



University of Tampere
Research Centre for Vocational Education

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Biography of the author:

Professor of Vocational Education, with particular reference to global learning environments at the University of Tampere, Finland, Research Centre for Vocational Education, and UNESCO Chair in global e-Learning with applications to multiple domains. Principal research associate of UNESCO-UNEVOC. Acting President of Global University System (GUS). Former Rector of the University for Peace in Costa Rica. Expert on media and digital literacy to the European Union. Communication and Media Scholar at the University of Helsinki and the University of Art and Design in Helsinki. and the University of Lapland, Finland, Published over 200 scientific contributions. Visiting Professor and Lecturer in many countries in Europe, North and South America, and other regions of the world.

Chair with Salem Al-Agtash, German-Jordanian University, of the first International Workshop on Ubiquitous ICT for Sustainable Education and Cultural Literacy, SECL 2008 conference, which will be held in Hämeenlinna, Finland on 6-7 October 2008. Conference will be organized together with University of Tampere, German-Jordanian University and HAMK University of Applied Sciences, in cooperation with: Finnish Ministry of Education, Nokia, Finnish National Commission for UNESCO, European Commission - Education and Culture TEMPUS, Bonn-Rhein-Sieg University of Applied Science, Talal Abu-Ghazaleh Organization, Umeå University, Bogazici University and City of Hämeenlinna. See:

http://elearningcentre.hamk.fi/international_workshop/index.html

Professor Varis has worked in several international EU and UNESCO related projects concerning media and digital literacy and promotion of the Global University System (GUS).
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University of Tampere: The Research Centre for Vocational Education (National UNESCO-UNEVOC Centre in Finland)

The Research Centre for Vocational Education belongs to the Faculty of Education at the University of Tampere, Finland. It has status both as a research and education institute of vocational and professional education (<http://www.uta.fi/laitokset/aktk/english>). The centre is responsible for the further education of teachers who work as vocational educators, as well as staff trainers and other experts of vocational and professional education. The centre is also responsible for research on vocational education and many areas related to it, especially those that relate to the future development of vocational education in Finland. The academic post-graduate education provided by the centre presents possibilities for both vocationally emphasized licentiate degrees and more

demanding doctoral degrees. The centre aims to provide at least 4-5 doctoral degrees and 6 to 8 licentiate's degrees every year.

The research centre has two full time professors: a professor of vocational education, Pekka Ruohotie, who is also the head of the centre, and professor of vocational education, Tapio Varis, with particular reference to global learning environments. In addition to these two professors, the centre has nine docents and six international (USA, Canada, UK, Estonia) visiting professors. The education and/or research staff includes an assistant of vocational education, 7 researchers on outside funding and 7 docents who have specialised in different aspects of vocational education.

The unit is active in international research fields and has many partners in North-America and Europe. One of the international partners is UNESCO International Centre for Technical and Vocational Education and Training ([UNESCO-UNEVOC](#)) and professor Varis works also as UNESCO Chair of in global e-learning with applications to multiple domains.

Presently, the Research Centre for Vocational education is engaged in three extensive research areas, all of which have been integrated with the education and research of the post-graduate students in national and international networks.

1. Learning and teaching of a profession / professional growth as a lifelong process
2. New learning environments in vocational education
3. E-Learning and digital literacy in teaching and research in the fields of TVET

As a UNEVOC national centre the Hämeenlinna unit of the University of Tampere could extend its cooperation with the Hamk University College and other cooperation partners in the area of e-learning and ICT applications to vocational education. The international cooperation with neighbouring university institutions in Estonia (Tallinn) and Russia (St Petersburg, Petrozavodsk, Taganrog) as well as with the UNESCO centre of ICT in Moscow has been encouraging. Joint course material could be produced and utilized in Asia, Arabic countries, Africa, and Latin America. Conferences like the SECL 2008 can be made regular and even rotate between countries.

National TVET policy

The Finnish education system is based on providing all children and young people with equal basic education services. In Finland, education is compulsory, starting from the year in which the child becomes seven years old and ending when he/she is 16. (Appendix 1)

Both municipal and private day-care services are available for children below school-starting age, up to the age of six. All 6-year-olds are entitled to pre-school education for one year before starting basic education. Pre-school education is available in both schools and day-care centres.

Pupils normally start their comprehensive school education in a local school indicated by the municipality. Having completed comprehensive school, young people may seek further education in upper secondary schools or vocational schools.

