustainability requires knowledge workers to develop a broader general education for economic literacy, sustainable production and consumption and entrepreneurial skills using the sustainable ethos of 'reduce, rethink, renew, recycle and reuse' principles.

Environmental sustenance

Environmental sustainability requires a change from the 'business-as-usual approach' to development to a sustainable production ethos. This involves the responsible use of raw materials, energy, and water, and applying concepts related to environmental sustainability to the workplace.

Social sustenance

Social sustainability involves ensuring that the basic needs of all people are satisfied and that all, regardless of gender, ethnicity or geography, they have an opportunity to develop and utilize their talents in ways that enable them to live happy, healthy and fulfilling lives. The concepts of social sustenance embrace existing concepts of work and employment but widen to include multiple forms of economic and non-economic activities.

TOWARD A KNOWLEDGE-BASED ECONOMY

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NEW GREEN JOBS AND TRAINING

Training for green jobs will form an important part of the skills policy response to climate change. There is job growth in renewable energy technologies, waste management and recycling, water and waste water treatment, land remediation and treatment of hazardous waste. 'Green jobs' will be created in the new 'eco industries' of solar, wind, bio-fuels and other renewable power sources.

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Since most innovations in technology are in areas underpinned by TVET skills, there is need therefore, for high quality, practical, flexible training of engineers, architects, technicians, trades people, builders, salespeople and the users of renewable energy. Some of the new innovations in the energy sector include: wind, solar and biogas energy.



Solar Panel Roof



you're always will be the problem



Biogas Plant

THE NEED FOR QUALIFIED AND EXPERIENCED TEACHERS

Amid the forementioned challenges, the ultimate challenge for teacher education is:

“to produce teachers who can cope with the challenges of the Knowledge Society, the ever moving target of technology, the ICT Era and Sustainable Development”.

There is dire need for teachers/trainers with higher skills and practical experience to prepare tomorrow’s workforce. This may be achieved by in-servicing those in practice and allowing them to take sabbatical leave to gain industrial experience on a regular basis.

TVET teachers will need higher level competencies in the same domains required of their graduates and must have wide experiences and skills in the application of various teaching/pedagogical tools.

EMERGING ROLES OF TEACHERS

The traditional role where learning was teacher centred is no longer suitable in modern learning environments. The teacher is at best a facilitator enhancing experiential learning through multimedia practices.

THE NEED FOR NEW TEACHING AND LEARNING STRATEGIES

The modern teaching and learning environment has benefited immensely from technology. The integration of ICT in teaching and learning now makes it possible to reach more learners and to address their learning needs at personal level. The shift from verbal to interactive media, from clickers to on-line software and into blended learning is transformational. Learning has become flexible, interactive multi-sensory and engaging.

Table 1 New Role for Teachers.

Traditional Role of Teachers	Modern Role of Teachers
Transmitter of knowledge	Facilitator of knowledge
Controller of learning	Creator of learning environment
Always expert	Co-learner and collaborator
Single media application	Multimedia application
Expository learning	Experiential learning

CONCLUSION

The next generation of TVET teachers have greater responsibilities to prepare and produce a workforce that will not only have knowledge and skills for specific occupations but widely adaptable for vertical and horizontal movements in related occupations through lifelong learning and training. Furthermore, it is important that new knowledge and skills be explored for greening society and economy to ensure a more sustainable future for humanity. This is a millennium challenge for TVET teachers and professionals. Skills development systems need to go beyond matching training to labour market needs; they need to play a catalytic role in future economic growth and resilience by enabling enterprises and entrepreneurs to adapt technologies, compete in new markets, diversify economies and thus accelerate job growth. Every job can potentially become greener. Integration of sustainable development and environmental awareness into education and training at all levels, starting from early childhood education, is an important task. It will contribute to changing consumer behaviour and triggering market forces to push the greening agenda ahead.

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PROFILE



Prof. Bonaventure Wanjala Kerre is currently a Full Professor of Technology Education in Moi University, Kenya. He is also the Lead UNESCO Scholar in Technical and Vocational Education and Training (TVET) and a Visiting Professor of Education (Tech and Voc. Ed.) and Ag. Dean, Faculty of Education, Kenya Methodist University. He was an International Lead Consultant for the Establishment of Rwanda Workforce Development Authority (RWoDA) from Nov. 2007 – Feb. 2008. Prior to this, he held numerous positions in the government and universities in Kenya.

As an experienced consultant, researcher and author, his interests are technology education in the school curriculum, teacher education for technology education, technical and vocational education in Africa, to elements of curriculum design for the 21st century.

Prof. Kerre is a member and former Vice President for the Africa Region (1986-1990) of the International Vocational Education and Training Association (IVETA). He was awarded by IVETA and Iowa State University Foundation with the 2004 Silvius – Wolansky Award as an Outstanding International Leader in Technical and Vocational Education and Training. He also obtained the 2001 Presidential Award for Service in the Jua Kali Sector in Kenya

He obtained his Doctoral degree in Vocational and Technical Education in 1984 from the University of Minnesota, USA and M.Sc. in Vocational and Technical Education in 1980 and B.S. in Trade and Industrial Education in 1979 from the Oregon State University, USA.

PANEL DISCUSSION 3

*Research and New Initiatives
in TVET Educators' Development*

NEW INITIATIVES FOR QUALITY ASSURANCE IN TVET EDUCATORS' DEVELOPMENT–POLYTECHNIC INITIATIVES

Ms. Noor Aidi Binti Nadzri

*Principal Assistant Director
Academic Development Division
Department of Polytechnic Education
E-mail: nooraidi@mohe.gov.my*

INTRODUCTION

Malaysia has made huge strides in poverty eradication and in raising its citizens' living standards and incomes. After Malaysia's independence in 1957, half of Malaysians lived in absolute poverty with a GDP per capita of around \$260 (MR 788). In 1970, it was reduced to at least 50% of the population. Currently, only 4 percent of Malaysians live in poverty and GDP per capita has reached \$8,100 (MR 24,300). Malaysia was among the best-performing economies in the world since World War II, consistently achieving an average of 7+ percent GDP growth between 1980 and 1997. Despite of this remarkable development however, Malaysia currently seems to be getting farther from its goal of becoming a fully developed country by 2020.

Malaysia is in the so-called "middle-income trap," in which a country gets stuck at a relatively comfortable level of income but cannot seem to take the next leap to developed nation status. The National Economy Advisory Council (NEAC) identified in its report that approximately 80% of Malaysian workers is not in a position to drive the economy upwards. It further established that for Malaysia to break-out of the middle income trap, income must increase and should commensurate with higher value-added activities.

How then can Malaysia pull itself out of this so called middle-income trap? In its report entitled the Malaysia Economic Monitor: Repositioning for Growth (2009), the World Bank recommended measures to enable Malaysia towards catapulting itself in becoming a high-income country. Among the basic recommendations include: (1) reducing the bureaucratic red tape that stifles competition and suppresses investment, (2) bolstering the education system so it can produce more top-notch graduates, and (3) funneling more financial resources to start-ups and other potentially innovative firms. In addressing this issue, the Prime Minister of Malaysia introduced the National Transformation Program supported by four pillars namely: (1) the 1 Malaysia, (2) Government Transformation Plan (GTP), (3) the Economic Transformation Plan (ETP) and the (4) 10th Malaysia Plan. Specifically the GTP is designed to provide all Malaysians access to improved public services irrespective of race, religion and region. The New Economic Model (NEM) to be achieved through an Economic Transformation Program (ETP) which will propel Malaysia to being an advanced nation with inclusiveness and sustainability in line with the goals set forth in Vision 2020.

Higher education account for a substantial proportion of public and private expenditure and are universally regarded as vital instruments of social and economic policy aimed at promoting individual fulfillment, social progress and national prosperity. Thus, in line with Malaysia's initiative towards propelling the nation to become a developed nation, the NEAC highlights the following roles of Higher Education institutions in supporting the NEM:

1. Producing skilled human capital needed by market
2. Being the source for R&D and innovation
3. Improving the outcome of the education (in particular higher education) sector

4. Producing human capital that is competitive with high skills who can earn high income while ensuring low income groups to have access to quality education which will help improve their livelihood
5. Attracting the best talent for producing human capital, innovation that will lead growth, ensure inclusiveness and promote sustainability

POLYTECHNIC TRANSFORMATION PLAN

Polytechnics under the purview of Ministry of Higher Education Malaysia (MoHE) are one of technical and vocational education and training (TVET) organization at the post secondary level. In line with the government's transformational initiatives, the Department of Polytechnic Education, Ministry of Higher Education Malaysia launched its Polytechnic Transformation Plan on 25 March 2010 to reinforce the role of polytechnics and technical education in Malaysia. The targeted outcome of the transformation plan is to enable the Polytechnic Institutes to be the regional leader in TVET. Currently, 85% of graduates employed within six months of graduation and 50% of eligible Sijil Pelajaran Malaysia (SPM) holders choose polytechnic as their first choice to further their education.

The Transformation Plan outlined four thrusts, consisting of: (1) the enhancement of polytechnics towards becoming the students' choice and preferred institution that is at par with universities, (2) development of programs and research in niche areas representing the different strengths of each polytechnic; (3) provision of polytechnic teaching personnel and support staff with high skills and competency, and (4) development of an excellent work culture and image (MoHE, 2009). Specifically, the academic staff plays a great and important role towards realizing the outcomes of the transformation plan. Hence, the four main initiatives of the third thrust are to: (1) elevate the lecturers' academic qualifications, (2) to elevate the lecturers' skills competency, (3) to elevate the staffs' professionalism and (4) to capture best talents from the industries.

As a result, of this third thrust, performances of teaching personnel are evaluated to ensure the efficiency and effectiveness of teaching personnel in polytechnics based on key indicators identified that include, teaching and supervision, research and innovation, administrative tasks, professional activities and services to community. The evaluation of the teaching personnel is done as a yearly appraisal and also as a mechanism for career advancement. Currently, polytechnics are still in its first phase of the transformation plan, labeled as the "quick wins and institutional transformation" phase. The outcomes of the first phase of the transformation are targeted to be achieved by the year 2012.

QUALITY IN EDUCATION- MALAYSIA SCENARIO

Rapid economic globalization, the advances in information and communication technology, increasing shift towards knowledge-driven economy and international market competition are some of the great challenges that faces the education systems in nearly all countries of the world today. Various education initiatives and reforms were developed to adapt to these aforementioned challenges in education systems.

According to Cheng (2003), there are three waves of world-wide education reforms have been experienced since 1970. The first wave, referred to as internal quality, focuses on improving the internal environment and processes in such a way that the effectiveness of learning and teaching can be ensured to achieve the planned goals. During this wave, an important target is the improvement of teacher and student performance to targeted standards. On the other hand, the second wave, commonly referred to as interface quality, emphasizes on the interfacing of effectiveness with respect to education quality, stakeholders' satisfaction, and market competitiveness aiming at ensuring quality and accountability to the internal and external stakeholders. Finally, the third wave of education reform, referred to as the "future quality", ensures the relevance of aims, content, practices, and outcomes of education to the future of new era of globalization, information technology and the knowledge-driven economy.

Cheng (2003) further elaborates the significance of the third wave of reform in preparing the future graduates to effectively cope with the rapid transformation in an era of globalization and information technology. Polytechnics under the purview of MoHE is without doubt currently addressing the third wave of education reform especially in identifying new academic programs to be offered. Current economic, technological and political scenarios are the three major factors that have a direct impact on new program offerings. Currently, the 12 sectors under the National Key Economics Area (NKEA) are the main secondary reference in identifying new programs. However, being in the third wave of education reform does not mean that initiatives under the first wave and the second wave are discontinued. In fact, issues such as educators' development and accountability towards internal and external stakeholders' are continuously addressed.

The implementation of the Malaysian Qualifications Framework (MQF) as the basis for quality assurance of higher education and as the reference point for the criteria and standards for national qualifications came into place. This measure is parallel to the world-wide education reform and with the coming in force of the Malaysian Qualifications Agency Act 2007 and the establishment of Malaysian Qualification Agency (MQA) on 1 November 2007. MQA, being the entity that is responsible for monitoring and overseeing the quality assurance practices and accreditation of national higher education, is responsible towards developing standards and criteria and all other relevant instruments as national references for the conferment of awards with the cooperation of stakeholders and to facilitate the recognition and articulation of qualifications. Under the MQF, eight levels of qualifications in three national higher education sectors are established and are supported by lifelong education pathways. The three sectors are Skills, Vocational and Technical and Academic. MQF also provides educational pathways through which it links qualifications systematically. These pathways will enable the individual to progress through credit transfers and accreditation of prior experiential learning, in the context of lifelong learning. With the establishment of MQA, higher learning institutions in Malaysia began to realign their educational programs, systems and procedures towards meeting the criteria and standards as outlined by MQA.

Quality Assurance-Polytechnic Initiatives

TVET is often seen as an "alternative route" or a "last choice education" as a consequence of diverse factors among which is the lack of quality in TVET. Hence, towards accomplishing quality assurance in TVET institutions, Majumdar et. al., (2009) stated that three important measures are needed namely (i) validation of qualifications and/or standards (ii) accreditation and audit of education and training institutions and (iii) quality assurance of assessment leading to the award of qualifications. It also emphasized that quality enhancement is one of the main objectives of TVET system on top of increasing attractiveness of education, training and promoting mobility among technical and vocational students.

Susan Holland defines quality improvement in VET as (i) involving development of industry standards, (ii) development of the corresponding curriculum for courses and training programs, (iii) establishing mechanisms for accreditation and national recognition, (iv) provision for flexible methods of delivery and outcomes-based assessment and (v) certification of students achievement (as cited in Majumdar et. al., 2009). Quality assurance in TVET therefore encapsulates issues pertaining to standards, auditing and accreditation, assessments and certifications.

Prescribing to this philosophy towards establishing an effective quality assurance system and in overcoming the issue of lack in quality of TVET institutions, the Department of Polytechnic Education (DPE) and all 30 polytechnics under its supervision pursue to abide fully to the prescribed Quality Assurance and Quality Control standards by seeking a certification from a standardization organization or by adopting an effective quality assurance management mechanism. Initiatives towards achieving quality in polytechnics educational programs began as early as 2005 by embedding within institutional procedures the prescribed code of practice of ensuring quality assurance in QMS. As early as 1999, polytechnics began initiatives in achieving the MS ISO certification and until now, 20 polytechnics are MS ISO certified. Continuous initiatives towards achieving quality education within the polytechnics' system

has been taken and listed as in Table 3.1. Looking again at the polytechnic's transformation agenda, it is without doubt that quality plays a critical role towards achieving all three outcomes of the polytechnic's transformation agenda. Continuous imparting of knowledge and know how as well as abiding to practices of quality and promulgation of good practices amongst polytechnics' members will over time, aid DPE and polytechnics towards achieving the desired quality in its education.

PURPOSE	ACTIVITIES	YEAR
Buying In	<ul style="list-style-type: none"> • Continuous trainings and workshops on areas as follows: <ul style="list-style-type: none"> - QA principles and practices - Continuous Quality Improvements 	2007 - 2010
	<ul style="list-style-type: none"> • Benchmarking visits to establish best practices that can be adopted within the polytechnics' system 	2008 - 2010
Capacity Building (Phase 1)	<ul style="list-style-type: none"> • Development and launching of Polytechnics' Competency Standards 	2008
	<ul style="list-style-type: none"> • Development of template for curriculum development process including definition of PAI, PLO, CLO, GO and SO. 	2007-2010
	<ul style="list-style-type: none"> • Development of mock MQA 01 documentation for practice purposes 	2009
	<ul style="list-style-type: none"> • Restructuring of DPE and Polytechnic to include QA division/unit 	2010
	<ul style="list-style-type: none"> • Realigning of DPE's MS ISO 9001:2008 certification by Llyods Register Quality Assurance with its scope of "Curriculum Design, Development, Review and Monitoring" to include MQA's code of practices 	2010
Capacity Building (Phase 2)	<ul style="list-style-type: none"> • Realigning of all polytechnics' MS ISO 9001:2008 certification to include MQA's code of practices 	2010
	<ul style="list-style-type: none"> • Establishment of joint Technical Committee with representatives of MQA with scheduled discussions on polytechnics' QA practices and procedures 	2010
	<ul style="list-style-type: none"> • Continuous trainings and workshops on areas as follows: <ul style="list-style-type: none"> - Outcome Based Education (OBE) principles - Constructive alignment of curriculum, instruction and assessment - MQA's requirements on all 9 areas to be audited 	2010
Developing Communication Tool	<ul style="list-style-type: none"> Continuous trainings and workshops on areas as follows: <ul style="list-style-type: none"> - Development of Internal Auditing Instruments - Internal Auditing Procedures and Practices - Development of Self Review Report - Development of MQA 02 documentation 	2010 - 2011
Developing Communication Tool	Development of Curriculum Information and Document Online System (CIDOS) as a platform for the purpose of collaboration and communication between Curriculum Development Evaluation Division, curriculum development committee, polytechnics lecturers and polytechnics students.	2007
Outcome-Based Curriculum	<ul style="list-style-type: none"> • Reviewing of all curriculum towards OBE compliance • Constructive Alignment of curriculum, instruction and assessment 	2008 - 2010
Outcome-Based Delivery	• Reassessing of instructional auditing procedures to suit the requirements of MQA	Begins in 2010
Outcome-Based Assessments	<ul style="list-style-type: none"> • Reassessing of assessment procedures, practices and auditing mechanism to suit the requirements of MQA • Development of Assessments Specifications Table (Jadual Spesifikasi Pentaksiran), Tests Specifications Table (Jadual Spesifikasi Ujian) and Items Specifications Table (Jadual Spesifikasi Item) – towards strengthening assessment practices to suit the requirements of MQA 	Begins in 2010
		2010

Continuous Quality Improvement (CQI)	<ul style="list-style-type: none"> • Establish audit and feedback mechanism to ensure all procedures and processes are in line with best practices at reputable educational institutions • Continuous promulgation of best practices amongst DEP and polytechnics staffs 	Begins in 2010
Lecturer Training	<ul style="list-style-type: none"> • Continuous training for lecturers to develop knowledge, skills and professionalism 	Continuous
MQA's Full Accreditation Status for Advanced Diploma Programmes	<ul style="list-style-type: none"> • 5 Advanced Diploma programmes undergo rigorous auditing by MQA auditing panel towards achieving the Full Accreditation status 	2011
Provisional Status Dublin Accord	<ul style="list-style-type: none"> • Initial workshops to establish criteria and standards towards achieving Provisional Status of Dublin Accord 	2011

EDUCATORS' DEVELOPMENT TOWARDS QUALITY ASSURING ACADEMIC PROGRAMS

Towards establishing quality educational programs, DPE and all of the 30 polytechnics under its supervision will first and foremost strive towards achieving a "Full Accreditation" status for all of its educational programs by adhering to all of the benchmarked and enhanced standards prescribed by MQA. Existing QMS processes and procedures will be reviewed such that critical standards required by MQA are addressed. Steps toward conformance of procedures and processes, especially in terms of curriculum delivery and assessment, are taken so that educational programs offered at differing polytechnics results in educational outcomes that are of equal standards.

Self-accreditation status granted by MoHE through the Malaysian Qualifications Agency (MQA) is set as one of the major achievements under the Polytechnic Transformation Agenda since it will be testimony to the high quality of the programs offered. The status of being self-accredited means that the institution can accredit its own program without going through the MQA. To achieve this, MQA carries out a thorough institutional audit with the assistance of a panel of experts from within the country as well as fellow quality assurance bodies in the Asian region based on its Code of Practice in Institutional Audit (COPIA). Upon the receipt of the self-accreditation status, MQA would carry out a maintenance audit once every five years to ensure the institutions maintained their internal quality assurance system.

One of the most important components that DPE has to address towards quality assurance of all of its educational programs is the maintaining the quality of its academic staff. Proper and effective recruitment, service, development and appraisal policies are needed to establish a conducive garnering of staff productivity. Qualified and sufficient numbers of academic staff undergoing continuous development is crucial in ensuring quality of educational programs. With respect to educators' development, standards outlined by MQA (2008) are as follows:

- The academic staff must be provided with the necessary training, tools and technology for self-learning, access to information and for communication.
- The HEP should provide opportunities -- including funding -- for academic staff participation in professional, academic and other relevant activities, national and international. It should appraise this participation and demonstrate that it utilizes the results of this appraisal for improvement of the student experience.
- The HEP should have appropriate provision to allow for advanced enhancement for its academic staff through research leave, sabbatical, and sponsored participation in, and organization of, conferences.

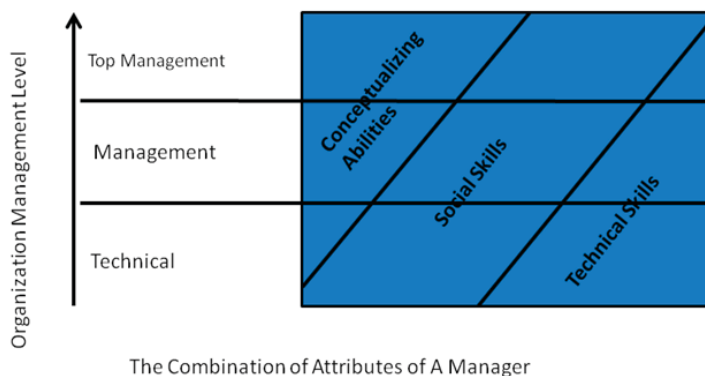
DPE has, thus, designed its human capital development agenda to ensure strategic and focused management of human capital as pillars of transformation and change management and the implementation of high-performance culture. High performance culture requires professional characteristics such as efficiency, effectiveness, decisiveness in the formulation of strategies and the constant drive to improve performance. Professional characters are formed and formulated among others, by excellent training programs. Hence, the scheme for Pegawai Pendidikan Pengajian Tinggi (PPPT) gazette via service circular 33 in the year

2007 was developed based on the concept of excellence. The concept of excellence developed through the Criteria for Excellence is geared towards developing academic staff that are competent, knowledgeable, highly skilled and creative. They are also trained to be responsive to the change in ensuring educational programs relevant and marketable in paving the reputation of the polytechnics as a leading provider of workforce in technical and vocational field. Criteria of excellence are also a mechanism to ensure professional quality amongst academic staffs towards strengthening the culture of high performance in the polytechnics and inevitably gaining the trust of society and industry.

Polytechnic Educators Development under the 10th Malaysia Plan

The developments of Polytechnic educators' are streamlined according to their roles and functions based upon three (3) different attributes of a manager namely: (1) conceptualizing abilities, (2) social skills and (3) technical skills. With a total of 7,359 academic staffs and 2,565 supporting staffs, staff development must be well planned with exhaustive training needs analysis carried out. The development of educators' attributes varies based upon the responsibilities of the educators is shown in Diagram 4.1.

Under the 10th Malaysia Plan and in line with the initiatives under the 4th thrust of the Polytechnic Transformational plan, DPE aims to develop its educators through the master programmes based on the following categories:



- Generic Skills via Career Path Competency Matrix (CPCM)
- Technical Skills via Skills Development Programmes
- Industrial Skills via Lecturers Industrial Attachments
- English Proficiency via English Enhancement Programmes
- Benchmarking via Internationalization Programmes
- Teaching Core via Androgogy Instructional Leadership Programmes and Teaching Methods
- Coaching and Mentoring via Associate Coach Programme
- Industrial Certification via Professional Industry Certification
- Various Skills via Multi Skilling Programmes

Educators' excellences are also planned via series of sponsorship under the Pemberian Hadiah Latihan Persekutuan (PHLP) towards upgrading the academic qualifications of the educators. By the year 2015, 40% of total polytechnic educators are to achieve academic attainment at Masters level while 15% at Doctorate level.

The earnestness of the DPE towards developing its educators in line with the Polytechnic Transformational plan in producing employable and quality graduates is reflected in the large amount of budget allocated for this purpose. The impact of the training provided to polytechnic educators is continuously monitored via surveys and observation at all polytechnics. Throughout 2011, students as well as educators were questioned on the effectiveness of teaching and learning as a direct effect of training and overall positive feedback was received from both educators and students. Continuous survey will be carried out to evaluate the effectiveness of the training programs so that the desired outcomes of educators' development are achieved. Table 4.1 summarizes the amount of money spent on educators training in the year 2011.

Table 4.1 Expenditure on Polytechnic Educators Training in 2011

ITEM	PROGRAMME	EXPENDITURE (RM)	NO. PARTICIPANTS
1	Skills Development Programmes	2,250,000	1367
2	Career Path Competency Matrix (CPCM)	2,000,000	2863
3	Instructional	2,400,000	868
4	Lecturers Industrial Attachments	975,323	65
5	English Enhancement Programmes	338,000	560
6	Coaching & Mentoring	739,970	450
7	Internationalization	500,000	12
8	Professional Industry Certification	500,000	61
9	Multi Skilling Programmes	250,000	120
	TOTAL	9,953,293	6366

CONCLUSION

To achieve the outcomes of the Polytechnic Transformational Plan, all initiatives must be properly planned and structured so that all critical and necessary actions are executed. With respect to educators' development, exhaustive training needs analysis need to be carried out to identify the exact trainings required by educators at all level. The achievement of the students is very much dependent upon the commitment, knowledge and quality of the educators. Hence the impact and effectiveness of the trainings need to be continuously evaluated so that desired outcomes of the trainings are achieved. In addition, conforming to prescribed sets of criteria and standards is one definite step towards quality assuring educational programs resulting in high employability rate of graduates and achieving positive perception amongst public towards polytechnic education.

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RESEARCH IN TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET) EDUCATORS' EDUCATION AND DEVELOPMENT

Dr. Abdul Rahim Ahmad

*Director, Research and Development Division
Department of Polytechnic Education
Ministry of Higher Education, Malaysia
arha@mohe.gov.my*

INTRODUCTION

Technical and Vocational Education and Training (TVET) provided to current and future students' needs to change significantly in order to prepare our graduates for a world of rapidly accelerating changes. Developed and developing countries, including CPSC's members countries are driving rapid changes in science, engineering, technology and economics; along with consequent changes in other areas. As an example, Mote (2011) makes the observation that none of the top-ten U.S. employment opportunities in 2010 existed in 2004.

The common factors that have impacts on the TVET educators include the modernization or transformation of TVET, the labour-market, technological developments and demographic change. TVET is becoming increasingly driven both by the labor-market and varied learner needs, with an emphasis on providing relevant and up-to-date technical knowledge and skills while developing employability skills. "Competency Standards" are being applied to describe TVET "learning outcomes" and used in assessment. Innovative delivery approaches are introduced which focus on the "learner-centred learning." TVET is also gaining prominence as an essential element of lifelong learning. In addition, the range of TVET clients has extended to include not only students but also government, industry and employers, employees, local communities and parents. These changes generate higher expectation of the outcomes and the quality of TVET systems.

The consequent demands on TVET such as Polytechnic Education System in Malaysia cover work-related competencies; the quantity and type of information available; the way that TVET systems being implemented; changes in the environment and changes in the culture of learners and teachers.

The significant impacts are on curriculum; teaching and learning delivery; assessment and TVET educators' development. As teaching and learning is the core of TVET systems, including Polytechnic Education System in Malaysia, thus, endeavours and initiatives to improve teaching and learning practices are at the centre of any high-quality TVET system. This will require TVET educators to test new approaches in an environment of active experimentation. One of the approaches is through action research.

CONTEXT AND TRENDS FOR TVET EDUCATORS

Polytechnics aimed to be Malaysia's main provider of innovative human capital through transformational education and training for the global workforce by 2015. This sector of sub professional workforce accounts for about 45% of the total requirement under the Economic Transformational Plan (ETP). Currently, the Department of Polytechnic Education (DPE) administers 30 Polytechnics which conduct various courses and training programs in the areas of engineering, technology, commerce, hospitality and services; and the enrolment figure as of July 2010 was at 87,751 for full time course and 2,908 for part time courses (DPE, 2010). From its inception, there were already 338,391 graduates across disciplines working in various industries. (Figure 1 below)

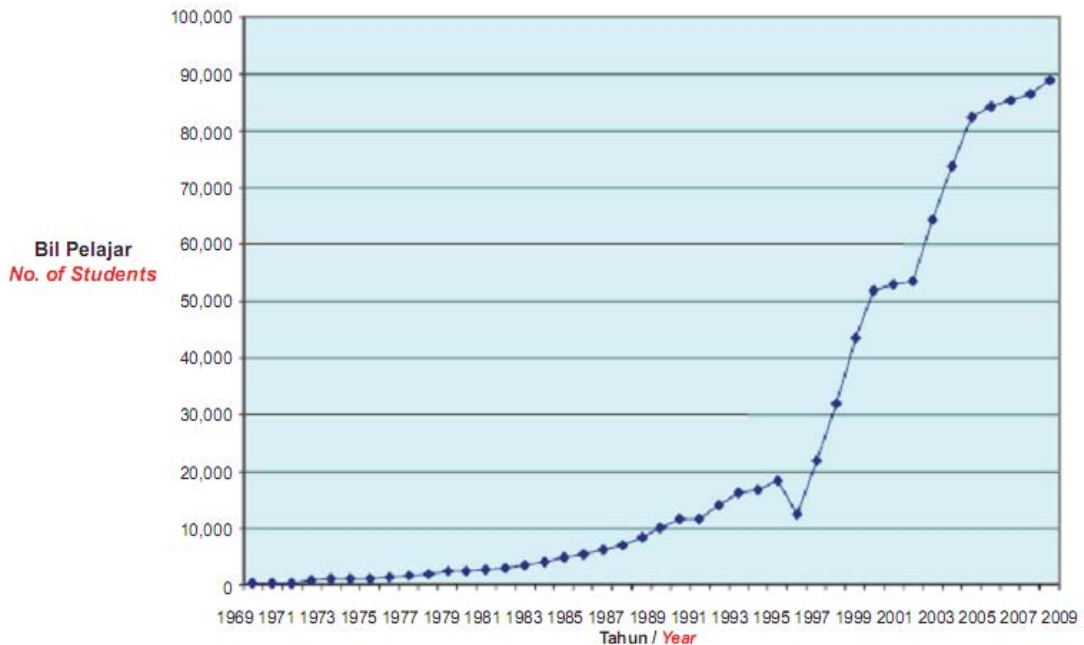


Figure 1: Enrolment of Polytechnics 1969 - 2009

The Polytechnics Education System in Malaysia will be providing about 400,000 new workforce to the 12 industry clusters identified in the Economic Transformational Plan (ETP) by the year 2020 and at the same time Polytechnics will have to produce the quality of workforce required by the industries.

Malaysia requires a flexible and competence workforce that is adaptive to change. The workforce needs to be continuously equipped with knowledge and skills to increase Malaysia's competitiveness in the global market (Jailani, et al., 2009). The competency profiles and attributes of these new workforce will have to be identified and more importantly is how to develop the students to that level of industry expectations.

The above requirement is leading to a demand on the TVET delivery system. There has to be a transformation on how the learning and training should take place, which are particularly the roles and responsibilities of TVET educators. TVET educators must endeavour to introduce innovative approaches in teaching and learning for this reform which will produce the much emphasized practice-oriented education for technicians.

The ingredients of reforms or innovative approaches of TVET that directly or indirectly affect TVET teaching and also educators include:

- Developing new pedagogies and methods, more learner-centred;
- Renewing the curriculum objectives and content
- Increasing the emphasis on work experience and on work-based learning
- Introducing new forms of assessment and validation of knowledge and skills and competences

These innovations demand new TVET educators' roles and responsibilities. These will in turn translate into new knowledge and skills requirements for the initial pre-service training of TVET educators and also for in-service training and continuous professional development (CPD). Also, there must be a coherence and continuity between TVET educators' initial professional education and subsequent induction, in-service training and professional development.

IMPACTS ON THE TVET EDUCATORS' FUNCTIONS OR ROLES AND RESPONSIBILITIES, AND THEIR LEARNING NEEDS

Basically, TVET educators must understand TVET helps people for work, develops as well as upgrade their skills while at work and changes what they are doing to adapt to new work environments or different occupations. Thus, some of the essentials that need to be undertaken include:

- Examine the characteristics of innovative teaching and learning practices
- Compile examples of innovative teaching and learning practice (Best Practices)
- Compile the sources of information, examples from websites, literature, experience etc.
- Contextualize the relevant practices so as to work effectively in TVET such as Polytechnic Education System in Malaysia.
- Build support system for educators to use the research, and gathered further contributions to the knowledge of good teaching and learning in TVET.

The major challenges for TVET educators and professionals include understanding and keeping up with the changes and reforms affecting their profession, working in new and more flexible ways and continued commitment to adapt to the dynamics of the teaching profession. Below is an example of TVET educators' profile that can be used as a guide (CEDEFOP, 2009):

- extensive subject knowledge
- good knowledge of pedagogy
- knowledge, skills and competences to support learner-centred teaching
- profound understanding of social, cultural and economics dimensions of education
- lifelong learning skills – developing their skills continually; recognizing the importance of acquiring new knowledge
- ability to innovate
- capability to use research evidence to inform their practice
- ability to collaborate in partnership with schools, local communities, industries, enterprises and workplaces.

There is also a need to explore the contribution of diverse research approaches to TVET educators' education and development. The integrative approach to TVET educators' education and development should include:

- The core content for the expertise of TVET educators which is to be grounded by research
- The pedagogic expertise of TVET educators which is to be grounded by analyses on pedagogic and curricular projects with TVET teaching and learning processes.
- The innovative expertise of TVET educators which is to be grounded with the help of action-oriented and co-participative innovation research that links the TVET learning to broader innovation contexts.
- The renewal as well as upgrading of TVET educators which is to be grounded by research activities that take into consideration challenges that may radically change the usability of prior TVET competences.

Important aspects that will support research endeavors to develop TVET educators:

- Existing knowledge-bases and resources
- Related chains of knowledge processes, namely knowledge creation, knowledge enrichment and knowledge utilization.
- It is important for TVET educators to be able to step back from their daily routine and grind to think about what and how they can do things differently and innovatively in order to improve their practices.

