

# **International Journal of Vocational Education and Training**

**Volume 23  
Number 2  
2015**

**Davison M. Mupinga  
Editor**

**Official Publication of the  
International Vocational Education and Training Association**



As a refereed journal, the *International Journal of Vocational Education and Training* depends on qualified individuals to serve as manuscript reviewers. We send feature article manuscripts to three reviewers. So as not to overwork our reviewers, we need some of you to join us for a one-year term.

If you have a record of publications, research experience, and an interest in gaining additional practice in the use of the Publication Manual of the American Psychological Association, please email your vita to Robert Clark at [tuf07751@temple.edu](mailto:tuf07751@temple.edu) or Elizabeth Richard at [tuf32379@temple.edu](mailto:tuf32379@temple.edu).

---

# International Journal of Vocational Education and Training

Volume 23, Number 2

©The International Vocational Education and Training Association

---

## Editorial Staff

Editor: Davison M. Mupinga

Typesetter: Christine Brooks

## Editorial Board

Anthony Baily, Australia	Chris Parkin, UK
Curtis R. Finch, USA	Doo H. Lim, USA
Jeanette Daines, USA	Jim Gleeson, Ireland
Kenneth S. Volks, Hong Kong	Johanna Lasonen, Finland
Ramlee B. Mustapha, Malaysia	Moustafa Wahba, Egypt
Rob Shea, Canada	Stephanie Davis, USA
Stamatis N. Paleocrassas, Greece	Sterling Saddler, USA

## Past Journal Editors

Dennis R. Herschbach • Volumes 1-3

Alexander F. Thompson • Volumes 4 and 5(1)

Magnus M. B. Ross • Volume 5(2)

Curtis R. Finch • Volume 6(1)

Dennis R. Herschbach • Volume 6(2)

Clifton P. Campbell and Ernest W. Brewer • Volume 7

Ernest W. Brewer and Clifton P. Campbell • Volume 8

Ernest W. Brewer • Volumes 9-16

Davison M. Mupinga • Volume 17-19

David Passmore and Rose Baker • Volume 20

Davison M. Mupinga • Volume 21-22

Mabel Okojie • Volume 23(1)

Davison M. Mupinga • Volume 23(2)

Even though space does not permit us to include the names of many others who contributed their valuable time and talent in service to the *Journal*, we do thank them as well. Since 1993, they have served as associate editors; co-editors; guest, style, copy, and managing editors; managing reviewers; members of the editorial board; regional editors; and publishers.

The *International Journal of Vocational Education and Training* is the official refereed publication of the International Vocational Education and Training Association (IVETA). It is published bi-annually and sent to members and subscribers. Regular individual membership dues are US \$50.00 per year. For subscription information, change of address, or to purchase additional copies of the journal, contact Christine Gardner, Executive Secretariat, IVETA, 186 Wedgewood Drive, Mahtomedi, MN 55115. Phone her at 651-770-6719 or email her at [iveta@visi.com](mailto:iveta@visi.com).

**ISSN: 1075-2455**

---

# International Journal of Vocational Education and Training

Volume 23, Number 2

©The International Vocational Education and Training Association

---

**President:** Carmel Therese Thompson, The Southern Cross Connection

**President-Elect:** Robert Mahlman, The Ohio State University, Center for Vocational Education and Training for Employment

**Immediate Past President:** Olga Oleynikova, Center for Vocational Education and Training Studies

**General Secretary:** Margo Couldrey, Lista Consulting

**Executive Director:** Mari Kontturi, Luovi Vocational College

**Executive Secretariat/Treasurer:** Christine Gardner, Ohio ACTE

## Regional Vice-Presidents

### Eastern & Western Africa

John Ntamuhira Twesigye

### Southern Africa

Wilson Makulumiza-Nkhoma

### East Asia & The Pacific

Lori Hocking

TasTAFE

### East Europe & Central Asia

Ilhan Gunbayi

Akdeniz University Faculty of  
Education

### Europe

Brenden Tempest-Mogg

Warnborough College

### Latin America & Caribbean

Reynold John

Metal Industries Company

Limited

Nigel Forgenie

Youth Training and Employment

Partnership Programme Limited  
(YTEPP)

### North America

John Gaal

Carpenters' District Council

### South Asia

Baharudin Abdullah Sarawak

Skills Development Centre

### Middle East & North Africa

Abdulaziz S. Al Amr

Technical and Vocational  
Training Corporation (TVTC)

**International Journal of Vocational  
Education and Training**  
Volume 23 • Number 2 • 2015

**Table of Contents**

<b>Contributors</b>	4
<b>Message from the Editor</b>	5
<b>Articles</b>	
Transforming Schools into Meaningful, Global, Vocational Education and Training Experiences <i>Gail Crossley-Craven</i>	7
Curriculum Integration in Vocational and Technology Education: Implications for Teaching and Learning <i>Atsumbe B. Numgwo, Raymond Emmanuel, Abutu Francis, and Robert O. Okwori</i>	15
Transformation and Globalization in Technical, Vocational Education and Training—Which Way Should TVET Take? <i>Georg Spoettl and Gert Loose</i>	28
The Role of Technical Vocational Education and Training in the Diversification of Nigerian Economy: Beyond Oil Approach <i>Chinyere S. Ayonmike and Benjamin C. Okeke</i>	45
Vocational Education and Training Opportunities for Students with Disabilities in Southern Africa: An Exploratory Study <i>Steven McIntosh and Davison M. Mupinga</i>	55
Using E-Portfolios to Achieve Better Learning Outcomes in Professional Training: Views from Teacher Trainees and Supervisors <i>Christina Wai Mui Yu</i>	67
Innovation, Sustainability and Leadership in Technical and Vocational Education and Training <i>Rónán Haughey</i>	79
<b>Publication Guidelines</b>	91

Articles do not necessarily reflect the position or policy of the International Vocational Education and Training Association or the *Journal's* editorial staff, and no endorsement by the association or editorial staff should be inferred.

## Contributors

**Gail Crossley-Craven**, Ph.D., is an expert of educational practices in a private practice at CC Education & Business Services in Australia. Her research interests are in psychology of education. She can be reached at: drcc@drcc.com.au.

**Atsumbe Bernard**, Ph.D., is a professor of industrial and technology education in the department of industrial and technology education at Federal University of Technology Minna, Niger state in Nigeria. His research interest are in the area of curriculum development in technology education. He can be reached at atsumbe@futminna.edu.ng.

**Raymond Emmanuel**, Ph.D., is a senior lecturer of electrical/electronics of education in the department of industrial and technology education at Federal University of Technology Minna, Niger state in Nigeria. His research interest are in the areas of ICT instructional techniques. He can be reached at emmaray@yahoo.com.

**Abutu Francis M. Tech** is an assistant lecturer of automobile technology of education in the department of industrial and technology education at Federal University of Technology Minna, Niger state in Nigeria. His research interest are in the area of special instructional techniques in vocational education. He can be reached at francisabutu@futminna.edu.ng.

**Robert Okwori**, Ph.D., Is an associate professor of wood work technology education in industrial and technology education department at Federal University of Technology Minna, Niger state in Nigeria. His research interest are in wood science engineering. He can be reached at okworirobert@yahoo.com.

**Georg Spoettl**, Ph.D., is professor at University Bremen Germany, director of the Center for Technology, Work and TVET (TAB) at University Bremen, Uni Bremen Campus Unit. His main research interests are in the development of the automotive sectors and its implications for human resource development. Other research interests in competency measuring in engineering science, and TVET. He can be reached at: spoettl@uni-bremen.de.

**Gert Loose**, Ph.D., is researcher at University Bremen, Uni Bremen Campus Unit. His main research is on curriculum development, work-process oriented training, lifelong vocational development, employer-based training and international TEVT. He can be reached at: gert.loose@gmx.com.

**Chinyere C. Ayonmike**, Ph.D., is a lecturer in TVET in the Department of Technical and Business Education, at the Delta State University Abraka, Nigeria. Her research interests are in Technical Education and Entrepreneurship. She can be reached at: chinyereshirley@ymail.com.

**Benjamin C. Okeke**, Ph.D., is a professor in the Department of Vocational Education at the Nnamdi Azikiwe University Awka Anambra State Nigeria. His research interests are in Technical Education and Entrepreneurship. He can be reached at: revbenchuks@yahoo.com.

**Steven McIntosh**, M.Ed., is an intervention specialist at Cuyahoga Falls High School, Ohio USA. His research and educational interests include post-secondary outcomes for students with disabilities, multicultural special education, and autism. He can be reached at: Steven.A.McIntosh1@gmail.com.

**Davison Mupinga**, Ph.D., is an associate professor in career and technical education in the School of Teaching, Learning and Curriculum Studies at Kent State University, Ohio USA. His research interests are in instructional technology, global competencies and multicultural issues in technical and vocational education. He can be reached at: dmupinga@kent.edu.

**Christina Wai-mui Yu**, Ph.D., is a professor (Practice) in the Department of Social Sciences and Director of School Partnership and Field Experience Office at the Hong Kong Institute of Education. Her research interests are in competence development and pedagogical strategies. She can be reached at: cyu@ied.edu.hk.

**Rónán Haughey** is the Founder and Development Partner at The Rónán Haughey Development Partnership in Sligo Ireland. He can be reached at: info.theRHdp@gmail.com.

## Message From the Editor

The need for globally competent workers in today's diverse and globally connected workplace cannot be overemphasized. Nowadays, most employers for both large and small organizations consider themselves as international or global companies. These organizations seek employees who can function in a global workplace, that is, employees who possess global competencies. Today's employers want new hires to have technical knowledge related to the job, but that's not nearly as important as good teamwork, decision-making, communication skills, and the ability to plan and prioritize work (Adams, 2014). Therefore, global competencies such as knowledge about the world--its cultures, languages, and how its economic, environmental and social systems work (Jackson, 2010) -- are essential. In addition to innovative and creative skills, employees should be able to use information and communication technologies appropriately to access, manage, integrate, evaluate, and create information (<http://www.p21.org/>). Since technical and vocational education and training (TVET) programs supply employees directly into the workplace, it behooves us to ask how TVET is responding to the needs of global economies.

A number of TVET researchers and practitioners continue to wrestle with this issue, and share their experiences/findings through publications such as this journal. Among the issues affecting TVET and global workplaces are: to what extent are TVET graduates meeting the needs of the global employers? What curriculum and training changes have been or are being done to address the needs of the global economies? What student populations are now being served in TVET programs? And finally, what changes have been made or need to be made to the delivery of TVET programs? The articles in this issue of the International Journal of vocational Education and Training (IJVET), shed some light on some of the questions above. These articles do so, as they describe current TVET policies and practices in various parts of the world. Other articles merely stimulate debate on these pressing TVET issues.

Like in other past IJVET issues, articles in this issue are current and relevant to TVET. The first article argues for the transformation of the schools to provide global education and training experiences. The second article addresses the benefits and implications of curriculum integration in TVET. Challenging TVET to tackle the transformation and globalization issues, the third article suggests approaches TVET can take. In the fourth article, the idea of using TVET to diversify an economy are explored. The need to provide technical and vocational education and training to special populations, in this case, people with disabilities, is the focus of the fifth article. Providing people who have disabilities with technical and life skills prepares them for life and work in their communities. With online now a preferred education and training delivery approach as well as for digital repository, the sixth article shares information on the use of professional e-portfolios to enhance teacher trainees' learning outcomes. As the world rapidly moves from the knowledge-based economy to the innovation economy (Innovation Strategies International, 2015), it is important to discuss the development of innovation, sustainability and leadership skills in TVET. From a practitioner's perspective, the last article does exactly that.

Once again, readers are reminded that articles published in IJVET come from all over the world, and as such, some authors do not speak English as their first language. While great care has been taken to correct the verbiage, there may be some errors that went unnoticed. As this is my last issue as the editor, I wish to thank all the reviewers, authors, and members of the editorial staff who worked tirelessly to produce the IVETA journal. I wish the new editors, Drs. Robert Clarke and Elizabeth Richard from the Centre for Professional Development for Career and Technical Education at Temple University in Philadelphia, USA, the best as they take on the editing responsibilities. Please note that the articles in this journal do not reflect the position of the journal's editorial staff, reviewers, or policy of IVETA.

DAVISON M. MUPINGA  
*IJVET* Editor



# Transforming Schools into Meaningful, Global, Vocational Education and Training Experiences

**Gail Crossley-Craven**

Queensland, Australia

## **Abstract**

Systemic changes are required in TVET education in schools. In our fast pace of life, there seems to be an educational shift to shorten the duration of vocational education and degrees and this is actually devaluing education rather than promoting it. The author's dream is to transform schools into meaningful, global, vocational education and training experiences where governments and businesses internationally collaborate to allow the young people to professionally advance through making a significant and meaningful contribution to world-wide economic growth. This vision consists of firstly having a 4 year embedded VET studies to commence in Year 9 and to be completed in Year 12. Secondly, schools to become entrepreneurial with their students; and thirdly schools to collaborate internationally for Year 12 VET students to learn VET with an international focus. This three-point model considers the seven sets of influences that are contributed to successful job outcomes. To move forward from its conception, several considerations are crucial for this dream to become a reality apart from an overall change of mindset and change of pedagogy.

*Key Words:* VET, schools, education, global experiences, job skills

I have a dream... that one day schools will deliver meaningful, global, vocational education and training experiences. I have a dream that one day governments and businesses internationally will collaborate with schools to allow our young people to educationally and professionally advance their contribution to world-wide economic growth. Regardless of the country, organizations and governing bodies encounter a conundrum: increasing levels of youth unemployment and young job seekers with inadequate job skills. How can governments and businesses worldwide successfully transition the younger generation from education to employment? This is not global breaking news and unfortunately, there is not a quick fix solution. Many young people around the world, especially the disadvantaged, are leaving school without the skills they need to thrive in society and to find employment. As well as thwarting young people's hopes, these education failures are jeopardizing equitable economic growth and social

cohesion, and preventing many countries from reaping the potential human capital that lies latent in our youth. Technical and vocational education and training (TVET) seeks to provide an opportunity for our youth to obtain knowledge through the study of technologies, linked disciplines and the acquisition of practical skills, attitudes, work-related understanding and knowledge in different areas of economic contribution. TVET includes technical education, vocational education, vocational training, on-the-job training, traineeship and apprenticeship training as well as a combination of the mentioned. This paper, briefly looks at the background and methodology of this sector, and then discusses why systemic changes are required in TVET education in schools and shares the author's dream. This dream will transform schools into meaningful, global, vocational education and training experiences where governments and businesses internationally collaborate to allow our young people to professionally advance through making a significant and meaningful contribution to world-wide economic growth.