Some upper secondary schools specialize in education with an emphasis on music, physical

education, the fine arts, languages or the natural sciences, for example. The schools have no grades. The idea is to complete the courses in three years. The upper secondary school-leaving certificate qualifies the student for studies in universities and other university-level institutes. Matriculation examinations are arranged twice a year. Upper secondary schools for adults also provide an opportunity to take the matriculation examination and to supplement the upper secondary school curriculum.

Vocational schools provide vocational qualifications. The studies take three years. Practical training is part of vocational school education. In addition to written exams, professional skills must be demonstrated in practice. Completing vocational education qualifies the student to seek admission to polytechnics or universities.

Finland also operates an apprenticeship training system. Young people already in working life can obtain basic vocational qualifications through apprenticeship training.

Finland has two types of higher education institutes, universities and polytechnics. The universities concentrate on academic and scientific research and teaching methods. The role of polytechnics is to respond to the needs of working life. The education focuses on developing professional skills.

Adult education and training offers citizens the opportunity to obtain education and complete qualifications at any stage of life. Adults can study either in the same educational institutions as young people, or at institutions and units aimed at adults, as is done in liberal adult education. Vocational upper secondary qualifications, further vocational qualifications and specialist vocational qualifications can also be obtained through competence tests independent of how the vocational skills have been acquired.

The General Approach of the UNESCO Chair and the UNEVOC Centre

The Director-General of UNESCO, Mr. Koichiro Matsuura, defined the general role of the UNESCO Chairs in 2003 as follows: "It is necessary to build up large movement to humanize globalization, based on solidarity, on the spirit of caring for and sharing with others". In order to achieve these goals UNESCO has promoted the Open Educational Resources (OER) initiative as a cooperation mechanism for the open, non-commercial use of educational resources. These principles form the basis of the University of Tampere activities of the UNEVOC centre as exemplified in the forthcoming SECL conference with German-Jordanian University.

Education has largely contributed to an increase in developing knowledge, providing an enabling environment for innovation, and in building human capital required for a potential future knowledge economy. Global reforms in education and challenging ICT demands have made a remarkable shift in the structure of the enabling ICT environment and the utilization of ICT technologies in education. Such technologies have become the key driver of the digital network in an era of technology-driven education. More schools and communities now have access to ICT resources to join the global economy with knowledge workers who have 21st century skills and are inspired by life-long learning. Much effort has been made for the advancement of education and multiliteracies.

Dakar Framework of Action for Education for All (EFA), adopted in 2000 as a roadmap to meet the Education for All goals by 2015, highlights the role that ICT has to support EFA goals at an

affordable cost. ICTs have great potential for knowledge dissemination, effective learning and the development of more efficient education services.

UN GAID (Global Alliance for ICT and Development) has been established in 2006 to address globally cross-cutting issues related to ICT in development and respond to the need for cross-cultural and cross-sectoral dialogue among diverse stakeholders.

Some of these issues and challenges are: Lowering cost of access in the developing world; developing inclusive technologies for the disabled; producing low-cost computers; and reducing barriers to ICT use and diffusion in key sectors of the economy and society, including enterprises, governments, education, tourism, agriculture, financial services and rural and civil society institutions.

Alliance of Civilization (AoC) established in 2005, to explore the roots of polarization between societies and cultures, and to recommend a practical programme of action to address this issue. AoC's main objectives: develop a network of partnerships to share the goals of the Alliance of Civilizations, to reinforce their interaction and coordination with the UN system; develop, support, and highlight projects that promote understanding and reconciliation among cultures; and establish relations and facilitate dialogue among groups that can act as a force of moderation and understanding during times of heightened cross-cultural tensions.

TAGorg (Talal Abu-Ghazaleh Organization), founded in 1972, is now the largest pan-Arab professional group offering diversified and expert services with commitment to communities and societies. Through TAG knowledge Societies (TAGKS) and TAGI Book initiative - towards a broader and more inclusive information society in the Arab world - the young generation of the Arab world will have more access to the internet, benefit from available professional development resources and content, use online language and ICT Skills.

e-Skills Industry Leadership Board (eSkills ILB) founded in 2007 with a vision to foster 21st century e-skills and digital literacy of Europe's workforce and citizens for a competitive, innovative and inclusive Europe. The e-Skills ILB is set to lead the ICT sector's contribution to the development and implementation of a long term e-skills and digital literacy agenda in Europe.