- TVET educators need to be facilitated and supported to test new approaches in a culture of active experimentation such as through action research endeavours.
- Research and Innovation Unit or Centre is very important in promoting research and innovation including better teaching and learning.
- Technologies can be used to support networks or community of TVET educators and practitioners.
- Knowledge Management Systems can be part of resource banks to foster better TVET educators' practice and assist them exchange ideas and resources.
- New technologies and the workplace can also be used to support teaching and learning. Thus, partnership arrangements are essential in supporting better engagement between institutions and employers and effective "Work-based Learning (WBL)".
- Collaboration across educational sectors, such as Polytechnic Education System with Malaysia Technical Universities Network (MTUN), is beneficial. The creation of "Bachelor of Technology" in Malaysia provides a way of developing employment-focused awards involving both TVET and higher education and also employers.

DEVELOPMENT OF TVET EDUCATORS THROUGH ACTION RESEARCH

In TVET system generally, there are three main research conceptual strands, namely:

- (i) Activities that focus scientifically based research and evaluation on "developing and improving methods that address the education, employment and training needs of participants, including special groups". (Workforce development – people-centred and needs-driven approaches)
- (ii) Activities that emphasize scientifically based research and evaluation designed to "increase the effectiveness and improve the implementation of TVET programmes with relevant, coherent and rigorous content aligned with challenging academic standards". (Curriculum development, delivery and assessment as well as evaluation)
- (iii) Activities that focus on scientifically based research and evaluation designed to "improve the preparation (education) and professional development of TVET educators and administrators in order to improve student learning". (TVET educators' education and development)

It is recognized in strand (iii) that TVET educators have the central role in bringing about changes and innovations in teaching and learning in TVET, as the ground agents of change that make change directly in the classroom, workshop and workplace. This role could be brought about through one of the diverse research approaches available, namely the action research which aims to improve practices rather than generate abstract knowledge. Action research helps to reveal real problems, issues and areas for improvement as perceived by the TVET educator and entails action, which provides feedbacks into the situation. Therefore, the aim of action research is to bring about positive change in one's own environment by critically investigating one's own practice.

In Europe, action research occupies a prominent role in TVET educators' professional development and education (CEDEFOP, 2009). Action research in education integrates teaching, educators professional development, curriculum development and evaluation; research and reflection; where theory directly informs practice (Flamini and Raya, 2007). In action research, TVET educators are the agent of change, playing a central role in their self-development, adaptation and self-renewal. Thus, action research promotes a culture of reflective practice and research within the TVET educators' profession.

In brief, action research involves:

- the systematic enquiry into one's teaching practice starting at classroom and workshop level;
- reflective process of progressive problem-solving led by individuals working with others in teams to improve the way they address issues and solve problems;
- small-scale researches and conducted by practitioners with the support of colleagues;

- the examination of current practices, implementing new practices and evaluating the results, which then leads to an improvement of teaching practices.

Action research approach being undertaken is guided by the following three characteristics:

- Firstly, it is about individuals working in their own context to bring about improvements in their own practice in areas that they determine.
- Secondly, it follows a systematic process characterized by planning, acting, observing and reflecting. This is described as a spiral because the cycles of planning, acting, observing and reflecting tend to be ongoing. (Refer to Figure 2)
- Thirdly, action research places a high priority on collaboration and sharing of knowledge. Some of the outputs indicating that TVET educators in Polytechnic Education System in Malaysia are actively participating in research and which include:

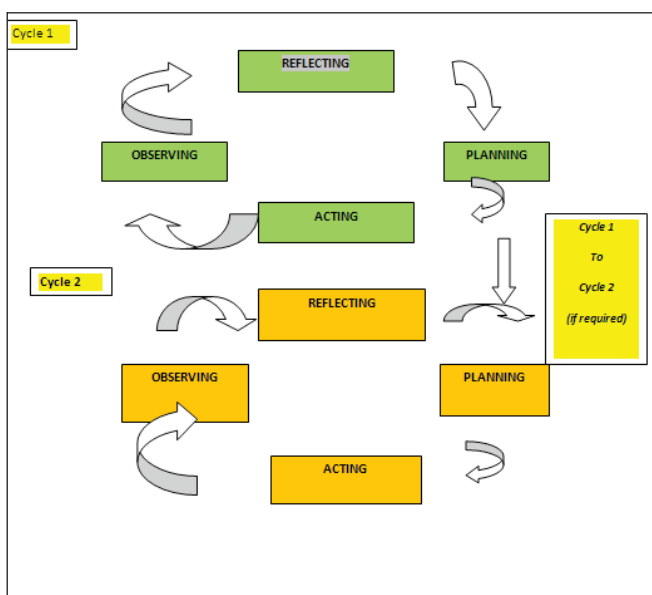


Figure 2: Action Research Process

In addition, other TVET research endeavours may also include specialized and trans-disciplinary research approaches that contribute directly to TVET educators education and to continuing professional development. These encompass “technical and vocational disciplines” and “teaching and learning methods or pedagogy” which are related to the context of developing TVET learning processes.

CONCLUSION

The contemporary roles of TVET educators in changing and transforming learning and work environment in TVET include:

- Shaping and implementing transformation and changes
- Generating their own changes and innovations.

Generic categories of innovative practices in teaching and learning that are relevant include:

- Close engagement with customers, especially employers and stakeholders, to ensure meeting their needs – linking the content TVET programmes more effectively to employers’ needs.
- Collaborations and partnerships in work-based learning
- Flexible and hybrid or blended delivery of teaching and learning, such as e-learning, Online Distant Learning, Online Virtual Distant Learning, Internships or On-the-Job-Training etc.
- Networks, centre of technology and resource banks
- Networks of professional practice.

Thus, TVET educators must be partners and key actors in change and transformation; and also as change agents or innovators at ground level in the context of action research. Action Research seems to be

particularly adapted and should be used as a tool to empower TVET educators in their endeavors and initiatives for professional self-development and local innovation.

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PROFILE



Dr. Abdul Rahim Bin Ahmad has 28 years of working experience in TVET and is presently the Director of Research and Development Division, Department of Polytechnic Education, Ministry of Higher Education, Malaysia. His main functions include designing and developing policy, system, procedure and guideline for research and innovation for Polytechnic Education System (PES) in line with the national and ministry policies; planning, implementing and managing the capacity and capability development of polytechnics' staff in research and innovation; and developing a management system for research and innovation undertakings in the Polytechnic education system.

Dr. Rahim acquired his Ph.D. in Human Factors from Loughborough University England in 2003, Master in Civil Engineering (Highway and Transportation) from the Universiti Teknologi Malaysia (UTM) in 1992, and B.Sc. (Hons.) in Civil Engineering from the University College of Swansea, Wales, United Kingdom in 1982.

VOCATIONAL TRAINING TEACHER SYSTEM AND EDUCATIONAL CASE IN KOREA

Prof. Su-Won Kim, Ph.D.

Associate Research Fellow

Korea Research Institute for Vocational Education and Training

swkim@krivet.re.kr

QUALIFICATION SYSTEM AND STANDARD FOR VOCATIONAL COMPETENCY DEVELOPMENT TRAINING TEACHER

A vocational competency development training teacher (also referred to as ‘vocational training teacher’) is defined as a person who performs various tasks which include: design of educational contents on both technology and theory implementation of training per training standard; monitoring and evaluation of training program implementation; and job counseling and career guidance in vocational training institute or vocational competency development training facility or even in business areas.

Requiring a standard qualification for the vocational training teachers is an institutional strategy to guarantee professionalism and raise social credibility among teachers. Setting certain standards of qualifications also helps in gauging teachers’ competency and capability and grade division or the necessity to provide for an appropriate training intervention to improve and enhance teachers’ competency or achieve needed skills per established qualifications. Further, the qualification system of the vocational training teacher becomes a means to protect trainee’s rights and interests, to guarantee teacher’s social status and to increase teacher’s socio-economic status.

The vocational training teacher is generally classified into “a vocational competency development training teacher” and “a person having a specified knowledge in a certain field”.

Qualifications of vocational competency development training teacher:

- Qualification job class of vocational competency development training teacher is of 101 jobs in 23 fields, and each job is classified into 3 grades.
- Basically, engineer or technician and teaching profession competency are required for the qualification, and a certain period of educational training or hands-on-background is needed.
- Although the training teacher has to basically complete a course of study determined by the Ministry of Labor with respect to the teaching profession competency, a certificate for secondary school teacher or more is permitted for fields of service and office related or general education background.

Table 1 Different fields of qualified jobs

Field of qualified jobs:		
1. Machine	9. Public work	17. Handcraft
2. Metal	10. Architecture	18. Industrial application
3. Chemical and ceramic	11. Textile	19. Service
4. Electric	12. Mine	20. Office management
5. Electronic,	13. Data processing	21. Finance and insurance
6. Communication	14. Land development	22. Medical treatment care
7. Shipbuilding	15. Agriculture and forestry	23. General culture
8. Aviation	16. Fishing industry	

A person having specified knowledge in a certain field

- According to Higher Education Act, a person who graduated from junior college or university, and having a career of performing with educational related training and experience in the relevant field.
- A person who has educational background and a study career of in the relevant field in a government-supported research institute or business-attached research.
- A person who has a hands-on-background for one year or more in the relevant field.

VOCATIONAL COMPETENCY DEVELOPMENT TRAINING EDUCATION INSTITUTE

The first vocational training teacher education institute in Korea is a central vocational training center established on June, 1968, which operates a 2-year specialized course and a short-term license course. However, when faced with a necessity to educate vocational training teachers who would have both theory and practical knowledge, the current Korea University of Technology and Education (KUT) was established and operated as a 4-year standard university by virtue of a Higher Education Act declared in November, 1991.

A focal agency for vocational competency development training teachers is a qualified vocational competency development training institute. This may be a national, local, autonomous, a public body or corporate body and organization under the purview of the Ministry of Labor and which can install and operate a training facility or training course to educate the vocational competency development training teacher which is at present is KUT.

Any local or autonomous training facility to be established or operated for such purpose must be duly approved by the Ministry of labor with the following main requirements:

- Manpower, facility and equipment with which the training facility or training course to educate the vocational training teacher can be properly operated.
- The training agency must be operated by somebody who is a professional train or and with background on education training to be able to properly operate the training facility or training course.
- The following discuss the scope of the corporate body or training organization that can install and operate training facility or training course to educate the vocational competency development training teacher is as follows.
 1. The school must follow the provisions by the “Higher Education Act”, which specifies that the vocational competency development training corporate body must be based on “the laborer vocational competency development act”.
 2. The corporate body and organization has appropriate manpower and facility corresponding to college operational standards based on “Higher Education Act” and “college foundation and operation regulation”.

VOCATIONAL TRAINING TEACHER EDUCATION TRAINING COURSE

Courses on vocational educators’ training institutes are classified into an educational training course, a teaching profession training course and an improvement training course based on regulation 18 of Labor’s vocational competency development act.

Regular educational training course

The Korean Polytechnic College (formerly Central Vocational Training Center) is the first vocational training teacher’s educational institute in Korea. Its regular courses produced vocational training teachers since 1972 and mainly trained theory and practice through major subjects for high school graduates or higher

for 2 years. Subject ratio of the regular course is 50 to 60% of practice, 25-35% of major subject theory, and 5 to 15% of teaching profession subject.

With a lot of vocational training institutes established in the middle and late 1970's, supply and demand in educating vocational training teachers educated through the central vocational training center were kept in balance. However, as demand for teachers rapidly decreased after public vocational training facilities were completed in the early 1980's and required qualification level for vocational training teachers became higher, changes in the teacher education course were inevitable. When the central vocational training center was integrated with the then Korea vocational training and management (now Human Resources Development Services of Korea) on June, 1982, the regular course for teacher education was abolished (December) and only the licensure course (currently teaching profession course) was operated. At the same time, the Ministry of Labour strengthened the vocational training teacher qualification standard under the condition that the vocational training teacher required higher professionalism and qualification, thus, KUT was established as a 4-year regular university to educate the vocational training teacher on March, 1992.

The vocational training teacher regular education course in KUT is for those who are qualified to enter the university based on the secondary education act. This university opened in March, 1992 with 8 departments, and currently operates 5 undergraduate courses namely, Mechanical Information, Mechatronics, Information Technology, Internet Media Engineering and Industrial Management, with 16 majors, and 4 major subjects including Applied Chemical Engineering.

Teaching profession training course

The teaching profession training course is a short-term vocational training teacher education course that has been offered until now since a vocational training business has begun in Korea in 1967, which has been first implemented by the Ministry of Labour in March, 1967. This was transferred to the former central vocational training center in October, 1968 and then has taken in charge of about 80% of the vocational training teacher education manpower until now. The course has been transferred to KUT which was a specialized institute to educate the vocational training teacher in September, 1998 and operated since then.

The objective of the training course is to provide basic teaching capability and skills to those who have specialized or major fields as required of the vocational training teachers in order to acquire a teacher's license.

Duration of the teaching profession training course and subject formation

The duration of the teaching profession training course when it started as a license course was one week for short term and 12 weeks for long-term. Now on its current operations, the course is of 4-week duration or more than 140 hours comprised of 20% of cultural subjects and 80% of the teaching profession components.

Table 2. Subject formation of teaching profession training course

course	Subject formation		
	area	Subject contents	Term
Teaching profession training course	[training term]	Vocational training trend and relevant law	[4 weeks or more, 140 hours or more]
	1. Cultural	. introduction of vocational competency development training	20%
	2. Teaching profession	. Training guidance technique . Training guide practice	80%

Data: Ministry of labor notification No. 2005-21 (2005.7.26) annexed table 5

Teaching profession course operation result

Those who obtained the vocational training teacher qualification through the teaching profession training course from 1998 to 2007 were 5,004, in which qualification obtainer who are in the service were the highest in the list with 28.6%, while mechanical and metal field (17.6%), information processing field (16.5%), Electrical Electronic Communication fields (11.9%) (internal data of competency development center in KUT). This is due to the fact that the knowledge-based society has set in where manufacturing industries have been increasingly replaced with manpower service industries and information communication.

Table 3. Teaching profession training course operation result

Class	Total	'98-'03	2004	2005	2006	2007
Total	5,004(100)	2,915	327	484	552	726
Mechanical · metal	882(17.6)	474	59	94	86	169
Electrical · Electronic · communication	593(11.9)	322	42	78	63	88
Architecture	263(5.3)	115	24	33	38	53
Information process	824(16.5)	421	55	95	102	151
Design	626(12.5)	405	48	53	64	56
Service	1,430(28.6)	1,029	77	81	118	125
Office management	316(6.3)	118	11	41	68	78
Others	70(1.1)	31	11	9	3	16

Data: internal data of competency development center (2008) in Korea University of Technology and Education (Unit: person, %)

Improvement training to obtain higher qualification

The promotion improvement training course is a course for vocational training teachers to achieve certain qualifications and enhance their competencies that will place them to a higher level or grade. This training is from 2 to 3 weeks or for 70 to 105 hours as prescribed by the Ministry of Labor.

Qualified to take the improvement training for higher qualification attainment are those who have a background on education training for 3 or more years after obtaining 2nd or 3rd grade training teacher qualification, and subject foundation is comprised of 20% culture, 40% teaching profession and 40% major subject and practice.

Job competency improvement training

The job competency improvement training is for those who have obtained the vocational training teacher qualification who are focusing on both theory and practice. This is to supplement training with knowledge on newly developed technology.

Table 4. Improvement training course subject formation

Course	Target	Subject formation		
1st grade training teacher course	Those who have an education training career of 3 years or more after obtaining 1st training teacher qualification	Area		
		[training term]	• vocational training trend • labor and management relation law and so on	[2 weeks or more, 70 hours or more, 3 weeks or less, 105 hours or less]
		1. Culture	• educational psychology practice(I) • subject guide skill (I) • Life guide skill(I)	20%
		2. teaching profession	• vocational competency development training administration and management(I)	40%
		3. main subject	• Theory and practice	40%
2nd grade training teacher course	Those who have education training career of 3 years or more after 3rd grade training teacher qualification	[Training term]	• vocational training trend • labor and management relation law and so on	[2 weeks or more, 70 hours or more, 3 weeks or less, 105 hours or less]
		1. culture	• educational psychology practice(II) • subject guide skill (II) • life guide skill(II)	20%
		2. teaching profession	• vocational competency development training administration and management(II)	40%
		3. main subject	• Theory and practice	40%

Note 1) Major subject practice of culture subject teacher can be substituted for theory. Data: Ministry of labor notification no. 2005-21 (2005.7.26) annexed table 5.

Improvement training course result

A total number of 83,661 teachers finished the improvement training course on competency development education at KUT from 1998 to 2007. Around 1,400 from among those who accomplished the training had obtained higher level of teacher qualification. Further, looking at the job improvement training from each education training course, training on innovative technology is the highest one, that is, 45.6%, and the next ones are commissioned training of 33.5%, job training of 18.7%, and qualification training of 1.7%.

Table 5. Yearly training result of Competency Development Education Center in Korea University of Technology and Education

Educational training course		term	Educational training result							Total	
Total			1998-2000	2001	2002	2003	2004	2005	2006	2007	
			14,427	7,723	6,703	7,231	8,402	10,356	10,937	17,725	83,661
Qualification training	Improvement training course (qualification)	2 weeks	399	93	160	196	160	155	120	117	1,400
Job training	Sub total		2,539	1,332	1,501	1,334	1,810	2,187	2,268	2,699	15,670
	Head of organization (manager) training	Less than 1 week	526	590	345	410	90	585	612	473	4,131
	Vocational competency development person training	1 week	235	189	323	200	476	761	933	1,862	4,979
	Vocational training teacher training	1-2 weeks	729	349	542	501	514	675	560	246	4,116
	Secondary teacher course counseling training	1-2 weeks	1,049	204	291	223	230	166	163	118	2,444

(new) technology training	Sub total		9,135	4,334	3,946	3,979	4,079	4,649	4,493	3,517	38,132
	(new) technology improvement training	1-2 weeks	7,293	3,846	3,664	3,836	3,862	4,055	,1154	3,192	33,863
	Job enlargement (switch)	1-2 weeks	608 (146)	423 (72)	220 (170)	36 (12)	58	-	-	-	1,745
	Oversea expert invitation seminar	1-2 days	1,234	65	62	107	159	594	378	325	2,924
Consignment training	Sub total		2,304	1,895	1,071	1,640	2,450	3,304	4,010	11,362	28,036
	Public institute consignment	1-4 weeks	579	561	-	453	1,493	2,686	3,037	4,139	12,948
	General consignment	1-2 weeks	1,725	1,273	1,035	1,155	957	605	966	6861	14,577
	Unemployment insurance support	1 1-2 weeks	-	61	36	32	-	13	7	362	511
	Foreigner training	2 weeks	50	69	17	41	20	20	31	13	174
	Expert oversea training	1-2 weeks	-	-	8	41	40	41	31	13	174

*() means job switch training number among the job enlargement (switch) column.

*Consignment training does not mean regular training course in the educational center but means unemployment insurance refund process and facility (living room/lecture room) lease.

Data: competency development education center in Korea University of Technology and Education (2008.2). Internal data

PROFILE



Prof. Dr. Su-Won Kim is presently an Associate Research Fellow at the Korea Research Institute for Vocational Education & Training (KRIVET) and a Lecturer in Polytechnic Colleges where he is in charge of 'Production Management' subjects. He previously worked as a Vocational Training Instructor at the Human Resources Development Service of Korea (1989-1997).

He earned his Ph.D. in Business Administration (1998-2002), his M.A. in Business Administration from the Graduate School of Business Administration, (1990-1993) and his B.A. in International Trade, College of Business Administration (1981-1988) from Kangwon National University, Korea. Among the various papers he had written were "An Analysis on the Learning Performance to Build a Learning Organization in the Manufacturing Sector" and "A Study to Improve the Method of the Vocational Training".

ACTION RESEARCH IN VET TEACHERS' EDUCATION AND TRAINING AND COMPARATIVE STUDY ON TVET TEACHERS' TRAINING IN ASIA – RESULTS OF JOINT RESEARCH PROJECT

National Qualification Framework and Related Standards - The RCP Interest

Asst. Prof. Dr. Sirilak Hanvatananukul

*Lecturer, Faculty of Technical Education
Rajamangala University of Technology Thanyaburi, Kingdom of Thailand
sirilakhanvatananukul@gmail.com*

Prof. Dr. Peter Dehnbostel

*Professor, Friedrich Alexander University Erlangen Nurnberg,
Carl von Ossietzky University Oldenburg, Germany
University of Basel, Switzerland and University of Klagenfurt, Austria*

EUROPEAN QUALIFICATIONS FRAMEWORK (EQF) AND DEVELOPMENTS OF NQFS

The introduction of National Qualifications Frameworks (NVQ) in the 27 states of Europe is to be seen for the background of the European Qualifications Framework for Lifelong Learning (EQF), which was decreed by the European Commission and European Parliament early in 2008. The EQF is linked to further concepts of the Europeanization of education. The recommendations of the European Union envision “the European Qualifications Framework as a reference tool to compare the qualification levels of the different qualifications systems and to promote both lifelong learning and equal opportunities in the knowledge-based society, as well as the further integration of the European labour market, while respecting the rich diversity of national education systems” (European Union 2008, p.6).

The EQF functions as a translation device or establishes a meta-framework for the national education and qualifications systems of the member states, enhancing European-wide transparency and comparability of qualifications and competences gained on a national level, thus facilitating and promoting mobility in and between European education systems and the European labour market. It should make it possible to “navigate” through complex education systems and provide support for authorities, education institutions, organizations and companies. The main goals and functions of the EQF are as follows:

- Creation of a meta-framework to classify and compare respective qualifications gained at a national level;
- Increasing mobility between nations and improving recognition of qualifications and competences acquired in other countries in economic and educational sectors;
- Expansion of formal learning through the inclusion of informal and non-formal lifelong learning on equal footing;
- Establishment of equivalence of vocational and general education and training;
- Creation of quality assurance and improvement.

The EQF consists of eight reference levels, describing learning outcomes, defining “what a learner knows, understands and is able to do on completion of a learning process” (European Union 2008; Annex I, p.2). On each of these levels, qualifications are described and recorded through the three so-called descriptors, knowledge, skills and competence. The following features are characteristics of the EQF:

- Outcome orientation: Recording qualifications through learning outcomes, whereby the learning outcomes may be based on formal, non-formal or informal learning,

- Eight levels or reference levels: All qualifications from vocational and general education or training are to be classified in these levels,
- 24 descriptors: Each of the eight levels shall deploy the three descriptors of knowledge, skills and competence.

The descriptors in the EQF are defined and understood as follows (cf. *ibid.*):

- Knowledge means “the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual”.
- Skills mean “the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments)”.
- Competence means “the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy”.

For the EQF the first level is characterized by descriptors which identify the learning outcomes for the attainment of qualifications pertaining to this level. The other levels are similarly classified. Levels 6, 7 and 8 correspond to the so-called Bologna descriptors, with particular reference to Bachelor’s, Master’s and Doctoral qualifications or competences. The EQF is not to be understood as the basis for content of other European National Qualifications Frameworks, although it does have an important function in terms of orientation for the respective national systems. The EQF states that “This Recommendation does not replace or define national qualifications systems and/or qualifications” (European Union 2008).

The NQFs of single countries should reflect the autonomy and character of the local educational and qualification systems. The recognition and crediting of results of informal and non-formal learning are to be included and lifelong learning should be strengthened by them. The mobility and the skills of students and employees are promoted and the respective education system will become more transparent and permeable. The number of national levels, as well as the definition and description of qualifications can be decided by the nations themselves. The EQF does not only strive for comparability of nationally achieved qualifications and competences, it also makes it possible to compare the respective national education areas and subsystems in all their strengths and weaknesses on a European level. This interest differs greatly from the common misinterpretation that the EQF seeks to assimilate and standardize the national systems. Another question is how the EQF will influence the national systems respectively.

NEW GUIDANCE AND DESIGN CONCEPTS FOR EDUCATIONAL AND VOCATIONAL TRAINING SYSTEMS

The effects of change in social and economic conditions and demands have been evident for some years in the redirecting and reinventing of educational and vocational training systems. Buzzwords such as standards and standardization, output and outcome orientation, qualification frameworks, validation, accreditation and quality assurance and development are emblematic of this development. In this context, informal and non-formal learning assume a pivotal role, without formal learning surrendering any of its relevance. Complementing, or in some cases replacing formal learning, new paths to qualification are marked out, integrating learning into the world of work and living environment, their essence distilled in the EQF, NQFs and Sectoral Qualifications Frameworks.

The development of the education system, Oelkes/Reusser suggest, that it “goes back to what has largely become an accepted international shift in perspective with regard to education policy” (2008, p.18). Up until now, input factors were the focal point of interest in terms of educational policy, whilst process, output and context tend to have been neglected. Henceforth, the results and outcomes of educational

programmes and sections will be given greater emphasis, with the development of educational standards, validations, accreditations and quality systems as so-called benchmarks. Efforts will be made not only to collate and assess the results of specific branches of education, but also to assess the performance of the actual educational systems. From the standpoint of educational economics, the deployment of resources will thus be linked to results. There is a fundamental shift in perspective in education policy, which – in short – interprets the goals of education in terms of efficiency, results and market needs. This is accompanied by a retreat of the state and the commercialization of education, discussed in connection with governance principles (cf. DDS 2009 for example).

The introduction of qualifications frameworks is part of the current wave of restructuring the educational system. If training programmes were hitherto characterized by a content-related structure, dependent on admission requirements and teaching and learning processes, qualifications frameworks are now geared towards the results of learning, that is to say, facilitating an outcome. In a national and international context, they should promote not only transparency and comparability, but also build trust in the validity of qualifications. With the aid of the qualification frameworks tool, the application of “knowledge, skills and competences” shall be optimized (Commission of the European Communities 2005, p.17).

In addition to National Qualifications Frameworks, there are also differentiated sectoral frameworks, allocated to particular disciplines, sectors or domains. Qualifications frameworks of this nature exist for a diverse range of disciplines such as business studies, chemistry, motor-vehicle technology or teacher education. These frameworks are to be understood as dynamic and process oriented and should be positioned between higher education and practical fields of work. Existing sectoral qualification frameworks – more are being created on an institutional level by companies and colleges of higher education – offer a domain-specific view of knowledge, skills and competences to be acquired. They have the potential to connect NQFs with higher education qualification frameworks and sectoral qualifications frameworks like this for teacher education. National and higher education qualifications frameworks cannot function without sectoral qualifications frameworks, as they provide an essential means of recording, assessing and classifying standards of specific occupational and professional qualifications and competences.

The variety in earning qualifications and acquiring competences in lifelong learning, and the corresponding breadth of the spectrum of learning possibilities and locations can initially appear confusing and engender a degree of uncertainty. Qualifications frameworks should instil transparency and clarity, whilst, at the same time, confidence-building structures are necessary with regard to the quality of study opportunities and learning potential. In this respect, the question of quality assurance and quality development is, in a manner of speaking, the other side of the coin as orientation towards learning outcomes grows. Questions concerning the input and processes of learning become virulent through concepts and instruments of quality development, and outcome orientation needs to be extended to include input and process orientation, so that learning processes become visible in their entirety.

QUALITY ASSURANCE AND QUALITY ASSURANCE REFERENCE FRAMEWORK

“Quality” is a concept which, in everyday use, is both, vague and diffuse, yet still positive. In general, it indicates the goodness of an object or product and seems to be a category which can be viewed from the outside. Statements on quality only really carry weight when the context is defined in which the judgement has been made. As a technical term, “quality” describes the entirety of characteristics of a unit with regard to their suitability in meeting fixed, preconditioned requirements. What is special about quality assurance and quality improvement in the fields of education and qualifications is that the “product” is actually only created through the interaction of teacher and student, or emerges informally. This distinguishes education and qualification from industrial production and other services. The criterion of customer satisfaction, which plays a central role in quality improvement in all models, does not per se carry such weight in the educational field in expressing the quality of an event or learning process. Often, learning in schools, institutions and companies initially encounters resistance, lack of understanding and lack of

motivation, which could be interpreted as a lack in quality of the learning environment and conditions in a misguided version of quality appreciation.

Discussions on quality have, over a period of many years, progressed from quality assurance to quality improvement, to quality management and ultimately to Total Quality Management (TQM). In quality assurance, the end product tends to take centre stage in quality evaluation and the number of imperfect productions should be minimized by a final quality control check. In terms of quality improvement, the focus is more on the processes of production and their standardization. Quality management goes one step further again, as not only the internal processes but also the external processes are optimized in the form of internal and external customer orientation, with a view to improving efficiency and the capability to adapt to different circumstances. Finally, in Total Quality Management, all of the processes and agents of an organization are integrated into an on-going process of reflection and optimization. Quality, thus becomes part of the organizational culture and is value-oriented. In such a “learning organization”, quality improvements are a fixed element of strategic and economic direction, of the organization strategy and education management.

The European Union has developed far-reaching designations and concepts for quality assurance and improvement in Europe. The European Council and Parliament formulated common principles for quality assurance:

- Quality assurance policies and procedures should underpin all levels of the European Qualifications Framework,
- Quality assurance should be an integral part of the internal management of education and vocational training institutions, [...]
- Quality assurance should be a cooperative process across education and training levels and systems, involving all relevant stakeholders, within member states and across the Community [...] (EU Official Paper 2008, p.7).

In July 2009, the European Parliament and Council officially accepted the recommendation for the creation of EQAVET: “European Quality Assurance in Vocational Education and Training” (cf. European Commission 2010). EQAVET is, via the conceptional diversion of the EQARF (European Quality Assurance Reference Framework) a continuation of the CQAF, developed in 2004 with the aim of improving and evaluating vocational training systems in terms of employment capabilities, reconciliation of supply and demand and the promotion of access to lifelong learning.

The anticipated effects of the European Quality Assurance Reference Framework in vocational training and further education can be summed up as follows: “The EQARF is the European reference framework designed to assure quality in vocational training and develop it further – with the aim of improving the range and mobility for learners and employees. In so doing, the reference framework will enhance transparency, promote mutual trust and strengthen the recognition of competences/qualifications and the trust in national vocational training systems” (cf. ENQA-VET 2010). The list of indicators for the qualitative evaluation of VET, i.e. vocational training and education:

1. Relevance of quality assurance systems for VET providers
2. Investment in training of teachers and trainers
3. Participation rate in VET programmes
4. Completion rate in VET programmes
5. Placement rate in VET programmes
6. Utilization of acquired skills at the work-place
7. Unemployment rate
8. Prevalence of vulnerable groups

9. Mechanisms to identify training needs in the labour market
10. Schemes used to promote better access to VET.

EDUCATION STANDARDS, VOCATIONAL AND COMPETENCE BASED STANDARDIZATION

Education standards are designed to secure the standardization and comparability of competences which learners have developed in the course of specific educational or qualification cycles. They should facilitate the verifiability, measurement and evaluation of competence development. Education standards are instruments of guidance, control and supervision with regard to educational and competence development processes, as well as benchmarks for the comparison of achievements and competences. Different systems of education standards are to be created for different sectors of education such as general and higher education or vocational training. Education standards are particularly well developed in Germany in vocational training and further vocational education where it is legally regulated as part of the overall education system.

Throughout the general school system, in vocational training, higher education and further education, there are differences in perspectives on education standards and their development, resulting, in some cases, in contradictory expectations. Central to all areas of education are questions concerning goals, function and structure of education standards. The following basic understanding is relevant to all areas of education. Education standards

- are intended to unify competences developed by learners after specific training or qualification periods in a common system and ensure their comparability;
- should make it possible to verify, measure and evaluate competence development, specifically through the performance, successes and failures of learners;
- are instruments for guidance, control and supervision of education and competence development processes, as well as benchmarks for comparison of education systems;
- promote quality assurance, quality improvement and evaluation of education systems.

It may be the case that education standards in the sense of appreciating what is actually learned are initially output oriented. In terms of task identity, however, the relevant learning content and processes of learning and action – the input factors, so to speak – have to be collated and evaluated through the central functions of quality assurance and quality improvement. Standards of education relate to each field of education in terms of fundamental structure, goals and development. This being the case, the question concerns the connection to the respective overall system, its evaluation and further development. Quality development and quality assurance are indispensable elements of education standards.

For a long time now, Germany's, vocational training and further education has had designated basic principles for the construction and implementation of educational standards. Particular characteristics include the organization of training and further education systems as instruments of standardization, and a learning field approach developed over a decade, which interprets the learning fields derived from the practical work sphere in terms of a cut between content and vocational tasks and carries out institutional learning in didactic learning situations conditioned by work-related courses of action.

The basis of standardization in vocational training in Germany lies in the occupational form of work. Type of occupation as a structural principle of vocational training remains a constitutive part of the system of vocational and further education in Germany. Standardization models, as defined in the framework of recognized trades, are still integral to the central orientation framework for vocational qualifications on an international level of comparison, (cf. Dehnbostel 2010, p.119ff.), and, with regard to standardization processes, they do not only appoint the curricula, but also the methodological rules and requirements for the qualification process. Hence, it can be asserted that the idea of standards is clearly established as far as vocational training is concerned. In connection with the discussion on goals and leading categories of

action orientation, occupational competence, learning field approach and quality assurance, the subject area of education standards has been taken up and continually discussed since the late 1980s.

The Vocational Education and Training Act, introduced in 1969, provides the platform for the introduction of education standards, incorporating input factors, process factors, output and outcome factors. Education standards in vocational training are applicable to all areas of vocational training, most notably dual and full-time study vocational training, occupational further education and various forms of continuing education. On the side of input guidance, legal principles and regulations determine who is permitted to instruct in companies or corporate vocational training centres or teach in schools. The educational framework is an integral part of the foundations for each newly classified occupation, as in the structured learning field curriculum. Education processes in different learning environments are steered by means of temporal and subject-specific outlines. Outcome and input standards are developed further in corresponding committees and in schools, vocational training chamber committees and in the regional boards of vocational training, against a background of general principles of the occupational competence in order to take action. Processes are kept open, over and above the means of regulation, so that technological innovations and modified work processes, including those within the restructuring phase, can be accommodated in current vocational training and teaching. Occupational situations of actions and the educational goals, as formulated in the respective education acts, form the common basis for learning content on the input side and thus, also the basis for the actions of teaching staff.