## **Background**

The Council of Australian Governments (COAG) has established collective strategic frameworks that guide government action on schooling and vocational education and training (VET) across Australia. Raising productivity is the key outcome for COAG (2012). COAG (2012) recognizes that developing an effective and efficient workforce in these sectors is crucial to accomplishing the desired outcome. Students' VET expectations and perceptions are largely influenced by the knowledge and skills of their teachers and trainers, their peers, the equipment used and the students' exposure to the applicability of the learning to the wider community. Therefore, it is imperative that VET students are given the opportunity and experience to learn in an environment that is rich in diversity to equip them to effectively contribute in the workplace in a diverse world. This is the great challenge facing VET in the school context.

## **Methodology**

The methodology that I have adopted is the application of an understanding of the literature to my experience. This synthesis has enabled me to develop an innovative approach to VET within the school environment that is linked with the global world. The literature on learning is extensive and covers a vast array of viewpoints. Depending upon the ideological position of the researcher or educational commentator, differing elements are emphasized. The range of elements, by no means exhaustive, include knowledge or skills acquisition (Bloom, 1956) cognition (Gagné, 1985), adult learning (Brookfield, 1986; Candy, 1991; Merriam, 2001; Mezirow, 1994), learning for intrinsic reasons (Fauré, 1972), learning as an individual of a community (Wenger, 1998) and learning and re-learning for personal identity (Falk & Kilpatrick, 2000). It is possible to integrate this wide range of learning perspectives within the VET program.

Many young people have become disaffected by learning (Allan, 2014; Jones, 2013). Work-based learning has a demonstrated effectiveness in reducing this disaffection (Allan, 2014; Hall & Raffo, 2004) and providing young people with direction (Anlezark, Karmel & Ong, 2006; Sondergaard & Murthi, 2012). Within Australia, research by the Australian Bureau of Statistics (2011) found that male Aborigi-

nal and Torres Strait Islander students who had been involved in VET in schools were more likely to complete Year 12. Students involved in VET programs were more engaged and had improved vocational outcomes than those not involved in VET programs (Australian Bureau of Statistics, 2011). This suggests that an effective VET program can have a significant impact on improving the social wellbeing of the student (Balatti & Falk, 2002).

In the context of the role that meaningful work plays in the shaping of one's personal identity as an individual and within a wider social context, there are seven key influences from the individual's viewpoint that contribute to the successful outcomes of any VET program. These are: (1) the individual's condition; (2) the individual's emotional status; (3) the individual's employment attitudes; (4) the individual's work-ready skills; (5) the individual's qualifications, education and training; (6) the individual's work related experience; and (7) the individual's attitude to their career. These elements need to be understood in order to achieve the intrinsic and extrinsic outcomes that can arise from involvement in a VET program (Copps & Plimmer, 2013).

VET programs are more than just the creation of human capital. They can develop social capital (Coleman, 1988; Falk and Kilpatrick, 2000). Effective VET programs foster participation and engagement (Billett, 2002). They are about providing vocational progression through self-awareness and achievement grounded in meaningful work (Hartung, 2013; Hodgson & Spours, 2010). Short-term VET experiences that are not grounded in the life span of the individual are limited in their effectiveness (Kammermann & Hättich, 2011; Newhouse & Suryadarma, 2011). Long-term VET programs can be highly effective in the positive development of the individual (Klotz, Billett & Winther, 2014).

The implementation of VET programs can be demanding. The importance of commitment and the challenge of gaining this commitment from employers to a VET program can be highly demanding (Dustman and Schonberg, 2012). Current VET programs and approaches are often highly restrictive due to contextual and resource limits (Thompson, 2010). They are often developed as an add-on to the school curriculum without any real integration.

There is little doubt that education needs a transformation if learning is to remain relevant for a large number of our young people. A report by UNESCO advances the need for a globalized orientation of education founded in international co-operation and assistance (Faure, 1972; United Nations Educational, Scientific and Cultural Organization, 2012). Innovative VET programs must be a part of this transformation (Rauner & Smith, 2010; Turner & Lapan, 2013).

### **Why systemic changes are required?**

Why are changes required in the education system? Firstly, in our fast pace of life, there seems to be an educational shift to shorten the duration of vocational education and degrees and this is actually devaluing education rather than promoting it. A reputable Australian Institution advertises daily that people can complete three fully accredited Post-Graduate Business Qualifications (including an MBA) in 12 months while working! In my way of thinking, this devalues education and makes a mockery of higher education. This is not part of my dream for education; it is becoming a nightmare. Why are people and governments attracted to a fast and furious way of learning? While it might be advantageous to list these "qualifications" on your resume, I question the validity of them and the true usefulness of them in a practical world. In fact, if I was interviewing a person who had completed three fully accred-

ited Post-Graduate Business Qualifications (including an MBA) in 12 months while working, I would be highly suspicious and question other aspects of their resume. To me, this is a deterrent. I certainly understand that the sooner a person completes their studies, the sooner they can earn money and contribute to the economy of the country. However, I cannot understand how some VET and higher educational providers can continually shorten the duration of their courses and still claim to deliver quality and meaningful education to students who are expected to implement their learning in the real world.

Secondly, not all people want to embark on a particular path of study but feel pressure to do so; pressure can come from parents, family, schools, teachers, peers, society and perhaps cultural obligation. Perhaps the student does not possess the capability to complete this course of study and resort to employing someone to assist with the assignments. All too often schools and colleges are requiring students to complete VET courses for the educational institution's reputation rather than for the student's career pathway. This method of educating devalues vocational education itself and can detract from the appeal of learning. Furthermore completing VET course for the sake of it, creates an academic-vocational divide with the view that vocational education is a quick fix to gainful employment rather than a meaningful learning experience that will take the student to a career path of their choice. Educational institutions that participate in this practice are doing themselves a dis-service as well as potentially steering the student in the wrong career direction.

School-based VET students usually commence VET studies in Year 11. By this stage of schooling, some students are disengaged with school and seek alternative options that do not usually involve completion of a course that will lead them to a stable career and income. Students' engagement in securing gainful employment and job-related learning are essential for developing their capability and employment pathways. People who are in full-time employment, full-time study, or a combination of part-time work and part-time study are considered fully engaged (Australian Bureau of Statistics, 2014). In my practice, young people who are fully engaged are at less risk of an insecure employment future and seem less likely to personally suffer from general anxiety. Furthermore according to the Australian Bureau of Statistics (2014), 'students who did not go on to higher education and participated in VET in Schools were more likely to be employed full time five years after doing Year 11'. Also reported in this group was the 'level of full-time employment for males five years after Year 11 had increased from 63 to 66 percent for the sub-population that did VET in Schools while females had increased from 46 to 49 percent (Australian Bureau of Statistics, 2014). There is no doubt in my mind that these figures from the ABS could be increased if the VET system in schools was changed to encompass and incorporate VET that is truly targeted to the student and embedded in the secondary education curriculum. Therefore, it is important for students' engagement that they are encouraged to participate in VET early in their secondary schooling for the development of their capabilities and lasting employment pathways.

### **My dream to transform VET in schools**

Transforming VET in schools will be no easy feat but I believe vast changes need to be implemented in order for my dream for education to come to fruition. My vision for meaningful, global, vocational education and training experiences consists firstly of having a 4 year embedded VET studies to commence in Year 9 and to be completed in Year 12; secondly schools to become entrepreneurial with their students; and thirdly schools to collaborate internationally for Year 12 VET students to learn VET with

an international focus. This three-point model considers the seven sets of influences that are contributed to successful job outcomes. To move forward from its conception, several considerations are crucial for this dream to become a reality. There would need to be an overall change of mindset and change of pedagogy.

The first point of my vision is to introduce a 4-year embedded VET studies to secondary students who would commence in Year 9 and would be completed at the end of Year 12. In the education vision I am proposing, the decision of matching a course to a Year 9 student would not be taken lightly. It is envisaged that students would be screened through interviews and assessments to ascertain the particular VET sector or sectors to which they are most suited. Opportunities arise at schools where students are offered VET course at school because there is a vacancy in that course not because the student is suited to the course or indeed has an interest or a desire to work in that particular VET sector. Once again, this method of VET selection and student/course fit devalues VET studies and can create a wider gap between the student, student learning and the career path pertaining to that VET sector. Additionally, the students would have VET studies counselling by well-informed professionals to avoid students from completing unrelated certificates that would result in a confused direction for their career path. Rather than the current trend to streamline courses that condenses them so much that underpinning knowledge and scaffolding of information is often omitted, the inclusion of broader and more in-depth content of the VET course would truly add value to VET studies in schools. A consultation process between government bodies, industry authorities and professional people in the VET sectors would be conducted to determine how VET studies in schools can be enriched to include some of the much needed information, content and practice that has been omitted in some of the condensed versions of VET courses that are being currently delivered to VET students. With the inclusion of broader as well as more in-depth content in VET courses, students are more likely to have a deeper understanding of knowledge in their chosen field. Therefore the students would be more likely to transfer that knowledge into the workplace to experience successful job outcomes. A 4-year embedded VET studies to secondary students who would commence in Year 9 and would be completed in Year 12 would increase the individual's emotional status, the individual's employment attitudes, the individual's work-ready skills, the individual's qualifications, education and training and the individual's attitude to their career.

My second point is that schools need to become more entrepreneurial with their students. Schools have the capacity to provide many opportunities for students to participate in VET studies and work in the selected VET areas of study within the school community. It is unique as secondary schools are one of the few areas where students could be exposed to the majority of VET study sectors without necessarily leaving the school environment thus providing a safe learning and working environment. It takes a total change of mindset by government and industry bodies, all school staff, parent and guardians, the students and the school community. Students would be more likely to take ownership of their VET learning if they perceived it as an ongoing daily valuable and practical contribution to the workplace. Schools are businesses and by using innovative business savvy, VET studies can be embedded into the business management of the school. Think about the VET sectors that apply to a school. The VET students could: assist in the school's business administration; install, program and maintain the school's technology; build and maintain the school's website; the cater for the school's tuckshop/canteen; cater for school functions and events; manage the school's tuckshop; supply sustainable produce to the school's catering



ventures; landscape the school's gardens; maintain the school grounds; maintain and complete construction projects which would include plumbing, carpentry, painting and bricklaying. Each of these areas would be discrete, profit centers to teach business acumen to VET students. This list is only the beginning of the innovative and entrepreneurial ways that secondary schools can incorporate VET students' studies to transform schools into meaningful, vocational education and training experiences to allow our young people to professionally advance through their contribution to economic growth of the school community. This entrepreneurial approach to VET studies would transfer to successful job outcomes through the student's conditions; the student's emotional status; the student's employment attitudes; the student's work-ready skills; the student's qualifications, education and training; the student's work related experience; and the students' attitude to their career.

My last point of my vision is for schools to internationally collaborate for Year 12 VET students to learn VET with an international focus. Under my vision, Year 12 students would have already completed three years of the four-year VET course so would meet the challenge of learning from and communicating with international VET students, international VET staff and international business people. People with degrees have more of an opportunity to work internationally than vocationally trained people. We need to break down the barrier to the academic-vocational divide by transforming schools into international vocational education bodies rather than only a local community focus to allow the international stage to recognize and embrace the value of VET students in the same manner as people with degrees. In this technological age of Skype and the like, virtual classrooms, webinars, video conferencing, attending video conferences and the many other technologies unlisted and undiscovered, teaching VET with an international focus is both feasible and viable. This international approach to VET studies would contribute to successful job outcomes through the conditions; emotional status; employment attitudes; international work-ready skills; the student's qualifications, education and training that would be accepted internationally; the student's work related experience; and the students' attitude to their career that could be potentially international.

## **Conclusion**

I am not naïve in that I am fully aware that this vision will not happen overnight and will be met with road-blocks along the journey. There is much to be done as I have mentioned. For my vision to become a reality, strategic thinking and planning among a collaboration of educational institutions (secondary, tertiary), governments, industry bodies, organizations/businesses with an international focus and professional experts needs to take place. Systemic changes are required in TVET education in schools due to our fast pace of life where there seems to be an educational shift to shorten the duration of vocational education which is actually devaluing education rather than promoting it. Essentially students would commence their VET studies in Year 9 at the age of 14 rather than the current system where most schools commence VET students' VET studies when they are in Year 11. The students would be thoroughly guided and counseled prior to program commencement to ensure a correct fit to match the student and to the VET program. In the four years until they complete Year 12, the students would be trained with a local entrepreneurial focus in the safe environment of the school as well as an international focus in their chosen area of study while they

are in their fourth year of the VET program. This three-point model considers the seven sets of influences that are contributed to successful job outcomes. The seven key influences from an individual's viewpoint that contribute to the successful outcomes of any VET program are met using my vision. These elements will achieve the intrinsic and extrinsic outcomes from the involvement in this proposed VET program.

To move forward from its conception, several considerations are crucial for this dream to become a reality. There would need to be an overall change of mindset and change of pedagogy. Furthermore, government, industry and corporation collaboration for student sponsorship would provide the much-needed resources to change the future of VET studies in schools. My dream is that one day schools will deliver meaningful, global, vocational education and training experiences and governments and businesses internationally will collaborate to allow our young people to educationally and professionally advance their contribution to world-wide economic growth. My dream is also that I live long enough to witness this meaningful VET experience.

## References

- Allan, D. (2014). Quantity for quality: a case study on the impact of an English work-based learning program on disaffected pupils' qualification achievements. *Educate*, 14(1), 10–16.
- Anlezark, A., Karmel, T. & Ong, K. (2006). *Have school vocational education and training programs been successful?* Adelaide: National Centre for Vocational Education Research. Retrieved from [www.ncver.edu.au](http://www.ncver.edu.au).
- Australian Bureau of Statistics (ABS). (2014). *Outcomes from Vocational Education and Training in Schools, experimental estimates, Australia, 2006-2011*. Retrieved from <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4260.0?OpenDocument>.
- Balatti, J. & Falk, I. (2002). Socioeconomic Contributions of Adult Learning to Community: A social capital perspective. *Adult Education Quarterly*, 52(4), 281-298.
- Billett, S. (2002). Workplace pedagogic practices: Co-participation and learning. *British Journal of Educational Studies*, 50(4), 457-481.
- Bloom, B. (1956). *Taxonomy of Educational Objectives, Book 1, Cognitive Domain*. UK: Longman. Brookfield, S. (1986). *Understanding and facilitating adult learning*. San Francisco: Jossey-Bass.
- Candy, P. (1991). *Self-Direction for Lifelong Learning: A Comprehensive Guide to Theory and Practice*. California: Jossey-Bass.
- Coleman, J. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, 95-120.
- Copps, J. & Plimmer, D. (2013). *Inspiring impact: The journey to employment. A guide to understanding and measuring what matters for young people*. London: New Philanthropy Capital (NPC). Retrieved from <http://www.thinknpc.org/publications/the-journey-to-employment/inspiring-employability-final-for-web/?post-parent=7805>.
- Council of Australian Governments. (2012). *Education in Australia 2012: Five years of performance, Chapter 4 - Leaving school*. Canberra: COAG Reform Council. Retrieved from [www.coag.gov.au](http://www.coag.gov.au).
- Dustmann, C. & Schönberg, U. 2012. What Makes Firm-Based Vocational Training Schemes Successful? The Role of Commitment. *American Economic Journal: Applied Economics*, 4(2), 36-61.
- Falk, I. & Kilpatrick, S. (2000). What is social capital? A study of rural communities". *Sociologia Ruralis* 40(1), 87-110.
- Fauré, E. (1972). *Learning to be: The world of education today and tomorrow*, Paris: UNESCO. Gagné, E. (1985). *The cognitive psychology of school learning*. Canada: Little Brown & Co.
- Hall, D., Raffo, C. (2004). Re-engaging 14-16-year-olds with their schooling through work-related learning, *Journal of Vocational Education and Training*, 56 (1), 69–80.