Similar efforts exist around the world, which also aim at advancing education for better literacy. This workshop is intended as a contribution to bring together scientists, public authorities, businesses, academics, civil society organizations and other interested groups and stakeholders to understand challenges for sustainable education and cultural literacy in the global context; identify the potential of ICT to advance and improve education; share knowledge and best practices about successful policies in global education; create venues of collaboration; and consolidate responsible communities for multi-literacies.

The SECL workshop is a continuing effort of academics representing consortium institutions from Finland, Germany, Sweden, and Jordan collaborating on an EU Tempus funded project. The main objective of the project is to advance the frontiers of knowledge in ICT education as a core driver for Jordan national prosperity. The academics envision a collaborative atmosphere among Jordan and EU institutions for advanced teaching, applied research, staff/student exchange, and development for better quality of ICT education and relevance knowledge in a socio-economic development context.

Understanding TVET

The 2001 UNESCO and ILO Revised Recommendation concerning Technical and Vocational Education uses “technical and vocational education” as: “a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life”.

The Revised Recommendation understands technical and vocational education as:

- “(a) an integral part of general education;
- (b) a means of preparing for occupational fields and for effective participation in the world of work;
- (c) an aspect of lifelong learning and a preparation for responsible citizenship;
- (d) an instrument for promoting environmentally-sound sustainable development;
- (e) a method of facilitating poverty alleviation.”

It includes “aspects of education that are technical and vocational in nature, provided either in educational institutions or under their authority, by public authorities, the private sector or through other forms of organized education, formal or non-formal, aiming to ensure that all members of the community have access to the pathways of lifelong learning.”

The English word “vocational” is not broad enough to include the different meanings of the word “professional”. The problem in the information and knowledge societies is what kind of intellectual qualities and intelligences are needed in vocational education. Work and professions are no more as they used to be in the industrial society. Vocational education includes more entrepreneurship than before. The new qualities can be approached primarily as processes of life-long learning and only secondarily from the point of view of the substance. We cannot either take professions as given from outside from the working life only but we may influence them by relevant vocational education.

Generally, vocation and career are used interchangeably. Vocational education might be contrasted with education in a usually broader scientific field, which might concentrate on theory and abstract conceptual knowledge, characteristic of tertiary education. Vocational education can be at the secondary or post-secondary level and can interact with the apprenticeship system. Increasingly, vocational education can be recognized in terms of recognition of prior learning and partial academic credit towards tertiary education as credit. However, it is rarely considered in its own form to fall under the traditional definition of a higher education.

Up until the end of the twentieth century, vocational education focused on specific trades such as for example, an automobile mechanic or welder, and was therefore associated with the activities of lower social classes. As a consequence, it attracted a level of stigma. Vocational education is related to the age-old apprenticeship system of learning.

It is estimated that at the beginning of the new millennium 80% of all work requires more brain capacity than manual skills; fifty years ago the situation was exactly the opposite (see e.g. Pugh & Hickson 1996). Although mental work, or knowledge work, involves specialized technical know-how and occupational skills, it also increasingly requires generalized abilities, skills and dispositions.

Nowadays, more and more often those with higher vocational education find themselves in a job that requires thinking ability, responsibility, and leadership skills. They may not necessarily be in a traditional leadership position, but in new 'stripped-down' organizations leadership, responsibility, and authority are often quite widely distributed. Modern administrators are often more trainers, facilitators, and distributors of resources than controllers and supervisors. They may take personal responsibility for providing leadership when necessary, but increasingly they also share it with or delegate it to others. Thus, all employees in the organization, but particularly the professional staff, are expected to be willing and able to accept responsibility and provide leadership in a team environment. They are also responsible for the continuous improvement of their own skills and are expected to apply their know-how flexibly and to be capable of working cooperatively, which, in turn, can generate new combinations of know-how; that is, collective competence.

The objective is a systematics of professional development, with an emphasis on learning at work, and where the concepts of an innovative environment, creative tension and a developer network are exploited. In development activities there is an emphasis on empowering and participatory leadership and management, and on coping at work. Thus the creation of a work environment of lasting development is attempted, where the basic values of human and social well-being are seen as the basis of economic growth. (INFOSOC 2006)

People of the work force face two overlapping challenges. The first is to acquire the skills necessary to enter an increasingly digital job market, and the second is to continually improve those skills, and learn new ones, as life-long learning. Many studies suggest that workers around the world may not be keeping pace. It is widely believed that schools are failing to sustain the pipeline of employees who are adequately prepared to exploit new knowledge and skills.