In addition to the statutory standards of vocational training and further education, competence orientation and the leading goal of a comprehensive competence of action in occupational situations have established themselves since the 1990s as referential and orientation standards. In vocational training and further education, competence development has led to the creation and expansion of comprehensive occupational competence of action, in which various dimensions of competence are brought together. Competence of action is understood as the willingness and capability of the individual to act in occupational, social and private situations with maturity and social responsibility. Competence of action unfolds in dimensions of expertise, personal competence and social competence (cf. *ibid*, p.17ff.):

- Professional competence describes the ability and readiness to solve tasks and problems on the basis of expert knowledge and skills in a goal-oriented, appropriate and self-sufficient manner, using suitable methodology and evaluating the results.
- Personal competence describes the ability and readiness to reflect on personal development and, allied to a willingness to further develop one's individual social and moral values.
- Social competence describes the ability and readiness to appreciate and understand social relationships and interests, as well as interacting and communicating with others in a responsible manner.

If the comprehensive vocational competence of action is defined as the leading goal and concept of vocational training and further education, then it is linked to the aspiration to elevate educational work beyond the level of qualifications, thus, shifting the balance from the perspective of application to that of the subject. There are other aspects to competence of action which, for example, can take on method competence as an additional or alternative area of competence, whilst primarily differentiating between competences in their scientific theoretical basis and thus, organizing them differently. In terms of the purposes and concepts of vocational competence of action, what they certainly have in common is the reference to three or four areas or dimensions of competence, as well as a subject-related approach which highlights reflective, self-governed, experiential learning.

CHALLENGES AND COMPETENCE BASED STANDARDS FOR TEACHER EDUCATION

The introduction of NQFs and sectoral qualifications frameworks and the associated new control and design concepts provide a fundamental reorientation for teacher training and continuing education. The main didactic goals of competence orientation and self-directed learning also require a change in

education and training of teachers education standards such as the application of quality assurance and the reference to an NQF and sectoral qualifications frameworks. In many parts of teacher training and continuing education there has long been a close connection between theory and practice, whether in the training phase of the trainee or in the adaptation skills of academically qualified students, who go without a teaching degree and training in the teaching profession and nonetheless become fully integrated in the teaching profession.

In Germany, during the great educational reforms in the early 1970s, single-phase models of teacher training were successfully developed and tested, so that a teacher had to face the practical side of teaching from the very start of the professional training, i.e. to be involved with the teaching and the general school day. A principle, that is comparable in form and based on the dual degree programmes which are now increasingly widespread. This concept is also expanding a great deal internationally in the form of part-time career linked BA and MA courses.

In 2004, in Germany for the general teacher training and continuing education, standards were introduced (KMK 2004) to define the requirements for the teachers work. The standards define the objectives of a teacher's work and provide a sound basis for a systematic review of goal attainment. The competencies formulated standards are applicable to the teacher education programmes at the universities, the training and the continuing education of teachers. This is based on the following general job description for teachers:

- 1.) Teachers are experts in teaching and learning. Their core mission is the systematic and scientific research designed to plan, organize and reflect on teaching and learning processes as well as their individual assessment and systemic evaluation. The professional quality of teachers decides on the quality of their teaching.
- 2.) Teachers are aware that the task of education in school is closely linked with the lessons and general school life. This works best when closer co-operation with parents is established. Both parties must be prepared to work together to find constructive solutions when it comes to educational problems or when learning processes fail.
- 3.) Teachers exercise their appraisal and consulting role in lessons, in the allocation of allowances for training and career development of competent, fair and responsible teachers. They also require high pedagogic and analytical skills.
- 4.) Teachers constantly develop their skills as in other professions, by training and taking on continuing education opportunities to keep up with new developments and to consider scientific findings in their professional field. In addition, teachers need to maintain contact with institutions outside school, as well as contacts with the general working community.
- 5.) Teachers participate in the management and development of schools and in designing a healthy supportive school culture for learning, and a motivating school atmosphere. This should also include the willingness to participate in internal and external evaluations.

Standards set for teacher training need to be specific about teachers' requirements. The standards are set based on teacher training, which is divided into three phases, which will be under the auspices of the state educational authorities. The first phase represents the university education, the second preparatory training as the foundation. Whilst in the second, more practical phase the theoretical foundation should still remain as the point of reference and stability. The relationship between academic and more practically oriented vocational training has to be coordinated so that a complete systematic, cumulative experience and capacity building is achieved. The third phase is the continuing education and vocational training, which in principle apply to the same standards and competencies, as for the first two phases, but now in conjunction with lifelong learning as a goal for teaching professionals.

The standards in teacher training is competency-based and take into account that teaching and lessons focus on the subject content for the training of vocational and technical syllabus. The competencies are

described on the basis of the requirements of the profession. For teacher training four competency areas with 11 competencies have been formulated. The individual competencies are associated with standards, and that distinction is made between “standards for the theoretical training periods” and “standards of the practical training periods.” The following are not individual standards, but the respective areas of competence and the associated competencies.

Competence Area 1: Teaching. Teachers are experts in teaching and learning.

- Competence 1: Teachers plan lessons professionally, appropriately, competently and objectively carry it through correctly.
- Competence 2: Teachers assist with the design of learning situations, to enable pupils or students to learn. They motivate pupils or students and enable them to draw connections and use the lessons learned.
- Competence 3: Teachers encourage and promote the ability of students to work independently and learn in a self-directed way.

Competence Area 2: Educate. Teachers carry out their educational role.

- Competence 4: Teachers understand the social and cultural life settings of pupils and take part in the school directed influence on the development of the individual.
- Competence 5: Teachers communicate values and standards and support self-determined decisions and actions of pupils or students.
- Competence 6: Teachers must find solutions for difficulties and conflicts in schools and in lessons.

Competence area 3: Evaluate. Teachers carry out their task of assessing fairly and responsibly.

- Competence 7: Teachers diagnose learning abilities and learning processes of students, they encourage and assist pupils or students in a targeted way and advise them and their parents.
- Competence 8: Teachers assess pupils or students on the basis of transparent criteria.

Competence area 4: Innovate. Teachers continually develop and upgrade their skills.

- Competence 9: Teachers are aware of the special requirements of the profession. They understand their job as civil servants with particular responsibilities and obligations.
- Competence 10: Teachers understand their profession as a lifelong learning process
- Competence 11: Teachers will participate in the planning and implementation of school projects and plans.

The areas of competence and skills need to be adapted in relation to the individual school districts. In Germany, this is federal state specific, but on the basis of the above and supported by all provinces across competencies and standards. For the syllabus for teacher training of vocational education teachers, need to consider the various professional fields and disciplines as well as the various types of professional schools such as vocational schools, technical schools, specialized secondary schools and economic and technical colleges. In addition, the competencies and standards have to refer to vocational preparation measures.

CONCLUSIONS AND PERSPECTIVES

In Europe a variety of national qualifications frameworks are emerging, all 27 countries of the European Union have one or on the way to introduce one (cf. Young 2005; Allais 2010; Bjornavold/Coles 2010; Bjornavold/Pevec Grm 2010; Raffe 2011). The various models are more or less prescriptive, relating to different areas of education, some based on vocational principles and others on modules below the

level of educational programs and professional codes. Most member states of the European Union have looked into the creation of an NFQ or adequate framework without legal obligation through the EU. Some states have already developed an NQF or similar instruments, as in France or Great Britain, for example. England, Wales and Northern Ireland have an eight level NQF, Scotland a twelve level framework. In Europe there are additionally a lot of sectoral frameworks including frameworks for competence areas and competences for vocational teacher education.

NECESSITY OF FRAMEWORKS AND QUALITY ASSURANCE

The experience and developments of qualifications frameworks contribute to the transparency and comparability of competences acquired in different education sectors and branches. Different national and sectoral qualifications frameworks are absolutely essential to meet the special characteristics of competence profiles in the individual education and vocational sectors. The National Qualifications Frameworks establishes a basic comprehension of competence, qualifications and descriptors which encompasses the understandings of sectoral qualifications frameworks. It is strongly advised to develop special qualifications frameworks for important branches of the economy such as commercial trade, tourism and nutrition, as well as for learning sectors such as higher general education, universities and vocational teacher education.

The accreditation of qualifications measures, modules and education programmes, as well as of education providers, means that guidance and quality control through administrative measures and authorization procedures are superseded by more flexible, content-driven education standards, quality models or comparable benchmarks. Quality assurance and development cover the content and processes of the respective qualifications based on outcomes and education standards. Test procedures for quality management relate to the self-defined objectives of an institution and should take compliance of education standards into account.

THREE TYPES OF NQFS

To summarize there are three main characteristics of NQFs: they are social constructs, they are multi-purpose tools, and they differ from each other. Analytically you may differentiate three types or categories of NQFs:

- A communications framework takes the existing system as its starting point and aims to make it more transparent as a basis for rationalizing it, improving its coherence and developing progression pathways. It is typically loose in design, outcomes-referenced, voluntary and at least partly led by educational institutions.
- A transformational framework takes a proposed future education and training system as its starting point and defines the qualifications it would like to see in this transformed system, without referring explicitly to existing provision. It is typically tighter in design, with stronger central direction, and it tries to drive change directly.
- A reforming framework is an intermediate category which combines features of the first two types. Like a communications framework it takes the existing system and its institutions as its starting point. But whereas a communications framework provides a tool to facilitate change driven from elsewhere, a reforming framework has more specific reform objectives of its own, for example, to fill gaps in provision or to make quality standards more consistent

Scotland is an example of a communications framework and Ireland of a reforming framework. Examples of transformational frameworks include the English National Vocational Qualifications and the South African NQF. It seems to be that most European frameworks are presented as communications frameworks aiming to make education, training and qualifications systems visible and to clarify the vertical and horizontal links between different types of qualifications.

Necessity of higher education frameworks

In many countries in parallel with the establishment of NQFs and sectoral qualifications frameworks, they also developed higher education frameworks. Competencies in teacher education and training of TVET teachers are therefore classified in these higher education frameworks. In Europe, at the beginning of 2005 a “Framework for Qualifications of the European Higher Education Area” (EHEA) was agreed. Against this backdrop, the parties committed European countries to develop their own higher education qualifications framework. As the EHEA and the EQF are to be understood as a meta-framework that will enable them to relate to in different national and sectoral qualifications systems embedded with each other. This would provide more transparency, recognition of qualifications and aid mobility throughout Europe. A key design principle of the EHEA is its focus on qualifications and learning outcomes. Courses are therefore no longer controlled primarily through course content, length of study and access, but through prescribed qualifications as the target of learning outcomes.

In 2005, Germany also decided that the “Qualifications Framework for German Higher Education Degrees” (DHQR) should be approved by the competent authorities. The Qualifications Framework is to provide a systematic description of all the qualifications, which were approved by the education system. It specifically, dealt with the representation of the qualification profile of graduates with certain degrees, a collection of attainment outcomes, a description of “competencies and skills” of the graduates. In addition, they were concerned with formal issues, such as degree titles, privileges and also the intended scope of work for the achievement of performance credit points. Courses for the training of teachers and their areas of expertise, competence and qualification objectives are profiles of higher education that the frameworks related to. The higher education frameworks were provided for the courses at the same time as a reference and a structural frame.

Teacher education framework and TVET teacher training

A teacher training framework has the qualifications, competence areas, individual competences to establish specific standards for teacher training. The fifth section of this paper outlines the job description and then outlined areas of competence and competences as an example. Although this example is tied to specific national conditions, it nevertheless consists of essentials for transferring, just as it did during the national higher education frameworks between different countries. The extent, to which vocational teacher training in such a qualification framework has a direct input, depends on national circumstances and decisions. The teacher training and continuing education for TVET teacher can be done in two ways, as part of a general teacher training framework or as a vocational and competence-based standardization. At any rate a legal and institutional framework for it is necessary.

The competencies and standards for the specific professional and career-related teacher training and continuing education for TVET teachers are in each case in accordance with the NVQs, vocational qualifications framework for sectoral industries and the national higher education framework. A contemporary teacher training and continuing education refers both to the NQF as well as the higher education framework. The underlying competencies and standards for vocational teacher training are the definitions of competence and areas of higher education framework that need to be harmonized and coordinated. Only then can a mapping and classification in the higher qualifications framework function and thus, provides a strengthening of transparency, permeability and quality of the education system.

THE RCP INTEREST: STANDARDIZATION FOR ENHANCING QUALITY OF VOCATIONAL TEACHER EDUCATION

1. Conclusions and suggestions related to frameworks and standards of RCP joint research, the “Comparative Study on TVET teacher education and training in China, Germany, Thailand and Vietnam”

2. RCP future plan: focal points on frameworks and standards

Conclusions and suggestions related to frameworks and standards of joint research, the “Comparative Study on TVET teacher education and training in China, Germany, Thailand and Vietnam”

The research’s objectives were to compare TVET teacher education and training in China, Germany, Thailand and Vietnam and to provide suggestions at national and institutional level. The qualitative methodology was implemented through Documentary Research and Focus Group by comparing 9 issues focused on educational system, TVET teacher institution, educational reform in TVET, competency standards of TVET teachers, curriculum and programs, in-service training, concerning problems, cooperation with industries and gender issues.

COMPARISON OF FACTORS AFFECTED TVET TEACHER EDUCATION AND TRAINING

From results of analysis, factors of TVET teacher education and training were not significantly different among 4 countries such as educational system, TVET teacher institution.

Educational reforms were processed in China, Thailand and Vietnam in different stages but still focused on standardization, accreditation, quality assurance and decentralization. Germany and Thailand set up the qualifications frameworks at regional and national level. Competency standards of TVET teachers were the common interest among those systems.

TVET teacher curricula varied from 4-5 years which curriculum structures mainly composed of professional and academic courses, practical courses and teaching courses. In Thailand, Professional Standards for Teachers were set by the Teacher Council of Thailand (TCT) and graduates from certified faculties will legally acquire teaching licenses.

In – service trainings for VET teachers and trainers in Germany were legally enforced by more than 10 laws which were delivered for continuous training or learning, this includes participating in Training courses with salary and level promotion. Rest of the countries which provided training by training institutes and universities were not significantly different.

Problems of TVET teachers were identified insignificantly different which were lower professional attraction, lack of skilled workforce in terms of quality and quantity caused from society’s negative values about TVET, inadequate quality and quantity of vocational teachers, and inadequate distribution of vocational teachers.

All identified countries were considered that cooperation with industry in TVET teacher education and training was the most important factor to enhancing quality of TVET teacher students. And there was no major problem about gender issues among 4 RCP countries.

SUGGESTIONS RELATED TO STANDARDIZATION

Details of this research also provide particular suggestions related to standardization as follows:

1. To reform TVET teacher training through Quality Assurance system and national planning of resources to avoid mismatch between demand and supply.
2. To build and promulgate professional competency standards of vocational teachers through policies, regulations and strategic projects.
3. To improve selection process of finding talented candidates who will provide inputs to TVET teachers, students and skilled workers and with good experiences in industries, as well as with strong commitment to the teaching profession
4. To establish teaching license system through certification and assessment for other professionals who aspires to be TVET teachers.

5. To improve the teaching competence of staff in TVET teacher education institutions through the combination of theoretical and practical teaching.
6. Formulating and promulgating standard of vocational teachers training on the basis of building up the core curriculum trainings.
7. To set framework of TVET teachers' qualification in the form of national or regional competency-based standards in order to recognize prior learning and transfer credits among providers.
8. To promote cooperation between TVET teacher education institutions and vocational schools especially in the aspects of trainings of teaching competence.
9. To regulate that the TVET teacher students should obtain some kind of technical certificates or vocational qualifications before graduation, such as dual-degree program.
10. To formulate and promulgate professional competency standards of vocational teachers as core-standard of professional development
11. To train the vocational teachers to reach professional competency standards
12. To encourage training not only in TVET teacher education institutions but also in companies. It is required that the certificates of attending such trainings be a part of evidence for job position or title upgrading.
13. To legally set the professional competency standard in developing staff and improving their capacities to make them competitive in the national level.
14. To strengthen the research competence of the staff of TVET teacher education in the fields of teacher education and training through the international cooperation research projects.

Suggestions provided by the research's results showed common interest of RCP members on standardization in many aspects of educational operations as follows:

Suggestions at the national level were agreed as setting the National Qualification Framework for vocational teachers as a national policy, to promulgate professional competency standards of vocational teachers and to set up teaching license system.

At the institutional level, there were suggestions that RCP members' interest on standardized learning processes as well as quality of management such as standardized selection process of vocational teacher students for qualified inputs should collaborate for core curriculum programs among RCP members with accreditation and credit transfer systems, to improve the teaching competence of teaching staff by combining theoretical and practical teaching, formulating and promulgate standards of vocational teachers as requirement of professional development. Additionally, there were suggestions to implement policies focused on incentives to encourage and attract industries, experts, scientists, technicians in enterprises, and skilled man for cooperative education as well as to strengthen the research competence of the staff.

Some of the suggestions at individual level included importance of cooperation with industries for improving knowledge and skills of lectures and vocational teacher students to reach high standards.

RCP future plan: focal points on frameworks and standards Regional Cooperation Platform for Vocational Teacher Education in Asia (RCP)

The Regional Cooperation Platform for Vocational Teacher Education in Asia (RCP) was established in 2009 to be an international platform of 8 vocational training institutes and ministries from 5 countries. The RCP is supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), an international cooperation enterprise for sustainable development, federally owned by the German Government. The RCP is funded by the German Ministry for Economic Cooperation and Development (BMZ).

For 2011, the RCP institutional members are Tongji University of China (Institute of Vocational Teacher Education or IBB), National University of Laos (NUoL), Indonesia University of Education (UPI) of Indonesia, Burapha University (BUU) and Rajamangala University of Technology Thanyaburi (RMUTT) of Thailand and Namdinh University of Technology Education (NUTE) of Vietnam.

The members of this platform aim at establishing a network to promote exchange on the national vocational education systems, to learn about the strength and weaknesses of the different systems, to encourage joint research, to foster cross-country recognition of degrees in vocational training and to jointly develop innovative training concepts for vocational training teachers (e.g. online trainings) to jointly conduct trainings for teachers and to exchange personnel and experience. More information about RCP and activities can be searched from <http://www.rcp-platform.com>

RCP INTEREST FOCUSING ON FUTURE PLANS

As mentioned the 2010 RCP joint research which was showed underlining standardization affected to continue developing quality of vocational teacher education, raised by RCP educators. The national qualification framework, national professional standard for teachers, competency based standards, Quality Assurance system, certification as well as accreditation systems, were standardized systems and tools which have been interested RCP members.

According to RCP 2011-2013 Plan, RCP educators have been interested in standardization and proposed 70.59% of total research, capacity building measures and reform proposal projects focusing standardized systems and tools varied to developmental stages of each RCP member countries which were also approved by RCP steering committees.

Details of RCP interest and challenges caused by VET teacher education and training of RCP institute members were expressed through 2011-2013 RCP projects as follows:

- Definition competence standard of TVET teachers (IBB, RMUTT, BUU, NUoL),
- Standards of Vocational Teacher Education in Lao PDR considering the current state of Development of the NQF in Lao PDR (NUoL, UPI, RMUTT, Ministry of Labor, War Invalids and Social Welfares or MoLISA),
- Occupational competence needs analysis (UPI, NUoL, RMUTT, BUU),
- Standard & Curricula Development in Relation to the Establishment of NQF in Asia (RMUTT, BUU),
- Standards of Vocational Teacher Education in Lao PDR considering the current state of Development of the NQF in Lao PDR (NUoL, UPI, RMUTT, MoLISA),
- Promote Practical Teaching Competencies of Teachers and Trainers (UPI, NUoL, RMUTT)
- Research work on: Professionalization in vocational teacher education and Quality, standards and individual competence development in vocational education IBB, GDVT, RMUTT, NUoL)
- VTE teaching professional reform in Thailand (RMUTT). On the other hand, the RCP institute members paid a lot of interest in setting up co-standards through the development of core curricula, shown as following projects:
- Curriculum development of vocational teacher education within the context of ASEAN integration processes. (Thailand, Laos, Vietnam and China) (RMUTT, BUU, NUTE and IBB)
- Study on core curricula for vocational teacher training in mechanical engineering and electrical engineering within regional integrated context (NUTE, NUoL, UPI, IBB)
- Mutual recognition of studies schemes for organization and Credit transfer scheme for students exchange (UPI, NUoL, BUU, RMUTT, IBB, NUTE).

CHALLENGES AND SUGGESTIONS

Setting particular standards such as standards of vocational teacher education and, teaching profession standards particularly in terms of competency are very useful for the educational system because those standards are applicable to many aspects of vocational teacher education in many levels.

At the classroom level, the competency standards are very useful tools for the selection process of inputs to particular programs, for designing teaching and learning management as well as setting standardized criteria for measurement and evaluation of students' outcomes.

At the institutional level, the competency standards can be used as academic standards to develop curricula and institutional core programs, especially into TVET teacher education, as well as into Human Resource Management.

At the national level, setting national qualification frameworks are applied in terms of outcomes or competency standards. In Thailand, Professional Standards for Teachers have been set by the Teacher Council of Thailand (TCT). In this case, TVET teacher education programs must be certified by those standards and graduates from certified faculties to be able to acquire teaching licenses.

The Thai Qualification Framework for Higher Education (TQF:HED) (Office of the Higher Education Commission, 2006) provides appropriate points of comparison in academic standards for institutions in their planning and internal quality assurance processes, for evaluators involved in external reviews, and for employers, in understanding the skills and capabilities of graduates they may employ. Programs developed within this Framework should not only lead to the knowledge, generic skills and professional expertise normally associated with studies leading to comparable awards throughout the world, but should also include particular emphases reflecting the policy priorities of Thailand. In 2011, TQF:HED of Technical Education and Professional Standards for Technical Teachers started with their research-based operations.

Research shows that in developing and identifying standard qualifications of TVET teachers, responsiveness and adaptability of teachers to the current demands of the industry and visions for future employment must be taken into account by TVET training institutions and must be legally enforced.

Capable and talented candidates should be able to accomplish TVET teacher standards and should not be restricted by social diversities between groups such as races, religions, social status or gender.

On the other hand, this might cause challenges in the centralization and may affect verification of processes and hierarchical procedures and criterion-referenced measurements and evaluations.

Raising high standards of TVET teacher education in Asia: RCP commitment

The RCP is an international platform supported by the GIZ and BMZ, with strong commitment to enhance quality of TVET teacher education in Asia. Working together, RCP members have good opportunities to learn and to share from each other and other networks for gaining access to needed information, academic support and resources which will reduce problems and increase efficiency to the education systems. Standardization is one focus of RCP and an effective tool which concretely connect RCP members to the quality of TVET teacher education.

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PROFILE



Asst. Prof. Dr. Sirilak Hanvatananukul is presently a Lecturer at the Faculty of Technical Education, Rajamangala University of Technology Thanyaburi, Kingdom of Thailand. She is also a committee member of the Ministry of Education on a New Model of Teacher and a member of the Progressional Standards Committee on the Secondary Educational Service Area 3, which encompasses Nonthaburi and Ayuthaya Provinces. She has previously held the post of Dean of the Faculty of Technical Education of the Rajamangala University of Thanyaburi.

She finished her Bachelor of Science degree at Chiang Mai University and Master of Education degree at Chulalongkorn University. Thereafter, she obtained her Doctorate on Technical Education at King Mongkut's University of Technical University, North Bangkok.



Prof. Dr. Peter Dehnbostel is a Professor and University Lecturer of TVET at the Friedrich-Alexander University in Nuremberg, Carl von Ossietzky University in Germany, University of Basel in Switzerland, and University of Klagenfurt in Austria. He is also a Consultant and Researcher of national and international research projects in the fields of TVET and has been associated with international organizations such as the GIZ in China, PMU in Egypt, GFA and NORDMETALL in Germany.

He graduated with a degree on mathematics and social sciences at the Free University of Berlin and has been conferred with Doctorate degree in the field of education and study sciences at the Technical University of Berlin, Germany.

Track C

*Good Practices and Emerging Challenges for TVET
Educators' Development: Regional Experiences
(Country Perspective Presentations)*

PREPARING TVET TEACHERS FOR THE NEXT GENERATION: RESPONDING TO THE CHALLENGES, UNEVOC CENTER PHILIPPINES INITIATIVES

Prof. Renato M. Sorolla, Ph.D.

*Head, UNEVOC Center in Western Visayas, Philippines
College Professor, Western Visayas College of Science and Technology
renatosorolla@yahoo.com*

INTRODUCTION

In any particular society, the quality of human life largely depends on how people manage and harness their human and material resources to achieve growth and development. In this cognitive era of the 21st century, educational institutions around the world are trying to respond effectively to the challenges posed by the UN's Decade of Education for Sustainable Development. The educational sector plays a significant role in the process of social transformation through human resources development.

This paper presents how the Western Visayas College of Science and Technology (WVCST), a UNEVOC Center in Western Visayas responds to the issues and challenges of preparing TVET teachers for the next generation. WVCST's initiatives and institutional experiences are focused on projecting the College as instrumental in enhancing the capability of teachers through various disciplines. The efforts are centered in teacher in-service training, curriculum development, researches, and recently transforming the college into green institution and to become a learner-centered institution. The effort of integrating the green concept in its various programs and activities aims to improve the over-all efficiency of the institution. These initiatives are anchored on enhancing the role of teachers especially on meeting the challenges, responsibilities and accountability of the teachers for the future generation.

It is hoped that the college as a UNEVOC Center in Western Visayas can give its modest contribution to the over-all effort of empowering TVET teachers towards education and training for sustainable development.

THE PHILIPPINE EDUCATION SYSTEM

The Philippine framework for education is focused on the goals to provide knowledge, skills and values for the Filipino people to lead productive lives, achieve growth and sustainable development amidst the global changes. Learning institutions in the country are considered responsible in transforming human capital for socio-economic transformations. There are three (3) agencies that are responsible for the educational program in the country, namely:

Department of Education (DepEd)- Responsible for the basic formal education specifically the elementary and secondary education

Technical Education and Skills Development Authority (TESDA)- Takes charge of post-secondary program specifically on TVET, and

Commission on Higher Education (CHED) Takes charge of the higher and advance education

The three educational agencies in the country are interlinked and interdependent in their functions to assure effective implementation of education program. Each agency is responsible in the creation of balance along intellectual, environmental, societal, cultural and economic considerations in the pursuit of enhanced quality of life.

The Philippine Education System

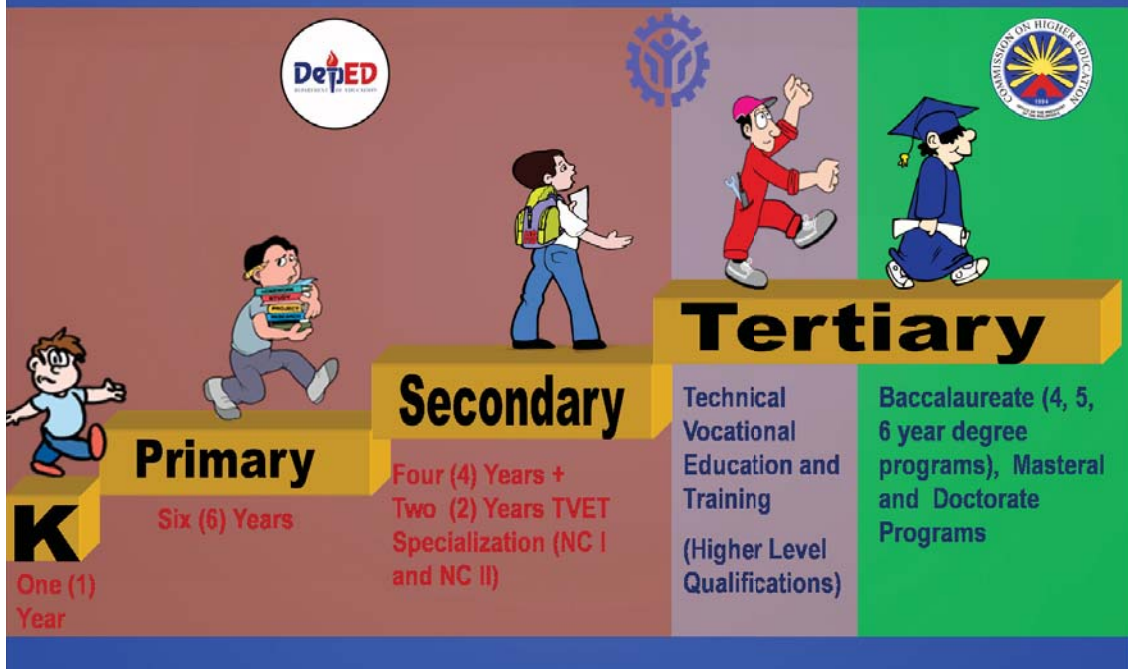


Figure 1. The Trifocalization in the Management of Philippine Education System (TESDA)

After four years of secondary education the offering of Ladderized TVET program leading to degree courses is aimed towards harmonization between TVET and degree courses. Schools need to collaborate with other institutions in addressing education and training issues. Networking with other institutions and agencies both local and international is necessary to remain vibrant and effective in addressing the issue of ESD (Education for Sustainable Development). How to prepare teachers to push the boundaries of knowledge and in making sound decisions, effect change in policies, curriculum development, practices, culture and in moulding the character of young people becomes a major challenge in the role of teachers.

Harnessing human potentials for maximizing sustainable growth requires a learner-centered institution that can enhance the students' potentials to think and work independently. Producing a graduate with work competencies, sensitive to the issues confronting environment and sustainability are among the challenges of TVET teachers in the next generation.

TESDA AND TVET IN THE PHILIPPINES

In the Philippines, TESDA (Technical Education and Skills Education Authority) is the responsible agency for TVET. Institutions offering TVET programs need to register in UTPRAS (Unified TVET Program Registration and Accreditation System). UTPRAS is a mechanism installed by TESDA to ensure that the programs offered to the public are quality assured and comply with the minimum standards set forth by the government.

TESDA Competency Standards Development

TESDA, the Philippines' authority for TVET had developed competency standards of all courses leading to middle-level skilled workers. The competency standards serve as teachers' guide in teaching. Competency standards consist of units of containing descriptors for acceptable work performance. These competencies are packaged into qualifications that correspond to jobs and occupations. Each qualification has specific levels in the Philippine TVET Qualifications Framework (PTQF).

The competency standards and qualifications, together with training standards and assessment arrangements comprise the national training regulations (TR) promulgated by the TESDA Board. The training regulations issued to TVET schools serve as basis for registration and delivery of TVET programs, competency assessment and certification, and the development of curricula for the specific qualification.

The units of competency are aligned with PTQF levels. The alignment takes into account the breadth and depth of skill and knowledge and the level of autonomy and responsibility for work.

TESDA Assessment and Certification of Skilled Workers

The assessment and certification of the competencies of the middle-level skilled workers are done through the Philippine TVET Qualification and Certification System (PTQCS). The assessment process seeks to determine whether the graduate or worker can perform to the standards expected in the workplace based on the defined competency standards. Certification is provided to those who meet the competency standards. This ensures the productivity, quality and global competitiveness of the middle-level workers.

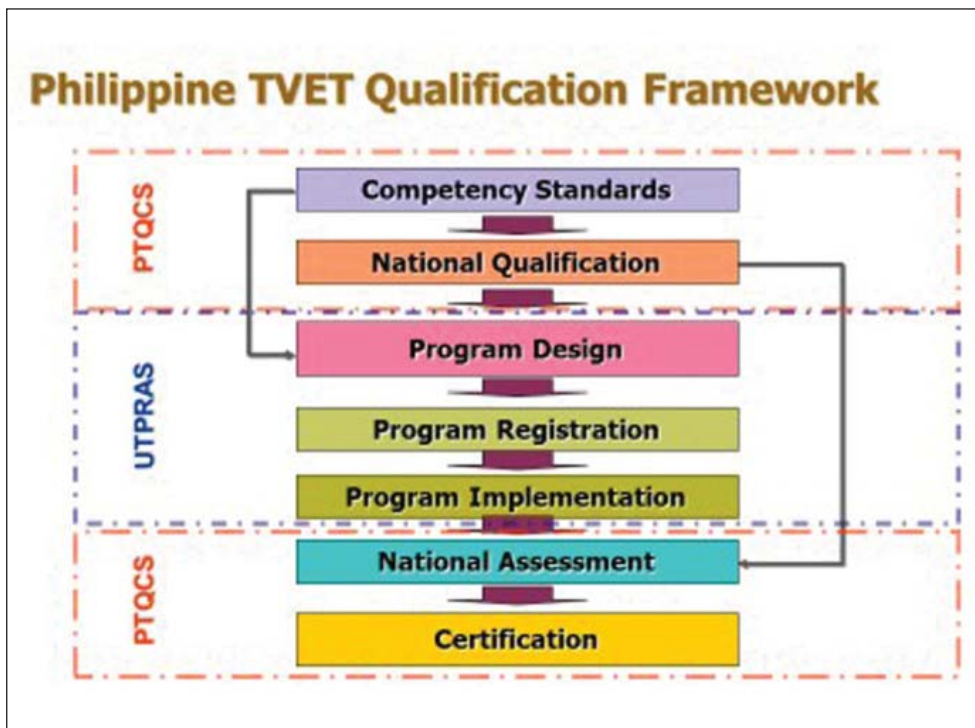


Figure 2. Diagram of the Philippine TVET Qualification Framework

To date, there are 4,328 private and public TVET learning institutions of which 125 are directly under the supervision of TESDA. It has 224 Training Regulations which provide information on the development of pool of certified workers for certain occupations nationwide. TESDA has accredited assessment centers and 7,094 competency assessors who conduct competency assessment process for persons applying for certification. Since 2005, TESDA has assessed and certified 2,985,198 skilled workers. The National Technical Education and Skills Development (NTESD, 2011-2016) plan is centered in the development of skilled Filipino workforce to become technically competent, innovative and creative. Emphasis is given on knowledge-based with higher order thinking skills as well as good foundation for life in the pursuit of lifelong learning opportunities.