- Hartung, P.J. (2013). The Life-Span, Life-Space Theory of Careers. In S.D. Brown, R.W. Lent, (Ed.) *Career Development and Counseling. Putting theory and research to work* (2nd ed.). New Jersey: John Wiley and Sons Inc., 83–113.
- Hodgson, A. & Spours, K. (2010). Vocational qualifications and progression to higher education: the case of the 14–19 diplomas in the English system. *Journal of Education and Work*, 23(2), 95– 110.
- Jones, T. (2013). Through the lens of home-educated children: engagement in education. *Educational Psychology in Practice: theory, research and practice in educational psychology*, 29 (2), 107– 121.
- Kammermann, M. & Hättich, A. (2011). Two-year apprenticeships – a successful model of training? *Journal of Vocational Education and Training*, 63(3), 377–396.
- Klotz, V.K., Billett, S. & Winther, E. (2014). Promoting workforce excellence: formation and relevance of vocational identity for vocational educational training. *Empirical Research in Vocational Education and Training*, 6(6). Retrieved from <http://www.ervet-journal.com/content/6/1/6>
- Merriam, S. (2001). The new update on adult learning theory. *New Directions for Adult and Continuing Education*, San Francisco: Jossey-Bass.
- Mezirow, J. (2000). *Learning as transformation; Critical perspectives on a theory in progress* (1st ed.). San Francisco: Jossey-Bass.
- Newhouse, D. & Suryadarma, D. (2011). The Value of Vocational Education: High School Type and Labor Market Outcomes in Indonesia. *World Bank Economic Review*, 25(2), 296–322.
- Rauner, F. & Smith, E. (2010). *Rediscovering Apprenticeship. Research Findings of the International Network on Innovative Apprenticeship (INAP)*. London: Springer.
- Sondergaard, L. & Murthi, M. (2012). *Skills, Not Just Diplomas- Managing Education for Results in Eastern Europe and Central Asia*. Washington: World Bank.
- Thompson, R. (2010). Teaching on the margins: Tutors, discourse and pedagogy in work-based learning for young people. *Journal of Vocational Education and Training*, 62(2), 123–137.
- Turner, S.L. & Lapan, R.T. (2013). Promotion of Career Awareness, Development, and School Success in Children and Adolescents. In S.D. Brown and R.W. Lent, (Ed.). *Career Development and Counseling. Putting theory and research to work* (2nd ed.). New Jersey: John Wiley and Sons Inc., 539–564.
- United Nations Educational, Scientific and Cultural Organization. (2012). *Youth and skills: Putting education to work. Education for All Global Monitoring Report 2012*. Paris: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0021/002180/218003e.pdf>.
- Wenger, E. (1998). *Communities of Practice. Learning, meaning and identity*. Cambridge: Cambridge University Press.



# **Curriculum Integration in Vocational and Technology Education: Implication for Teaching and Learning**

**Atsumbe B. Numgwo, Raymond Emmanuel,**

**Abutu Francis, Robert O. Okwori**

Federal University of Technology, Minna, Niger State, Nigeria

## **Abstract**

Employers are requiring that schools give graduates of vocational and technology education the 21st century skills. Hence fresh employees are required to learn new skills quickly and be able to communicate, solve problems, and work with technology. Current technological, communication, managerial, and entrepreneurial skills required by the students are to be imparted by the schools, but the present narrow focus on academic and psychomotor skills is affecting the curriculum. This shallow and straight jacket curriculum which separates knowledge into discrete portions has negative implications on effective teaching and skill development. This paper deals with how curriculum integration could facilitate effective teaching and skill development. Specifically it focuses on concept of vocational and technology education, curriculum integration, types of integration, principles of integration, key requirements for successful integration, benefits of integration, approaches to effective teaching and learning, implications of implementing an integrated curriculum and problems associated with curriculum integration.

*Key Words:* Curriculum, Curriculum integration, Vocational and Technology Education, Teaching and Learning.

## **Introduction**

Vocational and technology education is an aspect of learning which leads to acquisition of practical and applied skill as well basic scientific knowledge. It is a form of education designed to prepare individuals for industry, agriculture and commerce, among others. This type of education is usually provided at senior secondary or lower tertiary and the university level. Vocational and technology education can also be seen as a planned program of course and learning that begins with the exploration of career options, supports basic academic and live skills and enables advancement of 1. high academic standards, leadership, preparation for industry, chosen occupation, and advanced and continuing education.

As the global world develops rapidly, it is creating jobs that require a solid education and technical skills. In fact, Quinn (2013) observed that as the needs of our global world are changing vocational educators must prepare students to meet these needs. This according to her is because new technologies and management skills require employees to have better communication skills, critical thinking skills and problem solving skills. Lamenting the incompetency of technology education graduates, Wagner (2008) noted that there seems to be a skill gap in which many students are lacking, the skill to compete for the 21st century jobs. Governments all over the world are lurching ambitious reforms of basic education with strong emphasis in vocational and technology education. All these reforms are geared towards increasing the quality of training given to graduates of vocational and technology education program.

Despite these reforms and explosion in every sphere, VTE graduates still lack required skills and knowledge. Therefore many of such graduates cannot or do not want to pursue higher education and cannot compete in the evolving labor market and contribute to the economy. Graduates often have difficulty finding employment because their training has not given them the skills required by employers. At the same time, employers particularly industrialists complain that graduates from the vocational and technology education programs in Nigeria do not possess the skills they need and are said to be luring foreign labor instead.

The existing technical skill gap between the VTE graduates and industries has become a major concern to parents, business leaders and educators in Nigeria. Employers of labor have continued to express their concern and worry over the quality of current VTE graduates. According to Partnership for 21st century Skills (2011), Technical Vocational Education and Training (TVET) students are actually short on or lack relevant skill required for employment in the public and private sectors. Idris and Rajuddi (2012), observed that most industries and employers of labor in Nigeria complains, include inadequate skill requirement of VTE graduates for most cutting edge technology in addition to very poor theoretical background. The second international conference of VTE held in Korea 1999 set the mission for all nations under UNESCO to use VTE to address the employment or other socio-economic challenges of the 21th century. These challenges include globalization, trade liberalization, an ever-changing technological scenario, ICT revolution and the consequent rapid pace of social change (UNESCO 2000). The constant and pertinent questions that vocational academics have continually asked are: How relevant, appropriate, and current is the VTE curricula in all tiers of training institutions? Do they meet the needs of employers, industry and society in the age of convergence of information and communication technology? It is regrettable that most of the curricula are those that have been in use for the past fifteen years.

For example, various production task which were manually performed before this time, have become mechanized, digital and in some cases automated. In the face of all these changes, review and updating of the present curricula is inevitable. Even though many vocational educationist and general educationist have blamed the non-performance of vocational and technology education graduates on several factors such as poor facilities, tools and equipment, acute shortage of trained teachers, poor administration, and underfunding, among others, curriculum theorists talk about mismatch between the content of what is taught in schools and the demands of the industries. Several technology education experts, will normally and generally call for curriculum review without talking about the technicalities involved. This paper focuses on how to tackle these challenges through curriculum integration.

## **Concept of Curriculum**

Curriculum can be described as the totality of all the learning experiences which learners are exposed to under the guidance of the school. Curriculum according to Atsumbe (2010), is a set of courses or content that is planned and taught in or outside the school for the purpose developing of the learner physically, morally, socially and intellectually. In the present dynamic society where change is inevitable, curriculum also encompasses all the planned and unplanned experiences which learners acquire at school or in a training center or any training environment. Curriculum gives a definite focus to the educational process and encourages co-operative endeavor in the school system. Curriculum also emphasizes that school life is a continuation of the life in the society it serves, what the school designs and teaches does not end within the school programs. The common types of curriculum among others includes subject centered curriculum, activity/experience-centered curriculum, child-centered curriculum, hidden curriculum and core-curriculum.

Educators are constantly searching for new ways to help students, make sense out of the multitude of life's experiences and the bits and pieces of knowledge they gain from traditionally departmentalized curriculum. Students today continue to move from one discipline to the next forcing the information to be disconnected to anything that resembles real life situation. To lighten some of the fragmentation among our students and teachers experience, holistic and integrated curriculum are being proposed and adopted by many educational institutions. A major driving force behind integrated teaching and learning is the belief that when themes, subjects or projects are combined students begin to see meaningful connections between the subject matter. Materials then serve as a vehicle for learning rather than simple pieces of information. In addition to this, repetition of material from one subject to the next is essentially eliminated.

## **What is Curriculum Integration?**

Curriculum integration can be described as an approach to teaching and learning that is based on both philosophy and practice. It can generally be defined as curriculum approach that purposely draws together knowledge, skill, attitude and value from within or across subject areas to develop a more powerful understanding of key ideas. Curriculum integration occurs when components of the curriculum are connected and related in meaningful ways by both the student and the teacher. An integrated curriculum is all about making connections, whether to real life or across disciplines, about skills or about knowledge (Drake & Burns, 2004). An integrated curriculum fuses subject areas, experiences and real life knowledge are fused together to make a more fulfilling and tangible learning environment for students. Integrated curriculum, according to Vars (1991), seems to be the best vehicle for empowering VTE students and teachers. In situation where students move from one subject area to the next, information is disconnected and the ability to make material relevant to the life of the student is lost.

Supporters of an integrated curriculum believe that interdisciplinary education offers heightened for mastery of the content and real-world applications, which inevitably increases the opportunity for

deeper level of learning. According to Olaitan and Ali (1997), curriculum integration refers to the horizontal relationship between experiences. These relationships should be such that it can help students to have a unified view of the element being dealt with. For instance, in learning to solve problem in metalwork, it is also essential to consider ways in which these skills can be employed in other fields such as woodwork, automobile technology and electrical electronics. This will give learners a great perception of what they are learning and present them with an integrative image of various situation of daily life. Integration takes place when teachers present learning experiences in such a way that they enable the learners to develop more consistent patterns of thinking in various subject matter. Atsumbe (2010) further stressed that the major trust of our current educational system stipulates functionalism. Functionalism in education can best be achieved through the effective adoption of integrated curriculum into the educational system. Curriculum integration enhances a unified perception of knowledge. Curriculum integration actually implies summation of wholeness.

To integrate curriculum is to sum up all learning experiences and engender functional interplay among various subject towards a unitary perspective. This implies the synthesis of different aspects of knowledge into a quasi-transformed whole. In effect, it brings into conscious reality the interrelatedness of different part of knowledge and this shows how some concepts compliment and reinforce each other. In Vocational and Technology Education, curriculum integration reflects the philosophy that education must forge connections between knowledge development and its application in the workplace. In its most basic form, curriculum integration involves the infusion of academic content into vocational programs, often referred to as “enhanced academics.” Most VTE schools in Nigeria adopt departmentalized curriculum integration system. In this approach, students are exposed to learning experiences in all the trade areas of VTE at the early stage of the program and later restricted or narrowed to their departmental content. In this system, the students graduate to earn certificate in a single area of trade or specialization such as automobile, building, electrical, metal and woodwork technology.

Technological advanced countries like South Korea, Russia, China and Japan however practice full curriculum integration from the beginning of the VTE program to the end. The students are exposed to learning experiences in at least two trade areas of specialization. In this practice, the VTE students end up graduating to be experts in at least two trade areas. The students graduate with fused VTE degrees such as: Electro-mechanical technology, building/wood work technology, automobile /metal work technology, and welding and machining technology. Vars (1991) also revealed that in VTE schools in Ukraine there is also a case of VTE students obtaining degrees in Industrial Technology (electrical, mechanical and building/civil combined). In line with this, according to Pisapia and Riggins (1997) and Stasz (1997), the new vocationalism calls for “enhanced relevance,” which is achieved when students engage in learning experiences that are situated in real-life contexts. Furthermore, engage in learning experiences that afford in-depth understanding and development of higher-order thinking skills achievable through curriculum integration.

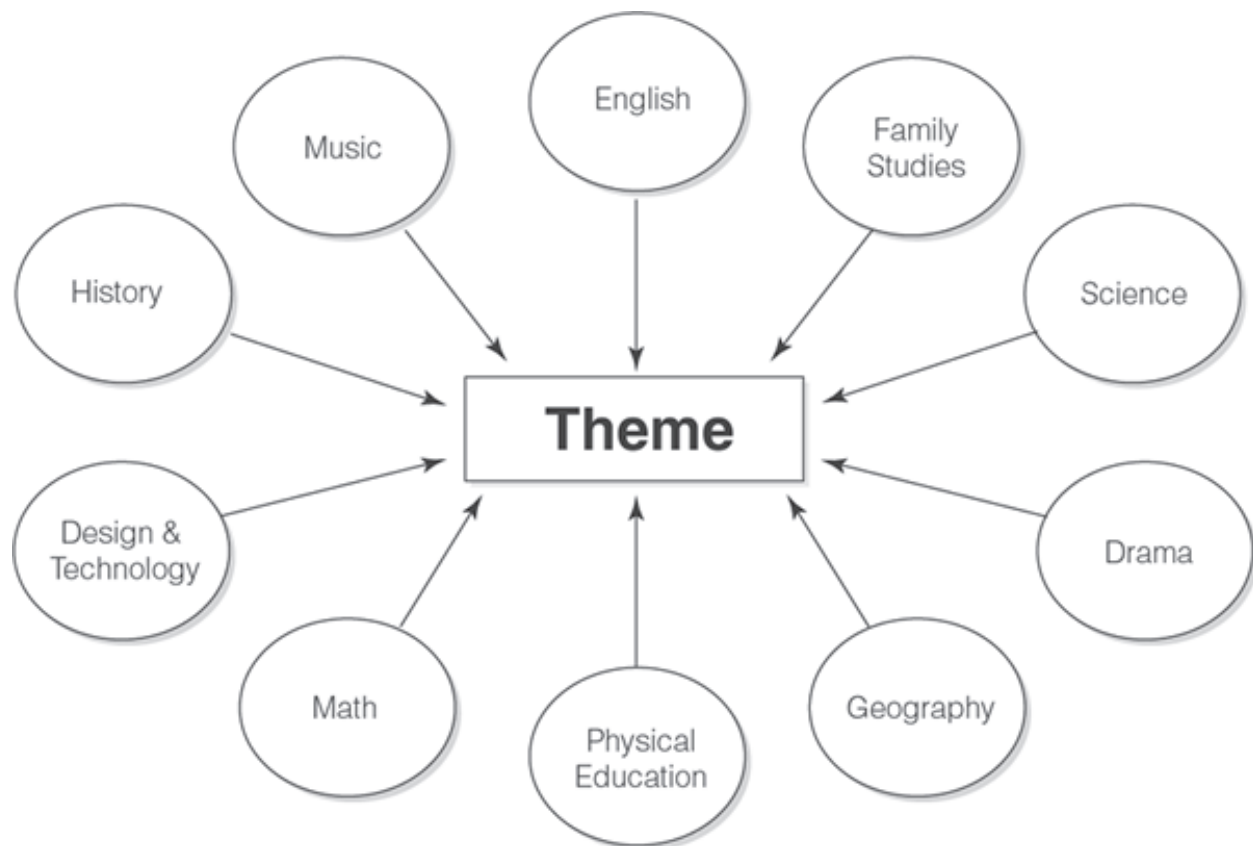
## Curriculum Integration Approaches

The integrated curriculum model is an organizational structure and approach that weaves together content disciplines through a substantial theme or complex topic. By immersing learners in an integrated thematic unit, we provide learning experiences across numerous disciplines that encourage students to transfer and retain knowledge conceptually and understand topics. The next section discusses multidisciplinary integration as a curriculum approach.