In the digital and information age people have to be able to purposefully access information from a variety of sources, analyze and evaluate the information, and then integrate it to construct a personal knowledge base from which to make intelligent decisions. Information and knowledge society requires new multiliteracies, digital literacy, and related competences. To reduce digital literacy exclusively to the skills of using a computer is a simplification and a loss in meaning. Using a computer requires diverse and complex previous knowledge. It also introduces the individual and humanity to new contexts, which demands mental, intellectual, profound and complex changes.

As the new working culture emphasizes the importance of life-long learning, corporations are beginning to provide workers with the means to customize and direct their own learning experiences. There are still several steps to be taken to improve employment opportunities for individuals and expand the innovative capabilities of companies. Everybody in working life and training is becoming more responsible for ensuring the development of the knowledge and skills acquired.

TVET are not just curriculum questions, nor are they just economic. They are intricately linked with social, cultural, historical, economic, technical, and political parameters. Hence formulation of sound and effective policies and plans of TVET requires an inter-disciplinary development approach, treating VET as an integral part of overall educational planning.

Today TVET plays a crucial role in the social and economic development of a nation. However the emphasis of the objectives and tasks set for education vary from country to country. According to this also the organization and administration of TVET is based on different models. TVET can be organized at the secondary or post-secondary level, and can interact with the apprenticeship or

further training system. Increasingly, TVET can be recognized in terms of recognition of prior learning and partial academic credit towards tertiary education. TVET can be given either in workplaces or in vocational schools. Nowadays different kinds of combinations of these two are most used. TVET is mainly administrated either by the Ministry of Education or The Ministry of Labour or by the relevant sectorial Ministries.

The ever-faster changes in the economy and society emphasize the importance of lifelong learning. Improving productivity and increasing competitiveness are objectives in most communities and companies. On the one hand the lack of qualified workforce is a common problem as well in Sub-Saharan Africa as in Northern European countries. On the other hand the unemployment rate is high and even getting higher in many areas. The target student groups are getting more diverse and in many fields it is more and more difficult to combine the needs of industry and the expectations of individuals. TVET is in many countries the “weakest” link in the total education system. In contrast, parents today continue to cherish the hope and aspiration that their children will make it to university. This intense desire to pursue a university degree generates unrealistic expectations amongst parents and adds pressure in schools. The consequence is a prejudice against and less than positive image of TVET. Yet, the greatest gaps in human resource development are in vocational education and in technical skills.

When looking for the new definition of TVET certain questions should be raised: what is an effective and responsive TVET system like? What are the options available to accommodate the needs of different social, economic and cultural conditions? Is the TVET system responding to the appropriate level and demand of skilled manpower in the economy? How is it positioned within the national education and training system? Is it meeting the training needs of school leavers and working adults? How well is TVET accepted by school leavers, parents, industry and society? What is its public image? What are the policy, funding and educational issues? How can the goals and objectives be translated into reality? How do we measure the results?

In this context, vocational education and training means both training for work and training for citizenship. The challenging task of TVET is to respond both to the needs of working life and the society as a whole as well as to the expectations of individuals. In the following seven chapter we will discuss about the factors and challenges that lead to emergent need of re-defining the traditional definition of the TVET.

According to a Finnish Expert Group managing distributed work is a major challenge (FinnSight 2015). The communication between employees and their managers may be based only on virtual contacts. In short-term assignments and in mobile work it is difficult to update and upgrade one’s competence. This would, however, be crucial to the future employability of knowledge workers. On the other hand, it is difficult for managers of distributed organisations to support continuous learning of individual employees and to emphasize shared learning of all employees of a team or an organization. There is a growing need for flexible structures and practices of lifelong learning. Learning at work and new web-based social software also have an increasingly important role in competence development.

The requirements of speed and possibilities of virtual work have emphasized the emergence of new business models, such as open source. Instead of strictly protecting a development work up to the launch of a product or service, the idea or project is openly discussed and collectively developed from an early stage in Internet. Based on open source, anyone can contribute an idea or provide improvements in the project in order to benefit the total development. The development resources can thus be multiplied.

Changing markets

With rapid transformation of societies in social, political, economic, technological, and education spheres, there has been a change in the perspectives on the need for and nature of TVET. New challenges have begun to emerge, and old ones to reemerge.

As a consequence, the demand for TVET and the forms of education and learning are changing. Educational systems are not independent of the rest of the society. When the society changes the educational system also changes.

The classical economy was grounded in agriculture and craft tools, the industrial economy in machines and machine systems. Machines have learned the use of language, languages are learned to use machines, and languages are central means of production. In the knowledge societies information, data and knowledge are needed also in vocational work.