WVCST as one of the TVET providers and assessment center of TESDA, closely work with the agency in the training of teachers/trainer, assessment of trainer and development of instructional modules and materials.

MAJOR ISSUES AND CHALLENGES IN TEACHING TVET

Need for Quality Learners

How to attract good student to enrol in TVET?

How to develop the readiness of the TVET students to learn independently?

Attracting good students to enrol in a TVET program is vital to the success of the training program. TVET needs students who can work and think independently. Institutions should adopt schemes to develop independence, resourcefulness and initiatives. It is also important that a student learn independently to be developed as part of the over-all culture of the institution where they enrol.

Based on the World Bank Development Report of 2007, young people in developing countries aging 12-24 years of age are numbered to 1.3 billion. They are, on average, more educated and healthier than generations before them. They represent a potentially stronger base on which to build in a world that is increasingly demanding more than basic skills.

This World Development Report of 2007 discusses priorities for government action across five youth transitions that shape young people's human capital. These are: learning, working, staying healthy, forming families, and exercising citizenship.

Need for Quality Teacher

Teachers who help improve the relevance of TVET Curriculum

The need for TVET teachers who could enrich the curriculum from time to time is very important. Curriculum, to be relevant, needs periodic review and enrichment. Identification of appropriate methods of teaching for efficient and effective instructional delivery can help the teachers' teaching effectiveness. Teachers' competence to facilitate individualized instruction for contextualized learners needs different approaches and strategies.

Teachers who can develop instructional materials and learning facilities

One of the critical issues in the teaching of TVET is the inadequacy of materials for instruction. Investment on the learning facilities like simulation devices, asynchronous learning program and modular approaches must be given premium in budget allocation of the institution. The adequacy of these instructional materials in terms of quantity and quality can help much in the successful implementation of the progressive learner-centered program. Acquisitions of real machine, tools and equipment can make the education and training more relevant and effective.

Teachers who conduct research

The concept of empowering the teachers and educators towards green movement and of developing good global citizens can help ensure sustainability and healthy environment for all. Green TVET institutions provides healthy school environment for the students to learn and play. The green movement can inspire learners to become innovators for environmental preservation and health values that will stay with them for life.

WVCST hosted the extension office for Intellectual Property (Innovation & Technology Support Offices). The office is facilitating the licensing of inventions, innovative work, green researches and creative works of faculty and students especially along climate change mitigation and adaptation, green technology and harnessing renewable energy

Teachers who can transform TVET Schools into Green Institutions

What is a Green School? Some possible answers are.... clean school environment, pleasant surroundings, healthy students and school personnel... and/or, highly performing educational institution.

Why Green Schools? The issue of building green school is important to the survival of the future generation. To do this, teachers must educate new generations of citizens with the skills to help solve the global environmental problems. Safeguarding the health of the personnel and students inside the institution is not just a fad, but the responsibility of providing a high-quality education. Teachers should think that greener school environments can help improve student's health and learning.

WVCST's RESPONSES TO THE CHALLENGES OF PREPARING TVET TEACHERS FOR THE NEXT GENERATIONS

Offering of Vertically Articulated Curricula in Industrial Technology

The industrial technology program offered in WVCST is envisioned to produce executives, managers, consultants, supervisors which the industries need in implementing, operating and improving the system of machines, processes, materials as well as human, financial and energy resources. The focus of the program is in the integration of technological management knowledge with leadership skills, and in managing and supervising production in the manufacturing and processing industries, in order to achieve the desired goals efficiently and effectively with concern to the environment.

The graduate program of industrial technology aims to provide a broad-based program to prepare individuals for (1) technical management position in business and manufacturing industry and (2) teaching and administrative positions in applied technology.

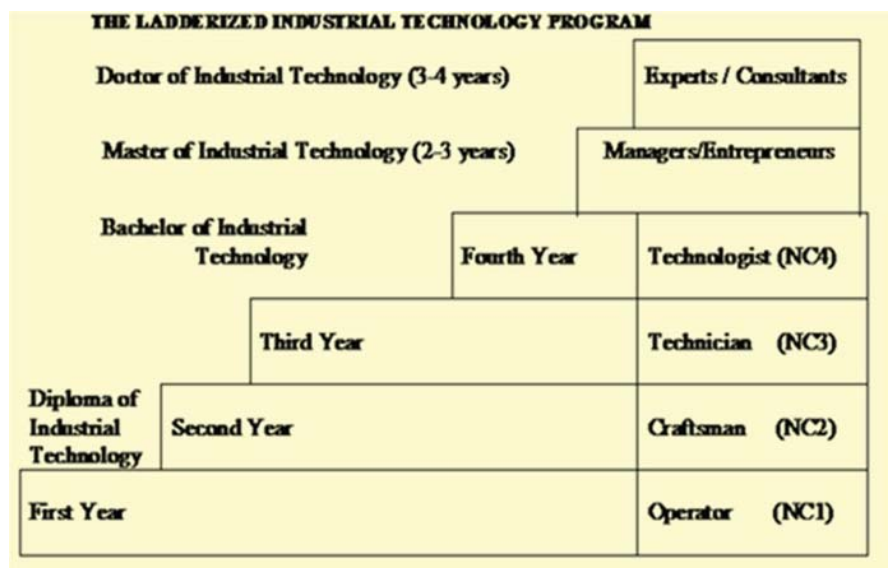


Figure 3. The Vertically Articulated Industrial Technology Program Offered at WVCST

The program provides a technology-based core of advanced courses in management of technology, materials and processes, manufacturing systems, communication concepts, visual presentation and research methodology.

The program is also designed to improve the managerial and technological knowledge of an individual by transferring and sharing the latest technology and practices through cooperative efforts with industry, government and other educational institutions.

The College initiated the offerings of the vertically articulated program in industrial technology, from post-secondary to graduate level. The Institutional Competency Assessment (ICA) was developed to assure teaching delivery in accordance to the requirements of labour market and national competency standards prescribed by TESDA (Technical Education and Skills Training Authority). Appropriate methods of teaching were used to enhance the full potentials of learners through individualized and collaborative learning scheme.

Instructional delivery includes activities that will enhance strong relationship between and among the learners as well as between learners and teachers. Curriculum facilitates the dynamic interactions that can help the learners to become cohesive and harmonious in the process of learning and teaching.

Graduate Program for TVET Teachers

- a. Diploma in Teaching (DT)
- b. Diploma Information Technology (DIT)
- c. Master of Science in Industrial Education (MSIE)
- d. Master of Science in Home Economics (MSHE)
- f. Master of Science in Teaching Vocational Education
- h. Master in Industrial Technology (MIT)
- i. Doctor of Industrial Technology (D.I.T)
- j. Doctor of Education (Ed. D.)
- k. Doctor of Education in Industrial Management (DEIM)

INITIATIVES AND PROJECTS IN PREPARING TEACHERS FOR the NEXT GENERATION

Project Intel

Intel teaching the future is a world-wide initiative focusing on skills to effectively integrate computer technology into existing curriculum to improve student learning. For more than 3 years the project had trained 1 million classroom teachers in over 29 countries.

Intel recognizes that educational technology if not properly and effectively utilized by teachers will not create its beneficial impact to education. It is, thus, of prime importance to focus on how both students and teachers should benefit from using technology in enhancing learning as well as through research, communication and productive strategies and tools.

E-Skwela Project

This project develops interactive e-learning modules in an effort to build knowledge-based instructions in TVET and for English, Mathematics and Science for the Alternative Learning Scheme of DepEd for out of school youths. This project is financed by the Information and Communication Technology Office and the Department of Science and Technology. Also developed are the interactive modules for TVET Skill for Livelihood Program in the area of Automotive, Refrigeration and Air Conditioning (HVAC), bartending and electronics. The project converted instructional materials into interactive module to facilitate effective teaching learning.

I-Schools Project

This project enhances the teaching competencies in the development of internet access to Public high school nationwide. The project provided internet connections to 320 public High School and hardware, software and trainings for teachers. This project was sponsored by Commission on Information and Communication Technology from 2006 to present.

TESDA Project on Animation

WVCST as training institution for TESDA Scholars and Trainers underwent training on animation and software development from 2005 to present. The development of software was funded by TESDA and its partner agencies to make teaching and learning efficient and effective.

Linking the College for Improving the Quality of Teachers and educators

WVCST is actively involved in steering the national organization of the Philippine Association of Colleges and Universities of Industrial Technology (PACUIT). PACUIT is a non-stock, non-profit organization for the purpose of enhancing the teachers' capability in the teaching of industrial technology program. To date, there are 47 member institutions nationwide and 642 professional members.

Since 2003, PACUIT vigorously organized a series of national conferences on various topics and discourse for the purpose of updating its members on the current issues and concerns along curriculum, research, resource management and sustainable development. Among others, the association provides avenue and opportunities for exchange of ideas, aspirations, problems and programs of activities and other information among the members.

Since its inception, the Association has focused its attention on the development of suitable policies, standards and guidelines for the industrial technology programs/curricula used by its member institution. To this end, the members have committed themselves to offer a common curriculum/program on Industrial Technology, the Bachelor of Industrial Technology (BIT).

The association has started its skills upgrading program for faculty specifically on Basic Mechatronics.

Table 1: Distribution of PACUIT Member Institution in the Philippines (2011)

Region	Number of PACUIT Institutions	Region	Number of PACUIT Institutions
1	3-SUCs	8	4-SUCs
2	1-SUC	9	1-SUC
3	6-SUCs	10	1-SUCs
4	4-SUCs	11	2-SUCs
5	4-SUCs	12	1-SUC
6	7-SUCs	NCR	4-SUCs
7	5-SUCs	CARAGA/CAR	3-SUCs

Establishing Patent Library for TVET professional and Teachers

Establishing a Network of Innovation & Technology Support Offices (I.T.S.O.) or 'Patent Libraries' at WVCST to Strengthen Local Institutional Capacity to Access Patent Information & Make Use of the Patent System" This project was established in cooperation with other institutions and local patent professionals. The project conducts the necessary knowledge orientation and skills training for faculty of the College. ITSO operates and deliver the following services: patent searches, patent drafting and assistance in patent

prosecution services. Intellectual Property (IP) Philippines design all training programs to fit the needs of the faculty and staff of the Institutions

Clearly, there is a great need to educate Philippine scientists, researchers, TVET teachers and businessmen on how to benefit from the patent system. Patent information need to be made accessible to TVET teachers. They can acquire the skill to search for relevant patents and comprehend patent documents. They can identify which technologies can be used for free and which would need to be licensed and finally, how to obtain the license and from whom is necessary. Consequently, initiative will enable the academe and research institutions to build upon latest technological breakthroughs and avoid repeating what has already been invented elsewhere. On the other hand, when more people know how to access patent information, industries will also be encouraged to produce innovative products and services using readily available (and most often, free) technologies.

ITSO office envisioned to provide the following services:

- a. In support of IP creation by facilitating access to global science and technology Information;
- b. In support of IP protection by promoting domestic and globally-competitive innovations: a. Provide general information on patents and patenting;
- c. In support of IP utilization by assisting commercialization of globally competitive Innovations:

Finally, TVET teachers can be an inventor, innovator and be recognized for their creative works to facilitate holistic learning in a learner-centered TVET institution.

"Leaders assuming roles akin to the learner-centered teacher who is described as a facilitator, designer, or guide"

- The role of teacher

CONCLUSION

Positive responses to the challenges of preparing teachers for the next generation can have profound implications in promoting the scholastic performance of the students, work motivation and positive sustainable culture. WVCST UNEVOC Center strives to contribute in defining and promoting the sustainable future in its educational activities, projects and initiatives, linkages and collaboration. The institution realigns its program to have significant link to economic, social and environmental conditions for sustainable development

WVCST recognizes the crucial role of teachers in understanding the practices oriented towards sustainable future. The changing nature in the world of work and the technological changes compelled WVCST to act to develop programs and projects for faculty development through scholarships, symposia, trainers training, industrial immersion, collaborative research and linkages. This endeavour can put forward a suitable framework for teachers to develop a learner-centered TVET institution and effective TVET teacher professionals.

Programs and projects that create opportunities for the teachers to get involved, learn and develop teaching competencies towards progressive learner-center environment are the top priorities. Infusing green culture and respect to the conservation and sustainable use of resources, social equity appropriate the workplaces are significant for sustainable future.

Finally, building the capacity of teachers to innovate, conduct research and advocate green practices will make them prepared to meet the challenges of the future generation. In effect it is expected that the efforts of WVCST to enhance the efficient and effective implementation of the educational program and by improving the green index of the institution can be manifested by the quality of its graduates.

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PROFILE



Prof. Dr. Renato M. Sorolla is currently the President of the Carlos Hilado Memorial State College (CHMSC), Negros Occidental, Philippines. He is presently the Head of the UNEVOC Center of the Philippines in Western Visayas. He also became a Faculty Specialist of the Colombo Plan Staff College for Technician Education (CPSC). He was formerly a College Professor and Dean of the College of Industrial Technology of the Western Visayas College of Science and Technology (WVSCCT), Iloilo City, Philippines.

Dr. Sorolla is a researcher, author and TVET Specialist. As Professor of Industrial Technology, he served as Trainer in the Technology and Livelihood Education (TLE) Teachers’ Training of the Secondary Education Development Program (SEDP) of the Department of Education, a member of the Regional Quality Assurance Team (R-QUAT) of the Commission of Higher Education (CHED), and a Certified Regional Trainer on Supervisory Development Courses (SDC) of the Civil Service Commission (CSC).

As Dean of the College of Industrial Technology, he enriched and implemented the Vertically Articulated Industrial Technology Program from Post-Secondary to Doctorate Level. An active member of AACUP, he had the opportunity to evaluate both chartered State Universities and Colleges (SUC) and TVET institutions in the country and abroad.

STATUS OF TVET INSTRUCTORS AND THEIR PREPARATION FOR TVET REFORMS IN BHUTAN

Hon. Dasho Pema Wangda

Permanent Secretary, Ministry of Labour and Human Resources

Royal Government of Bhutan

wangdapema@gmail.com

BACKGROUND

Bhutan is a tiny landlocked country situated between China and India. 69.1% of the population of 634,982 live in the rural areas despite increasing trend in rural-urban migration. About 33.1% of the population is under the age of fifteen. Its labour force is estimated at 66.4% of the total population. The private sector, considered as the engine of growth, continues to be weak and underdeveloped. The country is currently faced with a shortage of skilled workers, especially in the fastest growing construction sector necessitating the import of a huge number of foreign workers from India.

Gross National Happiness (GNH), propounded by the fourth King Jigme Singye Wangchuck in the 1980's, serves as the main guiding philosophy in Bhutan's approach to development. The philosophy considers that economic development of a country has more dimensions than just the GDP. It considers the happiness of the members of society as the main objective of development. Therefore, every step in the material development and change must be measured and evaluated to ensure that it will lead to happiness, not just economic development.

The conscious decentralization policy of the last four successive monarchs took Bhutan on a planned and gradual transition to a modern democracy. The biggest transition was witnessed in 2008 when the country became a constitutional democratic monarchy. The country has successfully installed its first democratically elected government and became the youngest democracy in the world.

Technical and Vocational Education & Training (TVET) was first introduced in 1965 with the establishment of a Don Bosco Technical Institute followed by the Royal Bhutan Polytechnic in 1972. Program offerings at the two institutes were limited to meeting the public sector needs in few sectors only. There were very limited recruitments in the two institutions due to preference for school education.

With the implementation of the successive five year development plans, rapid economic development demanded more skilled workers. Therefore, government established the National Technical Training Authority (NTTA) in 1999 through a Royal Charter to plan and implement TVET in the country. The NTTA developed and began implementation of the Skills Development Plan and VET Policy focusing on access and quality of Technical and Vocational Education & Training in the country.

With increased importance of vocational education, labor and employment issues, the Ministry of Labour and Human Resources (MoLHR) was created in 2003 by subsuming the NTTA and the National Employment Board (NEB). NTTA was bifurcated into the Department of Human Resources and the Department of Occupational Standards, mandated to focus on TVET delivery and regulatory functions, respectively.

The implementation of the Skills Development Plan and TVET reform initiatives was revived in 2009 and has gained some positive momentum. Some initiatives included development of the Bhutan Vocational Qualifications Framework, adoption of competency-based training, improvement in training resources,

enhancement of quality of TVET instructors and managers and, implementation of Quality Assurance Systems, amongst many others. By 2013 all the courses delivered in public TVET institutions will be based on National Occupational Skills Standards closely followed by private training providers. However, quality of TVET managers and instructors are acknowledged as the most critical factors in the success of the reforms as well as preparedness for the future challenges.

TVET POLICY OF BHUTAN

The TVET Policy of Bhutan was developed in the year 2004 and has since been guiding the development of the Technical and Vocational Education and Training sector and the implementation of the Skills Development Plan in the country.

The TVET Policy identified three key stakeholders and focuses on the benefits they derive from the TVET sector, as stated below:

- I. Bhutan's citizens who wish to start or improve gainful economic activities as employed workers, self-employed and small entrepreneurs.
- II. Employers in Bhutan, both in the public as well as in the private sector, with an emphasis on the latter group, who are keen to increase the productivity of their workforce and thus expand business.
- III. Training providers in Bhutan, both public and private, as well as companies who arrange for training on-the-job, with an interest in increased relevance and an expanded scope of their training activities.

The Policy helped provide the path for the development of relevant instruments and organizational structures for the efficient implementation of TVET reforms in the country. The Ministry has achieved considerable progress with the reforms since 2004. However, absence of a legal instrument in the form of a TVET Act is seen as necessary to facilitate effectiveness of the implementation of TVET reforms. The Policy accords high importance to the development of instructors' capacities through provision of short courses or series of short courses.

DEVELOPMENT INTERVENTIONS IN EDUCATING AND TRAINING TVET EDUCATORS

The ministry does not have a structured TVET teachers' training facility and programs in place with annual fund allocations. As an interim measure, the Technical and Professional Support Division of the Department of Human Resources conducts the Training of Trainers Programme (ToT) on need basis. This Training of Trainer comprises of four modules as listed below:

- i. TOT Skill
- ii. TOT Knowledge
- iii. TOT Visualization
- iv. TOT Evaluation

The instructors were certified after the completion of the program. They acquire basic teaching skills through this program and have found that they performed better in delivering training. However, the Certificate of Completion issued by the Department of Human Resources of the above programme is not recognized by the Royal Civil Service Commission for upgrading of their qualification since the training programs have not been institutionalized and formalized.

The capacity development of instructors has also been implemented abroad through bi-lateral or multi-lateral ad hoc offers. However, the impact has been limited due to some degree of mismatch between content of offers and needs of the instructors.

BEST PRACTICES THAT DESCRIBE UNIQUE SUCCESS AND MODALITIES FOR PREPARING EDUCATORS FOR FUTURE REQUIREMENTS

The best practices to develop TVET Educators are through the delivery of structured and institutionalized Teacher Training programmes based on training needs analysis. Trainings should also cater to capacity enhancement of TVET managers. Structured industrial attachment and internship programs also need to be organized to help TVET teachers gain the much required industrial experience. It is widely recognized that instructors with industrial experience perform much better as compared to instructors without industrial experience.

Instructors must be equipped with ICT skills to develop multimedia teaching aids which enhances and improves the teaching learning processes. In addition, the use of ICT in teaching-learning processes greatly enhances the learning potential of the trainees.

Having acquired the necessary ICT skills, instructors should be able to develop web based teaching-learning materials in order to make learning processes flexible and convenient to the future learners/trainees.

The instructors must receive a formal training on teaching methodology before their appointment/ or upon appointment as instructors so that the quality of training delivery will improve such training interventions.

THE MAJOR CHALLENGES

Findings from the critical review of the current scenario are presented below. The issues were found to have severely affected the overall quality of training and will continue to have impacts in the future.

The post of instructor is considered unattractive by the university or polytechnic graduates.

The post of instructor in the Technical Institutes has remained unattractive for graduates from universities and polytechnics. This is inferred from the lack of applicants for the instructors' posts despite repeated vacancy announcements. The graduates' preference for office jobs has been recognized.

Majority of the instructors are under-qualified.

Lack of interest from graduates had necessitated retention of instructors with certificate qualifications recruited already in the past. However, their experiences have helped compensate for the qualifications to a great extent and proved very useful in the delivery of training albeit lack of innovation and creativity. However, the career advancement rules based on academic qualifications of the Royal Civil Service Commission have been proven detrimental to the motivation of the instructors. Further, preference for recruits with higher qualifications has also affected their morale.

Majority of the instructors have not received formal instructional training

Majority of the instructors were recruited and placed in the Technical Institutes without any training in instructional methodology and industry experience. This has severely affected the quality of training. Only 20% of the instructors have undergone instructors' training before the introduction of To Programme by the Department of Human Resources (Loday K: 2008). It shows that most of the instructors have not received formal instructional training.

No industrial experience

The instructors of technical institutes are recruited directly after their graduation from the universities or polytechnic and hence, they do not have industrial experience. Relating industrial experience in training is very important to make training relevant to the needs of the industries. Efforts are made by each technical institutes to provide industrial experience to instructors through short term attachment and creation of the Institute Management Boards.

eMost instructors lack ICT Skills

Although ICT knowledge and skills are indispensable, majority of the senior instructors do not possess them. Therefore, they do not have the capability to integrate ICT in their teaching-learning processes. As a result they continue to rely on conventional and most often obsolete teaching-learning methods. Lack of ICT skills has limited the use and application of many ICT based teaching-learning aids and materials let alone development of customized aids and materials.

REMEDIAL MEASURES ADOPTED TO IMPROVE THE QUALITY OF INSTRUCTORS

Introduction of teaching allowance for teachers/instructors

The government introduced the teaching allowance as a financial incentive to attract and retain instructors. However, this has had very limited success due to more attractive jobs in the other public service and corporate sectors.

Training of Trainers' Programme

The instructors of the Technical Institutes are being provided with the Training of Trainers' training to equip them with teaching skills. Although the above programme contributed in enhancing their teaching skill, the certificate awarded after completion of above programme were not recognized by the Royal Civil Service Commission for career enhancement purposes. Therefore, the support of the Commission in recognizing the ToT completion certificates needs to be solicited (Loday K: 2008). A Technical Teachers' Training Centre is being built and trainer capacities developed. Furthermore, the establishment of the Center and offer of structured ToT programs in 2013 is expected to resolve all the relevant issues.

Upgrading qualification of instructors

The government has initiated long term study programs abroad to upgrade the qualification of instructors who are mainly certificate holders. The first batch of seven instructors have already received diploma qualification and upgraded accordingly. Plans have also been made to extend the same opportunity to all the instructors with certificate as well as diploma level qualifications. Further, plans are also being developed to implement industrial attachment/internship programmes for the instructors.

Enhancing IT Skills of Instructors and trainees

Developing the ICT skills of the instructors has been recognized as critical to shifting gears from conventional teaching learning processes to ICT enabled. In keeping with the government's plan to achieve an ICT based society, ICT Learning Centers have been established in the Technical Institutes. The centers will help develop the necessary ICT skills of both instructors and trainees as well as cater to training needs of the community.

Adopting Green technology

In recognition of the serious impacts of human activities on environmental degradation, curricula are being reviewed to incorporate environment friendly methodologies and introduction of environment friendly technologies.

FUTURE PLANS

The new generation is more IT Savvy than the old generation and hence use of IT in Teaching Learning process should be accorded high priority. More over use of Multi Media as teaching aid has always proved to be more affective than the conventional teaching aids. The availability of resources in the internet is so vast that trainees be provided with IT facilities to enable them to explore and learn on their own. In

this regard the instructors should be prepared to deliver teaching through IT. The instructors should be trained in IT and use of IT in teaching learning process. The institute management should develop necessary IT infrastructure in the institute to promote the use of IT in teaching learning process. It is planned that the Technical Teacher's Training Center will take the lead role in developing the required skills in the training institutes, both public and private.

A Technical and Vocational Education & Training Bill is planned to be written soon. The Act is expected to provide the TVET sector with the much needed legal basis for its efficient operation and credibility. Further, the act is also expected to help the ministry in mobilizing resources, especially qualified and experienced instructors.

CONCLUSION

It is widely known that the success of education and training systems hinges primarily on the quality of teachers and instructors. No matter how good the physical facilities, resources, or programs, poor delivery of programs by instructors will have a negative outcome of the program. Moreover, the quality of instructors and TVET managers in the training institutions will also determine the system's ability to adapt to the changing nature of training needs in a proactive fashion. There is also a need for TVET graduates to be competent in the global labor market in the future. Hence, TVET reform initiatives must ensure development of the potential of the instructors. Now is the time to enhance the quality of TVET to ensure quality of instructors in the future in addressing the need to meet the aspirations of the future generations.

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PROFILE



Hon. Dasho Pema Wangda is currently the Permanent Secretary at the Ministry of Labour and Human Resources, Royal Government of Bhutan. He is responsible for the human resource development in Bhutan and as such provides strategic directions in HRD including TVET policy formulation and programme implementation. He has extensively worked in the field of human resource development and employment since 1982. He was appointed by the King of the Kingdom of Bhutan in 2003 as a member of the Royal Civil Service Commission where he began his career as a Trainee Officer in 1982. During his tenure as a member of the Royal Civil Service Commission from 2003-2006, he held the position of the Chairman of the Commission twice. He holds a Master's degree in Public Administration from the University of Hartford, USA and a Bachelor of Science degree from Punjab University, India.

TRAINING AND DEVELOPMENT OF TVET EDUCATORS: PROSPECTS AND CHALLENGES IN THE CONTEXT OF NEPAL

Dr. Bhawani Shankar Subedi

*Executive Director, Training Institute for Technical Instruction (TITI), Nepal
bssubedee@yahoo.com; management@titi.org.np*

BACKGROUND AND CONTEXT

The Council for Technical Education and Vocational Training (CTEVT) was created by virtue of the Special Parliament Act in 1989, mandated to formulate policy, coordinate among TVET providers, ensure quality standards by means of skills tests and certify TVET graduates. The same Act envisaged the establishment of the Training Institute for Technical Instruction (TITI) as a separate semi-autonomous institution mandated for the training and development of TVET educators, including principals, instructors, curriculum developers and community facilitators with a mission to improve the quality of technical education and vocational training in Nepal.

During the past 30 years of its history, Nepal's TVET system has made a considerable progress. However, due to the rapid growth of population (30 million in 2011), prolonged socio-political conflict and subsequent stagnation of industrial-economic growth, employable skills training and education opportunities have reached only a small segment of the country's population (10-12% of 15 to 29 years) with less than 4% of the total national education budget allocated for TVET programs and services. However, the momentum is now changing. Multiple donors and stakeholders have focused on TVET programs and services below bachelor degree levels with more than 350 private technical training providers, 44 annex schools with one or more TVET programs and 23 constituent campuses of the CTEVT itself. All these have an intake capacity of about 50000 youths and adults in the TSLC and Diploma programs alone. A wide range of occupation-specific short-term courses (of 1- 6 months) are being offered for job-seekers in Nepal and abroad. Additionally, at least four universities are offering technical education programs of undergraduate and graduate levels. The number of TVET educators has, thus, reached over 8000. Professional development and training of these educators has become eminent. The Training Institute for Technical Instruction (TITI) is the only institute for the training and development of TVET trainers and professionals with scope for future expansion and innovations in its programs and services throughout the country and beyond.

TVET POLICY AND TEACHER DEVELOPMENT

The government of Nepal's TEVT policy (2007) focuses on five elements: expansion, inclusion, integration, relevance and sustained funding to ensure that the TEVT market can take off. Skills for employment project (loan 2277-Nep, 2004-2011) supported by ADB and implemented through the council for technical education and vocational training (CTEVT) aimed at increasing market oriented short term training to access 80000 unemployed persons within the last 5 years in Nepal. This project is currently phasing out with 'satisfactory' rating by Asian Development Bank (ADB, 2011).

Available information (CTEVT, 2005; CTEVT, 2006; ILO 2001) revealed that access to technical education and vocational skills training is limited, especially for the poor, women, Dalits, and disadvantaged, and the quality of such education and training is variable and often not linked to market needs. Overall, existing institutions in the country lack the capacity to fully serve the needs of the market-oriented

technical education and vocational skill training. It has been realized that new measures are required to substantially increase the number of people who acquire sound technological knowledge-base and skills that lead to income generation and productivity. Strengthening the technical education and training sub-sector to deliver more relevant and market-oriented education and training is one of such measures.

Nepal's economic growth assessment (USAID, 2008), in its first two of the top five priority recommendations enlists 'vocational and skill training for the poor and disadvantaged youth for local employment and migration' and 'labor intensive work programs aimed at the poor and excluded groups to provide infrastructure maintenance and other needed public works.' Likewise, the national action plan for youth employment in Nepal (2008-2015) has taken four Es framework- employability, equality, entrepreneurship and employment generation- as propounded by the youth employment network. Likewise, Save the Children Nepal in its mid-term evaluation report of the youth and employment project (ODW 2007-2011) recommended new impetus to vocational skills training for youths with due attention to what happens before, during and after all aspects of vocational skills training (ODW project midterm evaluation report 2009).

One of the objectives set by the three-year interim development plan (2008-2010) of Nepal states that the objective of national action plan for youth employment is 'to enlist the active participation of all Nepali youth in national reconstruction and socio-economic transformation by providing them opportunity to develop their capacity and potential.' However, an eminent inability to find employment is likely to create a sense of vulnerability and uselessness among youths. 'Vocational skills for youth employment and livelihood improvement' support could be an appropriate intervention to protect and empower youths in terms of the capacity to earn a living by getting engaged in productive occupations.

Education, gender and caste divides among youths are important factors that need to be taken into account in any effort to facilitate employment. Given the gravity of problems in equipping these youths for labor market, and generating employment opportunities that absorb youths, general employment policies and programs may not be sufficient. Hence, there is a need to focus with targeted interventions to address the youth specific issues and potentials of employment, especially in the informal sector of economy.

The need for training and development of TVET educators is likely to increase with the advent of EVENT (Enhancing Vocational Education and Training) project of the World Bank recently started (July, 2011) and Asian Development Bank's upcoming Skills for Employment Project (SEP II) in addition to the existing TVET programs and services

DEVELOPMENT INTERVENTIONS IN EDUCATING AND TRAINING TVET EDUCATORS

By the Act of CTEVT (1989), the Training Institute for Technical Instruction (TITI) was created as a semi-autonomous institution with separate bye-laws mandated for the training and development of TVET educators in-country and the region. Its vision stated "TITI is a centre of excellence for TEVT trainers and managers training in developing countries in Asia" whereas its mission states "Training is our business. The mission of TITI is to improve the quality of technical education and vocational training in Nepal"

The development interventions initiated by the government as well as non-government agencies characterize critical weaknesses at different phases of the training cycle. Without involving employers and other relevant stakeholders at all phases of the training cycle--analysis, design, development, implementation, evaluation-- training becomes more supply-driven and less market oriented. Thus, by effectively involving partners and stakeholders, quality and relevance of training can be improved. Linkages between training and employment or self-employment can be promoted by means of designing and offering need-based courses for the most appropriate persons identified and included as trainees.

Nepal TVET and Skills Development Policy– Outline*		
Key Messages	Key Policy Areas	Favoured Measures
<p>To citizens: every Nepalese shall be entitled to at least 3 months of training for employment free of charge; beyond that an increasing array of life-long learning opportunities will be available on a fee-paying basis</p> <p>To training providers: all businesses and institutions, small or large, private or public, commercial or charitable, will be encouraged and supported to offer skills development for school leavers and the national workforce</p> <p>To the business community: the supply of workers, competent and confident in their occupation will be massively increased thus, enhancing national productivity in essence: development of a strong and functioning market for TEVT and skills development</p>	massive EXPANSION of training opportunities	<ul style="list-style-type: none"> deregulation, autonomy, decentralization free start-up support to emerging providers outcome quality assurance (in line with NVQs) performance comparison, transparency and quality marks as elements of customer protection
	INCLUSION of and ACCESS for all citizens who need training	<ul style="list-style-type: none"> stipends (for tuition fees and subsistence allowance) especially for disadvantaged groups of people recognition of prior learning / open assessment entry level occupational standards preparatory & support courses to promote mainstreaming
	firm INTEGRATION of various training modes and pathways	<ul style="list-style-type: none"> Vocational Qualifications Framework as a bracket for formal, non-formal and informal training and learning bridging courses into general education promotion of typical occupational career ladders and career guidance for the workforce as elements of life-long learning
	enhanced RELEVANCE of courses and competencies	<ul style="list-style-type: none"> licensed trainers with industrial exposure curricula based upon occupational standards hands-on training (on-the-job & projects) independent assessment and certification
	sustained FUNDING sources and mechanisms	<ul style="list-style-type: none"> massive increase in public funds fees for all training measures beyond 3 months concerted donor assistance TEVT development funds on district level explore contributions from former stipend recipients

Most training interventions fail primarily due to what employers expect from the workers and what they are trained for, especially in the informal sector. Employers in the informal economy pay workers for the actual work performed, not for being listed in the payroll- as is often the case in government organizations.

Identification of and negotiation with appropriate training providers (institutions or enterprises) that are able and willing to organize and deliver the needed skills training modules for the targeted working youths and adults should therefore be the most critical activity for achieving training results-employment or self-employment. Access is not just bringing in the youths and admitting them for any training.

Access and opportunity to gain employable vocational skills include more than physical presence. It includes an authentic assessment of employers and employees needs that often remain dynamic due to emerging changes in the market economy, industrial and economic growth and affordability and achievability of the training opportunities as well. Objective indicators must be determined involving users, employers and providers in advance to effectively measure the achievement in terms of the extent of increased access and opportunities of employable vocational skills training for youths and adults.