### Multidisciplinary Integration.

Multidisciplinary approaches focus primarily on the disciplines. Teachers who use this approach organize from disciplines around a theme. Figure 1 shows relationships of different subjects to each other and to a common theme. For example, English, mathematics, science, social studies and career technical teachers all collaborate to plan and present lessons that center around a central, career themed issue or problem.

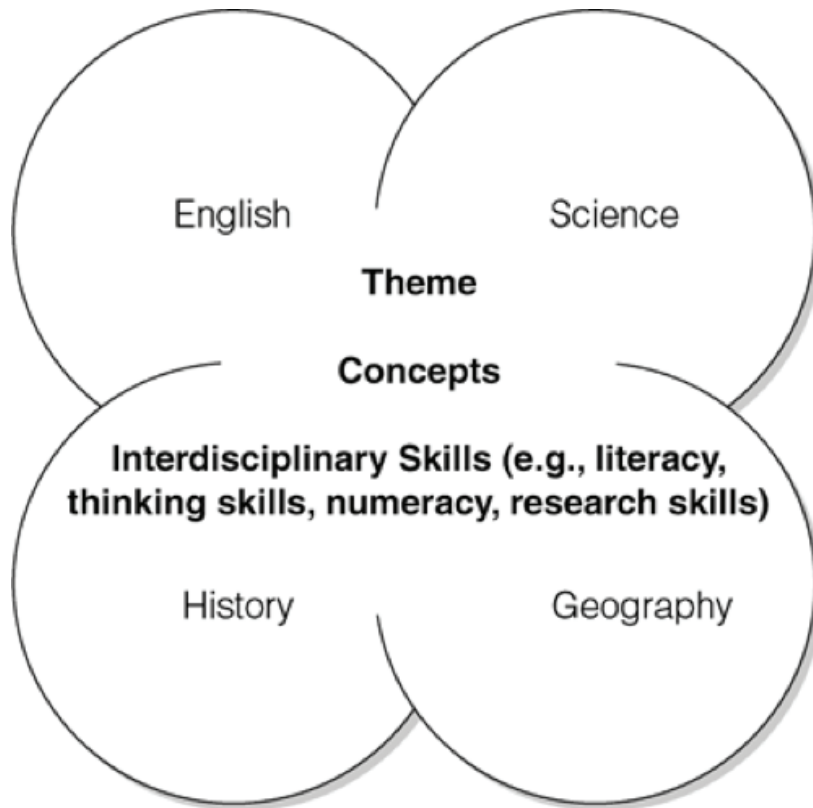
Figure 1: Multidisciplinary approach diagram



### Interdisciplinary Approach.

In this approach to integration, teachers organize the curriculum across disciplines. They chunk together the common learning embedded in the disciplines to emphasize interdisciplinary skills and concepts. These disciplines are identifiable, but they assume less importance than the multidisciplinary approach. Figure 2 shows the interdisciplinary approach.

Figure 2: The interdisciplinary approach diagram



While multidisciplinary implies looking at a common topic or theme in different disciplines; interdisciplinary means exploration of ideas, skills, processes common to different disciplines. Through an interdisciplinary approach, students can make connections, between disciplines and see the correlations, which improves overall learning. As a result, students receive a more relevant, timely, less fragment and enriching learning experience. With interdisciplinary integrated curriculum, true learning occurs; there are no distinct boundaries between areas of study. As much as a student is learning a subject, they are also learning how to learn. Teachers should always encourage learning across the curriculum. The result will always be comprehensive, well-rounded education, where critical thinking, inventive ideas and enthusiasm for learning naturally occur.

An interdisciplinary approach (also called horizontal integration) connects the independent knowledge and skills from more than one subject area to examine a central theme, issues, problem, topic or experience. It is a holistic approach that stresses linkages.

## Intradisciplinary Approach

Intradisciplinary approach involves an arrangement of knowledge and skills within one subject area. This approach respects the subject's ways of knowing distinct conceptual structures and methods of inquiry. It aims at integrating the subject knowledge and skills into a coherent whole. Another part of this approach is vertical integration where knowledge and skills within one subject area are connected from grade to grade. Teachers need to be aware of the scope and sequence of their subject areas, from first year through fifth year in the degree program.

When teachers integrate the sub disciplines with a subject area, they are using an intradisciplinary approach. For example, integrating every sub disciplines from technology to form introductory technology or integrated science integrates perspectives of sub disciplines such as Biology, Chemistry, Physics and earth space science. Through this integration, teachers expect students to understand the connections between the different sub disciplines and their relationship to the real world.

### Transdisciplinary approach.

Transdisciplinary approach places the characteristics, need, interests and personal learning processes of students at the forefront of the learning experience. Students engage in independent projects which aim at developing initiative, imagination and creativity. Research skills, Analysis and Synthesis skills, and Autonomy are also developed. As students work on projects, they acquire knowledge and skills that are based on the subject areas. However, the subject areas are subordinates to the project goal. In the transdisciplinary approach to integration, teachers organize the curriculum around students' questions and concerns. Students develop life skills as they apply intradisciplinary and disciplinary skills in the real-life context. Two routes head to intradisciplinary integration; project-based and negotiating the curriculum. Figure 3, 4, 5, and 6 below show diagrammatic representation of transdisciplinary approach, vertical relationship of experiences, horizontal relationship of experiences as well as vertical and horizontal relationship of experiences respectively.

Figure 3 Transdisciplinary Approach diagram

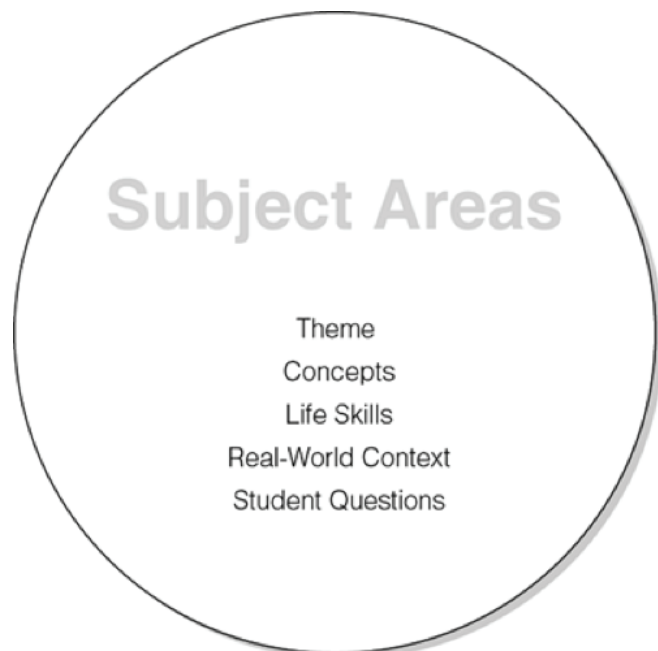




Figure 4: Vertical Relationship of Experiences

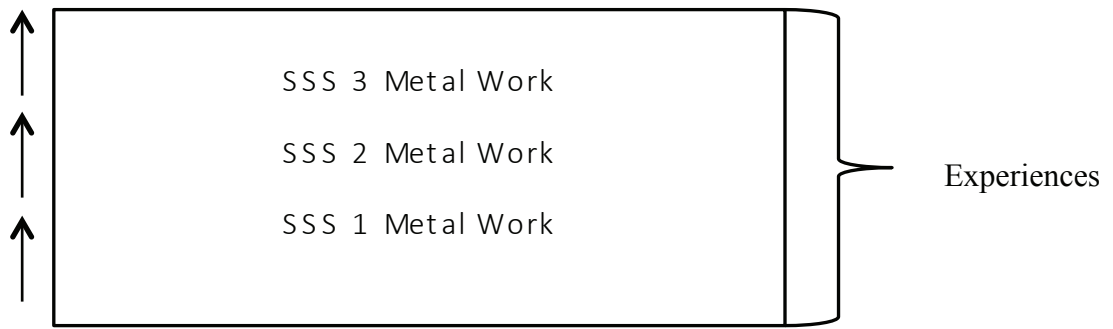


Figure 5: Horizontal Relationship of Experiences

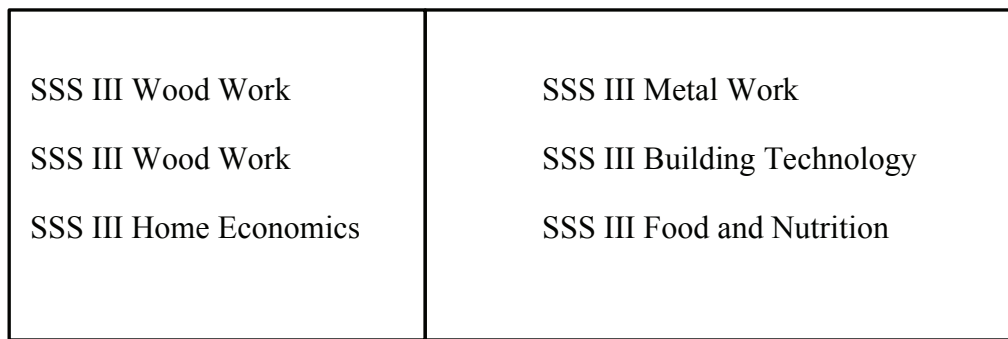
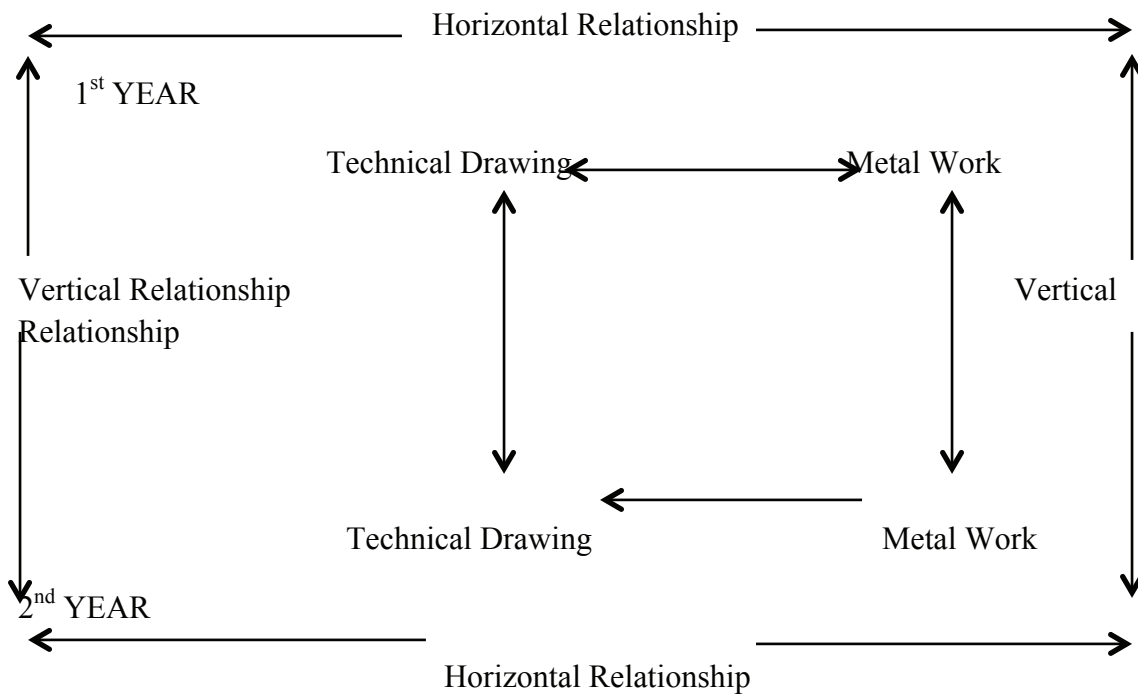


Figure 6: Vertical and Horizontal Relationship of Experiences





## Key Requirements of Curriculum Integration

Curriculum integration is more than a clustering of related learning outcomes. The selection of learning experiences should be based on the extent to which they promote progress or broaden and confirm understanding. There is no one best way to integrate the curriculum. However, the key requirements to be met for successful integration includes: content integrity, authenticity, criterion of validity, significance, interest and learnability.

## Benefits of Curriculum Integration

The benefits of integrated curriculum include not only looking at the concepts for an in-depth understanding, but also providing a meaningful learning experience for students through using real life examples. By uniting knowledge, teachers can help students to make connections among disciplines through solving real-life problems together. By making education not only relevant but also engaging, it keeps students interested in the learning process.

According to Drake and Burns (2004), an integrated curriculum is all about making connections, whether to real life or across the disciplines, about skills or about knowledge. An integrated curriculum fuses subject areas, experiences, and real life knowledge together to make a more fulfilling and tangible environment for students. Therefore, the interaction of what is taught and what they already know, play a large role in understanding concepts and retention of learning. Perkins (1996), Omrod (1999) and Guthrie (2000) specifically outlined the following as specific benefits of integrated curriculum.