In industrialized countries, educational systems have developed during the years to address specific social and economic challenges that emerged in the 20th century. The legal, political and economic institutions that underlie vocational education and training, in particular, have evolved to answer the demands of industrialized mass-production. In many ways, the reality of TVET reflects the needs to optimize production in a historically unique setting, where boundary constraints were set by the limits of transportation capability, resource availability, access to knowledge, and coordination and information processing capacity. Information and communication technologies are now radically moving these boundaries both in industrialized and developing countries.

In particular, available technologies, vocations, skills, and the ways in which work is organized are closely related. Vocations, skills and organizations are different in agrarian, industrialized and knowledge societies. The currently emerging global knowledge society is unique in its capability to connect countries across geographical distances and economic levels of development. It brings us a qualitatively different world, where vocations, organizations, skills, and knowledge acquire a new meaning. Development, in this context, does not necessarily mean, for example, that vocational and educational practices trickle down from the economically most advanced countries to the rest of the world. The best existing TVET systems in the economically developed countries represent the best answers to yesterday's socio-economic challenges. In principle, there is no obvious reason why these systems would be beneficial in the emerging knowledge society. On the contrary, it is quite possible that TVET systems that are optimized for the yesterday's world can be dysfunctional in today's world. Also for this reason it is important to consider the broader historical socio-economic situation where we now find ourselves.

Knowledge society is not only the next "modern" layer on top of the earlier ones; instead, it systematically "modernizes" traditional industries, agricultural production, as well as local markets and the production of crafts, arts, and social structures and values. In the current global socio-economic transformation, canals, railways, steel production, and cars all become integrated with information and communication technologies. The products of previous revolutions, as it were, become embedded into a complex global system of production, where real-time information, communication, and knowledge networks adapt the earlier technologies into radically new uses.

The ongoing transformation thus also penetrates boundaries that emerged and were shaped through the forces of the previous techno-economic paradigm. One of the most important of these boundaries is the one that separated “industrialized” countries from “developing” countries. The global knowledge-based economy slices geographical regions in new ways, where national borders have decreasing relevance. Instead of geographical proximity or local availability of resources, the underlying organizing principle in the knowledge economy is based on global networks (Castells 1996). The distinction between “developing countries” and “developed countries” is therefore becoming increasingly misleading. This change can now readily be seen, for example, in countries such as South Korea, India, and China, where regional hubs connect with global production networks. A similar reorganization can also be seen in the leading industrialized countries, where geographic specialization is now essentially based on diversification in the context of global systems of production.

This means that the challenges of vocational education will be surprisingly similar in countries that vary widely in their current economic level of development. This, indeed, is one of the key differences between the Industrial Age and the Knowledge Age. The Industrial Age in many ways produced the distinction between “developed” and “developing” countries. It also carried with it a specific global division of labour where vocational categories in both “developed” and “developing” countries made sense. The present socio-economic transformation is now widely visible in developed countries and its effects spread at a speed never before seen in the human history. The impact, however, is not limited to developed countries. In the next few years, it will reach also the most remote villages, potentially connecting them into the new global socio-economic system.

Enrolments in vocational education and level of economic development are related. Demand for vocational education seemed to exist in industrially developing societies, with growth and diversification of industrial structure; the lower the overall level of a country’s development, the weaker is the case for introducing vocational curriculum and diversify it. However, in these underdeveloped countries, the need for vocational education is felt.

Emphasis on diversified industrial production emphasises the need for labour force with vocational skills. Much growth in vocational education took place in countries like Korea during early industrialisation processes, when such education could increase employment opportunities. Therefore, vocational education becomes more popular in regions where jobs can be guaranteed. However, the relationship between demand for vocational education and economic development may not be linear. When the economies move away from reliance on its agricultural and manufacturing sectors and in favour of service sector, the demand for TVET may indeed decline. With the review of the experience of the East Asian countries, Mundle (1998) concludes that "enrolments in vocational education in the region has been substantial until a threshold level of gross national product (GNP) per capita (say about \$8000) was reached; thereafter the share of vocational education in senior secondary education seemed to have declined".

Each country has to decide the extent of TVET that has to be developed, depending upon the level of development and demand for skills. As Foster (1965,) observed, “in the initial stages technical and vocational instruction is the car rather than the horse in economic growth, and its development depends upon real and perceived opportunities in the economy. The provision of vocational education must be directly related to those points at which some development is already apparent and where demand for skills is beginning to be manifested.” Plans for TVET should be preceded by detailed manpower analyses and forecasts of economics and markets.