National

Technical Education and Vocational Training (TEVT) activities largely remained in the form of trial and error. This sector characterized scattered and uncoordinated experiments for more than 50 years in Nepal. With the establishment of 29 multipurpose high schools and one vocational teacher training center (NVTC) during the 1960s actually marked the formal beginning of TEVT provisions in the country. National Education System Plan (NESP 1971-1976) carried over the essence of the multiple purpose

schools by maintaining 400 marks of vocational subjects in the secondary school curricula with the purpose of vocationalizing general education. With the advent of Technical School Plan (1981), many donors and bilateral projects provided technical as well as financial assistance for the growth and expansion of the TEVT programs.

At the middle level (technician), the TEVT expanded and maintained continuity in the areas of engineering, health, forestry, food technology and education (Belbase, 1997). However, most of the technical areas and vocational trades remained male-dominated eventually limiting the access of women and other disadvantaged groups to those programs. Policies and practices did not fairly address the needs of those groups in terms of ensuring equity of access to TEVT programs at all levels.

NESP (1971-1976) was the first policy document that explicitly introduced the need for education to be oriented towards TEVT. Consequently, technician education in the field of medicine and engineering received more importance than training of skilled or semi-skilled workers even in those areas. Some of the policy level efforts that were available for review include national development plan documents developed for the country by the National Planning Commission (NPC), High Level Education Commission report (1998), Council for Technical Education and Vocational Training (Act 1989; policy 1999), International Labor Organization (ILO) documents, Employment Promotion Commission (EPC) charter. Those policies attempt to address (or at least reflect) the issue of equitable access to employment oriented technical and vocational education and training for women and other disadvantaged groups.

The tenth five-year plan (2002-2007) of the National Planning Commission (NPC) incorporated the following policy guidelines about training and education, including TEVT, for the target groups that implicitly attempt to address the issue of access and equity for the disadvantaged groups among others:

1. Supply the basic and medium skilled technical human power required for the country.
2. Implement programs on literacy, post-literacy, income generation and on other non-formal education for particularly assisting women and the backward community in increasing their living standards.
3. Develop human resources for the production of internationally competitive skilled human power that supports the national economy for the all-round development of the country; and to use education as a strong vehicle for economic and social development as well as poverty alleviation.
4. To develop sports and youth mobilization programs for producing capable, good and disciplined human power required for the country.
5. Expand and develop quality education required for development of the country, and to make easily available quality primary education for all.

There is still a growing interest exhibited by bi-lateral and multi-lateral donors and investors towards the development of TVET sector in Nepal.

Institutional

The Tribhuvan University (TU) of Nepal has been the oldest and used to be the only institution to produce human resources for the TVET sector (like other sectors), but lacks specific focus on the needs of TVET educators prior to the creation of CTEVT in 1989. Three more universities emerged and they all are producing teachers through different programs. However, these graduates fresh from the universities employed as instructors and/or trainers in the TVET sectors needed further training and education, especially occupational skills-upgrading and adult learning strategies. Many institutions, both government and non-government sectors, attempted to address this gap by conducting Training of Trainers (ToTs) of various durations and content. Still the need of TVET educators could not be addressed pragmatically. Therefore, the Training Institute for Technical Instruction (TITI) was established and operated since 1991.

There are still limitations and constraints in policy implementations as well as in practices particularly in making TVET programs as effective as they could have been. Until now training and development of TVET educators has not yet received adequate attention.

1. CTEVT's mandate to coordinate has been undermined by its focus on managing technical schools (World Bank, 1999). This indicates the problem of a dual role by CTEVT. As a training provider it operates in competition to other providers. Thus, its coordination role can be perceived as one training provider imposing its views about training on others (ADB, 2003).
2. The linkage between the TEVT sector and pro-poor development is not one that is strongly founded. TEVT programs implemented by the government agencies seemed to have had a very important positive impact upon poverty reduction and pro-poor development in its early years (Asher, 2003). However, reduced annual budget from the government pressed the training providers to reduce unit cost, to decrease the duration of training and to increase training fees. Additionally, entry qualifications were raised for recognition for employment of graduates in the formal sector. Eventually, TEVT programs in the public (and more so in the private) sector are getting less accessible for the poor and disadvantaged groups. This situation challenges the policy to open up TEVT programs for a wider segment of population including disadvantaged groups.
3. Female employment has increased but most of the women are still in the agriculture sector working as paid or unpaid workers (Sharma and Dhungel, 2002). In terms of human capabilities and income, women lag behind men and the situation of women who belong to the disadvantaged groups is the weakest (UNDP, 2003). This situation poses problems limiting the equity of access and inclusion of women in non-agricultural economic activities that demand employable technical skills.
4. The other hard hit group of poor consists of Dalits (Kami, Damai, Sarki...). Dalits make up 16 percent of the total population (CBS, 1995). Almost the entire population of Dalit woman is estimated to lie under the poverty line (ADB, 2003).
5. Opportunities in the TEVT sector for the school dropouts and failures below class 10 are limited. An average 65 percent of those appearing in the SLC examination fail every year. However, many of the formal training institutions do not receive appropriate trainees who could meaningfully use their skills for employment. This indicates mismatch between the type of skilled labor pursued by the enterprises and the kind and quality of training imparted by the technical training providers (Pandey and Pradhan, 2002). There are weak linkages or no linkage at all between the labor market and the TEVT training providers (Sharma, 2002).

Departmental

Moving towards the vision of becoming a 'centre of excellence' and to address the mission of 'improving the quality of technical education and vocational training,' the Training Institute for Technical Instruction (TITI) has developed its strategic plan and programs responding to the emerging needs of training and development of TVET educators in Nepal and elsewhere. Short term courses and long term programs are offered on regular as well as customized basis- on campus, off campus and abroad.

Programs are clustered into four categories based on types and duration- Instruction, Management, Curriculum and Community Development. Courses under the Instructional program, for example, include the following:

- Workshop, Lab and Field Instruction
- Classroom Instruction
- Training of Trainers – TOT (K, S, V & E)
- Instructional Media Development
- Technology Based Instructional Delivery

- Active Learner Methodology and many more.

Likewise courses under Curriculum Program, for instance, include:

- DACUM Facilitators Training
- Training Needs Assessment
- Job and Task Analysis
- Training Design and Development
- Training Course Design and many more.

Similarly, course of the Management Program basically include the following:

- Management Skills
- Supervision of Instruction
- Facilitation and Moderation
- Strategic Operational Planning
- Program Monitoring and Evaluation
- Project Management and many more.

Whereas, examples of courses under the Community Development Program are as follows:

- Foundation of Community Development
- Community Based Needs Assessment
- Intervention of Community Development
- Community Facilitation and many more.

Additionally, TITI has been conducting four-year Bachelor of Technical Education (B. Tech. Ed.) program with affiliation from Kathmandu University and 12 months Diploma in Technical Instruction (DTI) with emphasis on instructor preparation for specified occupational areas. Currently, the DTI program is being conducted for the second batch of 14 TVET instructors from Bhutan and the third batch is being negotiated for next year (2012). Thus long-term programs of TITI are as follows:

1. Entry level certificate (3 months)
2. Diploma in technical instruction (12 months)
3. Advance diploma in technical instruction (18 months)
4. Bachelor of Technical Education (4 years)
5. Advance diploma in occupational curriculum development (18 months, being developed)
6. Advance diploma in training institution management (18 months).

BEST PRACTICES AND MODALITIES OF DEVELOPING TVET EDUCATORS

In addition to Trainer Orientation Program Individualized (TOPI) and Induction of new trainers on Training Delivery Standards and Instructional Assessment Form (IAF), a Trainer Development Model specifically designed for TITI has been a powerful tool for the training and development of TVET educators in Nepal.

According to this model, a potential trainer when hired, will gradually move towards level 1, then to level 2 and then to level 3. This movement normally takes 10 years for very committed, able and willing individual/s to become a professional trainer. Career ladder in the system also allows vertical career growth for a Trainer (class 3rd officer) to Senior Trainer (class 2nd officer) and then to Consulting Trainer (class 1st officer). This model of trainer development and career progression is working very effectively in the context of Nepal.

One more model that works well is the definition of customer base for TITI as an institution. Since TITI was established by the Act of CTEVT (1989), preferential treatment always goes to the CTEVT institutions. Thus, CTEVT as a system is the primary customer as has been defined. Based on market conditions (i.e. emerging needs and demands), TITI can extend its services to other government as well as non-government agencies, projects and individuals seeking the services. During the current years, about 40% of its services are provided to CTEVT's institutions whereas 60% is offered to other agencies and interested individuals in-country and abroad. These services are customized based on proposals, needs analyses and mutual agreements, often won through competitive bidding process.

MAJOR ISSUES AND CHALLENGES

To be responsive to the existing and emerging training and development needs of TVET sector educators, it is always emphasized that the Training Institute for Technical Instruction (TITI) should acquire first and then consolidate the following three things:

Capacity Building: Expert trainers tend to leave the institution and newly joining trainers who are transferred from CTEVT or are freshly recruited need to be groomed. This grooming often takes about ten years to be an expert trainer who can operate not only within the nation but also internationally. Without having a provision of multiple ways of capacity building, the system in place is likely to suffer in terms of quality and credibility.

Operational Autonomy: Being a governed owned public sector organization, it is always a challenge for TITI to function effectively as an enterprise. It has gained a considerable momentum in terms of credibility and quality of programs and services. However, the struggle for greater autonomy is always something that the bureaucracy dislikes. To set an example it is essential for TITI to gradually move towards full sustainability and to prove that it can make a difference with commitment and quality delivered to the diverse clients.

Policy for Sustainability: Most organizations in the country have a tendency to collapse eventually after phasing out of the donor support. TITI is proving to be an exception. After complete phasing out of the Swiss contact project support in 2007, the institute has made tremendous progress in the image, income and innovations, and that has been continued. However, weak legal framework for the smooth operation of the institute may hit back while political instability is evident in the country. A strong policy for sustainability supported by any party or government would help safeguard the assets and activities of the institute in the years ahead.

ISSUES AND CHALLENGES BEING FACED BY NEPAL

1. TVET programs in Nepal are not yet considered as mainstream education despite growing interest of beneficiaries and stakeholders.
2. For the in-service programs and courses, subsistence allowance and travel costs of CTEVT training participants have not yet been revised (for the last 8 years).
3. Increasing drop out and decreasing retention of expert trainers/qualified staff
4. Lack of value addition/recognition of courses/programs within the country.
5. Low participation in training by private/affiliated schools (as most are part-time staff).
6. Inadequate staff development support (national & international training opportunities) from CTEVT to TITI
7. Lack of provision of skill test of trainers and instructors' licensing not yet introduced
8. Trainings not adequately linked to career development and financial benefits
9. Conventional organizational structure, insufficient positions to recruit trainers/experts

10. Shrinking HRD opportunities, no donors to support HRD at the moment
11. Inadequate managerial, operational and financial autonomy for TITI for example
12. Political instability and interference in staffing and resources.

POSSIBLE SOLUTIONS AND STRATEGIC ACTIONS (FUTURE PLANS)

1. Clearly define and distinguish between different levels and types of Technical Education (TE) and Vocational Training (VT), pre-employment or post-employment, formal, non-formal or informal-including purpose, entry requirements, coverage and duration of each type. This should help avoid confusions among users and employers.
2. Identify major skill requirements and size of the demand by periodic research and other surveys so that resources are not wasted or duplicated and the persons trained will be able to get jobs in the formal or informal sector.
3. Make special provisions for TVET educators training and professional development
4. Identify training needs in a scientific manner, analyze needs and review the status of the needs being met and new needs being emerged.
5. Increase the proportion of national budget of Education for TVET programs. Reward best training providers every year in terms of employment or self-employment of the persons they trained.
6. Involve major stakeholders (trainers, trainees, user communities or employers, workplace supervisors and so on) in the planning, designing and delivery of TEVT services to make them demand-driven rather than supply-oriented.
7. Empower local governments or communities in decision making about TEVT programs so that they are prepared to exhibit their ownership for sustainability of the programs.
8. Create and maintain special funds for TEVT programs to provide equity and access for women and other disadvantaged groups.
9. Generate resources by including contributions from the government, local communities, and NGOs operating in or around the area where the training programs are launched.
10. Conduct mobile types of training programs for enhancing access and equity for the poor and disadvantaged groups.
11. Establish a strong mechanism to follow-up and monitor post-training situation to ensure transfer of knowledge, skills and attitudes from the training environment to the workplace environment. Include major stakeholders in the post training evaluation.
12. Establish a functional Labor Market Information Management System (LMIS) to facilitate the linkage between labor market demands, training and employment perspectives in the formal as well as in the informal sector of the economy, covering both in-country and overseas.

For the effectiveness and relevance of TVET educators programs and courses conducted by TITI, the following strategies would be instrumental:

1. There is a need to periodically revise subsistence allowances and travel cost of CTEVT training participants as these are in-service training interventions.
2. Provide more autonomy to high performing institutions like TITI
3. Make provisions for better incentives. Review policy to retain experts/trainers/staff
4. Make training of trainers mandatory for all training providers including CTEVT's instructional/managerial staff
5. Organize for more internships and exposures for expertise development
6. Conduct more research and development activities, and use the research recommendations

7. Prepare school wise Training Plans and get them sent to TITI annually
8. Ask Principals to encourage transfer of learning from training to workplace for achieving expected change results from training interventions
9. Require TEVT providers to recognize training certificates and value addition for training and professional qualifications.

CONCLUSION

TVET educators training and development is inevitable to cope with the challenges of the future. Training providers are facing both prospects and challenges. Working together with national and international partners could be instrumental for professionalism and quality of performance of the TVET educators. National interest and priorities placed on TVET sector determine the way forward. In most cases, not enough attention is given to what happens before, during, and after completion of training.

Training is the solution to performance problems caused by knowledge and skills deficiencies. This deficiency is the gap between the 'existing' and 'expected' level of knowledge and skills to perform well on the job. Even in situations where training intervention are identified as the solution, problems still remain due to inadequate transfer of learning from the training environment to the workplace environment.

Given the gravity of problems in equipping TVET educators with skills and abilities to be responsive to the labor market, and in generating employment opportunities that absorb youths, general employment policies and programs may not be sufficient. Hence, there is a need to focus with targeted interventions to address the emerging needs of TVET educators for their effective training and development interventions.

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PROFILE



Dr. Bhawani Shankar Subedi is currently the Executive Director of the Training Institute for Technical Education in Kathmandu, Nepal. He has been a consultant, resource person and national expert aside from being an accomplished academician on his field. His areas of interest and expertise include analysis, design, development, delivery and evaluation of technical education and vocational training interventions, management of training, leadership development, human resource development, school effectiveness in research, quality education, teacher education, TVET educators and training, among others.

INSTITUTIONAL DEVELOPMENT OF VOCATIONAL TEACHER EDUCATION IN LAO PDR, CHALLENGES AND PERSPECTIVES

Prof. Dr. Boualin Soysouvanh
Dr. Rolf Gennrich

*Lao German Program on Human Resource Development for Market Economy
Regional Cooperation Platform for Vocational Teacher Education and Training
rbgennrich@web.de*

INTRODUCTION AND ESTABLISHMENT OF TARGETS

The Government of Laos (GoL) is consistently following its overall goal to prepare the nation towards its advancement and moving forward to the 2020, far from their status as Least Developed Country and to successfully integrate Laos in the regional and global markets. Membership in ASEAN and compliance with the AFTA agreement as well as the process of accessing WTO are of great importance to continue the promising period of strong economic and political stability, peace and security in Lao PDR and in the region since 1975. The economic growth and the development of civil society have far reaching implications to the people and the social development as well. The education system especially vocational education and training becomes extremely important. Teachers, trainers and school managers as well as administrators are needed in quantitative and qualitative dimensions as never before in Lao PDR.

Development strategies and policies of GoL are highly linked with human resource development to create a well-balanced and prosperous civil society in Lao PDR. In its objective of establishing better conditions for sustainable ecological and economic development, the country's human resources policy is the most sensitive and should be a top priority over the next ten years. Capacity building and legal foundations have to be developed and supported with quality and quantity dimensions.

The overall goal of this paper is to support the enhancement of Technical and Vocational Education and Training System (TVET) in general which has significant linkages to successfully achieve the development goals of the 7th and 8th SEDP by 2015 and to leave the LDC status of the country by 2020. In view of this, the quality and efficiency of Vocational Teacher Education is seen as a crucial element in this socio-economic development process until 2020 and onward. VTE development of policy, institutional and implementation level will play a major role in providing the next generations of teaching and managing personnel for the TVET system in Lao PDR. The paper's operational objective is to support and to promote existing potentials and institutions and to streamline ongoing and future activities and projects of VTE in Lao PDR. This paper also presents current issues and trends in TVET as well as reform requirements of VTE development in Lao PDR.

NATIONAL SOCIO-ECONOMIC DEVELOPMENT CONTEXT

The Lao economy grew strongly even during the Global Financial and Economic crisis reaching 7.5% in 2007, 7.2% in 2008 and 6.4% in 2009, thereby becoming the second fastest growing economy in Asia in 2009. This is to a large extent due to significant foreign investments into the resource sector (mining & hydro power) which contributed some 3.8% growth. To understand the current and the future socio-economic perspectives and challenges of the Lao Society three major development indicators should be emphasized. These are (i) Economic development (ii) Human Resource Development (HRD) and (iii) Foreign and local investment

Achieved and newly created development goals of Lao economy and the share of major economic sectors by generating GDP

Gross Domestic Product (GDP) for the last five years (2006-2010) amounted to Kip 219,795 billion, which represented a GDP annual average of Kip 43,959 billion (at constant prices). The GDP annual average growth was 7.9% (which exceeded the target by 0.4%). The breakdown of GDP (tax excluded) by sectors is as follows:

- Agriculture-Forestry sector increased by 4.1% (against a planned rate of 3.3%); accounting for 30.4% of the GDP
- Industry sector increased by 12.5% annually (against a planned rate of 13.6%), accounting for 26% of the GDP
- Services sector increased by 8.4% (against a planned rate of 7.4%), accounting for 37.2% of the GDP.

Table 1: Demographic development up to 2020

	2005	2010	2015	2020
Population (in Mio.)	5,4	6,0	6,9	7,6 (1,7%)
Growth rate (in %)	2,5	2,3	2,2	4,5 million
Persons under 19 years:			4,2 million	
2005: 50%		3,8 million		
2020: 60%	2,7 million			

The macro-economic targets of the 7th NSEDP (2011-2015) shows a GDP growth rate of not less than 8% per year which will raise the GDP per capita from currently close to USD 1,000 to USD 1,700 (based on an exchange rate of 8.500 kip/USD).

The planned GDP growth rate indicates that the industry sector has to contribute the highest growth. Compared to developments of the past 25 years and taking into account the targets up to 2020, the structure of the Lao economic sectors are moving towards further extensions of the industry and services sectors. The development agenda is also called “modernization and industrialization”.

Population forecast and human resources development

According to the last population and housing census (2009), Laos has a population of 5.75 million people. The expected growth rate is 2.3%. By 2020, the population will increase up to 7.6 million, even if the growth rate further declines as anticipated by 1.7% by 2025. Population in the working age (15-64 years) will increase from about 3.76 million in 2011 to 4.1 million in 2015. Nearly 50-60% of the total population will be under 19 years. Focus on the country’s human resources policy is a top priority and hence the most relevant and significant undertaking over the next ten years. The availability of sufficient and well-qualified work force needed as real “engine of social and economic growth” is considered the most crucial element in reaching the development targets set for 2020. In the next decade, Laos has to move towards quality and sustainability of development, integrating the three elements of economic growth, social justice and modernization, and sustainable environmental protection.

Local and foreign investment and its impact on the labour market and training provision

Major investments in the future will concentrate on mining, hydropower, agriculture and the services sectors. One of the central questions often raised by foreign investors refers to the availability of a sufficient and well-educated local work force. In this context, the World Bank’s Investment Climate Assessment (ICA) for Lao PDR shows that Lao businesses rate workforce education as third biggest

obstacle (behind tax rates and access to finance). The HRDME enterprises surveys, which have been conducted every two years since 2005, also show constant increases in the severity of this hindrance. The biggest mining companies in Lao PDR, MMG LXML Sepon and PanAust Phou Bia Mining Ltd. are looking for a well-qualified work force. Employment demand from investors calls for over 250 occupational activities, which are pre-requisites to their investments in these fields. Most of the required occupations in skilled categories do not exist in Lao PDR, and there is lack of adequate training institutions.

BRIEF HISTORICAL BACKGROUND OF VTE SECTOR AND CURRENT SITUATION

Due to the high value of well-qualified and competent workforces to achieve overarching development goals, relevance of education, especially of TVET is recognized in all GoL policy and strategy documents. These includes the Government's 2020 Vision, the National Growth and Poverty Eradication Strategy, the 6th and 7th National Socio-Economic Development Plans, National Education System Policy and Strategy - 2020, Education for All (EFA) - National Plan for Action (2005) and finally the Education Sector Development Framework (ESDF), recently elaborated by the Ministry of Education with support of the World Bank and the ADB.

A Vocational Teacher Education (VTE) system in Lao PDR exists since the introduction of the Vocational Teacher Training School at Sokphaluang Campus in Vientiane, which has been established with support of the International Labour Organization (ILO) and United Nations Development Programme (UNDP) in the year 1983. For many years this institution has successfully played its role as "VTE Provider" for up to 12 training institutions nationwide with a total capacity of up to 6000 apprentices. In 1996 the training of trainers has been stopped due to financial problems. Several years later the Teacher Training School had changed the status and was upgraded to the Vocational Education Development Centre (VEDC) referring to the Decree No.1663/MoE-TVET dated 05.10.1998 without any teacher training activities. Some years later VTE has been relaunched at VED-Centre with the introduction of Higher Diploma Program for TVET Teachers and Trainers. Parallel to that and due to the alarming situation in providing qualified teachers the first undergraduate study program for vocational teachers on Bachelor Level has been established at the Faculty of Engineering/NUoL with support of the Lao-German HRDME program in September 2004. Despite remarkable progresses and considerable national and international efforts, the vocational training system – in its current shape – is not able to fulfill its role as link between the HRD / education sector and the economic sector sufficiently. For important export-oriented and dynamic economic sectors (e.g. tourism, energy generation, wood processing) vocational training is a development obstacle rather than an asset. With regard to the challenges related to the ASEAN integration process, especially, these deficits become even more explicit.

In 2007, within the whole teaching staff involved in TVET in the MoE, two persons have a PhD, 29 have master degrees, 160 bachelor degrees while 793 a higher diploma or lower. Most of the teachers are young; many of them just finished their studies and started teaching. Many of the staff lack real working experience. ADB in 2010 summarized up in its TVET study that only 20% of TVET teachers are degree holders; 40% high diploma holders and 40% have diploma or lower level qualifications. Slightly less than 30% of all teachers are female, but there is a wide variation between training subjects: 93% of tailoring teachers, 89% of hospitality teachers, 46% of business teachers, and 35% of general subject teachers – across the whole system – are female. The envisaged student-to-teacher ratio is 18:1 across the system as a whole. Major variation occurs between specialist subject areas however, ranging from 2:1 in carpentry to 53:1 in business and 98:1 in mining. Many TVET teachers and staff have a comparatively low level of education. In order to enhance quality and relevance of TVET the pre-service and in-service training and development of TVET teachers and administrative personnel should be improve significantly. Therefore TVET Strategy and Master Plan has foreseen the following projects:

- Establishing a plan for pre-service and in-service training and development of TVET teachers and administrative personnel.
- Creating regional Vocational Teachers Training Institutes in order to train TVET teachers at

various levels according to the expansion of TVET institutions.

- Establishing a cooperation network at regional and international level in order to exchange lessons learned and experiences and to train and upgrade TVET teachers.

BRIEF DEMAND ANALYSIS OF VTE

To achieve a qualified and labour market oriented point of departure to prognosticate VTE demand and appropriate capacity planning, two different formula of estimation (calculation) should be adopted: (a) Labour market driven forecast based on figures of 7th SEDP (7th Five Year Plan 2011 to 2015) and (b) Supply driven approach to prognosticate VET development, based on relevant policy and strategy papers of GoL.

The results of the above mentioned supply and demand analysis should be carefully compared with existing experiences of DTVET and international expertise to finally generate a solid working basis for planning and decision making of VTE in the middle and long run (after 2020).

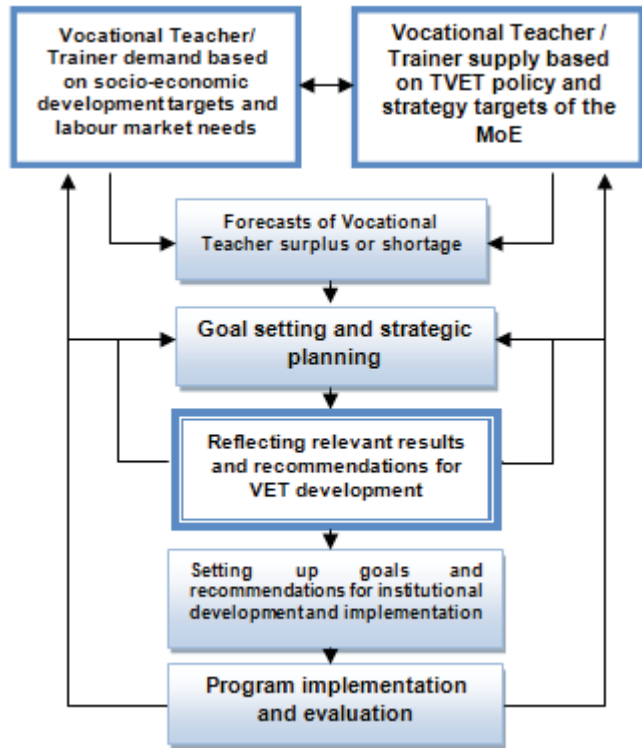


Figure 1: Overview of the Vocational Teacher /Trainer Planning Process

Labour market driven demand approach - based on figures of socio-economic growth and workforce development:

The labour demand forecast over the next five years predicts a need for up to 360,000 additional qualified workers (most skilled workers and technicians in industry and the service sector) over the next five years. As figures from MoE and MoLSW have shown, training capacities, including qualified VET teachers and trainers, are available for one third of the additional needed work forces by 2015 at most. (see Table 2).

	Labour force 2010		Labour force 2015		Additional qualified workforce needed to be trained	Currently existing public training provision
	in %	Total number (in million)	in %	Total number (in million)		
Agriculture	75.0	2.82	70.0	2.87	up to 60,000	up to 10,000
Industry	5.5	0.21	7.0	0.29	up to 90,000	up to 40,000
Services	19.5	0.73	23.0	0.94	up to 210,000	up to 50,000
Total	100.0	3.76	100.0	4.10	up to 360,000	up to 100,000

The above-mentioned figures show that the demand for additional skilled workers in Lao PDR is much more evident than the outdated estimations from the strategy and master plan of the MoE already set up in 2007. The projected TVET provision by 2015/2020 and the comparison of currently existing training capacities of the MoE underline also how important structural and personnel changes in the TVET sector are in order to provide the appropriate number and the right quality of workers for the next five to ten years. The current TVET capacity has to be aligned to these development needs in a very short period, both in quantity and quality terms. Regarding to the above outlined needs for additional workforce in the upcoming five year plan, which consequentially urges for the expansion of the existing TVET capacities and appropriate teaching personnel, TVET teachers and trainers for about 120,000 new training places by 2015 are needed.

Table 3: Demand of TVET teachers and trainers by 2015/2020 (labour market oriented approach)

	Additional workforce 2015	Training Demand 2015 (Estimated 30%)	Additional need of Teachers & Trainers (to be trained until 2015)		Currently existing public VET provision per year (without any external support or upcountry scholarships)	
			yearly up to	Total up to	yearly	Total number
Agriculture	60,000	18,000	200	1,000	up to 20	up to 100
Industry	90,000	27,000	300	1,500	up to 50	up to 250
Services	210,000	63,000	700	3,500	up to 30	up to 150
Total	360,000	108,000	1,200	6,000	up to 100	up to 500

Estimation formula (a):

Result (a):

In consequence to this unprecedented workforce development in Lao PDR, up to 6,000 new TVET teachers and trainers should be trained and employed in public and private training institutions little by little until the year 2015. This requires a yearly training capacity of up to 1,200 teachers and trainers in all three economic sectors. This also exceeds the currently available training capacity for TVET teachers and trainers by more than tenfold.

Supply driven approach based on strategic policies

The second estimation approach reflects the announcements of the Strategy and Master plan 2008 -2015 as well as the latest figures of MoE related to the growing demand on TVET provision. These figures are coming up mostly from ESDF and other relevant sources. Even those figures are not quite clear and often contradict with Strategy and Master plan 2008-2015, their orientations are clear and they put more attention to TVET, and described in qualitative and quantitative matters as follows:

Table 4: Supply and demand of TVET teachers and trainers by 2015 (supply oriented approach)

	Additional workforce 2015	Training Demand 2015 (Estimated 30%)	Additional need of Teachers & Trainers (to be trained until 2015)		Currently existing public VET provision per year (without any external support or upcountry scholarships)	
			yearly up to	Total up to	yearly	Total number
Agriculture	60,000	18,000	200	1,000	up to 20	up to 100
Industry	90,000	27,000	300	1,500	up to 50	up to 250
Services	210,000	63,000	700	3,500	up to 30	up to 150
Total	360,000	108,000	1,200	6,000	up to 100	up to 500

“By 2010, providing 8,000 training places per annum within TVET schools and 2,000 training places per annum for short-term courses; providing 3,000 training places per annum within non-formal education centers and community education centers nationwide; providing 5,000 training places per annum within skills training centers; and providing 200 training places per annum for Dual Cooperative Training in cooperation with Trade Working Groups for the sectors of restaurant and hotel, tourism, handicraft and wood processing industry.”

The table above shows that there are officially up to 1,200 Teachers/Trainers registered in VTE teaching profession delivering teaching services for nearly up to 45,000 apprentices in TVET schools and various TVET institutions. Approximately 40% of the mentioned training provision can be served by the officially employed teaching capacities. The missing 60% are covered by honorary teachers and calculated overtime. It is not an exception that one teacher is doing up to three jobs per day and therefore his income is growing up three times higher than his official salary. The lack of teachers and trainers as well as the continuous overload, which is the reason behind the high demand for additional paid overtime leads to the low quality and poor recognition of TVET training programs.

Result (b):

In accordance with the above mentioned figures, at least up to 3,000 new teachers and trainers should be trained and employed in public and private training institutions by the year 2015. Teachers for the envisaged “upper secondary TVET program” are not included in this estimation. (up to 5,000 Teachers are needed to implement this concept!) This part has to be taken into account in order to deal successfully with the overall demand situation of the reform programs determined by the ESDF and the TVET strategy and Master Plan. This includes the training provision of Technical and Vocational Education and Training (TVET), Integrated Vocational Education (IVET), non-formal Vocational Education, upper secondary education, dual Cooperative Training (DCT) and further training. Once this reform program will be implemented and the training programs will be running smoothly, the demand of teachers and trainers will increase enormously – at least to the double of the above forecasted figures.

Comparing results of labor market and supply driven demand

The results of the demand and the supply approach shows:

- Both calculations underline the alarming situation about the high demand of teachers and trainers as compared to existing VTE provisions.
- The demand driven approach, based on socio-economic development targets and figures from 7th SEDP, will have many implications to push up expansion of TVET school development in qualitative and quantitative matters.
- The supply driven calculation seems to be not fully in line with the socio-economic targets. Otherwise it shows awareness of Vocational Teacher Education by formulated targets for quality assurance of TVET.
- It seems to be more realistic to apply the above mentioned forecast to a long time period until 2020. (two five year periods)
- Compared to these results, the yearly prognosticated VTE capacity is tenfold higher than the current capacities at VEDC (45), VTTD /FE (25) and external capacities (up to 30).
- All above mentioned estimations are not yet specified in terms of professional teaching areas.

To summarize, the above mentioned facts and figures prognosticate that up to 5,000 teachers and trainers have to be trained and employed from 2010 until 2020. This requires a yearly VTE capacity of up to 500 Teachers and Trainers of different qualification levels involved in different programs and institutions.

CURRENT MODEL AND INSTITUTIONAL STRUCTURE OF VTE

Lao conventional VTE model

Due to financial and personnel problems both institutions are currently not able to provide sufficient qualified personnel to follow up the requirements and demands of the TVET strategy and master plan 2008 – 2015. VEDC and VTDD together are able to provide yearly a VTE capacity of at most 40 Higher Diploma (HD) students and 25 Bachelor (Bc) students.

Within the conventional model of VTE in Lao PDR, students pass a study program either in a non-academic (VEDC) or in an academic institute (VTDD). They are studying one subject matter area in addition to professional pedagogic and didactics. Most of the students of the Higher Diploma Program (non-academic study program) are graduates from TVET training institutions (11+2). The study program contains for all of them two years (11+2+2). The VTE Bc-program offers students a five-year study program.