- In an integrative curriculum with an interdisciplinary approach, students are often given a choice, making the subject inherently more meaningful. This in turn, increases the learners' intrinsic motivation and self-efficacy.
- Student's motivation and achievements are significantly enhanced by measures that counter fragmentation and attempt to make learning a more connect experience.
- In an interdisciplinary classroom, students work together in collaborative manner to solve problems, construct knowledge, and make connections between existing curriculums. This in turn brings about cooperative learning. In addition, model effective learning and problem solving strategies for one another.
- Inter disciplinary approach to learning brings about higher level of comprehension, recognition of inadequacies or misconceptions when students help one another learn, they create scaffolding for one another's' effect and they may collectively construct more sophisticated ideas and strategies than any single group member might be able to construct.
- Cooperative learning is a valuable instructional method. Our experiences, culture and society have shaped our minds, and this cannot be disconnected from learning environment. The cross-curricula instruction of integrated curriculum encourages students to continue to make these relevant connections.

Integrated curriculum allows for:

- **Flexibility:** through curriculum integration, teachers can plan for the development of key skills and understanding that transcend individual strands and subjects.
- **Building on prior knowledge and experience:** choosing meaningful connections among subject

areas helps students build on their diverse prior knowledge and experiences, supports their holistic view of the world and ensures more learning that is meaningful.

- **Unifying the students' learning:** Curriculum integration enables students to develop a unified view of the curriculum to broaden the context of their learning beyond single subject areas.
- **Reflecting on the real world:** When curriculum is organized in a holistic way it better reflects the real world and the way children learn at home and in the community.
- **Matching the way students think:** Brain research supports the theory that younger students take in many things and process and organize them at one time. Teaching ideas holistically, rather than in fragmented pieces better reflects how young students brain process information.

### **Major Possible Implementation Pitfalls**

A major barrier to developing an integrated school-to-work curriculum is territorial conflict between vocational and academic teachers (Bridges, 1993). In many schools, vocational and academic educations exist in two separate worlds. Vocational and academic teachers are “separated physically, socially, organizationally, and educationally,” and may be reluctant to collaborate. Some vocational teachers wish to maintain the integrity of the vocational curriculum; they may assert the importance of one-sided vocational skills and may be reluctant to add other vocations and academic content. Similarly, academic teachers may resent the integration of vocational issues. Administrators should emphasize the importance of all teachers working together and sharing information within departments, disciplines, and schools to keep open lines of communication and pave the way for integration. Schrenko (2010) notes that territorial conflicts are often resolved when teachers see the benefits of an integrated school-to-work curriculum.

Compared to urban communities, rural communities may have fewer financial supports to develop and sustain integrated vocational and academic programs. Rural communities also may have less business and industry available for making curriculum-design suggestions. Okon (2011) suggests the use of educational cooperatives to develop consolidated programs between school districts. He also notes that rural businesses and industry, though fewer in number and variety than their urban counterparts, may have more incentive to become involved in curriculum reform because “vocational education has been shown to play a pivotal role in arresting economic decline in some rural areas.” If not developed with an understanding of the goals for authenticity and increased learning, an integrated curriculum can result in decreased expectations for students.

### **Implication of Curriculum Integration for Teaching and Learning**

No matter which curriculum integration approach or model is selected for use, several common implications tend to emerge:

1. Integrating curriculum requires teacher flexibility and negotiation of content and method. Teachers must shift their belief system from one that is primarily didactic in nature to one that

has foundation in constructivism. Rather than asking students to follow the steps of procedure, memorize facts, or verify given principles or laws, students work together to discover knowledge, applying their knowledge as they solve real world problems. At one level this means working with one's peers to improve education. At another level, teachers work with their students in solving problems that have multiple answers.

2. To be able to implement curriculum integration in the classroom, teachers and other school personnel require continuing education and skill development. An extensive amount of professional development is needed for teachers, this includes a significant intervention of two or three weeks of knowledge development in curriculum areas other than the one they are certified to teach. In addition, this professional development must include extensive practice in the use of constructivist-oriented pedagogy.
3. To effectively practice curriculum integration, teachers need to manage experiential-oriented instruction. This includes inventorying and storing materials. The safe operation of instrumentation, machines, and equipment; and leading students towards efficient progress.
4. In implementing an integrated curriculum, teachers must be conscious of the fact that positioning children as competent and capable entity fosters their ownership of their learning. It also influences the nature of their interactions with adults and peers. This is because a crucial aspect of children's learning is persistence and ownership gained from grappling with problems. Teachers need to recognize fertile moments for provocation and extension.
5. An integrated curriculum may not address a logical sequence within a discipline such as mathematics. Further research into the effect of this will be needed if teachers are to look at the role of sequence in curriculum selection decisions.
6. In using an integrated curriculum, teachers need to learn to use authentic assessment strategies, performance in examinations and rubrics to document student's progress. This is because when the curriculum is based on broad concepts linked in thematic units, students may acquire knowledge in very different ways, making the traditional sequence less meaningful. This is an area that has not been fully explored in the research on integrated curriculum.
7. Best practices for initial and ongoing in-service training need to be explored more fully. A related issue is the extent to which pre-service teachers are prepared to teach in settings that are committed to curriculum integration.
8. Administrators and school board need to be oriented so that the necessary resources and ongoing support can be provided to the teachers to successfully practice curriculum integration.
9. Public information strategies need to be implemented in order to inform the community and parents that a new paradigm of education is being used because the expectation is for education to be provided as it has always been and unless the public is informed of changes to be made, there is likely to be resistance.
10. A final word of caution is for the teacher who feels that this must be an all-or-nothing scenario. There may well be instances in which curriculum integration is not the most appropriate way to go. A careful examination of successfully integrated programs may suggest the extent to which integration can or should be implemented.

## Conclusion

Going by this research work, one would acknowledge that full curriculum integration is necessary for effective empowerment of Nigeria's Vocational and technology education students with the requisite multiple trade skills for securing employment and for self-reliance in the 21st century world of work. Also at national and international platforms, it has been maintained that full curriculum integration in TVET provides the needed employable skills and attitude necessary for effective performance in the workplace. Furthermore, students taught with integrated curriculum are more likely to develop high academic and technical proficiency. Above all, it is an undisputable fact that technologically advanced nations of the world, that have become economically and socially balanced, are nations that have fully incorporated curriculum integration in their TVET practices both in their technical and technological institutions at secondary and tertiary levels.

## References

- Atsumbe, B.N. (2010). Integration of Vocational Education at the secondary school for effective teaching and learning. A paper presented at the National Training workshop organized by Institute for Science, Technical and Vocational Education Development held on 13th September at Niger State Education Resources Centre, Minna, Niger state.
- Bridges, D. (1993). Transferable skills: A philosophical perceptive. *Studies in Higher Education*, 18 (1), 1-10.
- Drake, S.M., & Burns, R.C. (2004). Meeting Standards Through Integrated Curriculum. Alexandria, Virginia: Association for Supervision and Curriculum Development.
- Guthrie, J.T., Schafer, W.D., Von Secker, C., & Alban, T. (2000). Contributions of instructional practices to reading achievement in a statewide improvement program. *Journal of Educational Research*, 93(4), 211-225.
- Olaitan, S.O., & Ali, A. (1997). The making of a curriculum: Theory, Process, Product and Evaluation. Onitsha: Noble Graphic press.
- Okon, U.E. (2011). Work-Based Learning initiatives. Paper presented at Step-B/World Bank- assisted TVET Teachers *Upskilling* workshop held at the University of Nigeria, Nsukka from October 23 – November 4, 2011.
- Omrod, D. (1999). Understanding reading comprehension: Current and future contributions of cognitive science. *Contemporary Educational Psychology*, 22(4), 213-247.
- Quinne, T.T. (2013). An investigation of curriculum integration in a vocational school setting: A qualitative study. Education Doctoral Theses at Northeastern University, USA. Retrieved from <http://www.hdl.handle.net>
- Perkins, D.N. (1996). Teaching for Transfer. *Educational Leadership Journal*, 46(1), 22-24.
- Partnership for 21st Century Skills (2011). School-industry collaboration. Retrieved from <http://www.p21.org/index.php>
- Pisapia, J., & Riggins, E. (1997). The Integration of Academic and Vocational Education. Richmond, VA: Metropolitan Educational Research Consortium, (ED 404 440).
- Rajuddi, A. (2012). A curriculum strategy that expands time for in-depth elementary science instruction by using science-based reading strategies: Effects of a year-long study in grade four. *Journal of Research in Science Teaching*, 29(1) 545-554.
- Schrenko, L.C. (2010). Standards and Guidelines for Work-Based Learning Programs in Georgia. State of Georgia Department of Education. *Sciences*. 4(5), 25-28.

- Stasz, C. (1997). Do Employers Need the Skills They Want? Evidence from Technical Work. *Journal of Education and Work*, 10(3), 205-223.
- UNESCO, (2000). *Enhancing adult motivation to learn*. San Francisco: Jossey Bass.
- Vars, G. F. (1991). Integrated curriculum in historical perspective. *Educational Leadership*, 49(2), 14-15.
- Wagner, T. (2008). *The global achievement gap*. New York: Basic Books.

# Transformation and Globalization in Technical, Vocational Education and Training—Which Way Should TVET Take?

**Georg Spoettl and Gert Loose**

Universität Bremen, Germany

## **Abstract**

We are in a position today to explain that we need two changes of paradigm in order to match the requirements needed for coping in tomorrow's world of work. This world is described by the formula of Industry 4.0. Firstly, we need to abandon the concept that young people have to first proceed with their "general development" before they should engage in "vocational development." These two developmental processes actually occur side by side and not in consecutive order. Consequently, because of following this misconception, the care for "early vocational development" (vocational awareness, systematization, orientation and exploration) has so far been neglected and should become emphasized. Secondly, we need to understand that "narrow skills" will no longer be sufficient for successful performance at the place of work. Instead we have to be in command of "broad competences" which convey the ability of coping with increasing complexity and rapid advance at the place of work. This necessary transition can also be described by progressing from the focus on (static) "work" to the focus on (dynamic) "work-processes." This article elaborates on these two indispensable changes of paradigm.

*Key words:* work-process analysis, occupational standards, detailed curriculum, vocational development

## **Introduction**

There seems to be only one thing today we can be completely sure of in training: That we have to live with constant change. What we have accepted as useful today, may already be redundant tomorrow. Sometimes people are afraid because they do not know what the future holds. In the case of vocational education and training, all variables regarding work undergo change, and therefore, technical and vocational education and training (TVET) itself is also strongly affected by change. Yet, when we accept change as a necessity, we also learn to appreciate its positive effects. Confucius once said: "Study the past if you want to define the future." That is exactly what this article seeks to do. In this endeavor our

inquisitive mind will rely on a very simple definition of training: “Training is preparation for successful performance at the place of work. In the past, today and in the future.”

### **Development of Training from Middle Ages to Industry 4.0**

Over time training has changed tremendously. In the early Middle Ages, most people were peasants but they also built their own houses and produced and maintained the tools and instruments which they employed in their daily work. It was only from the 12th century onwards that with the emergence of towns, people started to specialize in a certain craft, such as building wooden houses or baking bread. They performed these skills against a payment for the service to others. While the peasants were under noblemen these craftsmen were free; they formed guilds to establish rules and regulations regarding their role in the towns, where they lived and worked. Craftsmen were definitely different from the peasants with regard to:

- Following a specialization in their skills,
- Being dependent on the payment which they received for their work,
- Enjoying a higher standard of life, and
- Holding a higher social reputation.

Their political influence however was limited. Craftsmen were part of the middle classes. Basically, they built houses, produced goods and offered services. When society became more and more complex, new crafts came up as part of a further differentiation of the following groups of crafts: house building crafts, food related crafts, wood related crafts, metal related crafts, textile related crafts and some additional crafts, such as the barber-surgeon and the wagon-maker. The following groups of crafts with their specializations represented the range of craft activities from the Middle Ages until the beginning of industrialization (Buringh & van Zanden, 2009). Figure 1 also shows the development of the crafts and corresponding agents of training.

Figure 1: The Development of the Crafts (Occupations) and Corresponding Agents of Training

<b>Crafts</b>	<b>Agents of Training</b>
Peasants and Hunters	Family
12th Century: The emergence of towns: Specialization of crafts, work performed as a service against payment <ul style="list-style-type: none"> <li>• House Building Crafts</li> <li>• Food Related Crafts</li> <li>• Wood Related Crafts</li> <li>• Metal Related Crafts</li> <li>• Textile Related Crafts</li> <li>• Barber – Surgeon</li> <li>• Wagon-Maker</li> </ul>	Master Craftsman (from Father to Son etc.)
Industry 1.0 (Modern Crafts) Industry 2.0 to Industry 4.0	Master Craftsman and Vocational Schools Network of Institutions for informal, formal and non-formal learning



Children, particularly boys would follow their father's craft. As apprentices they would reside together with the journeymen in the house of a master craftsman. Upon completion of their apprenticeship they would become travelling journeymen for about six years in order to gain additional experience through their work with other master craftsmen. After these six years, they would work two years as a journeyman before they could enroll to become a master craftsman.

Hence, the son of a carpenter would be trained to be a carpenter and the son of a baker would become a baker and so on (girls could only become tailors, their main "occupation" would be to become a housewife). After the completion of apprenticeship (usually three to five years) and the acceptance of the journeyman's piece of work, the new journeyman as mentioned above passed through six years of mandatory work as a travelling journeyman in his field of work. This made sure that sufficient experience was gained in different work environments.

The guilds regulated the labor market for their field so that work in demand and skills offered would be in balance. They stipulated how many journeymen and how many apprentices could work with a master craftsman in accordance with common demand. Every talented trainee had the chance to become a master craftsman in accordance with transparent procedures (including the submission of a master piece of work). Transportation was no problem since the apprentices principally lived in the house of their master craftsman, usually even together with the journeymen.

So when we appraise the structure of medieval training, we become aware of simple, yet clear conditions and we have to consider, that the parameters under which young people became apprentices and later on journeymen and master craftsmen were simple but evidently effective. Of course, we need to emphasize that these provisions need to be perceived on the basis of the requirements for youth at that time. Over time the range of occupations – in particular for skilled work--was increasing. This has to be regarded as a reflection of the increasing complexity of society. Also, prosperity in the towns gave rise to demand for new products and services. The diversification of skilled crafts moved a large step forward when the upcoming industrialization introduced new modes of production, in particular the conveyer belt.

No longer were the children bound to follow the craft of their parents. From the crafts which were needed in the Middle Ages we eventually progressed to the 300 to 350 "training occupations" which we have today in most industrialized countries. "Choice" of a craft or rather "skilled work" became a new situation for youth and "talent" and "aspiration" gradually became the central parameters for young people's process of deciding in which kind of skilled work they intended to get prepared for employment. Somewhere on this way the preparation for skilled work became too complicated to rely only on the experience which master craftsmen and skilled workers passed on to the trainees. This resulted in the emergence of the vocational school, first as a weekend program for theory and more and more as an addition to practical training at the place of work.