Entrepreneurship

Entrepreneurship is seen to be in very important factor in both global and local economy. Entrepreneurship has played an important role in economic growth, innovation, and competitiveness. In addition, it may be the key to poverty alleviation over time. (Landes 1998) Self-employment is an important mean of earning a living in low-income developing countries, because there is typically lack of formal sector jobs in labour markets. People who work as entrepreneurs business have control over what they do in their working life. In addition, they are having opportunity to shape their work environment and make an impact on their community.

Entrepreneurs in developing countries encounter a different set of circumstances than ones in developed economies because of different underlying economies. Emerging markets typically lack a stable of mature markets and the consistency that such markets offer. On the other hand, opportunities for entrepreneurship in emerging markets are pervasive. While Western entrepreneurs operate at the outer edge of the economy, emerging market entrepreneurs in developing countries operate closer to the core when the needs and opportunities are more widespread. (Lingelbach et al. 2005) However, small and medium size enterprises, especially micro enterprises in developing countries have difficulties in obtaining financial resources to effectively scale up and grow their businesses (InfoDev 2005).

Nowadays students graduating from Technical and Vocational Education and Training work more and more as entrepreneurs in working life. The nature of many contemporary professions practically demands students work as self-employed after graduated. For example working in the field of catering and tourism as well as in the field of beauty and hair treatment requires many times establishment of one's own enterprise. In addition, persons who work in the field art and crafts selling their own products operate often self-employed like entrepreneurs.

The wide range of skills are needed for entrepreneurship –not just for selling the products but developing one's own expertise, markets and business etc.. Entrepreneurial skills involves conducting oneself, planning, thinking skills like decision making, problem solving and creativity, interaction and communication skills etc. These skills are very useful for working life whether a worker is self-employed or not. Entrepreneurship is not an inherited personal feature; it is a bunch of competencies combining of attitudes, knowledge and skills.

Students are building their skills of entrepreneur based on their prior knowledge and conceptions on entrepreneurship. This prior model defines robustly how and what kind of new information students learn. Every student may have a different prior model based on earlier experiences on the society she or he is living. The role of the family is major determinant; a student's parents and family may have had unemployment in many generations when students may not have had any contacts to entrepreneurship that would have fostered her or his prior model. If students have not any working experience in companies or government offices, they are totally lacking of the model of working as an employee. Many times, the only picture students in TVET have on working life and entrepreneurs is transmitted by media or friends.

In order to foster students entrepreneurship, the formal TVET should be organized so, that students would have contacts to the culture of entrepreneurship. Ideally, students should work in the culture of entrepreneurship in an educational institute or a school. However, many teachers working in traditional educational institutes lack initiative in terms of business and productivity and rather work academic and not-self-directed. Basically, they are not entrepreneurs by their heart. This sets a

major challenge to TVET: how to equip young people with skills that enable them to build up their own future and life as self-employed or entrepreneurs.

The entrepreneurial spirit is vital to vocational education and training both, in developed and in developing countries. The new and innovative programs are yielding dividends for the future of students. How can traditional vocational education institutions prepare their students with the entrepreneurial skills needed to succeed in this context? The following examples illustrate how culture of entrepreneurship is implemented in educational institutions.

Self-Sufficient Schools are innovative approach that combines entrepreneurship and vocational education. It does not only increase the relevancy of learning, but provides both a training ground for students and a means of finance for the school through school-based businesses. The activities include e.g. production and sale of goods & services, developing entrepreneurial culture, emphasizing the tangible benefits of acquiring skills and knowledge and co-operative forms of working. Self-Sufficient Schools have been implemented successfully in developing countries for example in Benin in West Africa (see Kafka & Stephenson 2006).

School-enterprises are another similar approach promoted by UNEVOC (Singh 1998). Motivation for establishing school enterprises is the need for promoting competencies for self and wage employment. School-enterprises promote competencies which are required for launching and managing small scale enterprises. Effective learning is achieved through combining learning with production so, that the training underlines the importance of visibility of future returns.