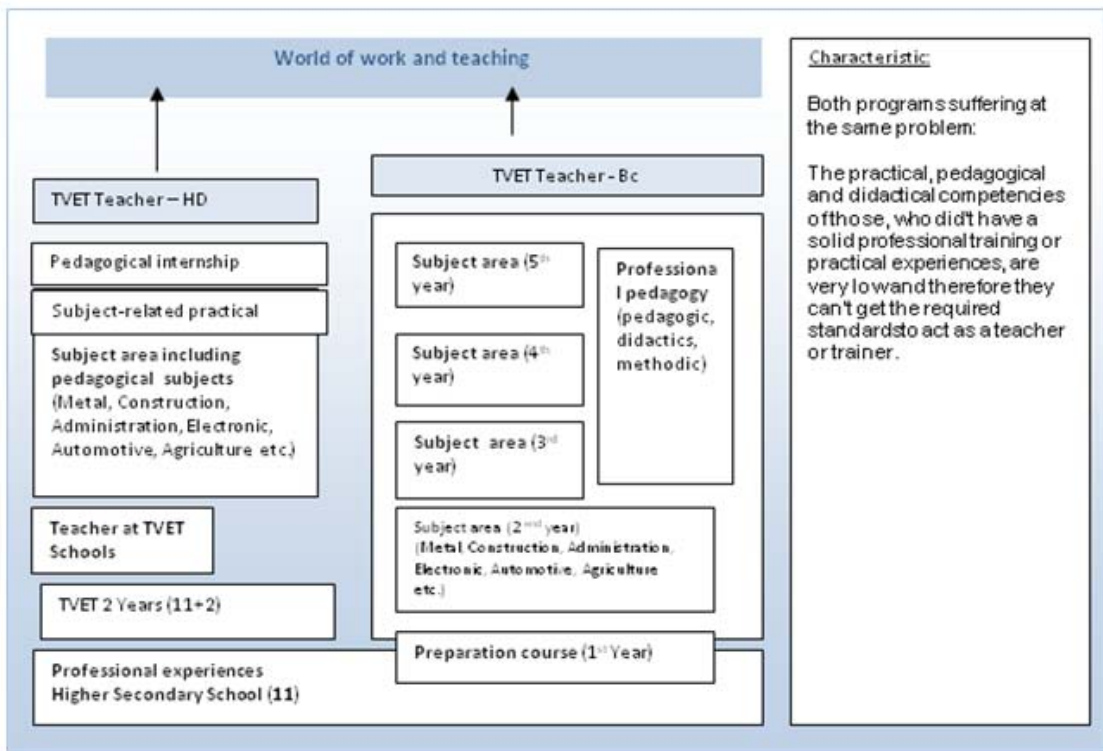


Figure 2: Conventional Model of VTE

Students in this program have to study first their chosen professional subject area like Mechanical Engineering, Electrical Engineering, Civil Engineering etc. In their third year they attend additional professional courses and lessons in pedagogical, didactical and methodical subjects. This program is under consideration and for modification per student needs and with more emphasis to the acquirement of practical competencies. Furthermore, a Tracer Study on this subject has been carried out by the Vocational Teacher Training Division of the Faculty of Engineering / NUoL.

Current institutional structure of VTE

The institutional system is still in an embryonic stage. The system is insufficiently defined, structured and so far not completely approved as regulatory institutional framework by the GoL.

Related to that and due to other reasons recognition for VTE in the public and private sector is still low. The Vocational Teacher Training Department (VTTD) at the Faculty of Engineering (FE) of the National University of Laos and the Vocational Education Development Centre (VEDC) are the main institutions of Vocational Teacher Training and Education. Both institutions have specific targets and mandates in providing the TVET system with well qualified teachers and trainers.

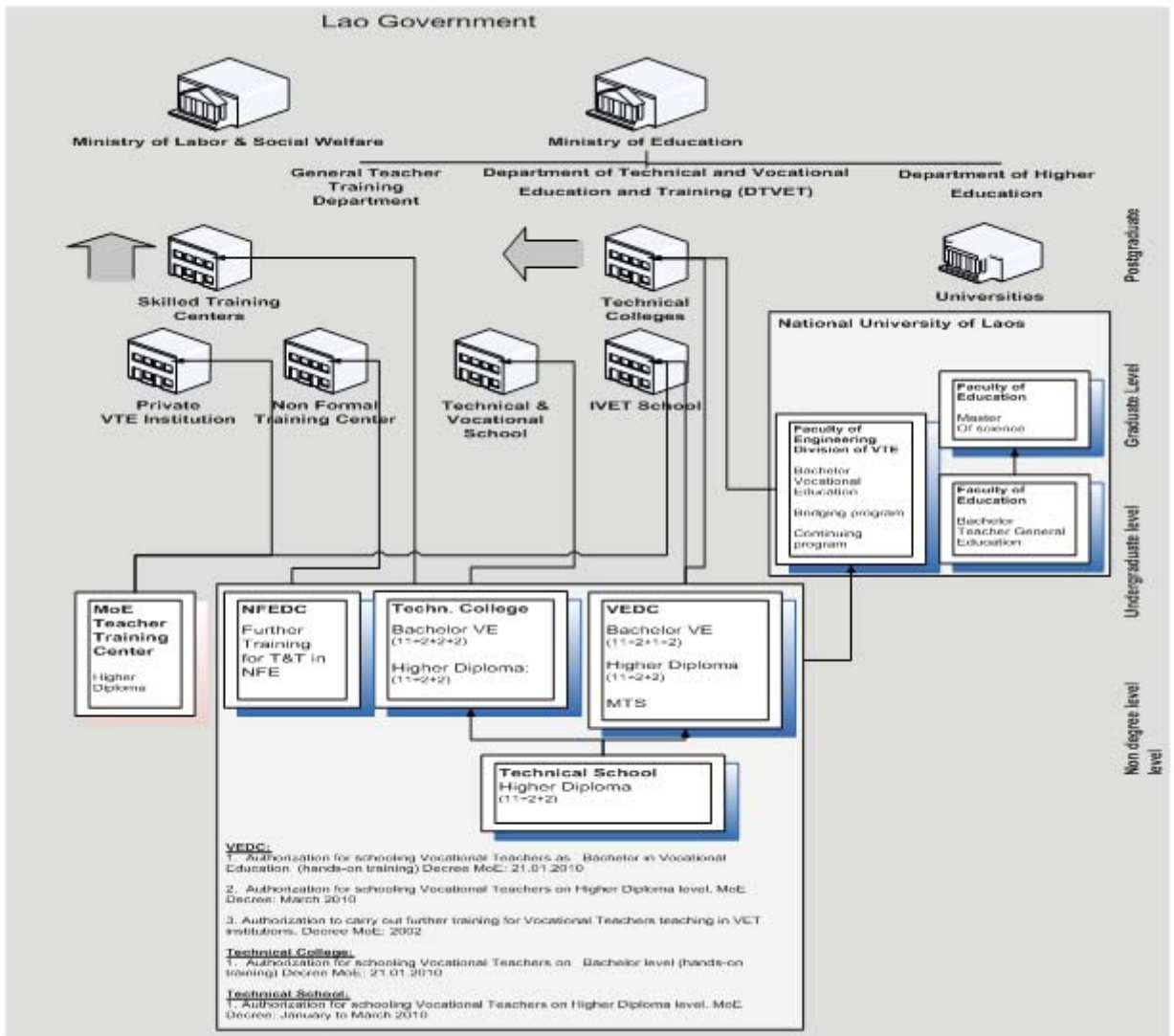


Figure 3: Current institutional structure of VTE

While VEDC's responsibility refers mainly to teachers training of higher diploma level including short term further training programs for teachers and trainers, the NUoL became the responsible institution to develop VTE of undergraduate and graduate level to serve TVET for the future.

Reform requirements of VTE in Lao PDR

VTE is neither an isolated field nor an arbitrary case. Vocational teacher education needs to be equally aligned with the above mentioned challenges, in a quantitative and a qualitative sense and should be

seen carefully as the crucial point for the successful implementation of Lao government development strategies and TVET-reform measures announced in the ESDF and the Strategy and Master plan of TVET 2008-2015.

The enhanced VTE capacity must be fully functionally and operational as soon as possible if it will have some impacts to the above described goals and targets of the 7th and 8th Five Year Plan within a clearly defined time line of 2011 to 2020. Besides the above mentioned alarming quantitative aspects, other issues have to be analyzed and improved immediately before, as they are:

- Institutional and capacity development
- Completion and/or further development of legal and regulatory VTE frame work
- Budgeting and financial implications to VTE
- Personnel implications (Lecturers and Managers)
- Modernization of teaching facilities and respective equipment
- Social status and financial situation of teachers and trainers
- Quality improvement of teachers and trainers training of different qualification levels at VEDC and FE/NUoL

Decisions on vocational teacher education are influencing TVET policy and strategy development. In so far as VTE reform measures are depending on political and administrative decisions of responsible government institutions, as they are the MoE and the National Training Council. The important documents are described above.

IMPROVED VTE MODEL AND LANDSCAPE BY 2015

Envisaged VTE - Model by 2015

The envisaged blended Model of VTE combines traditional and innovative VTE approaches which will be offered from the Department of Vocational Teacher Education at the Faculty of Engineering / NUoL and the Vocational Education Development Centre and some competent Technical Colleges which are selected from the Ministry of Education to train Vocational Teachers.

This kind of blended model can provide a broad range of already experienced approaches and innovative aspects to cover the needs of VTE in the short and long run. The model provides studies at a university level as well as studies at non-degree institutions like VEDC or Technical Colleges. The permeability of this blended model is guaranteed by law and provides access for students or decree holders from VEDC and Technical Colleges or for practitioners (e.g. young engineers or technicians) to upgrade their pedagogical and technical competencies by continuing their education and training at university level within a bachelor or master degree program.

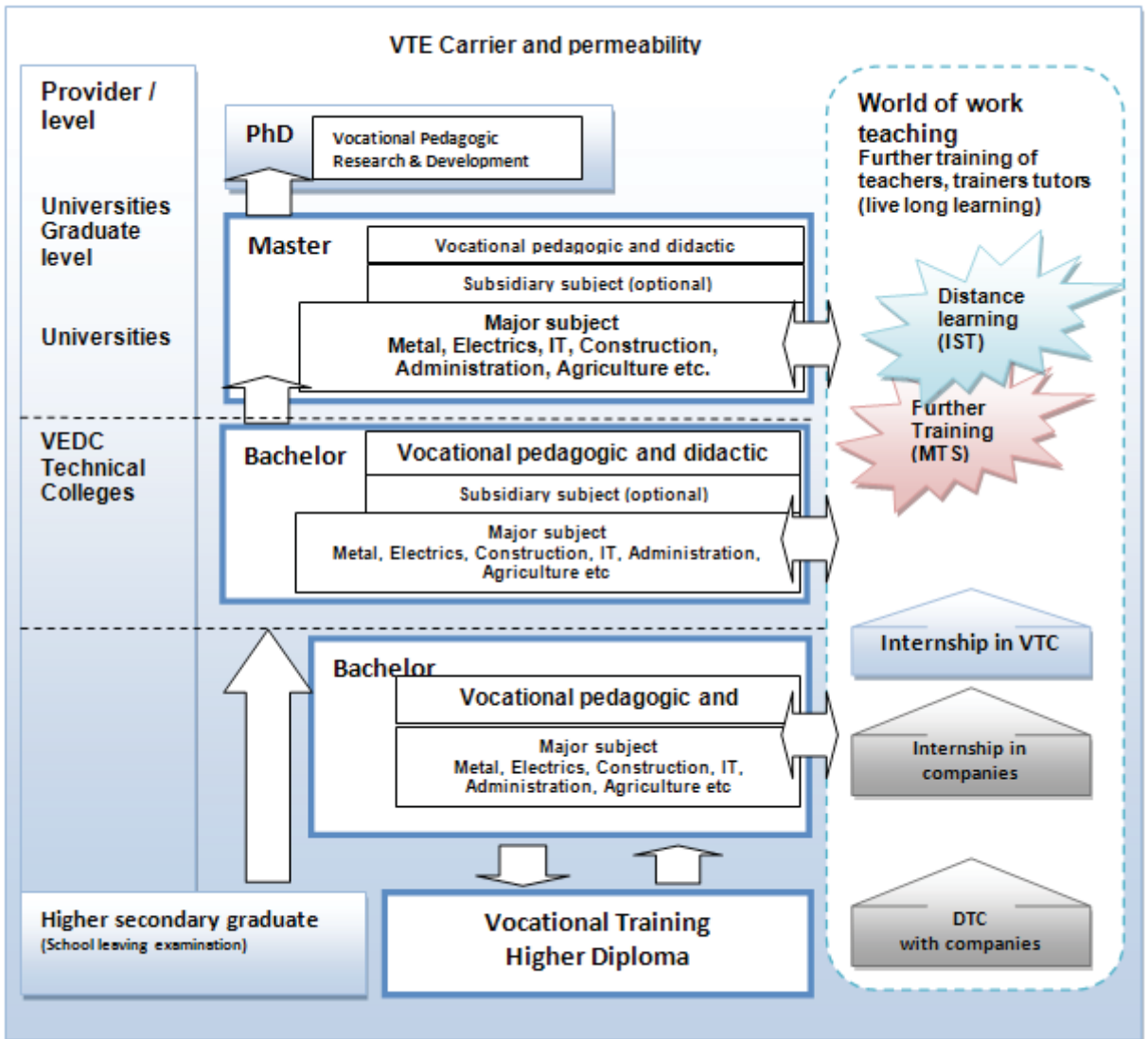


Figure 4: Blended Model of VTE Laos

The Blended Model offers the following new potentials with reference to the above mentioned reform measures and development principles:

- It creates more training capacities by using all potentials in a harmonized matter (VEDC, Technical Colleges, all universities from south to north).
- It uses synergies and avoids barriers for students (dual approach).
- It opens up access to VTE in general and to a flexible top-up qualification carrier.
- It establishes comprehensive, transnational standards and curricula
- It improves the quality and efficiency of the education of vocational teachers (cooperation with leading enterprises in dynamic economic sectors).
- It integrates further training.

Furthermore we see the blended Model as a reference frame to finally harmonize and enhance the sustainable institutional structure of VTE for the future.

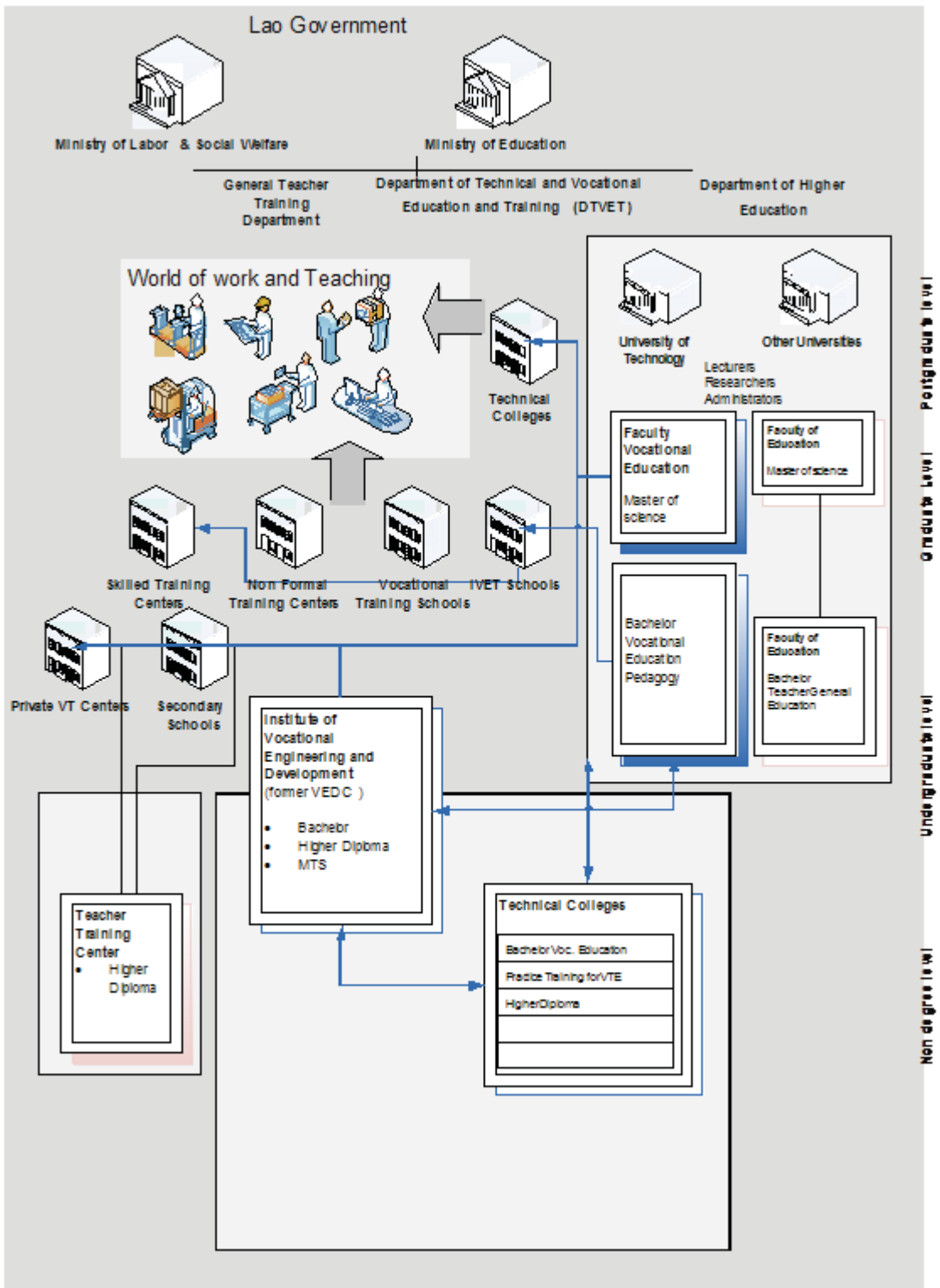


Figure 5: Envisage institutional landscape by 2015 (midterm perspective)

SUGGESTIONS & RECOMMENDATIONS FOR INSTITUTIONAL DEVELOPMENT OF VTE

The following suggestions and recommendations are indispensable to achieve demand oriented and sustainable institutional development of VTE. We presume that the following listed recommendations could be a kind of valuable “development principles for VTE-development and vocational teacher promotion” in all countries. While RCP-working group 2 (by RMUTT and IBB), has developed such reflections for VTE development in 2010, the RCP-working group 4 has further developed these ideas based on internal discussions between the NUoL and the Ministry of Education. Complementary to that the fact finding mission of Lao-German Co-operation to establish a new Vocational teacher training project in Lao PDR has newly initiated a controversial political debate which helps to focus more attention to this research subject.

Most valuable inputs were delivered and used from the findings of the tracer study of the VTED of FE/NUoL. Enriched with further reflections and newly made experiences this documented outcome has been presented and discussed at the Workshop of WG 4, in September 2010 in Vientiane and further on with the Department of Higher Education and the Department of Technical Vocational Education of the Ministry of Education and last but not least in numerous expert meetings of the Faculty of Engineering in March 2011.

Reform orientations and perspectives

The following priorities should be seen as a form of comprehensive and long term reform orientation and perspectives in order to clarify and qualify the ongoing process of VTE-development in Lao PDR. The research team strongly recommends to acting administrations, and public and private institutions to prioritize the proposed measures in recognition to the given situation and finally to define and to adopt a “minimum carter of institutional development priorities” within their respective areas of responsibilities (or countries) and to interact with respective local and regional VTE-networks together. The exchange of experiences, research results and documents are of great interest for all involved partner institutions.

Table 5: Most needed reform orientations and perspectives of VTE development in Lao PDR

Priorities	Actions needed
VTE Policy development (...with the focus to enhance access and promotion of VTE! Recognize the importance of TVET and TVET teacher education as a key function of developing countries by paying more attention and create favorable conditions on investment)	<ul style="list-style-type: none"> • Establish strategy and policy of VTE fitting to socio-economic development needs in Lao PDR • Reform TVET teacher training system through national planning on resources to avoid mismatch between demand and supply and clarify responsibilities of central level • Sharpen profile of existing models of VTE • Initiate development of VTE-standards and respective curricula and elaborate appropriate rules and regulations • Introduce appropriate incentives to promote access to VTE especially for woman and for technically well qualified people.
Quality assurance (Recognize that quality is the most suitable strategy to improve the TVET system)	<ul style="list-style-type: none"> • Elaborate and promulgate professional competency standards of vocational teachers through policies, regulation and strategic projects • Establish teaching license (certification) system through certification and assessment for other professionals who want to be TVET teachers or trainers • Improve the teaching competence of staff in TVET teacher education institutions through the introduction of well balanced theoretical and practical study programs • Introduce appropriate quality assurance and management system

Institutional structure and management of VTE	<ul style="list-style-type: none"> • Formulate and promulgate regulatory frame work for VTE-institutions • Clarify responsibilities and mandates of VTE-institutions • Foster institutional landscape of VTE and stimulate co-operation and interaction • Improve qualifications for lectures and managers
Cooperation with industries (shift VTE-development strictly to labor market demand and practice oriented teacher qualifications)	<ul style="list-style-type: none"> • Elaborate and implement policies focused on incentives (such as allowance, taxes and salaries) to encourage and attract experts, scientists, technicians in enterprises, and craftsmen interested and involved with vocational training as instructors and lecturers. • Set up and implement policies and regulations on incentives to encourage industries, businesses and services sectors involved in training by reducing taxes as incentive, CSR activities (Customer Social Responsibility) for example.
Social status and certification system (appropriate social recognition and reputation of TVET teachers, trainers, lecturers and managers)	<ul style="list-style-type: none"> • Improve social status and salaries • Setting up attractive work conditions and salaries for teachers, trainers, lecturers, academics and managers • Legally introduce certification system (compare also competency standards) for TVET teachers and managing staffs and train them to reach at national and regional level.
Gender stream (Imbalance between male and female in TVET teacher education)	<ul style="list-style-type: none"> • Set up suitable national policies to encourage women for professional carriers in TVET and TVET teacher education • Set up governmental policies to support disadvantaged female students especially in rural or remote areas to participate in TVET and TVET teacher education (especially in IVET-institutions and for non-formal vocational training).
Promote research and instruction	<ul style="list-style-type: none"> • Establish action oriented research and research networks and promote research projects • Enhance further study or research in the aspects of TVET teacher education and training especially in the micro-aspect such as teaching and learning theories and methods, teaching materials and textbooks, classroom learning situation, evaluation and examination, teacher license and qualification, implementation of practical education etc.

The above mentioned table of priorities shows, that VTE-reform measures are needed immediately and the request would be a multi-dimensional and comprehensive task of different levels and with public and private authorities and stakeholders.

In the light of Laos reform measures, well-implemented study programs related to the new challenges in demand-oriented and qualitative TVET and attractive working conditions are indispensable to mark a breakthrough in the development of TVET in the next five to ten years.

VTE development priorities and actions in a short run

Until now there is no qualified and well prognosticated policy available to steer a farsighted and harmonized discussion of Vocational Teacher Education development. Almost all important TVET development targets of the Lao government are not detailed with figures expected impacts and the implications to VTE-development. Therefore, decisions related to further developments of VTE should be more deeply analyzed and well-considered by MoE together with all involved partner institutions.

Only a highly developed VTE System with quality VTE institutions and recognized programs will attract young people to work in TVET with high motivation and commitment. The “future VTE-system” will finally support the expansion and improvement of vocational education and training in Lao PDR by the “delivery” of competent teachers, trainers, instructors and school managers for demand-oriented and qualitative technical education and training in schools and companies. Furthermore, specific training

challenges have to be further developed to conduct demand and workplace oriented TVET approaches like e.g. the ‘Integrated (formal and non-formal) Vocational Training Model’ (IVET), which is among others, related to the implementation of newly established “IVET-Schools” in all provinces of the country. This includes the Dual Cooperative Training Concept (DTC) which is highly demanded in the construction, tourism, furniture and mining sector in Lao PDR.

The ways and steps to setting up a comprehensive institutional structure of VTE will be further discussed with attention to the alignment of demand orientation versus supply orientation of TVET. Major tasks in this context of complex and permanent reform measures from now until 2020 are amongst others:

- Establish and conduct “National Qualification Frame Work for Vocational Teacher Education”
- Elaborate and promulgate rules and regulations for initial vocational teacher education and training of degree level and undergraduate education as well as of non-degree level, further training and upgrading
- Analyze and harmonize existing programs, degrees and certifications of VTE qualifications and promote high qualified academic study programs at university level
- Setting up VTE Standards and new study programs
- Establish quality standards, quality management and quality assurance system
- Promote existing institutions and establish new and high efficient VTE institutions and new study programs
- Establish attractive work conditions and salaries for teachers, trainers, lecturers, academics and managers
- Co-operate with the private sector of all levels of intervention
- Exchange of scientific experts, student and concepts and promote international cooperation

The responsible Ministry of Education and Sports should invite all public and private stakeholders in the field of TVET to discuss in a “round table process” this subject carefully and with strength of purpose. Major tasks and steps to succeed in this high complex and responsible matter would be as follows:

- Assign expert group for “VTE Reform Policy Project” (VTE-RPP)
- Elaborate “VTE Reform policy and project design frame work 2020” and work out one respective roadmap
- Establish sub working groups to clarify responsibilities and mandates of involved public and private institutions (discuss and fine tune VTE concept and road map)
- Invite involved VTE institutions and relevant international donors to streamline the reform processes (e.g.: “National Workshop on future perspectives of Vocational Teacher Education”, under steering of Ministry of Education and Sports)
- Streamline “VTE reform measures” with international and bilateral donors and partners, amongst others:
 - a. Lao-German Development Cooperation, e.g. Lao-German Program on Human Resource Development for Market Economy and Lao-German Vocational Teacher Education Project 2011-2015
 - b. ADB Project: Strengthening Vocational Education and Training in Lao PDR 2011-2015
- Elaborate decision paper (MoES – Decree: “VTE Reform Project and Roadmap 2020) and forward to the Minister for approval.

The National Training Council (NTC) in his political function as cross-national forum for TVET policy and strategy development and implementation should play a major role within the whole process of the envisaged VTE Reform. NTC together with MoES and MoLSA should highly support this reform project, for example by creating a special commission of VTE and TVET experts coming from public and private

sector to analyze the ongoing developments and to adjust, if it is necessary, the ongoing discussion process and respective implementation activities.

The NTC furthermore should invite all NTC members to articulate and discuss from their own institutional perspective VTE reform measures of central and institutional level. The authority of the NTC will encourage the decision processes of multi-dimension levels and with different public and private authorities and stakeholders over the next five year period.

PROFILE



Dr. Rolf Gennrich is a lecturer and consultant for TVET Policy and Strategy Development, Labor market-oriented and integrated vocational education and training. He was associated with TVET for 45 years and has been assigned to several countries such as Germany, Vietnam, Tunisia, Laos, Sri Lanka, China, Thailand and Oman as a consultant and academic person in-charge with improving and revitalizing TVET Education and systems in these areas. .

He is a holder of a Doctorate in Vocational Education and Adult Education with an engineering background and was assigned as a consultant, program director, project manager, chief technical adviser and structure and organizational development implements throughout his career. He is currently based in Thailand/Laos.



Dr. Boualinh Soysouvanh is currently the dean of the Faculty of Engineering at the National University of Laos. He is the project manager of the AUNP Project on Collaborative Development of Post-graduate level training materials that focuses on the design of synchronous and asynchronous digital circuits. He is also a coordinator of the National University of Laos for the Great Mekong Subregion Academic and Research Network (GMSARN) and a Project Manager for the EU-ASEAN Link project on Master of Environmental Engineering.

Before his current assignment, he has worked on government agencies such as the Ministry of Communication (Ministry of Post, Telecommunication, Transport and Communication) and the Ministry of Education. His specialization includes research, quality control and supervision of projects and TVET policy implementation.

USE OF ICT FOR PROFESSIONAL DEVELOPMENT OF TVET EDUCATORS IN INDIA

Dr. Sunil Dutt

*Associate Professor
National Institute of Technical Teachers
Training and Research, Chandigarh, India
sunildut2002@yahoo.co.in*

Dr. K.M. Rastogi

*Director
National Institute of Technical Teachers
Training and Research, Chandigarh, India
drkmrastogi@yahoo.com*

Dr. Rakesh K Wats

*Associate Professor
National Institute of Technical Teachers
Training and Research, Chandigarh, India
rakeshwats@yahoo.com*

INTRODUCTION

The rapid pace at which changes and advancements are taking place in technology pose a great challenge to training and supplying the right kind and quality of students from one system to another. There are primarily three categories of teachers needed by the technical education institutions in the country, i.e., teachers for ITIs/VTIs/CTIs, polytechnics, and IITs/Engineering colleges including technical universities. These teachers do not possess any formal certificate/degree for imparting instruction. Teachers of each of these categories play an equally important role in the development and growth of the nation. These institutions especially for TVET, therefore, need teachers/educators who have the required knowledge and skills to impart effective instruction in classrooms.

Technical and Vocational Education and Training (TVET) has an important role in imparting skills training for employment, self-employment and enterprises. However, TVET is often regarded as inferior or as second choice after professional or higher education. The education system continues to be primarily directed towards offering university degree. The stigma attached to technical and vocational occupation still persists. Under the XIth Plan, vocationalization of education has received a boost with more funds being allocated for the purpose. Besides, it is also being ensured that the marginalized sectors of the society, including women, get adequate representation in these courses. It can thus, be hoped that TVET will play a major role in improving the lives of the people of India.

In addition, the training of teachers of TVET is largely influenced by the nature of curriculum matching with requirements, quality of instructional processes, management of instructional system and the role played by these institutions in training of their students. Very meager facilities exist today in the country for training and continuous development of requisite capabilities in the educators of TVET.

Teachers, over the years, have been viewed mainly in the context of classroom teaching and massive efforts have been made to improve their teaching competencies. The emphasis now is shifting to develop professionalism beyond classroom, as the teacher in the present context needs to assume multiple roles. NPE (1986) stresses the multiple roles of teaching, curriculum development, consultancy, research and innovation for technical teachers. In addition to being a master of a specialized field of technology,

the teacher should possess the essential knowledge, and skills related to engineering and technology, pedagogy, educational management, interpersonal relations, research and innovation. If teachers have to assume these new roles, provisions for training must be made to enable them to acquire the necessary capabilities to perform these roles. Since technology has brought in revolutionary changes world over in every walk of life and has an important role to play in social transformation by disseminating knowledge to the society, thus ICT enabled education should focus on all disciplines. One caution is that teacher-taught interaction should not be ignored in the process of technology-enabled-teaching. Technology can act as a powerful vehicle for achieving excellence in education through better administration and management.

This paper describes the potential of ICTs as well as the issues and barriers to their implementation in TVET based on review of literature. Many success stories of ICT from across the world are available. Two of the most used technologies in instruction are video and computer assisted instruction and their use in teaching – learning and training is increasingly being seen in India. The paper also sought to answer the question: Which instructional method (i.e., CAI, Video and Lecture) will produce the greatest amount of immediate recall?

POTENTIAL OF INFORMATION AND COMMUNICATION TECHNOLOGIES

Countries in Asia and the Pacific region are at different stages of ICT development, in terms of both infrastructure and application of ICT in teaching and learning. ICTs applied in education offer huge potential to stimulate and realize the human capital which has profound implications to education and training. Without improved efficiencies in the present education delivery systems among developing nations, it is unlikely that these countries would be able to develop the additional human capital needed to achieve self-reliance in building a competitive economy in the context of the engaging cutthroat competition in the globalizing economy. In developed countries, the question goes beyond whether ICT can support education but how much, what, where and how, ICT can provide value to the existing system. It is thus, imperative to study how ICT can be rapidly diffused into Technical and Vocational Education and Training (TVET) systems by knowing what practices, strategies and approaches are in place to successfully integrate ICT in education especially in TVET in a sustainable manner.

Technology can cater to various stakeholders of the education system. An education management system can help administrators to access data and monitor the education system. A digital library can cater to the needs of teachers and students. Web based discussion forums can break teacher isolation and involve them in academic discussions. Technology enhanced distance education opportunities can help the professional development of teachers. Online training can meet the requirements of continuous training and life-long learning. Self-learning materials and virtual schools/colleges can minimize the dependence of students on the limited institution based experience. School/polytechnic drop-outs may be offered online tutorials to enable them to continue their studies at their own pace.

ICTs can enhance the quality of education in several ways: by increasing learner motivation and engagement, by facilitating the acquisition of basic skills, and by enhancing teacher training. ICTs such as videos, television and multimedia computer software that combine text, sound, and colorful, moving images can be used to provide challenging and authentic content that will engage the student in the learning process. Interactive radio likewise makes use of sound effects, songs, dramatizations, comic skits, and other performance conventions to compel the students to listen and become involved in the lessons being delivered. Networked computers with internet connectivity can increase learner motivation as it combines the media richness and interactivity of other ICTs with the opportunity to connect with real people and to participate in real world events. This list can be enlarged considerably to include various options for everyone in the education sphere.

There are a variety of different technologies that can be used in TVET. Each of these technologies has its own redeeming qualities and limitations, and different situations call for different technologies. A few to mention here are: Audio-Cassette Tapes; Radio; Video tapes; CD-ROM and DVD; Internet/Web-

Based Training; Web-Based Training (WBT) Programs; Audio/video conferencing; audio/video graphics; Interactive Television; Multimedia presentation etc. TVET educators need to keep up to date in order to maintain their occupational literacy skills. Those involved in the integration of ICT-mediated learning need training in the pedagogical applications of ICTs for teaching and learning.

It is a fact that the full realization of the potential educational benefits of ICTs is not automatic. The effective integration of ICTs into the educational system is a complex, multifaceted process that involves not just technology but also curriculum and pedagogy, institutional readiness, teacher competencies, and long-term financing, among others. Improving the quality of education and training is a critical issue, particularly at a time of educational expansion.

It is necessary, however, first to determine whether ICT is actually a more effective teaching tool than the traditional in-service teacher training programs offered by training organizations for teachers of higher education. Will teachers/students retain more information received through a lecture, or from a video or a computer assisted instruction? Will the technology produce greater amounts of immediate recall? Will the teachers/students be able to retain the information received through ICT over an extended period of time?

SUCCESS STORIES AND RESEARCH

Many success stories of ICT from across the world are available. However, keeping ground realities in mind, it is necessary for us to see how we may optimally use ICT to remove some of the ills of our education system. Any new intervention in education must be clear in its goals and based on learning from previous experiences and situations.

Integration of ICT into various fields of education and training has been a topic of discussion by educational researchers (Wang, 2009; Howie and Blignaut, 2009; Bryderup et al., 2009; Rogers, 2002; Gulbahar, 2007; Louw et al., 2009, Jimoyiannis, 2010), organization (OECD, 2004; UNESCO, 2008; ADB 2009), and stakeholders in other sectors of the economy. In fact, ICTs gained its application in almost all areas of educational specialization; in architecture (Wang, 2009), mathematics and science (Singh, 2001; Pabla, 2006; Kochhar, 2007; Jindal, 2008; Howie & Blignaut, 2009; Sama, 2011; and Sood, 2011), social sciences (Louw et-al, 2009), comparative studies (Blignaut et al., 2010), geographical information system (Muniandy and Lateh, 2010), teacher education (Usun, 2006, 2009), vocational education; (Jantrakool, 2010) and in other human development programmes which are too numerous to mention.