The clear and simple structure of training for a craft in the Middle Ages gave to Modern Times way to a complex cooperation between employers and unions and the vocational schools plus company training facilities and regional training centers. Instead of the fatherly professional guidance provided by a master craftsman it became more and more whole "networks" of partly interacting human resource agents which secured the competence of the trainees.

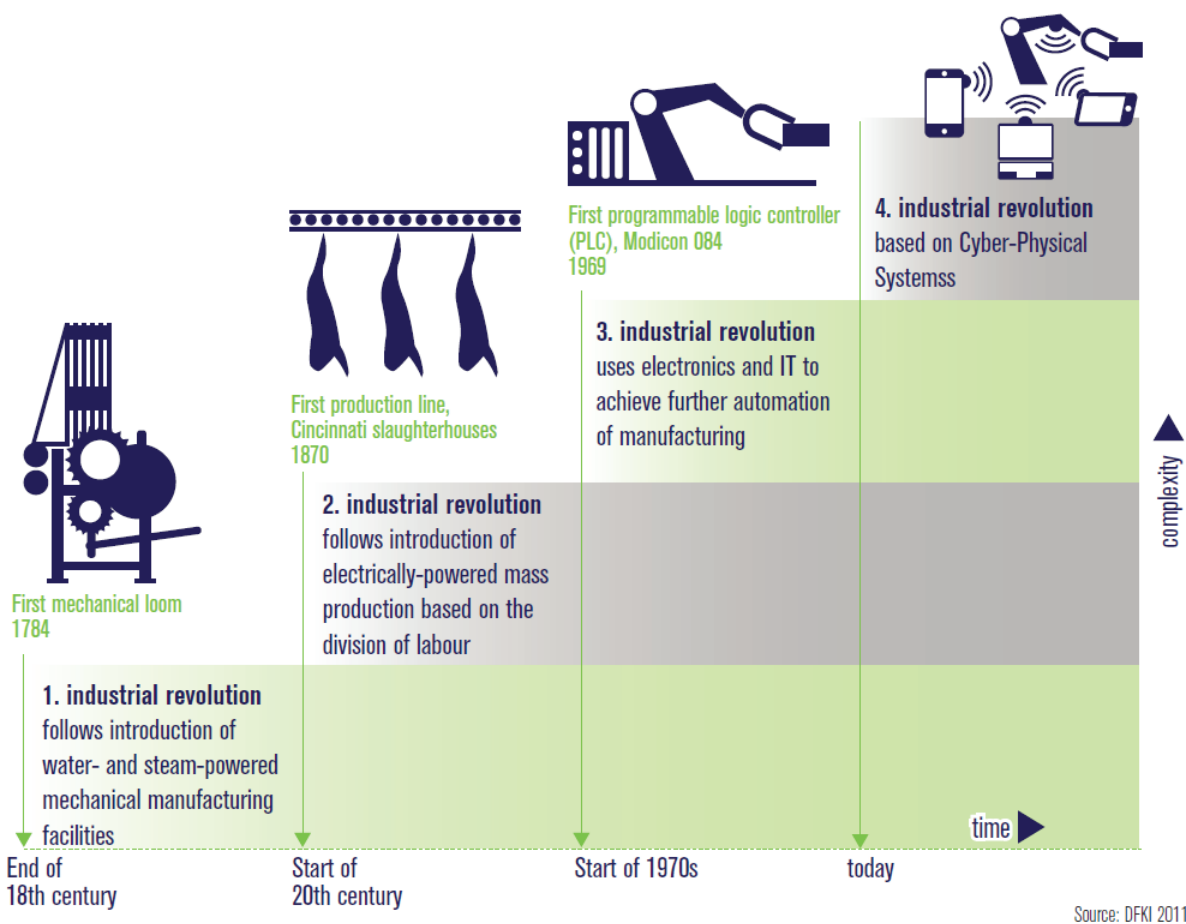
This differentiation process received additional momentum when in the post-industrial era the new emphasis of work swung to the service occupations and production assumed a less important role. Fur-



thermore, the detachment of work from the family background had far reaching implications for the choice of individuals identity with work, ranging from work just as “a means for earning a livelihood” to work in a specific occupation in the sense of “cherishing a vocation” and regarding it as the core attribute for a central role in life.

Yet, this change in the structure of getting prepared for one’s work is by far not sufficient for understanding the scope of the challenges in technical vocational education and training which we have to face today (see Figure 2). With Industry 4.0 coming up the nature of work is about to change drastically again (Lee, 2013). The individual is in the process of stepping back from his or her active role in work and to arrange for segments of the work-process to interact with each other while the worker is just monitoring this process.

Figure 2: The Four Stages of the Industrial Revolution: Industry 4.0



Source: Hagermann, Wahlster and Helbig (2013)

In a way, we are enabling the work-process to arrange for itself. This can only become operational on the basis of a profound understanding of the work-process and of the potential of its respective segments of communicating in a meaningful way with each other. In industry 4.0 no longer will the competence to act directly be the focus of our preparation for work, instead our attention is going to be

placed on the potential of subsystems to communicate with each other and for the worker to engage in monitoring the overall work-process.

Finally, over the centuries' preparation for work changed from informal learning at the place of work to formal, non-formal and informal learning in a network of institutions and places. For the learner the process of decision-making for which area of work to receive training came up as a new area of concern and finally preparation for work does no longer focus on the acquisition of "narrow skills" but because of conditions at the place of work undergoing permanent change "broad competences" are needed for coping with this situation.

With this present scenario of change and uncertainty regarding the preparation for work we need to question whether our direct focus on the "preparation for work" is still the appropriate concept in searching for the optimal programs in this field. "Preparation for work" today still usually neither includes guidance provided for the important decision-making process for which occupation preparation is sought nor for building one's own rationale for the process of withdrawing from active vocational life at old age.

This seems to be reason enough for a more detailed elaboration of the appropriate concept for providing the individual assistance for coping with the vocational aspects of life. No longer is this just a question of acquiring the skills and competences needed for performance at work. The process of deciding in which occupation one should get engaged was not existent in the Middle Ages and the incidents of change in a career are important events today. Finally, retirement from one's work has also become recognized as an important phase of one's life.

### **3 From "Vocational Education" to Stepwise "Vocational Development"**

It may partly be because of the complex embeddedness of the preparation for work today that we very often look at this area of activities in false terms. We assume that an individual first undergoes a "general development" before the "vocational development" is encountered as the preparation for engaging in gainful employment. Very often we think that our children should first acquire a solid general education before they enroll in vocational training.

This concept is wrong. General development is not preceding vocational development. Individuals actually undergo their "general" and their "vocational" development side by side. Young children engage in fantasy choices of an occupation they would like to devote their time and efforts to. Boys may want to be a policeman or driver of a racing car. Girls often opt for being a nurse or a housewife. Of course, these are fantasy choices, yet they constitute an early but very important manifestation of vocational development. So the fantasy occupational choice of becoming the driver of a racing car may finally lead to the realistic choice of becoming a car mechanic, as it happened to the authors of this article.

When we analyze the fantasy vocational choices of children we arrive at a very surprising insight: The motives behind the early vocational aspirations of children are very similar to the motives why adults consider their work important (Hartung, Porfelli & Vondracek, 2005). Table 1 shows a comparison of vocational behavior of children and of adults in terms of conformity with selected vocational behaviors. In early childhood individuals develop a first understanding of their role in working life. This process needs to be enhanced and enriched in order to allow the individual to develop his or her full potential for gainful employment later in life.

Table 1: Vocational Behavior of Children and of Adults in Comparison

Vocational Behavior	Adults	Children
The particular vocational activity is felt to be in line with personal strengths.	X	X
The particular vocational activity is felt to enjoy good reputation of the public.	X	X
The particular vocational activity is felt to be regarded as a positive contribution to “society”.	X	X
The particular vocational activity is felt to be of importance to the people	X	X

Hence, vocational development is a lifelong process, starting early in childhood, progressing through all phases of a vocationally active life until we retreat from vocational activities in old age. More importantly, all different phases of an individual’s vocational development are in need of support and guidance (BWP, 2010).

We owe it in particular to American research in vocational guidance (Brown & Brooks, 2002) that the stages of vocational development have been elaborated following a lifelong cycle. Donald Super has defined five stages of vocational development which structure the lifelong process from childhood to old age as follows (Denham, 2010): “**Growth**” begins at birth with the early form of developing vocational self-concepts. “**Exploration**” is entered around the age of 14 years, when a vocational preference is eventually developed. “**Establishment**” begins around the age of 24 years, when all efforts are invested to build a career. “**Maintenance**” is reached around the age of 44 years, when the emphasis of vocational development lies on holding on to what has been achieved. And finally “**Decline**” is reached, when individuals around the age of 60 years and up gradually disengage from working life until they finally retire and plan for their life “after work” (Patton & Lokan, 2001).

Hence, we need to recognize that preparation for work should not only be concerned with the skills and competences which we need to acquire in a particular occupation in order to perform successfully at the place of work. No, we need also to give our full attention to the process of gradually arriving at a decision regarding the occupation for which we want to train in order to make it the center of our working life. This is not an article about the lifelong stages of a working life, so we will not concentrate on the process of disengaging from working life, yet all stages of development which should be passed before “vocational preparation” proper must be of concern to us. What Donald Super has in a rather wide concept described as “growth” should be elaborated with regard to the desired “intervention” of educators, instructors and counselors in this field.

For this reason we will proceed from Super’s rather psychological terminology to the more educational and also more detailed terminology of “career education”. Super’s research provided to quite some extent the basis for the concept of career education which became the major reform initiative of the American Government in the early 70s under the Commissioner for Education Sidney P Marland Jr. (Marland, 1971). Unfortunately, it lacked institutional support and very little of this excellent concept has become reality. When “career education” made its debut we definitely understood that it is not just about “preparation”

for performing in an occupation. Quite some decision-making and gaining vocational experience is usually involved before we have found the right entry point into a career. And even retirement from working life has become considered as an important phase of vocational development which should be assisted by professionals.

It is the “developmental” scenario of career education which is of particular interest to us here. It contains the theory underlying prevocational curricula, which help young children to understand the idea of gainful employment and accompany them through the early stages of vocational development until they settle in a career. The differentiation which is most common for this approach defines four stages of vocational development as explained in Figure 3.

Figure 3: Stages of Vocational Development before “Vocational Preparation”

**Vocational Awareness**

Becoming aware of the need for a wide variety of occupations in society and of the necessity to finally find one’s own position among them.

**Vocational Systematization**

Being introduced to categorizations which can be applied to structure the world of work regarding the different talents which have to be applied in society.

**Vocational Orientation**

Learning to find out about your own talents and which relevance they may have for your process of finding an occupation of your choice.

**Vocational Exploration**

Being given the chance to explore – from a childhood perspective – a real work environment, if possible including the involvement of actual work.

Source: Marland (1971)

**Vocational Awareness**

Vocational awareness starts early in a child’s life and it should be supported in kindergarten and pre-school by prevocational programs. These programs are intended to assist young children in learning that it should be their aim to be gainfully employed later in life. It contains an early introduction to the world of work which is based on the principle of the division of labor in society. Everybody should find his or her place in this paramount arrangement. Early vocational intervention could, for example, be arranged by having children in kindergarten listen to the fairy tale of the king who loved to eat rolls so much, that he ordered everybody in his kingdom to become a baker. This will prompt the protest of the children, that there must also be policemen and teachers and nurses. Hence, it is the aim of programs in vocational awareness to create in young individuals an identity that they need to become a part of the world of work and that they should learn how to best get engaged in line with their talents and aspirations.

**Vocational Systematization**

Only through a careful stepwise systematization can the complexity of the world of work be explained to young children. From simple differentiations children become aware that different talents are needed to keep the world operational and that it is important for each child to find out both, the talents

needed in society and the talents which one can contribute in a world which operates on the division of labor. The simplest systematization of different types of work differentiates between working with your hands and working with your brain. In working with your hands one must be strong enough. Working with your brain requires sufficient insight in a specific area and the means to come up with conclusions and working with your social capabilities in order to help others. Furthermore, the grouping of similar occupations into families and clusters is an ideal means for structuring the world of work.

### **Vocational Orientation**

With the children's more differentiated understanding of the world around them, the "matching-process" between a detailed understanding of the talents which are needed in the world of work and the talents oneself can offer is getting more intense. After understanding an outline of the world of work the focus is now on starting to find one's own place in it. Video-clips or cartoons may portrait scenes from the vocational life in different occupations, or areas of economic activity such as occupations in the harbor. They can be introduced in books and CDs regarding all the different occupations which interact in a particular area. After a basic understanding of vocational phenomena has by now been conveyed by prevocational programs we arrive at more specific questions regarding single occupations. Consequently, expert advice of a vocational counselor may be needed.

### **Vocational Exploration**

One's work is an activity which should involve the whole person. It is extremely difficult to anticipate all the effects of this process just from observing others at work and reading about it. The actual experience in an occupation is indispensable for arriving at a conclusion regarding the final commitment for training in a particular occupation. Even worse, are the impressions of any first work experience. These are so strong that only the comparison with a second and if possible also a third work exploration experience brings about a sufficiently solid base for comparison of experience, which allows the trainee to arrive at sensible decisions regarding longer term work in a particular occupation. In case we limit ourselves to just one practicum the trainee may be so positively impressed by performing actual work, that he/she overlooks important aspects of choice and suitability of the particular work. One may be turned off by work at all.

### **Vocational Preparation**

It is not before an individual has acquired practical experience in possibly three occupations and while comparing these periods of practical experience has selected one of these three occupations as his or her preference for making it the starting point for a lifetime career that we proceed to the stage of vocational preparation. This important step of finally getting prepared for employment has to be taken with some precautionary awareness: We can no longer rely on building up a homogeneous lifetime career. We must be prepared for changing our career, possibly even several times during a lifetime. Change in technologies and in the social parameters of life may force us to change our career.

We have started our investigation from the basic definition that preparation for work should convey the means for successful performance at the place of work. And we have questioned, if for today's situation we should directly head for "preparation for work" or if we should rather pursue the more differentiated way of providing support for an individual's "vocational development"? It can be argued

that after reviewing the “prevocational stages” of preparation for work, we realize that they contain crucial development aspects which need support and they would be left out if we would directly focus on preparation for work. Hence, we need to accept the concept of “vocational development” and the support which we owe to each individual in order to optimize his or her vocational development for each stage of this important, complex development process.

So far we can conclude: The setting of “preparation for work” has changed tremendously since the Middle Ages. We started out with vocational development being synonymous with “preparation for work” in a pre-assigned craft and we are faced today with a bundle of complex variables which make the individual in his or her vocational development process likely to be dependent on professional assistance by a whole network of agents in all stages of vocational development.