TVET as a Skill Acquisition Process

“Thus, basic education is central to effective TVET. Literacy and numeracy are vital here. The health and safety of workers often depend upon their ability to read instructions (e.g. on fertiliser bags) and to make accurate calculations (e.g. of mixing and application levels). The wider skills of scientific and social literacy are also important for, for example, equipment maintenance and repair and understanding technological change (scientific literacy) and for group work, dialogue and negotiation with colleagues and supervisors, gender and ethnic tolerance and other skills needed for harmonious relations in the workplace (social literacy). The application of such literacies to the world of work and active citizenship need to become core dimensions of TVET if it is to respond to the imperatives of social sustainability.” (UNEVOC 2006)

There is inexactitude of terminology with regard to the terms ‘skills’ and ‘competences’. Skill is sometimes seen as representing only lower order attributes (e.g. keyboard skills) but most often as including also higher order attributes (like thinking skills). Competence is often construed as the application of skills in specific contexts and also as synonymous with skill.

The European documents speak of “key competences”. These would consist of knowledge, skills, and attitudes. The generic key competences will enable successful life action. They are transferable, and therefore applicable in many situations and contexts, and multidimensional, in that they can be used to achieve several objectives, to solve different kinds of problems and to accomplish different kind of tasks. Key competences are a prerequisite for adequate personal performance in life, work and subsequent learning.

The Bertelsmann Foundation and AOL Time Warner Foundation observed in 2002 that the digital technologies have given us new and better ways to teach and learn as well as made us more efficient at work. In return, they demand that we continually acquire and develop new knowledge and skills

People of the work force face two overlapping challenges. The first is to acquire the skills necessary to enter an increasingly digital job market, and the second is to continually improve those skills, and learn new ones, as life-long learning. Many studies suggest that workers around the world may not be keeping pace. It is widely believed that schools are failing to sustain the pipeline of employees who are adequately prepared to exploit new knowledge and skills.

The first skill in the working life is to define the information problem. It is not possible to look back for an answer from earlier practice since such does not exist. This is followed by identifying information needed in order to complete the task to solve the information problem. There is a wide consensus that all workers should be able to:

- *master appropriate tools to gather information*
- *understand the context of that information*
- *actively shape and distribute information in ways that make it understandable and useful, and*
- *exchange ideas, opinions, questions and experiences.*

People have always learned at work. According to Mr. Mikko Salminen, Nokia Learning Centre Network of Nokia Corporation, the paradigm of learning at corporate setting is rapidly shifting from skills development to capability management. The strong drivers behind the change are the ever increasing need for faster innovation cycles and the ability to support the strategic competency renewal (Salminen 2005).

The new learning paradigm can be expressed as the 70-20-10 formula of learning:

- *70% of the capability is built through on-the-job development and real life experiences*
- *20% is built through coaching, assessments and increased self-awareness*
- *10% is acquired through structured learning deliveries such as instructor-led-trainings and eLearning*

The learner will soon realize that by adapting this formula he/she will make each day a learning day. The need to separately plan the time for learning and work disappears and learning becomes work as usual.

However, this does not mean that we will invest less in learning and development, says Salminen. Basically, the formula is about developing the right mindset for learning rather than making choices between learning events and modes of delivery. There will always be room for skills based competency development, and certain enabling skills will continue to be delivered in a classroom, not to mention highly interactive leadership development where discussions and networking play a major role. In a similar fashion, eLearning is here to stay as an easily scalable and cost efficient delivery channel for theoretical solutions.

As the new working culture emphasizes the importance of lifelong learning, corporations are beginning to provide workers with the means to customize and direct their own learning experiences. There are still several steps to be taken to improve employment opportunities for

individuals and expand the innovative capabilities of companies. Everybody in working life and training is becoming more responsible for ensuring the development of the knowledge and skills acquired.

Traditional focus of TVET on the skills needed for manual work is challenged by mental work and the changing mixture of competencies required in the workplaces. The division between manual and mental work is vanishing when many traditional forms of work undergo major changes. Sustainable TVET should concern and affect both aspects of manual and mental competencies. (UNEVOC 2006)

Future TVET

The traditional scope of TVET is expanding, becoming more complex and challenging as a consequence of the demands of working life and global socio-economic changes. The new challenges of vocational and professional education include the following objectives:

- prepare learners for the working life or from one field of professionalism to another (work-based professional competence)
- provide learners to become active in work and as citizens (life-long learning: daily update and deepening of competence)
- promote in all activities the competitiveness, development and innovativeness of the economic and business activities of one's own field (regional development, regional competitiveness, economic growth and employability)
- serve as road for further studies
- respond to the individual needs of knowledge and competence of different learners – from professional excellence to specific teaching
- prevent marginalization and promote social cohesiveness.