Two of the most used technologies in instruction are video and computer assisted instruction. The use of video and computer technology in teaching – learning is increasingly being seen in India both in institution based programs as also in distance learning programs. Lecture-based video programs and CAI packages are being developed and disseminated by many institutions like CIET (NCERT), IITs, NITTTRs and other agencies like ‘Marg Darshan’. In view of the large investment in creating infrastructure for production of video and computer assisted instruction, it is necessary to study the effectiveness of such tools in terms of learner achievement as also other related factors like motivation, type and nature of materials to be produced and the strategy for their development, and, the type of other support learning materials required. Research, in comparing CAI, VAI, and the traditional lecture format, although limited, has been used to pinpoint the particular power of each to provide for immediate recall of information presented to the students.

Ukkonen, (1987) published a general guideline of how much one should recall from hearing and seeing information. Her research states that of the things we hear, we remember 70% after three hours and 10% after three days. Of the things we see, we remember 75% after three hours and 20% after three days. Of the things we see and hear we remember 85% after three hours and 65% after three days. Judging by these numbers, she expected the video group to have the highest mean score on immediate and long term recall tests.

The research done by Gagne and Paget, (1980) tells a completely different story from Ukkonen's (1987) guideline. In this study, it was found that after being out of class for eight months, the average total retention of the information received from the class was 58.76%. In other words, 58.76% of the material presented through lecture was retained by the students. This percentage of long term recall from lecture closely resembles Ukkonen's guideline for recall of audio-visual after three days rather than lecture.

Instructional video also makes a claim to produce high levels of immediate and long term recall. In a study by Klees (1979), it was found that a group of Mexican ninth graders using instructional video in math and science scored significantly higher on achievement tests than the group learning through traditional methods.

Sodhi, GS & Dutt, Sunil (1987) concluded that educational television programs more effective in terms of achievement than traditional teaching. Sterltare (1991) showed that the use of mathematics video tape in first year algebra had a highly positive response. Bhattacharya (1996) concluded that ETV programs coupled with self-learning materials can help students learn equally well as learning from teachers and textbooks. Such educational materials can serve as either alternative or supplementary materials to direct teaching. Idayavani (2003) revealed that teaching through video tapes was not only effective and impressive but also motivating because it helped in building concepts by increasing the curiosity of the learner. Singh (2001), Pabla (2006) and Sood (2011) found CAI & VAI as most effective instructional strategies.

Video technology can be used as a tool for facilitating vocabulary acquisition. In a comparative study of 4th, 5th and 6th grade students with learning disabilities, analysis of pre, post and follow-up tests two weeks after the completion of the lessons indicated that students in the video instruction had statistically higher word acquisition scores than those in the non-video group (Xin & Rieth, 2001).

There are conflicting views on the effects of CAI on recall of information. Paden & Barr, (1980), found that students using the CAI program scored significantly higher on the final exam than the students who only attended the lectures. Lawson (1998) found that low achieving students receiving CAIs would show increased academic gains in mathematical computations, concepts and applications as compared to a similar population not receiving CAI. Sharma (2006), Kochhar (2007), Jindal (2008) and Sama (2011) found CAI as most effective instructional strategy. In contrast, Tsai & Pohl, (1980), found that there was no difference between their CAI group and their lecture group for both immediate and long term recall.

Computers empower students with special needs in several ways. (Weir, 1987) documented the effectiveness of using computers to develop and assess learning strategies for children with cerebral palsy, autism, or severe learning disabilities. Similarly, (Michayluk & Saklofske, 1988) have described the use of computers as a socializing agent with hyperactive children. The main theme in this research has been on the creation of learner-centered environments and the development of positive interactions among students (Ryba, Selby, & Nolan, 1995).

Despite numerous studies revealing the extent to which ICTs are applied at different educational specializations, literature on the effective integration of ICTs into TVET field is scarce and needs further exploration to highlight the TVETs' level of requirement for ICTs integration. Therefore, this paper attempts to add to the available literature on ICTs' integration in TVET by bringing out clearly the need for effective integration of ICTs in TVET, provide overview of the challenges to the effective integration of ICTs in TVET. The paper concludes by recommending for a proper planning and management of ICTs resources in TVET.

This paper took these concerns into account. The four instructional methods used were lecture, CAI, video alone and VAI. Each method contained the same information and subjects and each instructional group was given the same test for immediate recall.

WHICH INSTRUCTIONAL METHOD (i.e., CAI, VAI, Video alone and Lecture) WILL PRODUCE THE GREATEST AMOUNT OF IMMEDIATE RECALL?

Findings in the present research study (carried out on a sample of 160 students studying mathematics in two secondary schools of Chandigarh) indicate that CAI, VAI and lecture methods produce greater amounts of immediate recall than video alone, i.e., video alone is less effective in producing immediate recalling of concepts than the other three methods. The findings of the present study suggest possible related uses for each of these instructional media. Paden and Barr (1980) found that students using CAI and lecture together scored significantly higher on final exams than those who only received lectures. This suggests that combination of instructional media enhance immediate recall. Since CAI and lecture both yielded high immediate recall rates, perhaps combining the two would create even higher long term and immediate recall. As the CAI group scored high in immediate recall, CAI would have great potential for use as a study guide or review tool before tests. Lecture coupled with CAI or VAI as reinforcement has a possibility of raising immediate recall. A computer assisted instruction session could follow a lecture as a reinforcement tool or could be used to stimulate discussion and interaction from students.

In conclusion, while this research shows that CAI, VAI and lecture formats seem to provide better opportunity for immediate recall of information than video alone, further research is needed to test whether any single method of instruction or combination of these instructional methods can ensure significant amounts of long term recall of concepts in a given class situation at the TVET level.

ISSUES AND BARRIERS TO IMPLEMENTATION TO ICT IN TVET

Now the questions are: Does ICT-enhanced learning really works? How much does it cost? Will ICTs replace the teacher? What are the challenges in ICT-enhanced education? In fact, the educational effectiveness of ICTs depends on how they are used and for what purpose. And like any other educational tool or mode of educational delivery, ICTs do not work for everyone, everywhere in the same way. The relevance of ICTs in the field of TVET cannot be exhausted by studies available in the “knowledge-based” society. The world of work is in continuous change as ICT itself, thus posing more challenges to the educators in the 21st century and the institutions responsible for their preparation.

Haughey (2002) identified the policy issues and concerns that need careful consideration in deciding whether or not to implement e-learning in TVET:

- **Infrastructure:** Appropriate infrastructure must be available to ensure equity of access and proper delivery of content.
- **Administration:** The system must provide adequate resources and support for technology integration.
- **Learning:** ICTs must be used to enhance teaching and learning.
- **Teaching:** Teachers need to be adequately prepared for using ICTs to teach and facilitate student’s learning.
- **Content Development:** Content development can be costly and time consuming, and the content itself can have a short shelf life. Developing and keeping high quality instructional products up-to-date is a major challenge for TVET.

Stevens (2001) identified five barriers related to the implementation of ICT-mediated learning in TVET, namely: content and curriculum, appropriateness and efficacy of technologies, quality and branding of programmes, stakeholders’ resistance to innovations, and the digital divide.

Despite these barriers, one must appreciate the fact that the new information and communication technologies have dramatically changed the way we live, learn, and work, and even think about work. The synergy of combining globalization with new technology has had dramatic economic and social impacts. It has created new opportunities as well as new challenges and uncertainty. Many workers have been

dislocated, while a significant number of young people are structurally unemployed or underemployed. While these changes have brought about considerable challenges to TVET, they have created new opportunities for change and innovation. ICTs can play a crucial role in removing the gap between education and developing a lifelong learning culture in TVET. In spite of these potentials little is known regarding the usage of ICTs in TVET.

CONCLUSION

Teachers should make best use of technology in education and to provide access to a large number of the eligible groups without compromising with the quality. Since Technology has brought in revolutionary changes world over in every walk of life and has an important role to play in social transformation by disseminating knowledge to the society, thus ICT enabled education should focus on all disciplines. One caution is that teacher-taught interaction should not be ignored in the process of technology enabled teaching. Technology can act as a powerful vehicle for achieving excellence in education through better administration and management.

However, it certainly cannot be thought of as the replacement of teacher. ICT enabled education is the application of technologies to all aspects of teaching-learning processes and content creation for teaching and learning in various academic disciplines. In 10th Plan, UGC has formulated several schemes for empowering teachers with ICT-enabled approaches and for promoting ICT-enhanced learning, teaching and administration, providing inter- and intranet connectivity to all colleges and universities, providing access to electronic journals as a central service, creating digital repository of teaching and research materials and providing computer and internet literacy to all the teachers and administrators in the collegiate and university education system in the country. Figure 1 depicts the teacher and student centered approaches to instruction using low and high technologies.

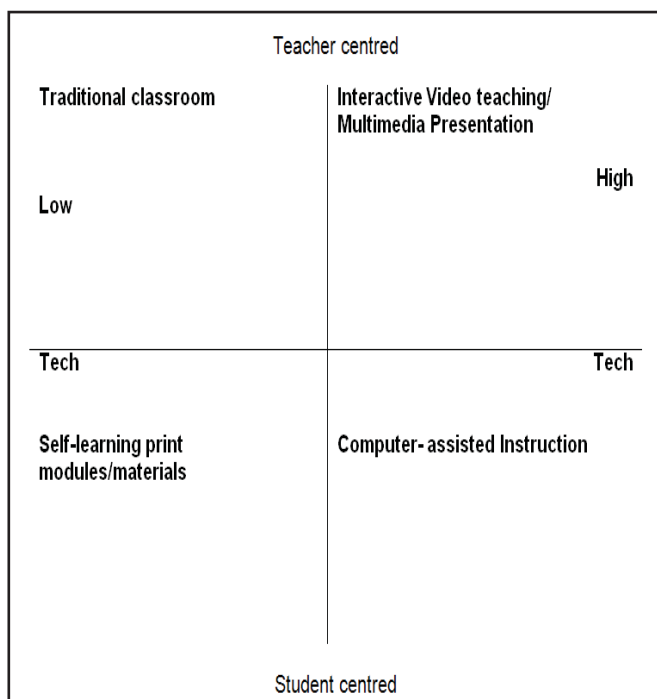


Figure 1: Changing approaches to teaching and learning

To conclude, a forum may be formed to look at the possibility of using ICT as a tool in TVET system. Its applications have not been implemented broadly. We can find the best solution suitable for the country because it is found that in India only teachers of primary & secondary schools possess teacher training certificate/degree generally as an essential qualification. Further, many educators join TVET system just after obtaining their graduate/postgraduate qualification with little/no input in effective training. ICT, therefore, can play a vital role to reform the education and training process by way of professional development of educators of TVET. If designed and implemented properly, ICT-supported education can promote the acquisition of the knowledge and skills that will empower educators for facilitating lifelong learning among students. A pilot project may be taken up for this purpose and then, based on its success, scaled up at all levels.

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PROFILE



Dr. KM Rastogi holds ME (Electrical Engg.) and Ph.D. in Management. He is presently the Director of the National Institute of Technical Teachers Training & Research (NITTTR), Sector-26, Chandigarh (India). He joined NITTTR in February, 1981. He has 44 years of experience in teaching, research and consultancy projects. His areas of specialization include Electrical Engineering, Educational Management and Curriculum Development. He has coordinated about 250 education and training programs; designed 36 diploma curricula; revised 180 diploma curricula and designed 24 vocational courses; developed 4 video films, 3 work books, 2 laboratory manuals and 3 experimental boards for laboratories; coordinated 18 research and development studies, etc. He has to his credit 2 text books (viz. Laboratory Manual in Basic Electrical Engg., and, Basic Electricity), 33 research publications (including eight in Journals), and has guided 3 M.Tech. Engg. Edu. and 2 Ph.D. thesis.



Dr. Sunil Dutt holds M.Sc. (Hons.) Chemistry; M.Ed., and, Ph.D. in Education. He joined National Institute of Technical Teachers Training & Research (NITTTR) Sector - 26, Chandigarh (India) in November, 1992 where he is presently an Associate Professor, for Education and Educational Management. He has 27 years of experience in teaching, research and consultancy projects and more than two years in industries. His areas of specialization include Educational Technology, Research Methodology, Guidance & Counseling and Educational Management. He has coordinated about 150 Education & Training Programs; developed 2 video films and 16 CAI packages/self-learning material; Coordinated 10 research and development studies etc. He has to his credit 4 text books (viz. Educational Technology, Essentials of teaching learning etc.), 42 research publications (including six in International Journals), and has guided 24 M.Tech. Engg. Edu. and 20 Ph.D. thesis.



Dr. Rakesh K Wats holds B.E.(Civil Engg.), M.E. (Irrigation & Hydraulics: Civil Engg.) and Ph.D. in Management. He joined the National Institute of Technical Teachers Training & Research, Sector – 26, Chandigarh (India) in November, 1992. Presently, he is an Associate Professor for Media Centre and Continuing Education and Faculty and handles the administration of the institute. He has 2 years of experience in the industry and 23 years of experience in teacher training, research and consultancy projects. His areas of specialization include Educational Technology and Management, General Management, Quality Management, Behavioral Sciences and Civil Engineering. He has coordinated about 130 Education and Training Programs. He has developed 2 video films and 3 Continuing Education Modules and has coordinated 34 research and development projects, etc. He has 35 research publications (including three in International Journals) to his credit.

Track D

***Good Practices and Emerging Challenges for TVET
Educators' Development: Regional Experiences
(Country Perspective Presentation)***

EMERGING CHALLENGES FOR DEVELOPING TVET EDUCATORS IN INDIA

Dr. Rakesh K Wats

Associate Professor

National Institute of Technical Teachers Training and Research, Chandigarh, India

rakeshwats@yahoo.com

INTRODUCTION

Competent manpower with appropriate skills and knowledge are the driving forces of economic growth and social development of any country. They have become even more important given the increasing pace of globalization and technological changes taking place in the world. Nations with higher and better levels of skills adjust more effectively to the challenges and opportunities of globalization.

As India moves progressively towards becoming a 'Knowledge economy', more emphasis should be placed on the advancement of skills relevant to the emerging economic environment. In the old economy, skill development largely meant development of shop floor or manual skills. Even in this area there are major deficiencies in our workforce which need to be rectified. In the new or knowledge economy the skill sets can range from professional, conceptual, managerial, operational, behavioural to interpersonal skills and inter-domain skills. Although, in general, 'Skill Development' refers to the larger objective of equipping an individual with marketable skills, however, in recent times the term has been largely used in the context of technical and vocational education and training (TVET) for various sectors of economy. Science progresses towards a better understanding of the miniscule, that is, genes, nano-particles, bits and bytes and neurons, knowledge domains and skill domains also multiply and become more and more complex.

To cope with this level of complexity a very high priority has been given to Higher Education in its Eleventh Five Year Plan in India. Establishing 30 new Central universities, 5 new IISERs, 8 IITs, 7 IIMs, 20 IIITs, 10 NITs etc. are some of the major initiatives aimed at meeting this part of the challenge of skill development. In addition a major focus has been placed on the mass scale skill development in different trades through specially developed training modules delivered by ITIs, Polytechnics, vocational schools, etc. The formulation of the National Skill Development Policy in the year 2009 and launching a National Skill Development Mission (SDM) mandated to skill 500 million persons by the year 2022 are the commendable initiatives taken by the Government of India (GoI). These aim to enhance individual employability and competitiveness of the country and thereby bring about a paradigm change in the handling of 'Skill Development' programmes and initiatives.

Some of the major issues this policy envisages to address comprise of expansion of outreach, equity and access, quality and relevance, benchmarking skill deficit, skill development in unorganized sector, setting up of sector skill councils etc. In addition to facilities, opportunities and infrastructure for such a mammoth target group requiring skills of different levels and for diversified sectors of Indian economy some of the other important parameters for the success of this mission are the development of a National Qualification Framework for the horizontal and vertical mobility of individuals and integration of vocational education and training with other main education streams for the multi-level entry and exit of students, formulation of creditable accreditation system, involvement of industry and other partners in skill development etc. The Government of India has established many new structures and organizations for the strategic planning and implementation of this policy. National Council on Skill Development headed by the Prime

Minister for providing vision and guidelines, National Skill Development Co-ordination Board for effective co-ordination amongst different agencies involved in skill development, National Skill Development Corporation to take care of skill development of different sectors of economy are a few examples in this direction. However, for skilling of such a huge number (50 million) of individuals in the diverse sectors (20 nos.) of economy, as envisaged under the mission, one of the most challenging requirement is the availability and development of a large number of qualified and competent TVET educators and trainers. This paper deals with some of the important challenges in the development of highly competent and world class skilled manpower in India. It lays a special emphasis on the development of effective TVET educators, the most significant link in the achievement of the above goal.

SKILL DEVELOPMENT: ISSUES AND CHALLENGES

In India, skill acquisition takes place through two basic structural streams—a small formal one and a large informal one. The formal structure includes: (i) higher technical education imparted through professional colleges, (ii) vocational education in schools at the post-secondary stage, (iii) technical training in specialized institutions, and (iv) apprenticeship training. A number of agencies impart vocational education/training at various levels. Higher professional and technical education, primarily in the areas of agriculture, education, engineering and technology, and medicine, is imparted through various professional institutions.

There are 17 ministries and departments of GoI which are imparting vocational training to about 3.5 million persons every year. Most of these are national level efforts and individually they are able to reach a very small part of the new entrants to the labour force. Even collectively, they provide training to about 20% of the number of annual additions to the labour force.

The quantitative dimension of the Skill Development challenge can be estimated by the following:

- 80% of new entrants to workforce have no opportunity for skill training. Against 12.8 million per annum new entrants to the workforce the existing training capacity is 3.5 million per annum.
- about 2% of existing workforce has skill training

The Qualitative aspect of challenge

A basic problem with the skill development system is that the system is non-responsive to labour market, due to a demand—supply mismatch on several counts: numbers, quality and skill types. It is also seen that the inflexibilities in the course/curriculum set-up, lead to oversupply in some trades and shortages in others. Of the trained candidates, the labour market outcomes as seen from placement/ absorption rates are reportedly very low.

The quality of the training system is also a matter of concern, as the infrastructural facilities, tool/kits, faculty, curriculum are reportedly substandard. The existing institutions also lack financial and administrative autonomy. The testing, certification and accreditation system is reportedly weak, and since the deliverables are not precisely defined, there is no effort at evaluating outcomes and tracking placements. The problem is further complicated with lack of industry–faculty interaction on course curricula and other factors.

The capacities of the TVET educators are also not in consonance with the current requirement of various sectors due to various restrictions of the affiliating agencies.

The private sector does undertake in-house training programmes and to a very limited extent, trains 'outsiders'. However, such programmes are limited to catering to their own felt needs, in the nature of captive skill development. Low-paying capacity of learners and reluctance of industries to train workers for fear of losing them to competition has resulted in chronic deficiency in private investment in this area.

India has the youngest population (average age 24 years) in the world. It means that India has a unique opportunity to complement what an ageing rest of the world needs most. The demographic structure of India, in comparison with that of the competing nations, would work to the advantage to the extent our youth can acquire skills and seize the global employment opportunities in the future. This involves co-ordination, dialogue and discussions with the State Governments, private partners and other stakeholders, arriving at estimates of number of skilled personnel required across the sectors, aligning them with the career objectives of the youth drawing up different sector-specific modules of varying duration thereby.

The launch of the major SDM with an outlay of Rs. 22800 crores by the GoI is a path breaking initiative to create a pool of skilled personnel in appropriate numbers with adequate skills in line with the employment requirements across the entire economy with a particular emphasis on the twenty high growth high employment sectors. Table 1 presents the incremental human resource requirement in vocational stream by the year 2022.

SDM Mission Objectives and Functions

Articulate a vision and framework to meet India's skill needs:

- Assess skill deficits sector wise and region wise and meet the gaps by planned action in a finite time frame.
- Orchestrate Public Sector/Private Sector Initiatives in a framework of a collaborative action.
- Realign and reposition existing public sector infrastructure ITIs, polytechnics and VET in school to get into PPP mode and to smoothen their transition into institutions managed and run by private enterprise or industry associations. Give them functional and governance autonomy.

Table 1: Incremental Human Resource Requirement in Vocational Stream (in '000s)
Source: IMaCS analysis

Sectors, requirement in '000s	2008	2022	Incremental	Proportion Vocational Stream	Incremental human resource requirement in Vocational Stream	Annual requirement in Vocational Stream
Textiles (Spinning Fabric Processing, Garmenting)	13.100	29.900	16.800	85%	14.280	1.020
Electronics and IT Hardware	906	4.129	3.223	35%	1.128	81
Leather	2.500	7.139	4.639	85%	3.943	282
Organized Retail	283	17.623	17.340	80%	13.872	991
Gems and Jewelry (including Jewelry Retail)	3.335	7.943	4.608	75%	3.456	247
Building Construction, and Real Estate	35.968	83.270	47.302	70%	33.111	2.365
BFSI	4.250	8.500	4.250	65%	2.763	197
Furniture and Furnishings	1.455	4.873	3.418	80%	2.734	195
Auto and Auto Components	13.000	48.000	35.000	54%	18.900	1.350
Tourism and Hospitality	3.530	7.172	3.642	65%	2.367	169

Food Processing	8.531	17.808	9.277	80%	7.422	530
Construction Materials and Building Hardware	1.140	2.497	1.357	40%	543	39
Chemicals and Pharmaceuticals	1.668	3.546	1.878	25%	470	34
Transportation, Logistics, and Warehousing	7.374	25.101	17.727	40%	7.091	506
Total	97.040	267.501	170.461	66%	112.080	8.006

- Establish a 'Credible accreditation system' and a 'guidance framework' for all accrediting agencies, set up by various ministries and or by industry associations. Get them to move progressively away from regulation to performance measurement and rating/ranking of institution. Rate institutions on standardized outcomes, for example, percentage graduates placed, pre and post course wage differentials, dropout rates, etc.
- Encourage and support industry associations and other specialized bodies/councils and private enterprise to create their own sectoral skill development plans in 20 High Growth Sectors
- Establish a 'National Skill Inventory' and another 'National Database for Skill Deficiency Mapping' on a national Web portal—for exchange of information between employers and employment seekers.
- Establish a Trainee Placement and Tracking System for effective evaluation and future policy planning.
- Reposition 'Employment Exchanges as Outreach points of the Mission' for storing and providing information on employment and skill development. Enable employment exchanges to function as career counseling centres.
- Enlarge the 50000 Skill Development Centres (SDCs) programme eventually into a 'Virtual Skill Development Resource Network' for Web-based learning.

TVET EDUCATORS FOR SKILL DEVELOPMENT

One of the biggest challenges in the successful implementation of the SDM of the GOI is the availability of competent TVET educators. With a mandate to provide skills of varied levels in diverse areas and allowing horizontal and vertical movement for attaining higher level skills and integration of VET with main education streams, All India Council for Technical Education (AICTE) has formulated a National Vocational Education Qualification Framework (NVEQF) for the country. It is clear from this framework that skill development programmes of different levels have to be conducted in the institutions of varied levels i.e. ITIs, vocational schools, polytechnics, engineering and other degree level institutions, Universities etc. However, in a country where there is already a shortage of educators and trainers to the tune of 25 to 30%, availability of experts for skill development is going to be a daunting task. Table 2 presents the expected number of TVET educators required for skill development in India.

Areas of Competence of TVET Educators

In order to identify the skills and competencies for professional TVET teachers and trainers, it is necessary to have a clear picture of what professional teachers do. There are essentially four areas of responsibility for which TVET educators have to prepare themselves.

Table 2: Expected Number of TVET Educators Required for Skill Development

Sr. No	Category of Institution	No. of Institutions expected to Join Skill Development Mission	Annual Target Per institution	Expected No. of Persons likely to be trained annually	No. of TVET Educators Required	Trainer trainee Ratio
1	IITs/IISc/IIMs, R&D Labs, (DRDO NPL, CSIR Labs etc.)	81	600	48,600	4860	1;10
2	NITs and other National Institutes, School of Planning and Architecture, NITIE etc.	50	300	15,000	500	1:30
3	Management institutions	1,500	100	1,500,00	5,000	1:30
4	Engineering Colleges	2,500	300	6,00,000	20,000	1:30
5	Degree/PG Colleges affiliated to Universities	13,000	150	19,50,000	63,000	1:30
6	Central and State Universities	300	600	1,80,000	6,000	1:30
7	Polytechnics	2,000	300	6,00,000	20,000	1:30
8	Vocational Schools	10,000	200	20,00,000	50,000	1:40
9	ITIs and ITCs	6,900	150	9,53,000	47,650	1:20
Total		35831		64,96,600	1,97,010	

Occupational profiles and content of the occupational field (curriculum design)

The first thing a TVET teacher deals with is the design of training programmes and curricula which are developed according to the needs of students/trainees, industry, and society. Knowledge of occupational profiles and the subjects they deal with, how they developed over time, of procedures for development and evaluation, as well as the ability to analyze labour markets are needed in order to develop appropriate course offers in TVET.

Analysis, shaping, and organization of work processes

Relevant for the work as TVET teacher, this area, covers the ability to conduct work and work process studies in the relevant occupational field. In that respect it relies heavily on knowledge of the object of occupational work and at the same time, mainly provides methodological competences which are needed not only to keep up-to-date with the changing world of employment but also take part in shaping those changes.

The object of professional work

A distinction is generally made between services related to individuals, economic and technical occupational profiles, fields, and vocational disciplines. TVET teachers have to master their subject in terms of professional work.

Analysis, shaping and organization of occupation-related learning processes

This part of a vocational discipline enables the TVET teacher to teach and to develop learning environments which are appropriate for his occupational field. These competencies include, among others, the definition of educational goals, the selection of content and methods of teaching, and the ability to apply appropriate procedures for examination and assessment.

These four areas of competence are closely interlinked with each other. However, occupational profiles can only be analyzed or developed with appropriate knowledge of the goals of the work, the tools and methods which are used to manipulate objects and achieve goals, the organizational framework in which work takes place, and the demands which are posed from different sides, e.g. the company, the legislation, the customer, and society.

Broadly speaking an effective TVET educator requires following areas of competence for becoming a thorough professional:

- Hard Teaching Skills (Subject/Discipline specific)
- Awareness of Principles of Teaching
- Aptitude and attitude for training
- Industrial experience/exposure
- Soft Skills

Table 3: Skill and Training Requirements for TVET Educators in India

Level	Skill and Training Requirements
Principal/ Director	<ul style="list-style-type: none"> • Institution Building • Strategic Planning and Management • Managerial Effectiveness • Academic Planning & Management • Human Resource Management • Monitoring, Evaluation and Performance Appraisal • Networking and Relationship Building
Head of Department	<ul style="list-style-type: none"> • Departmental management • Curriculum Design and Implementation Managerial Effectiveness • Managerial Effectiveness • Academic Planning & Management • Human Resource Management • Monitoring, Evaluation and Performance Appraisal • Project Planning and Management • Networking and Relationship Building • Skill/Subject Updating • Industrial Processes and Practices
Lecturer	<ul style="list-style-type: none"> • Educational Pedagogy • Educational Technology • Skill/Subject Updating • Curriculum Design and Implementation • Assessment and Evaluation • Communication Skills • Industrial Processes and Practices

DEVELOPING TVET EDUCATORS

The Skills and competencies in TVET educators essential to meet the present day challenges will not be achieved through the traditional forms of TVET teacher-training curriculum and delivery and its systems. A multi-dimensional approach should to be adopted to meet the objectives. These may 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 programs;
- integration of training and education in cooperation with industries and private sectors;
- life-long and flexible learning to enable the teachers to meet the higher and varying demands of the teaching job;

- knowledge and skills of using new technologies of training and education (ICT applications);
- 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.

Some of the strategies which can be used for preparing large number of professional TVET educators required for developing world class skilled work force in India are as follows:

Institutionalized Training of TVET Teachers

As skill development programs of different levels are to be conducted in the institutions of varied levels, accordingly formal and non-formal pre-service and in-service training of TVET educators can be conducted in different institutions in India, which are presented in Table 4.

Table 4: Skill and Training Requirements for TVET Educators in India

Sr. No	Category of Institution	Areas of Teacher Training
1	IITs/IISc/IIMs, R&D Labs, (DRDO NPL, CSIR Labs etc.)	<ul style="list-style-type: none"> • Highest level Conceptual skills e.g. R&D, Design etc. • Behavioural and Managerial Skills • Problem Solving Skills • Educational Technology • Educational Pedagogy
2	NITs and other National Institutes, School of Planning and Architecture, NITIE etc.	<ul style="list-style-type: none"> • Higher level Conceptual skills • Behavioural and Managerial Skills • Problem Solving Skills • Entrepreneurial Skills • Inter- Domain Skills
3	NITTTRs	<ul style="list-style-type: none"> • Higher level Conceptual skills • Behavioural and Managerial Skills • Problem Solving Skills • Educational Technology • Educational Pedagogy • Discipline/Sector Specific Skills • Inter-Domain Skills • Entrepreneurial Skills
4	Management institutions	<ul style="list-style-type: none"> • Behavioural and Managerial Skills • Problem Solving Skills • Entrepreneurial Skills
5	Engineering Colleges	<ul style="list-style-type: none"> • Discipline/Sector Specific Skills • Inter-Domain Skills
6	Central and State Universities	<ul style="list-style-type: none"> • Discipline/Sector Specific Skills • Higher level Conceptual Skills • Inter-Domain Skills • Behavioural and Management Skills
7	Polytechnics	<ul style="list-style-type: none"> • Discipline/Sector Specific Skills • Higher level Conceptual Skills • Inter-Domain Skills • Behavioural and Management Skills • Discipline/Sector Specific Skills • Inter-Domain Skills
8	Industry/Trade/Sector Specific organizations	<ul style="list-style-type: none"> • Discipline/Sector Specific Skills

Distance and Open Learning for Continuing Education of TVET Teachers

Distance education can act as a necessary supplementary mode for training TVET educators and trainers as per their convenience, pace and place. Indira Gandhi National Open University (IGNOU) and similar other state universities and institutions can play a significant role in this direction. The broad objectives of the distance learning programs for TVET educators should be:

- to update and upgrade a large number of serving TVET educators and key personnel responsible for management and quality improvement of technical-vocational education and skills-development
- to have convenient and continuing access to advance training which are of immediate relevance, cost-effective, and reflective of prime concerns to the country
- to contribute towards developing a cost-effective 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
- to design appropriate methods and learning materials(both print and non print) for skill development;

Some of the international organizations like the Commonwealth of Learning (COL) are also promoting the concept of distance education for TVET teachers.

Modularized Open Learning and ICT applications

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, programs should be flexible in nature. The flexibility may be provided in selecting the contents, time and duration of training, place of training, strategy (method and media) for training, etc. The learner should have the flexibility with the choice of course content according to job requirements. This flexibility helps to motivate the teacher to take part in the program.

ICT can play a very vital role in providing flexibility in pace, place and convenience to the trainees. With the use of ICT, training modules/packages of best experts from any parts of the world can be placed at the disposal of an individual. Its large scale application can help in developing knowledge and skills in a large populace in the diversified areas.

Industry-Institute partnership

Considering the rapid change in technology and open competitive global market demands, it is necessary that the TVET teachers also change and re-equip them with broad-based competencies/capabilities. For this, collaboration between industry/ industrial associations/sector specific organizations both at the national and international levels and training institutions can play a pivotal role. The experts and master trainers from the world of work can help in designing curriculum for training programmes, skill in handling technology and experiences of industrial processes and practices.

CONCLUSIONS

The skill development mission of the country is a gigantic task. Development of about 500 million skilled human resource is the mandate of the country to make it a competitive force to reckon with in the world. This nut seems hard to crack, where the limiting factor is the availability of competent and skilled educators/trainers to set up a chain reaction for the mass production of skilled and employable work force by the year 2022. Although, presently some institutions, industries and organizations are already engaged in this project, but as the target is very huge, some strategic planning in this direction is a must. Conventional methods of training along with rigid curricula may not produce the desired results.

Efforts should be expedited to fulfill the needs to restructure curricula, redesign procedures and reschedule process to provide flexible entries and exits to the students/trainers/educators.

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PROFILE



Dr. Rakesh K. Wats was born on April 9, 1964 and holds B.E. (Civil Engg.), M.E. (Irrigation & Hydraulics: Civil Engg.) and Ph.D. in Management. He joined National Institute of Technical Teachers Training & Research, Sector – 26, Chandigarh (India) in November, 1992. Presently, he is an Associate Professor for Media Centre and Continuing Education and Faculty In-charge for Administration in the institute. He has 2 years of experience in industry and 23 years of experience in teacher training, research and consultancy projects. His areas of specialization include Educational

Technology and Management, General Management, Quality Management, Behavioral Sciences and Civil Engineering. He has coordinated about 130 Education & Training Programs. He has developed 2 video films and 3 Continuing Education Modules and has coordinated 34 Research & Development Projects, etc. He has 35 research publications (including three in International Journals) to his credit.

PREPARING TVET EDUCATORS FOR THE NEXT GENERATION COUNTRY PERSPECTIVE - FIJI

Mr. Tomasi Naborisi

Senior Education Officer (Vocational), TVET Section
Ministry of Education, Fiji
tomasi.naborisi@govnet.gov.fj

BACKGROUND

The Republic of Fiji comprises an archipelago of more than 332 islands, of which 110 are permanently inhabited, and more than 500 islets, amounting to a total land area of 18,300 square kilometers (7,100 sq. mi). The two major islands, VitiLevu and Vanua Levu, account for 87% of the population of almost 883,125 (July 2011 est.).