#### **4 Beyond Preparation for “Work” to Acquiring Competence of Mastering “Work-Processes”**

Back to our agenda: We have emphasized the importance of proceeding with a change of paradigm in TVET in the sense that we need to redirect our focus from direct “vocational preparation” to stepwise “vocational development.” Yet, we should not overlook a second equally important area of necessary improvement in training. We need to proceed from the focus on work-oriented “narrow skills” to work-process oriented “broad competences.”

In thriving for quality in today’s struggle for improving the effectiveness of vocational education and training to better match the requirements of industry, it has become evident in all industrialized countries that we have to move away from conveying “narrow skills”. Instead, we need “broad competencies” to respond to increasing complexity and rapid technological advance at the place of work. We need to progress from focusing on “work” to concentrating on “work-processes” which incorporate the excessive change which we are witnessing today at the place of work.

Regardless of the uncertainty which we have to face today we need to run the risk of acquiring skills and competences which we may later have to abandon. Of course, the broader the competences are which we acquire, the smaller will the threat be, that they might become redundant. Consequently, “vocational preparation” exhibits a tremendous complexity and therefore we can no longer focus on “work” and convey narrow skills as a stable point of reference for training; instead we need to try to incorporate this complexity in our training programs by addressing “work-processes.” With a focus on “work-processes” we attempt to counter the challenge, how we can enable our trainees to cope with excessive change at the place of work. This is the only way to ensure that they can stay employable.

Today curricula endeavor to convey a range of “broad competences.” At the core of successful performance at the places of work lies “human competence,” which is closely related to “social competence,” needed to work in teams and networks and for anticipating the social benefits or shortcomings of one’s work. Finally, a broad understanding of “professional competence” is needed, since this competence is today subject to continuous change and it must therefore be flexible enough to incorporate this change. Furthermore, today’s workers need to be able to approach their work in a methodologically structured way and they need to be “willing to continue learning” to catch up with the change which they encounter. This culminates in Industry 4.0 up to the point where workers retreat from active work and just monitor work-processes which communicate with each other.



We have in the past years pressed forward in research regarding work-process oriented training programs. For the stage of “preparation for work” we have meanwhile established a solid procedure. Our progress has in particular become possible through the introduction of **Advanced (“intelligent”) Occupational Standards** (Spoettl & Loose, 2014) which can incorporate the increasing complexity and the rapid technological advance which we have to cope with at the place of work. Furthermore, the introduction of **“Learn and Work Assignments”** has resulted in a giant step forward in the didactics of coping with uncertainty at the place of work. The trainee is encouraged to apply self-directed learning to the problems which he or she has to solve there.

It is a careful string of strategic steps which conveys the ability for the development of curricula which enable the learner to succeed at tomorrow’s places of work. On the country level, we start from establishing a network of skilled occupations which are needed in a particular national economy. These occupations form clusters – such as the occupation of “electrical installation” is part of the cluster of “electrical technology.” Starting from a **draft occupational profile** for each occupation (in our example “electrical installation”) we engage in **work-process analyses** in related places of work.

The **work-process analyses** have the intention to **identify eight to twelve core work-processes** for each occupation. The core work-processes are then one by one detailed according to a set procedure into **(a) a narrative, (b) a compilation of the core competences, and (c) a detailing of the narrative** (see Figure 4). All these elements together constitute an Advanced Occupational Standard, explained in the next sections (Spoettl & Loose, 2013). These standards are then taken as the basis for the development of the **Advanced Detailed Curricula**. In other words, the standards are the “Launchpad” for defining how we arrive at the broad competences which we need for successful performance at the place of work tomorrow. We will take the occupation of the “automotive mechatronic” and as part of it, the core work-process of performing a “standard service” as an example for establishing an Advanced Occupational Standard (Ministry of Manpower, 2014).

Figure 4: The Format for the Advanced Occupational Standards

<b>Occupational Standard:</b> [name of Standard]		
<b>CORE WORK PROCESS - NARRATIVE</b> [short description of Core Work Process]		
<ol style="list-style-type: none"> <li>1. What has to be done? – Main task</li> <li>2. The overall and detailed tasks to be coped with.</li> <li>3. What are the requirements?</li> <li>4. How can the requirements be complied with?</li> <li>5. How are requirements interlinked?</li> <li>6. Solutions of problems</li> </ol>		
<b>OCCUPATIONAL COMPETENCIES</b>		
• [Occupational Core Competency 1]		
• [Occupational Core Competency 2]		
• [Occupational Core Competency n]		
• [...]		
Place work tasks related to the core work processes above as well as the verb defining the competency level		
<b>DETAILING THE CORE WORK PROCESS</b>		
<b>Objects of Skilled Work</b>	<b>Tools, Methods Used, Organisation of Skilled Work</b>	<b>Requirements in Terms of Skilled Work and Technology in use</b>
<ul style="list-style-type: none"> <li>• [...]</li> </ul> <p>Write down activities relevant to carry through the core work processes</p> <ul style="list-style-type: none"> <li>• relevant steps</li> <li>• relevant products,</li> <li>• relevant technology,</li> <li>• relevant phenomena (such as customers, hidden tasks ...)</li> </ul>	<p>Tools</p> <ul style="list-style-type: none"> <li>• [...] Write down the tools relevant to carry through the activities under “objects”</li> </ul> <p>Methods</p> <ul style="list-style-type: none"> <li>• [...] Write down the methods to carry through the activities named under “objects”</li> </ul> <p>Organisation</p> <ul style="list-style-type: none"> <li>• [...] organisation necessary/ relevant to carry through the activities named under “objects”</li> </ul>	<ul style="list-style-type: none"> <li>• [...]</li> </ul> <p>Write down the requirements defined by the</p> <ul style="list-style-type: none"> <li>• customer,</li> <li>• company,</li> <li>• government,</li> <li>• skilled worker himself/herself.</li> </ul>

As briefly indicated in Figure 4, our concern is in generating the following elements of an Advanced Occupational Standard:

- a) Defining and Describing Core Work Processes
- b) **Compiling the Core Competences** (see Figure 5)
- c) **Detailing a Core Work (Learning) Processes** (Figure 6)



Figure 5: Outline of the Core Work Process and List of Competences

<b>Occupational Standard: STANDARD SERVICE</b>	
<b>CORE WORK PROCESS</b>	
<p>The purpose of standard service is to maintain the safety of the vehicle in terms of roadworthy operations and functions and therefore maintaining also the utility/ resale value of vehicles and systems. All service tasks required for preparations, execution and commissioning are to be carried out. The focus is on functional checks including the identification of wear and tear using methods of standardized and individual service concepts, routine diagnosis as well as the service-relevant interaction of compound groups and elements. The operational and functional safety with a view on manufacturing service plans, customer requirements, and the state of the vehicle has to be ensured.</p>	
<b>OCCUPATIONAL COMPETENCIES</b>	
<p><b>In order to master “standard service” as a core work process the following occupational competences are required:</b></p> <ul style="list-style-type: none"> <li>● Handling of vehicle reception and identification</li> <li>● Practical application of rules for customer relations and customer care</li> <li>● Knowledge of various service concepts and service standards</li> <li>● Carrying through the standard service/inspection with the aid of service plans</li> <li>● Able to carry through the ordering process of material / spare parts</li> <li>● Use and reading of service plans, service documentations, work / repair order sheets</li> <li>● Acquisition and use of information with diagnostic tools and information systems</li> <li>● Conduct routine diagnosis and procedures of integrated diagnoses</li> <li>● Documentation of work with the aid of work order sheets and part lists</li> <li>● Know-how of and making use of electronically controlled service instructions</li> <li>● Safeguarding of driving safety, operational reliability and function of the automobile through service</li> <li>● Knowledge and confident application of different forms of communication with clients/ customers and colleagues in relation to preparing, servicing and commissioning of vehicles</li> </ul>	

Figure 6: Detailing the Core Work-Process

<b>DETAILING THE CORE WORK PROCESS - STANDARD SERVICE</b>		
<b>Objects of Skilled work</b>	<b>Tools, Methods used, Organization of Skilled Work</b>	<b>Requirements in terms of skilled work and technology in use</b>
<p><b>Preparation of the service, the customer and his/her service order</b></p>	<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>● Customer and vehicle data bases, identification systems</li> <li>● Service documents, service booklet</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>● Communication with customer, service clerk, foreman, supervisor</li> <li>● Order planning</li> <li>● Working in teams</li> </ul> <p><b>Organization</b></p> <ul style="list-style-type: none"> <li>● Cooperation with manufacturer</li> <li>● Use of service concepts</li> <li>● Reception procedures</li> <li>● Placement and organization of orders</li> </ul>	<p><b>By customers:</b></p> <ul style="list-style-type: none"> <li>● Transparency of service volume</li> <li>● Transparency of costs</li> <li>● Friendly services</li> </ul> <p><b>For skilled workers:</b></p> <ul style="list-style-type: none"> <li>● Well planned workflow</li> <li>● Efficient cooperation with colleagues</li> </ul> <p><b>By company:</b></p> <ul style="list-style-type: none"> <li>● Well organized service procedure</li> <li>● Efficient order processing</li> <li>● Team concepts in use</li> </ul>
<p><b>Safeguarding of driving safety, operational reliability and function of the automobile:</b></p> <ul style="list-style-type: none"> <li>- <i>Engine and motor management:</i> Check of mechanical functions, condition of oils, fuels, mixture formation, filters, cooling, status of fault memory and motor management system</li> </ul>	<p><b>Tools</b></p> <ul style="list-style-type: none"> <li>● Standard set of tools</li> <li>● Diagnostic systems and service indicator reset tool</li> <li>● Manufacturers service information (diagnostic error codes, software updates and adjustment data)</li> </ul> <p><b>Methods</b></p> <ul style="list-style-type: none"> <li>● Communication with customer and other departments</li> <li>● Visual checks</li> <li>● Change of oil, filters</li> <li>● Inspection of the state of oil, filters and cooling agents</li> <li>● Routine diagnosis</li> </ul> <p><b>Organization</b></p> <ul style="list-style-type: none"> <li>● Organizational preparations for prospective repair orders</li> </ul>	<p><b>By customers:</b></p> <ul style="list-style-type: none"> <li>● Little repair or service required</li> <li>● Transparency of costs</li> <li>● Friendly services</li> </ul> <p><b>For skilled workers:</b></p> <ul style="list-style-type: none"> <li>● Well planned workflow</li> <li>● Efficient cooperation with colleagues</li> </ul> <p><b>By company:</b></p> <ul style="list-style-type: none"> <li>● Repair and service friendly tool handling with regard to order volume and service intervals</li> <li>● Efficient order processing</li> <li>● Team concepts in use</li> </ul>

Next “**Learn and Work Assignments**” are introduced to assist the trainee in monitoring his or her own learning process. A task is defined to be fulfilled by the way of self-directed learning. The assignments contribute the didactic core to this learning process. A manual for the development of “Learn and Work Assignments” is also available (Spoettl & Loose, 2015).

## **5 The Missing Part: Expanding the Advanced Occupational Standards Beyond the Preparation for Performance in Work-Processes to Include All Stages of Vocational Development**

If we follow these procedures in training for skilled work, we can already claim that we have made tremendous progress in matching the demand for competences which we encounter at the place of work. Yet, this approach still falls short of our expectations: So far the areas of early vocational development and the stage of “vocational decline” have been excluded from lifelong vocational development. In particular we have not tapped each individual’s potential of building up competence through early vocational development, because this area has so far not been covered by Advanced Occupational Standards.

We have convincing definitions of the stages of early vocational development, i.e. vocational awareness, vocational systematization, vocational orientation, vocational exploration and finally vocational preparation. Yet, we do neither have Advanced Vocational Standards nor appropriate Learn- and Work-Assignments for the stages of the prevocational domain or for the time of retreat from gainful employment.

Consequently, on top of targeting the complete differentiation needed for mastering work-processes in a particular occupation it will be necessary to also convey an understanding of how to enter the world of work and finally disengaging from it (Wuttke & Seifried, 2013). We need a comprehensive framework of vocational development, in which intelligent Advanced Vocational Standards lay the groundwork for an optimum career to be pursued by each individual.

For a career-path in line with lifelong vocational development we need to achieve a break-through regarding both overcoming the redundant concept of pursuing first in one’s general development before the vocational development is envisaged and abandoning the obsolete orientation to focus on “work” instead of concentrating on “work-processes.” As explained above we have a state-of-the-art concept of establishing **Advanced Occupational Standards** for training with regard to mastering complex work processes. This concept needs to be expanded to include all prevocational stages of vocational development plus the retreat from active work at old age.

The proposed mode of Advanced Occupational Standards constitutes the basis for vocational preparation through the development of **Advanced Detailed Curricula** which are concerned with performance at the place of work in an occupation for which we want to convey professional competence. The missing parts of a comprehensive concept of Advanced Occupational Standards are then concerned with:

- (a) an understanding of the whole world of work (awareness), it continues
- (b) with establishing a structure for the occupations which we get to know (systematization), it allows us
- (c) to align occupations with our potential of talents and aspirations (orientation) until we become
- (d) tentatively engaged in up to three occupations in the way of acquiring actual vocational experience (exploration), and
- (e) opt for acquiring professional competence in just one of the three occupations which have been tried out (preparation).

Finally the process of disengaging from employment in old age (decline) should be referred to here, though it is not our concern in this article.

In conclusion, in early childhood we start out with an understanding of the whole world of work. We learn how to structure different requirements as they relate to different occupations and to the potential of different individuals. We become aware that our vocational talents and aspirations should guide us in finding our place of being gainfully employed. We explore if possible three occupations in the sense of acquiring actual work experience. And we decide to be trained in one of these three occupations, and we should be able to hold on to this occupation, regardless of all change which might be required – or, alternatively in case the circumstances make it necessary, we need to commit ourselves to acquiring competence in another occupation. Finally we retreat from employment at old age and hopefully learn to enjoy a happy life after work (Bolder, Dobischat & Reutter, 2012).

## **6 Training for Tomorrow: We Need Two Changes of Paradigm**

The two changes of paradigm which have been described as indispensable in this article are:

- (a) adopting the concept of stages of vocational development instead of “directly” aiming at vocational education as preparation for employment, and
- (b) moving the focus of preparation for work from narrow skills for mastering “work” to conveying broad competences for coping with the complexity and flexibility of “work-processes” in order to capture the uncertainty and advance at the place of work. Further research should attempt to interlink more strongly these two areas of research (see Figure 7).

Vocational technical education and training is at the crossroads between the individuals’ vocational talents and aspirations and the myriad ways how these corresponding traits can become operational in the world of work. This should always be kept in mind when we invest all our efforts in making vocational/technical education and training more meaningful for our trainees and more supportive for the employers.