Following the creation of new businesses new professions are born and instead of the traditional highly specialized, narrow focus professionals a broad scope of skilled workers are needed who can combine skills of many professions. Because of the reorganization of the working-life the differences between traditional work and work demanding higher education are disappearing. The professional worker has to be able to design, manage and evaluate his own work or the team-work while many workers with higher education take part in the operative work.

In spite of the rapid social and technological changes many basic professions remain very much the same as before. However, in the future it is not enough to respond to the challenges of the working-life. TVET will also play a role in the reform and development of working-life. Future innovations are multi-disciplinary in nature. In addition the innovative capabilities there is an increasing need the social competence to work in teams with people in different professions and with different educational background. Successful innovations in production and services require active participation in research and development as well as production and services.

In the future the students and learners of TVET are comprised of much wider selection of people than today. They include young people studying for their first profession, Adults changing their field of work, and people who are doing continuing studies. The background of these students as well as their motivational basis, culture and expectations are broader than today. Education and training must respond to these changes. Learning environments are becoming global and

multicultural, learning methods more diversified and learning culture for learner-centered and proactive.

Professional teacher training also needs to follow the new requirements of working-life and quality. Most important for TVET is to remain true to its mission in staying focused in the area of vocational and technical skills. The real tests of success of VET are the employability of the graduates, personal development, opportunities for further education and career development, public acceptance and image. Ultimately, the effectiveness and responsiveness of a VET system would be measured by its impact on the social and economic development of the nation.

Global learning

There are major challenges for development of TVET that are not bound to any continent or historical tradition but globally equip students with skills that enable them to build up their own future and life in global and multicultural environment. Some educational institutes are already expanding out of the geographical borders to global actors on the field when utilizing elearning and possibilities of ICT. Learning community and tutors may be distributed in various countries and cultures. The trend is also towards examinations and qualifications of TVET that are internationally recognized.

With the steep rise of multiculturalism, there is an increasing need for people to be able to deal effectively and competently with the diversity of race, culture and ethnicity. In general terms, one's ability to deal effectively and appropriately with diversity is referred to as intercultural competence (ICC).

Intercultural competence is a relatively new concept and there has been no consensus about it so far. The concept of intercultural competence is also referred to with different terms; some refer to it as multicultural competence while others call it cross-cultural competence. Traditionally speaking intercultural competence or competence in general is often divided into three main components:

1. **Knowledge:** also known as cognitive factors
2. **Motivation:** also known as attitude
3. **Skills:** also known as competence in social relations and communication behaviour

Intercultural competence scholars consider Knowledge, Attitude and Skills to be the key components of ICC and each of these components alone is not sufficient to achieve intercultural competence. Overall, the process of intercultural learning is intense for numerous reasons and its content can be difficult to grasp. Firstly, it requires learners to reflect upon matters with which they have had little firsthand experience. Secondly, unlike more conventional approaches to education, which tend to emphasize depersonalized forms of cognitive learning and knowledge acquisition, it includes highly personalized behavioural and affective learning, self-reflection, and direct experience with cultural differences. Thirdly, "learning-how-to-learn", a process-oriented pedagogy, replaces learning facts, a product-oriented pedagogy, as a major goal. Fourthly, intercultural education involves epistemological explorations regarding alternative ways of knowing and validating what we know, i.e. the meaning of truth and reality (Paige, 1993).

Additionally, becoming interculturally competent demands a wide range of culture-general knowledge from peoples' behavioural repertoires and people are also required to apply that

knowledge to the culture that they interact with. People also have to be emotionally and skillfully responsive with various ranges of choices in order to act competently depending on the limitations of any given situation. They also have to have extensive intercultural interaction experiences and have the know-how of adjusting to different patterns of thinking and behaving.

There is a long tradition of international cooperation in the field of higher education. It is evident that the common global challenges are leading to a intensified regional and international cooperation also in the field of TVET. Good example of this is the growing emphasis on TVET in the common policy of the European Union. Another example is the intensified global cooperation within the framework of skills competitions. International skills competitions offer an excellent tool for the analysis of the common future needs of industry and societies all over the world, for the determination of the key skills needed in different trades, for cooperation between TVET and working life and for improving the quality of for TVET by transferring good practices and new innovations and by giving a possibility to international benchmarking. The number of member countries of the WorldSkills International, the organization responsible for the skills competitions of young professionals, has gradually increased, being at the moment 48. The members represent countries from all continents and from industrial to newly industrialized and less developed countries.

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Appendix 1

Chart 1. The Education System of Finland (Source: The Finnish National Board of Education (FNBE))

Education System Chart