The total population of Fiji is about 883,125 (July 2011 est.) and the population range of age structure ranges from:

0-14 years: 28.9% (male 130,409/female 124,870)
15-64 years: 65.9% (male 297,071/female 284,643)
65 years and over: 5.2% (male 21,187/female 24,945)

(The population growth rate of Fiji is 0.798%)

Fiji is a multiethnic island nation. The nationality of Fiji is Fijian and the national language is English. The natives of Fiji are known as I-Taukei and make up 57.3% of the total population, ethnic Indian 37.6%, Rotuman 1.2%, other 3.9% (European, other Pacific Islanders, Chinese) (2007 census). The Ministry of Education (Fiji)

The vision for the Ministry of Education is “Education for Change, Peace and Progress and its mission is “To provide a holistic, inclusive, responsive and empowering education system that enables all children to realize their full potential, appreciate fully their inheritance, take pride in their national and cultural identity and contribute fully to sustainable national development”. The Ministry of Education is responsible for the design, implementation, monitoring and evaluation of educational legislations, policies and programs in early childhood schools, primary schools and secondary schools in Fiji. It provides the structures, human resources, budget and administrative and management support to ensure that the quality of service delivery is maintained at a high level.

The Technical Vocational Education and Training Section (TVET) in Fiji come under the Ministry of Education. The primary role of the TVET Section of the ministry is to be responsible for the delivery of TVET subjects in Primary and Secondary schools throughout the country.

DEVELOPMENT INTERVENTIONS IN EDUCATING AND TVET EDUCATORS

Highly competent, qualified, motivated, flexible and creative TVET teachers and instructors are the backbone of any TVET system. They should be capable of adjusting to changing technological environments and creating conducive learning environments for different target groups.

The aim of this process is to create TVET teachers/instructors capable of preparing trainees to successfully pass occupational assessment. Systematic training, education and further training are being provided for teachers and instructors in the TVET system at all levels in the formal programs.

To increase the supply with relevant training and further training, TVET teachers are supported by the Ministry of Education to upgrade/ up skill their qualification through:

- in-service training
- scholarships to study locally and overseas
- Short courses

TVET Educator Training Providers

a. University of the South Pacific

The two TVET educator training providers are the University of the South Pacific (USP) and the Fiji National University (FNU) formerly known as the Fiji Institute of Technology. The University of the South Pacific offers courses for TVET educators from Fiji and other pacific island nation in the region. The university offers the following Bachelor of Education programs for TVET teachers in secondary schools:

- Bachelor of Education (Technology)
- Bachelor of Education (Foods and Textile)
- Bachelor of Education (Computing Science)
- Bachelor of Education (Agriculture)

Most graduates who majored in education with some TVET subjects are now teaching TVET subjects in secondary schools.

b. Fiji National University (FNU)

The Fiji National University's Department of Tertiary Teaching which is part of the College of Humanities and Education offers professional teaching education programs leading to the award of certificates, diplomas and most recently degrees. The department conducts research in various aspects in the field of education; and provides consultancy as a community service to both government and non-government organizations at the national, regional and international levels.

The Department offers educational and training programs for TVET teachers, secondary school teachers, NGO coordinators and other suitably qualified individuals. As a significant step forward, the Department has commenced a new degree program, the Bachelor of Education in Technical Vocational Education and Training [B.Ed. (TVET)], to provide professional development and relevant qualifications for technical and vocational teachers, lecturers and trainers from other institutions and school teachers.

Before the development of the Bed TVET program, FNU offered the International Diploma in Tertiary Teaching (IDTT). This tertiary teacher training program was developed in association with the Auckland Institute of Technology as part of the institutional strengthening project supported by the New Zealand Government. It was available to the FNU lecturers, TVET school teachers, other tertiary lecturers and industry trainers all over Fiji.

This program was developed to "provide professional qualifications in tertiary teaching and educational management appropriate for teachers and educational administrators in Fiji and other Pacific Island countries". The program was designed to "build on and recognize the existing skills and experience of course participants, and provide a focus for continuing development of skills and expertise in the education of adults (in fields of technical and vocational education and training)".

The programs were originally developed, offered and monitored by the Auckland Institute of Technology, but in due course have been transformed into a Fiji based operation taught by local staff. The program is now known as the Diploma in Tertiary Teaching (DTT).

A key component of these programs is the association of project work with more formal studies according to the premise that “teacher education has both a practical skills component and a cognitive aspect”.

Hundreds of teachers from TVET organizations have completed the program and many more are presently enrolled. These teachers are drawn from a number of organizations which include the following and many have shown interest in enrolling and upgrading their qualification in the Bed TVET:

- Ministry of Education (vocational teachers in secondary schools)
- Fiji School of Medicine
- Fiji School of Nursing
- Fiji Military Forces (Engineering Section)
- Telecom Training Centre
- Navuso Agriculture School
- Fiji College of Agriculture
- Methodist and Handicraft and Training School

The new Bachelor of Education (TVET) program differs from, as well as supplements, other more traditional teacher-training courses where it is in-service for practicing teachers, educators and trainers. It has a strong focus on technical and vocational education with teaching majors in two subject areas. It is theoretical as well as practical-oriented and activity-based; and encourages self-directed learning.

The Department has extended the degree programs to include the Bachelor of Education in Science, Bachelor of Education in Social Science, Bachelor of Education in Physical Education, Bachelor of Education in Commerce and Bachelor of Education in Music Education. A Postgraduate Diploma in Education is proposed to replace the current Diploma in Tertiary Teaching.

Selected graduate students may also undertake postgraduate research studies for the Master’s and Doctoral degree awards. The Department also offers a Teacher’s Certificate III in Technical and Vocational Education and Training (TCTVET).

Other Training Opportunities

A number of other training opportunities are provided through international agencies and donor governments. These include the following:

a. Australia- Pacific Technical College

In collaboration with TVET section of the Ministry of Education, the Australia-Pacific Technical College (APTC), which is an Australian Government initiative, has made significant contributions in building capacity of teaching staff of partner TVET institutions through the provisions of certificate IV in training and Assessment (TAA). Since 2007, this course (which is the base qualification in Australia for TVET Trainers) has been offered to about 500 Pacific Island students from 10 countries who have now achieved an internationally recognized teaching certificate. Majority of the Fiji graduates are employed in teaching and supervisory positions across the country.

b. Japanese Government

Training opportunities related to technology transfer are provided through JICA. These are normally based in Japan, although one-to-one training may be offered from resident Japanese experts on assignment to the Institute. Japan based programmes range from one month to one year in duration and may include a requirement for Japanese language study. A number of TVET teachers in secondary schools have recently undergone short courses in Japan through JICA.

c. Other Donor Governments

Various training opportunities are provided by the governments of Taiwan, Malaysia, India, Indonesia, China, Australia and New Zealand.

d. Training The Trainers

The National Training and Productivity Centre (FNU) provide the Training the Trainers program for industry and organization trainers. The center has over the years used this opportunity to train its own TVET educators and also sponsored a number of training opportunities abroad provided by the Asian Productivity Organization to which the Centre is affiliated.

This is the major program available to industry in Fiji to meet the training needs of industry personnel who undertake training in their respective industries. It is comprised of three modules, the first of two weeks duration and the remaining two of one week each.

- Instructional Skill (including task analysis, course design and test design)
- Training Systems (including training policies, strategic planning and manpower planning)
- Training systems in Fiji (including specific information on the NTPC training provisions)

BEST PRACTICES

a. Entrepreneurial Skills

A proven indicator of economic development and prosperity in developed and fast growing economies is the attention and prioritization that these countries accord to entrepreneurship education and training. Apart from being well established as a key subject, its key concepts and fundamentals are properly ingrained, main streamed and blended into the other disciplines, and in the whole curriculum.

The Ministry of Education has identified the need to strengthen the vocational education and training programs in secondary schools in Fiji through the introduction of the Start Your Own small Business Course (SYOB) and thus have trained its vocational trainers in schools to be able to teach the course to their trainees.

The implementation of the SYOB Course is supported by the International Labour Organization through TACKLE Project (Tackling Child Labour). The SYOB course aims to add value to the trade skills gained by trainees during their training. The reality is not all TVET graduates will find jobs straight away and so the entrepreneurial skills that they gain from the SYOB course would help them start a small business in their specific trade or in other areas as well.

Through the support of ILO at least one vocational trainer from all vocational schools around Fiji has undergone the Start Your Own Business Course. ILO has also assisted in the development of an SYOB Teachers Guide and a Students Workbook which are to be supplied free to all schools offering vocational courses. These resources will greatly assist the TVET trainer whose task is not only to train his trainees to gain specific trade skills and knowledge but also teach entrepreneurial processes and skills.

The SYOB course has recently been trialled in a number of schools with encouraging feedbacks from teachers and students and it is to be fully implemented in all vocational schools in 2012.

MAJOR CHALLENGES

Low quality Training

In general, the quality of training is low, with undue emphasis on theory and certification rather than on

skills acquisition and proficiency testing. Inadequate instructor training, obsolete training equipment, and lack of instructional materials are some of the factors that combine to reduce the effectiveness of training in meeting the required knowledge and skills objectives. High quality skills training requires qualified instructors, appropriate workshop equipment, adequate supply of training materials, and practice by learners. Many of the issues surrounding the training of technical and vocational teachers and trainers in Fiji are those which affect economic development in general and education in particular in developing countries. These issues include the following:

- Lack of resources
- Lack of trained and experienced personnel (with those available spread too thinly)
- Priorities for development strategies not clearly defined
- Relatively low levels of productivity and quality in the workplace

Coupled with these general issues are some more specifically related to technical training. These include the following:

- Confusion between the needs of the formal and informal (including subsistence) sectors
- Confusion between “technical” education (which may be academically or domestically based) and truly vocational studies
- Lack of formal job opportunities at the end of training
- Lack of equipment
- Difficulty of access to new technologies

Three of these issues - the need for truly vocationally oriented programmes, the lack of formal job opportunities for graduates and the relatively low level of productivity and quality in the workplace - constitute a particular challenge to the process of providing education and training for the educators and trainers.

Provision of Truly Vocationally Oriented Programmes

There appears to be a tendency in school based programmes to equate technical skills with hobbies or with the domestic equivalent of a skill. An example of this would be using a “home economics” environment to provide basic training in professional cookery.

One solution to this is that being adopted by the Ministry of Education in Fiji whereby the training of the teachers is to be undertaken by the same unit which provides the training for the TVET lecturers in Fiji National University (formerly the Fiji Institute of Technology). It is hoped that by this means the teachers being trained will be clearly oriented towards vocational needs of their students and that there will also be a clearer perception of the place of industry in determining the skill base required.

Lack of Formal Job Opportunities for Graduates

It is assumed in Fiji that the formal job market will not, in the foreseeable future be able to absorb all the young people exiting from the schools and the various post school training institutions. It follows that if graduates of vocational programmes are going to be able to generate their own occupations they must be equipped with the skills and values that could encourage them to develop entrepreneurial opportunities.

It is essential, therefore, that the teachers of these students, and the curricula they develop, provide the necessary skills and motivation to enable their graduates to succeed in this environment.

Relatively Low Levels of Productivity and Quality in the Workplace

It has been agreed among the Government, Unions and Employers in Fiji that if the community is to achieve the level of economic affluence to which members aspire, it will be necessary to improve quality and productivity in the workplace.

It is clear that one avenue through which the necessary attitudinal changes could be achieved will be the various organizations responsible for technical and vocational education and training - and this in turn comes back to those responsible as teachers and trainers.

FUTURE DIRECTION

In Fiji a number of initiatives are currently being taken to stimulate economic development and many of these will (or should) impinge on the TVET sector and the teachers and trainers involved. The following are likely to be the most significant:

National Qualification Framework (Fiji)

The establishment of the Higher Education Commission is the first major step towards the development and promotion of Fiji's higher education sector. It is in line with the government's priorities of achieving higher economic growth and making Fiji a knowledge-based society as stated in Pillars 5 and 9 respectively of The Peoples' Charter for Change, Peace and Progress.

Working with the Commission is the Fiji Qualifications Council whose primary role is to administer the National Qualifications Framework. The Council is governed by the Higher Education (Qualifications) Regulations 2009. The Council will accredit vocational and trade qualifications and the providers offering such qualifications. It will review its qualifications every 5 years to ensure adherence to acceptable and relevant standards of teaching and assessment. The setting up of this institution is long overdue and will certainly lift the standard of TVET delivery in Fiji.

ICT Integration

Preparing teachers to face the challenges of an ICT enriched teaching and learning environment is crucial. Teachers have been equipped with the fundamentals of ICT tools and sufficient understanding on the integration of these tools in teaching and learning. Efforts have been towards changing mind set and developing positive attitudes towards ICT application in teaching and learning to improve TVET delivery and promote quality in instruction.

STATUS OF E-LEARNING FOR THE MINISTRY OF EDUCATION IN FIJI

This refers to the number of high schools which are currently involved in e-learning in Fiji. For example, the size of e-learning to date is as follows: Size of e-learning in:

- 2009 - 210 students – Pilot IDL commenced in 3 government high schools which represents 2% of all the high schools in Fiji.
- 2010 – 215 students – IDL Inclusion of 12 more high schools – total of 15 which represents 9% of all high schools with a total growth of 7%.
- 2011 – 551 students – IDL inclusion of one more high school - total of 12 high schools representing 16% of all high schools with a 16% growth.
- 2011 – 551 students – Implementation of e-learning [Website – moodle] to 12 government schools.
- It is envisaged that by 2012 – 2015 the MoE should target the inclusion of 40 high schools - 30% involvement of all high schools with the 23% growth of e-learning.

The capacity building program refers to the actual training and general awareness of TVET teachers to become more competent and committed to the formal task of delivering curriculum to the students. It also refers to the appropriate awareness made to facilitators/teachers to be more vigilant in ensuring the safe delivery of curriculum material/notes and other supplementary curriculum through the website to ensure that the students have ready access for them. This also relates to the administrators and facilitators/teachers to be more vigilant in ensuring that all the ICT technologies and facilities and other

primary components of e-learning are well-reviewed to ensure sustainability of e-learning education service to benefit quality learning for students.

CONCLUSION

TVET refers to deliberate interventions to bring about learning which would make people more productive in designated areas of economic activity. This is the distinctive purpose of TVET. However, TVET will also have other purposes which are not unique to TVET, and which also apply to other forms of education, e.g., knowledge, skills, insights and mindsets which are deemed to be generally valuable for the learners, not only in designated areas of economic activity. Such “other” aims will be especially pertinent for longer and full time courses for youth—in contrast to short and episodic training events. TVET also needs to be conducted according to general social norms about how learners and people in general are to be treated by institutions, e.g., that persons be treated with respect. Thus, “work productivity” is not the only aim and concern of TVET, but it is its distinctive objective which sets it apart from other forms of education and training.

Learning for transformation through TVET requires a shift towards a system that better addresses the emerging needs of the world of work. A transformation of e.g. mindsets, educational approaches, structures, technical systems and innovative teaching and learning methods is needed. The role of TVET teachers has changed dramatically over the years and more major changes are anticipated to take place to fit into the global economy. An era of rising expectations for future TVET experience is for TVET educators to help students to become intentional learners to be able to succeed in the 21st century global society.

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PROFILE



Mr. Tomasi Naborisi is the Principal Education Officer of the Ministry of Education, Technical Vocational Education and Training of Suva, Fiji. He had been a Vocational Training Teacher in various vocational schools in Fiji for 8 years since 1984. Then he became a Senior Education Officer (Vocational Training) of the Ministry of Education (Headquarters) for 8 years also since 2002 until 2011 prior to his current position.

He has attended various TVET related workshops abroad, most recent of which is the 3rd International Conference on TVET organized by UNESCO and hosted by the People’s Republic of China.

Mr. Naborisi earned his Bachelor of Education (Technology) degree from the University of the South Pacific. He earned a Diploma in Multicraft (Automotive Engineering) and a Technical Teacher Certificate from Fiji Institute of Technology as well as a Certificate 4 in Workplace Training and Assessment from Australia Pacific Technical College.

THAI VOCATIONAL TEACHERS IN THE SECOND DECADE OF EDUCATIONAL REFORM

Dr. Kanchana Pasurapan

*Director, Lampang Vocational College, Office of the Vocational Education Constitution
Ministry of Education*

INTRODUCTION

Thailand is moving forward to be an ASEAN Community by 2015 which is another major turning point in the country's economy, society and politics. Particularly, the education system is an important mechanism to develop and build the capacity of the Thai people to enable them to adapt to the changing workplace and face the challenges by 2015. Thailand, therefore instituted educational reforms in the country in the second decade (B.C. 2009-2018). These reforms are divided into three goals: (1) Improving the educational qualities and standards of Thai people. (2) Increasing access to education and learning, and (3) Promoting the participation of all sectors of society in the educational management. The Objectives of immediate reforms in the educational and learning system and they are divided into four main reasons:-

1. In the development of new Thai generation, encouraging self-learning, independence, self-reliance, and learning good habits from early childhood must focus on communication ability, problem-solving skills, creative thinking, moral ethics, discipline, values, consciousness and national pride, adherence to the democratic regime of government with the King as Head of State, and aversion to corruption, against the purchase and sale of civil rights. This is to create citizens with good health, high quality of manpower, equipped with basic skills, knowledge and competencies, ability to work effectively and opportunity to learn equally.
2. Quality improvement of new generation of teachers conducive to student learning through development of teachers with focus on value for the academic profession. This strategy must be attractive enough to get good teachers, and educational staff who will be able to plan high standard lessons. In addition, a strong foundation of principles of good governance, must be instilled in training teachers and staff to ensure good quality of life, stability and sustainability in their careers and morale.
3. Improvement of the educational quality and new learning resources. This includes improving the quality of education in all levels and all types of learning and developing other learning resources for both formal, informal and non-formal education, such as public libraries, museums, art galleries, parks, zoos, botanical gardens, science park and technology, sports and recreation center for promoting student learning and lifelong learning with quality.
4. Development of new quality management that focused on decentralization of the education sector, and local government organization, which include participation of the guardian, community, private sectors, and all sectors. This quality management system must be based on the principle of good governance with transparency, righteousness and critical thinking, a new management system that brings about change leadership. Financial and budget management should also focus on learners.

OVEC EDUCATIONAL POLICY IN THE SECOND DECADE OF EDUCATIONAL REFORMATION

The production and development of manpower through vocational education system is an important mechanism in producing and developing the country's workforce as recognized during the second decade

of educational reforms (B.C. 2009-2018) and approved from through a cabinet meeting on December 21, 2010. In view of this, guidelines and framework for manpower development and quality capacity building interventions were established. This is in line with the pursuit of enhancing competitiveness of Thai workforce who are ready to face challenges of globalization, and the changing economic condition, (including merging of free trade sectors). Thailand visualizes that “The production and development of manpower of country is in accordance with the needs and the efficiency in creating sustainable development of the country, be able to compete with international countries with the cooperation of all sectors”.

The following are the country’s strategic directions towards improving manpower development manpower strategy for the second decade of educational reforms (B.C.2009-2018):

1. An establishment of a National Qualification Standard Framework for manpower development based on applicable qualification standards.
2. Establishment of vocational occupational institutions to support knowledge, working performance abilities as well as professional qualifications.
3. Expand the Dual Vocational Training, and internship system in proportion with the dual and co-education learners are 30 percent of vocational and higher education learners.
4. Increased proportion of vocational students versus general education students in high school is targeted at 60:40.
5. Increase of up to 65 percent in the successful completion of complete secondary education, and in gaining standard professional qualifications.

Mechanisms for educational reforms in the second decade of vocational education development:

The sub-committee of the educational reform policy in the second decade of developing vocational education has designed policies to address concerns on both quantity and quality is divided into 4 parts:

1. Aim to enhance TVET systems and make it more responsive to the needs of the market.
2. The development of new generation of teachers, new teachers in appropriate fields.
3. Improvement in the quality of college education through innovative learning resources.
4. New management strategies in improving quality of education.
5. Aim to enhance TVET systems and make it more responsive to the needs of the market.
 - Enhancing vocational education development is not only targeted to the learners, guardians, instructors, and vocational colleges director, but also includes the other colleges which produce manpower but as well entrepreneurs in the labor market.
 - A more dynamic system. Apply in ga The group of knowledge workers both technical and technological levels by applying dynamic system.

Formal Education system

- Performance improvement adhering to international standards.
- An opportunity to enter in vocational education starting secondary level.
- Strengthening linkage and cooperation with both government and private sector to further enhance training and development in formal education, non-formal education, and DVT (Dual vocational training).

Non-formal education system

- Career and lifelong learning and job developing, income in various formats equally and long life.

The general public

- To promote life-long learning in the vocational profession in preparation for the future
- To transfer vocational knowledge and new career

Parents of students

- To inculcate the value of earning and acquiring work experience while studying reduce the cost of their parents.
- To promote stronger parent and education partnership in society.

Entrepreneur

- To make management corporations globally competitive.
- Promote and build cooperation network for nurturing new entrepreneurs.
- Develop learners' quality and skills to observe professional qualification.

2. The next generation teachers, inappropriate fields, teachers' development policy. There are three groups of vocational education teachers:

- Teachers in colleges
- Teachers in workplaces, and
- Local wisdom (community?) teachers.

The development mechanisms for teachers are as follows:

Teachers who teach in colleges today:

- Must increase the teaching potentiality in teaching vocational subjects by training in the workplaces, and adjust the new role of teaching.
- Increase the teachers' competency in searching learning; develop them to overtake adapt to the sustainable changes.

Teachers in the workplaces

- Develop teachers within the workplace.
- Cooperate with the workplaces in building and establishing motivation system for trainee teachers.

Wisdom teachers (Expert teacher in the local area)

- Register the records of wisdom teachers.
- Promote motivation-building of wisdom teachers for them to actively participate in developing vocational education learners' skill.
- Enhance management system of vocational subjects to increase global competitiveness and potential to ensure linkage in the commercialized industry.

To establish standard qualifications of vocational education teachers

- Establish specific qualifications for vocational education teachers' to develop and enhance standards of vocational subject teachers in line with improving their performance.

3. Policy for developing the quality of colleges and new learning resources

The quality and learning resources of the college are prerequisites for effective teaching to ensure producing quality learners. The college may utilize the following learning development mechanism:

Raising the standard level of vocational education college

- Develop vocational management structure and establish appropriate missions under the rules and regulations that are in accordance with the emerging changes and conditions.

- Build cooperation network and consume mutual resources.
- Develop inter-inspection and quality guarantee system.

Increase the amount of colleges in dual system.

- Provide a vocational education information center for strategic planning of manpower production and development.
- Develop the dual system to be in accordance with the needs of private sectors.

4. The policy for developing new management quality.

Improving the quality of vocational education is a very significant factor building and producing quality manpower for the socio-economic needs of the country. The following are some of the driving mechanisms to achieve quality in vocational education:

Manpower production in response to market needs

- Improve skill mappings in accordance with in establishing policies for manpower development to ensure responsiveness of vocational education with the needs of agriculture and service industry sectors.
- Build base competency learning and teaching curriculum.
- Actively develop manpower data base.

Learners' promotion

- Request for loans for vocational education in equal rate with bachelor degree courses.
- Promote establishment of vocational education development foundations

Build-up motivation to invite more interest to vocational subject learning.

- Make an agreement with the private sectors to provide wages to workers who qualifies for each standard level
- Accelerate to adjust the vocational subject education costs and investment to be suitable for the learners skills development

Form of Thai vocational education development OVEC has been carrying on teacher's development in various forms as follows:

- Development of communication abilities of vocational skills teachers improve their conversational skills with foreign languages such as Chinese, Japanese, and English.
- Capacity-building development of teachers as professional teachers for Mathematics, Science, English, Thai, Social studies, and Physical Education.
- Provision of scholarships for master degrees and doctorate degrees.
- Supervision of learning teaching plan which are problem based and project-oriented.
- Development of self-learning package.
- Development of new generation teachers in various methods based on practical needs
- Building of teachers' researcher network.
- Development of critical thinking.
- Development of technological skills.

CONCLUSION

Students should adapt to the fast changing world and dynamic conditions of the society, economics, and politics. The learning and teaching system must go with the changing times and must greatly be improved. Students must enhance their knowledge and skills but must be more pro-active and self-learning.

It is necessary for teachers, on the other hand, to have needed skills such as identification skill, making familiarity skills or rapport with students, must know how to provide project project-based oriented learning, must have persuasion skill, creative thinking skill, and innovative and practical thinking skills.

The teachers must possess attributes that are appropriate for working performance; those are critical thinking, creative thinking, team work, understanding of different cultures, possess ability in communication and technology.

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PROFILE

Miss Kanchana Pasurapan is the Director of Lampang Vocational College, Office of the Vocational Education Commission, Ministry of Education. She was formerly the Director of Lampang Polytechnic College, Director of Intrachai Commercial College. She started as a Teacher at Lampang Vocational College, then she became Deputy Director of the College before becoming its Director. She had presented some papers in many forums in Thailand. Ms. Pasurapan earned a Bachelor's degree in Accounting in 1975 from Chiang Mai University, Chiang Mai, Thailand; a Bachelor's degree in Educational Administration in 1986 from Sukhothai Thammathirat Open University, Bangkok, Thailand; an M.Ed. in Educational Administration in 1987 from Srinakarinwirot (Prasanmit) University, Bangkok, Thailand and a Ph.D. in Vocational Education Administration in 2004 from King Mongkut's Institute of Technology Ladkrabang.



GOOD PRACTICES AND EMERGING CHALLENGES FOR TVET EDUCATORS DEVELOPMENT IN MYANMAR

Dr. Aye Myint

*Rector, Technological University(Mandalay), Department of Technical and Vocational Education
Ministry of Science and Technology, Union of Myanmar
dr.ayemyint@gmail.com*

OVERVIEW OF THE TECHNICAL AND VOCATIONAL EDUCATION (TVET) SECTOR IN MYANMAR

The Technical and Vocational Education Training (TVET) sector of Myanmar is managed by the following institutes

1. Ministry of Science and Technology
2. Ministry of Education
3. Ministry of Labor
4. Private Center (Schools)

Specifically, the Ministry of Science and Technology (MOST) is the agency responsible for implementing and developing the necessary initiatives to address human resources requirements. In recognizing the need to meet current manpower requirements in the present and in the future, several plans are being conceptualized such as:

- i. Introducing Competency-based curricula and new courses;
- ii. Introducing Entrepreneurial training to promote self-employment;
- iii. Establishing more training institutions;
- iv. Promoting high technology training, research and development.

Thus, Technical and Vocational Education Training will continue to be a high priority in Myanmar for sustainable human resource development. Although there is no shortage of staff in imparting technological and vocational knowledge to future engineers, technicians and other professionals, most of them are locally trained. As a part of their career growth and experience, they obviously need international exposure, and training sponsored by a highly efficient and prestigious institution will be highly beneficial to the trainees and the country.

Executive courses on managing and developing a modern technical institution may take up to three weeks and specialist training-of-trainers (TOT) courses can be up to eight weeks.

Nowadays, industrial and economic sectors of the world are changing rapidly due to the advances in science and technology, especially in the field of Engineering. As a result, there are corresponding transformations in the patterns of occupations and qualifications. Myanmar, being a developing country, is not fully equipped with the means of dealing with such emerging challenges. The proposed project will play a major role in equipping the technological and vocational teaching professional with necessary expertise, which will also have a multiplier effect.

Best Practices of TVET in Myanmar



No.	Name of Town	No. of students	No. of teachers
1.	GTHS(MyitKyi Nar)	31	69
2.	GTHS(Bamaw)	31	57
3.	GTHS(Kalay)	68	106
4.	GTHS(Monywa)	68	108
5.	GTHS(Min Tut)	28	86
6.	GTHS(Taunggyi)	34	138
7.	GTHS(Larshio)	30	50
8.	GTHS(Pinlon)	22	47
9.	GTHS(MeikHiiLar)	51	281
10.	GTHS(Pakhoku)	52	104
11.	GTHS(Magway)	56	194
12.	GTHS(Kyaukse)	65	107
13.	GTHS(Nay Pyi Taw)	57	627
14.	GTHS(TaungNgu)	49	225
15.	GTHS(Pyay)	56	133
16.	GTHS(Loikaw)	36	132
17.	GTHS(Hpaan)	48	44
18.	GTHS(Mawlamyaing)	35	120
19.	GTHS(Pathein)	43	179
20.	GTHS(Hinthata)	44	140
21.	GTHS(Maubin)	55	102
22.	GTHS(Pyinsalu)	19	6
23.	GTHS(Chaungwa)	20	31
24.	GTHS(Ahmar)	20	45
25.	GTHS(Dawei)	19	41
26.	GTHS(Myeik)	20	67
27.	GTHS(Sittway)	37	40
28.	GTHS(Khamti)	30	21
29.	GTHS(Putao)	19	70
30.	GTHS(Kyaington)	20	32
31.	GTHS(Ywarma)	17	158
32.	GTHS(Pinpat)	20	143
33.	GTHS(Myingyan)	24	183
34.	GTHS(Chaungoo)	23	172
35.	GTHS(LetKhoneKone)	19	85
36.	GTHS(Teetain)	9	37
	Total	1275	4180

Courses conducted to GTHS

1. Building Technology
2. Building Services Technology
3. Auto Mechanic Technology
4. Machining Technology
5. Electrical Technology
6. Electronic Technology
7. Metal Process Technology

CURRENT STATUS

The Ministry of Science and Technology has been making efforts to provide the required scientists, engineers and technicians to address the demands for their services. Altogether 149,651 persons have been trained and offered degrees or certificates by the Universities, Colleges and Institute under the Ministry of Science and Technology. The number of graduates in each discipline from the Technological Universities, Colleges and Institutes under MOST are shown in table (1).

Table (1) Number of graduates from the Technological Universities, Colleges and Institutes

Sr. No	Degree / Certificate	Up to 1996 (Before MOST was established)	Jan 1997-June 2010 (After MOST was established)
1	Engineering Degrees	17,573	60217
2	Computer Degrees	988	29748
3	Certificates	32,793	119514
	Total	51,354	209514

The aim of newly opened technical vocational Schools (GTHS) across the whole country is for every qualified citizen to be able to learn and study the advanced science and technical subjects in their native region and then to be able to improve industrial sectors in their region. So far, 1115 teachers are employed for 4225 students in vocational education.

Technical Training Schools (TTS) are opened for the students who completed high school level and are ineligible to attend the Technological University. This program constitutes 2 year courses with workshop and practical work. Because of this training, the number of technicians and skilled workers is rising in Myanmar.

Government Technical High Schools were established to answer the needs of medium level qualified labor in industries. In addition to high level qualified labors, lower level labors are also educated in these institutions. In Academic year 2009-2010, the Government Technical High School (GTHS) started a two year course that can be attended by students under 18 years old passing a Grade-9 exam qualification. A six month on job training follows after completion of the two years course and one can go on for the Government Technical Institute diploma if qualified. If no further education can be pursued, students can continue their education at vocational colleges. The technical high school education system is based on that system, which characterizes the upgrade of General Curriculum to Competency Curriculum to develop the qualified technician profession

MAJOR CHALLENGES OF TVET

Several challenges were encountered when GTHS were opened in remote area of the country. Five GTHS are situated in Myanmar's borders. These are: (1) GTHS (Putao) is located in northernmost Myanmar, (2) GTHS (Kyaingtong) is located in easternmost part of Myanmar, (3) GTHS (Myeik) is located in southernmost part of Myanmar, (4) GTHS (Sittwe) is located in western part of Myanmar and (5) GTHS (Hkamti) is situated in north-west part of Myanmar in Chin state. Because of that condition, it is very difficult to send teachers to remote area and to deliver the necessary instructional equipment.

Moreover, each GTHS teacher has to take training courses once a year. The training courses consist mainly of lectures combined with demonstrations and exercises in workshops and laboratories. Teacher training programs are normally conducted in the vacation time of a year. The Ministry of Science and Technology has sent its teachers and qualified students and teachers to foreign countries for further studies, training and for attending international seminars and conferences.

Myanmar currently faces the following challenges and issues in TVET:

- First, the occupation concept is very complicated. The approach should take into account the long time traditions of Myanmar.
- Secondly, Myanmar does not have a legitimate dual style structure.
- Lastly, Myanmar has to be aware of participating in the development of TVET program as a dual form.

FUTURE PLANS

As the global economy progresses, the needs and the challenges change as preferences, standards and expectations needs to be at par with the recent trends. The limited research that focuses on the trends and challenges faced by the TVET defines the need to develop more studies and improve or update existing ones. The study therefore recommends a deeper analysis on the challenges of TVET in Myanmar, especially follow-up studies to see if the challenges and issues in TVET identified by the Colombo Plan Staff College for Technician Education were noted and was given attention.

The major transformational agenda in TVET of CPSC (2004) aims to ensure “a high level of human resources development”, with the “triple A” (Admiration to Customers, Advanced Technology, and Aggressive Activities) strategies that effectively articulate its goals and objectives. This just showed how committed CPSC in further improving TVET system of Myanmar and other member countries through fostering cooperation between the member countries in collectively addressing and facing the challenges of TVET in the region.

CONCLUSION

Myanmar is a relatively large country in Southeast Asia and the development of the human resource will have a significant impact to the economic and social development of the region. Although technical and vocational education initiatives took off from had a good start, the challenge is now to further improve the system. If undertaken properly, this project will enhance the building of a robust higher education system that can further serve Myanmar’s needs as it strives to become a modern and developed nation. Furthermore, it will equip Myanmar citizens with quality education and the advanced skill or knowledge they will need in an increasingly competitive environment and create a firm foundation to pursue lifelong learning while at the same time nurturing the cultural roots and identity of the country.

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PROFILE



Dr. Aye Myint is currently the Rector of the Technological University of Mandalay and is handling administrative duties and management of research work. He obtained his Bachelor’s and Master’s degree in Metallurgy from the Yangon Technical University and a Doctoral degree in Nuclear Engineering from the Xi’an Jiaotong University in China.



Colombo Plan Staff College (CPSC)
for Technician Education
Bldg. Blk. C, Department of Education Complex, Meralco Ave.
1600 Pasig City, Metro Manila, Philippines
Phone: (+63-2) 631-0991 to 95
Fax: (+63-2) 631-0996, (+63-2) 633-8425
E-mail: cpsc@cpsctech.org
www.cpsctech.org