We need to focus on “vocational development” instead of directly addressing “vocational preparation.” When it comes to the final preparation for work, we also need to emphasize the acquisition of broad competences to access “work-processes” since narrow skills remain “work-oriented.” These two transformations are equally important and they both strengthen the human resource potential which is so badly needed to monitor the productivity of our IT-dominated world.

Figure 7: Work Accomplished – And the Agenda for Work Ahead

				Vocational Preparation	
Work Recently Accomplished					
				Sector Analysis Work-Process Analysis Advanced Occupational Standards & Detailed Curriculum	
Agenda for Work Ahead					
Vocational Awareness	Vocational Systematization	Vocational Orientation	Vocational Exploration	Vocational Preparation	Vocational Decline
The Word of Work	Structuring the World of Work	The Individual and the World of Work	Structured Vocational Experiment (1)	See above Determining the Capability for After Work Activities Planning for Disengagement for Work	Defining After Work Activities
	Structuring Individual Traits	Structuring an Individual's Traits	Structured Vocational Experiment (2)		Determining After Work Activities
	Structuring the Division of Labor	Structuring the Corresponding Division of Labor	Structured Vocational Experiment (3)		Planning for Disengagement from Work

Do these two necessary transformations coincide? No, unfortunately they do not. But they are both indispensable elements for designing effective training programs. Hence, we need to reflect on both changes of paradigm from the perspective of being stepping stones for effective performance at tomorrow's places of work.

Interestingly the thrust of research in vocational development comes from the USA, where we find the basics of conceptualization in vocational guidance, which has provided the core of the theoretical basis for a developmental approach in prevocational education. And the thrust of research in the analysis of work-processes comes from Central Europe as the cradle of the apprenticeship system.

Finally, in order to secure an optimum of vocational training, covering all prevocational activities we need to **establish a complete network of lifelong Advanced Occupational Standards**, which spans all stages of vocational development including the prevocational stages and the stage of “vocational decline.” Being prepared for work in three or three-and-a-half years of intensive training compares to lifelong vocational development as a crash-course for achieving competence to the gradual achievement of competence through lifelong vocational development. Since we thrive to bring together the findings of both areas of research in our design of most effective training programs we look here at an area of high importance in comparative research in international vocational education and training.

## References

- Bolder, G., Dobischat, G., & Reutter, G. (Eds.). (2012). *Beruflichkeit zwischen institutionellem Wandel und biographischem Projekt*. Wiesbaden, Germany: Springer
- Brown, D., & Brooks, L. (Eds.). (2002). *Career Choice and Development: Applying Contemporary Theories to Practice*. San Francisco: Jossey Bass.
- Buringh, E., & van Zanden, J. L. (2009). Charting the rise of the West: Manuscripts and Printed Books in Europe: A Long-Term Perspective from the Sixth through the Eighteenth Century. *The Journal of Economic History*, 69(2), 409-445.
- BWP - Berufsbildung in Wissenschaft und Praxis (BWP) (2010): Bildung- und Bildungsverläufe gestalten. 39(5), 1-70.
- Denham, T. (2010). The 5 Career Stages: Careers and Work Life. Retrieved from <http://blog.timesunion.com/careers/the-5-career-stages/385/>
- Hartung, P., Porfelli, E. J., Vondracek, F. W. (2005). Child vocational development: A review and recommendations. *Journal of Vocational Behavior*, 66(3), 385-419.
- Hagermann, H., Wahlster, W., & Helbig, J. (2013). Recommendations for implementing the strategic initiative INDUSTRIE 4.0. Acatech-National Academy of Science and Engineering. Retrieved from [http://www.acatech.de/fileadmin/user\\_upload/Baumstruktur\\_nach\\_Website/Acatech/root/de/Material\\_fuer\\_Sonderseiten/Industrie\\_4.0/Final\\_report\\_\\_Industrie\\_4.0\\_accessible.pdf](http://www.acatech.de/fileadmin/user_upload/Baumstruktur_nach_Website/Acatech/root/de/Material_fuer_Sonderseiten/Industrie_4.0/Final_report__Industrie_4.0_accessible.pdf)
- Lee, J. (2013). Industry 4.0 in Big Data Environment. *Harting Tech News*, 26/2013.
- Marland, S. P. (1971). *Career Education Now*. Presentation at the National Association of Secondary School Principals. Houston, Texas, January 23, 1971.
- Ministry of Manpower, (Eds.). (2014). *Advanced Occupational Standards for the Automotive Mechatronic*. Muscat: Government of Oman.
- Patton, W. A., & Lokan, J. (2001). Perspectives on Donald Super's construct of career maturity. *International Journal of Educational and Vocational Guidance*, 1(2), 31-48.
- Spoettl, G., & Loose, G. (2013, June). *Conducting Work-Process Analyses as the Core of Curriculum Development*. Muscat, Oman: Ministry of Manpower.
- Spoettl, G., & Loose, G. (2014, June). *From Advanced Occupational Standards to the Development of Advanced Detailed Curricula*. Muscat, Oman: Ministry of Manpower.
- Spoettl, G., & Loose, G. (2015, May). *Conducting Work-Process Analyses for the Development of Advanced Detailed Curricula: A Manual*. Muscat, Oman: Ministry of Manpower.
- Wuttke, E., & Seifried, J. (Eds.). (2013). *Transitions in Vocational Education and Training*. Stuttgart, Germany: Barbara Budrich Publishers.

# **The Role of Technical Vocational Education and Training in the Diversification of Nigerian Economy: Beyond Oil Approach**

**Chinyere S. Ayonmike**

Delta State University, Abraka, Nigeria

**Benjamin C. Okeke**

Nnamdi Azikwe University, Nigeria

## **Abstract**

The purpose of the study is to ascertain the role of TVET in the diversification of Nigerian economy. Three research questions guided the study and the survey research design was used in the study. The population of the study is TVET educators in Nigerian universities. 400 TVET educators were randomly selected using simple balloting technique. The instrument for data collection was a questionnaire that was validated by three lecturers. Twenty copies of the questionnaire were administered to TVET educators from Northern Nigerian universities and a reliability coefficient of 0.69 was obtained using Cronbach Alpha technique. Data were collected by the researchers and simple frequency count and percentage were used to analyze the data. The study revealed that TVET has a significant role to play in the diversification of Nigerian economy by producing skilled and competent human resources for all the sector of the economy.

*Keywords:* TVET, Diversification, Economy, Oil, Nigeria

## **Introduction**

Nigeria is the most populous African nation; it has an estimated population of 170 million. Nigeria has over 250 ethnic groups with diverse tradition, culture, and occupation. Gyorgy (2014) posited that, the Nigerian economy is now the largest in Africa, predominantly oriented toward the production of crude oil and some agricultural. Agriculture accounts for about 30.9 percent of the Gross Domestic Product (GDP), 70.0 percent of employment but contributes only 2.5 percent of export earnings. While, crude oil and natural gas account for export earnings and 79.0 percent of government revenue. According to Gyorgy (2014), Nigeria is a resource rich country, with about 34 different minerals, including gold, iron ore, coal and limestone. It has about 37.2 billion barrels of proven natural gas and produces about 2.3



million barrels of oil per day. It also has about 70 million hectares of farm land. The manufacturing base is narrow and has been dwindling. The share of the manufacturing sector in the GDP declined from 6 percent in 1985 to about 4 percent in 2011. The main driver of Nigerian economic growth namely oil production, does not require large amounts of labor and thus is not able to absorb the estimated 1.8 million new entrants in the labor force every year (Gyorgy, 2014).

Before colonization of the entity Nigeria, the people of the present day Nigeria were diverse in their occupations which are Technical Vocational Education and Training (TVET) oriented. Some of their occupations then were farming, hunting, fishing, blacksmithing, goldsmith, making of sculptures such as the NOK art, the Benin Bronze, and the Ibibio arts. As well, the production of leather products and weaving of mats. The products from these activities were all exported from Nigeria to other parts of the world. Notable then were the export of groundnut, palm oil, rubber latex, cocoa, cotton, hide and skin, and art works. In support, Akinseinde (2014) posited that vocational education had been in existence before the introduction of Western Education in Nigeria. Buttressing this statement, Akinseinde further opined that manual training provided by the father and mother to their sons and daughters had vocational purposes. The male children learnt how to farm, drum, and make boats. On the other hand, the female children learnt weaving of clothes, mat making, hair making, and other home making services. Also, skills like traditional medicine, child delivery and circumcision were exclusively for family members and considered as family secrets. As well, the apprenticeship system where youths were taught skills and character.

The discovery of petroleum and exploration in large quantity in Nigeria which is characterized by the oil boom era of the 60s to 70s led to rapid growth of the Nigerian economy. However, the increase in foreign earnings through the exploration of crude oil led to the neglect of other sectors that were driving the economy before crude oil was discovered. Notable was the agricultural sector which produced the groundnut pyramids, cotton, hide and skin in the Northern part of Nigeria, and the cocoa, cassava, palm nut, plantain, and sea foods from the Southern part of Nigeria. Oil dominates the economy, accounting for about 80 percent of the Federal Government revenues, and 95 percent of foreign exchange earnings (Okezie & Amir, 2011). During the 1970s, Nigeria evolved from a poor agricultural economy into a relatively rich oil-dominated one. In 1969, the oil sector accounted for less than 3 percent of GDP and more than half of her GDP was generated in the agricultural sector. The high economic gains of the oil industry made the nation to abandon other sectors of the economy and depend solely on the oil industry. This situation has led to non development of other sectors of the economy like exploitation of abundant solid minerals, agriculture, manufacturing, industries and services industries (Anyahie & Areji, 2015).

According to Aminu and Anono (2012), Nigeria was heavily dependent on agriculture which was the sector accounting for more than 40 percent of the Pre-1973 GDP. It was the major source of fund for implementing the first development plan of 1962-1968. However, since independence, the role of agriculture in the economy has been on the downward trend, especially its contribution to GDP which has fallen from 39.9 percent in 1970/71 to 20 percent in 1988. This situation has been partly due to emergence of oil as an important commodity and partly due to the poor performance of the sector. Apart from agricultural sector, the telecommunication, transport, construction, manufacturing, and hospitality sector are contributing significantly to the economy of the nation. Notably deplorable are the contributions of Nigerian Electric Power Authority (NEPA) now Power Holding Company of Nigeria (PHCN). In order to bring back the Nigerian economy to stability, there is need to diversify the nation's economy whereby all non-oil sectors will contribute their quota to improve the economic condition of the nation.

Economic diversification is simply the expansion of economic activities by investing in new areas which can help improve positively the economic situation of a nation. According to Anyaehie and Areji (2015), economic diversification is a process of broadening the range of economic activities both in the production and distribution of goods and services. It does not necessarily entail increase in output but it enhances stabilization of economies by diversifying their economic base. Economic diversification is widely seen as one of the pathways out of the 'resource curse' for developing countries such as Nigeria that are abundant in natural resources (Alan, 2010). Samuelson (cited in Onodugo, Amujiri & Nwuba, 2015) described economic diversification as an act of investing in a variety of assets, mentioned its benefit as that which reduces risk especially in the time of recession, inflation, and deflation. Economic diversification strives to smooth out unsystematic risk events in a portfolio so that the positive performance of some investments will neutralize the negative performance of others. Some scholars have argued that natural resources wealth or dependence on such resources can lead to heavy distortions in the economy, de-industrialization, and poor economic growth (Alan, Auty, Sachs & Warner; Karl, cited in Onodugo et. al., 2015).

Onodugo, et. al. (2015) citing Central Bank of Nigeria (CBN) opined that the Federal Government profile in the last half-decade showed that oil earnings accounted for over 80.0 percent of the foreign exchange earnings, while the non-oil sector, contributed 20.1 percent. Thus, revealing the extent of vulnerability of the economy to swings in the price of oil in the international market. Also, the renewed emphasis on the production of shale oil in the United States and other alternatives to fossil-fuel energy in the advanced economies, has reduces oil demand and price, and further weaken Nigerian earnings. Non-oil sector comprises those groups of economic activities which are outside the petroleum and gas industry or those not directly linked to them. It consists of sectors such as manufacturing, agriculture, telecommunication, service, finance, banking, tourism, real estate, construction, aviation, hospitality, transport, education, and health sectors (Onodugo, et al, 2015).

Alan (2010) posited that developing countries as a whole have been remarkably successful in diversifying their economies and their export structures. This process of diversification has taken many forms. The most prominent change has been the shift towards industry. In the 1960's, some 80 percent of developing country exports were primary commodities. Today, almost 80 percent are industrial products, this massive transformation in export structure has been associated with the rise of major industrial power-houses. China most prominent, but also countries such as Korea, India, Brazil, Malaysia, Vietnam, Indonesia and Mexico. Most of these industrial powers were previously primary-based economies.

Nigeria reliance on oil for its wealth cannot be overemphasized. Diversifying Nigerian economy is a welcome development. One key indicator of achieving the Nigerian economy diversification plan is embracing technical vocational education and training (TVET) which is one of the major drivers of economic growth and development. TVET is a special form of education which is aimed at producing manpower for industries. According to the Federal Government of Nigeria (FRN, 2009), the goals of TVET are to:

- i. Provide trained manpower in the applied science, technology, and business particularly at craft, advanced craft and technical level;
- ii. Provide the technical knowledge and vocational skills necessary for agricultural, commercial and economic development;
- iii. Give training and impart the necessary skills to individual who shall be self-reliant economically.

In addressing the economic instability and the poor state of Nigerian economy, there is need to diversify the nation's economy so that other sectors or non-oil sector which include manufacturing, aviation, telecommunication, banking, business, construction, agriculture, education, transportation, and tourism sector can contribute significantly to the presumed economic growth as a result of economic diversification. These sectors are all TVET oriented, this implies that TVET has significant role to play in the diversification of Nigerian economy which is regarded as developing economy. The highly developed economies of Hong Kong, Singapore, South Korea, and Taiwan (often referred to as the four Asian Tigers) are as a result of exceptionally high growth rates and rapid industrialization which emphasized TVET programs (Akinseinde, 2014). Nigeria is in human capital development crisis, unemployment is also rising (Akinseinde, 2014). Unemployment rate has risen from 8.2 percent in 1999 to 23.9 percent in 2011 (Akinseinde, 2014 citing Sanusi, and Lawal). TVET is paramount for effective, realizable, and sustainable human resource development (Akinseinde, 2014). In order to ensure a high quality TVET, priority should be given to the recruitment and initial preparation of adequate number of well qualified teachers, instructors/trainers, administrators, and guidance staffs. Also, there should be continuous professional up grading of teachers throughout their career. Requisite facilities should be available to enable the teachers function effectively (UNESCO & ILO, 2002). According to Baryamureeba (2014) developing countries have no choice than to embrace TVET as a necessity and precondition for socio-economic transformation which is the major aim to diversify national economy. Baryamureeba further posited that it is now a commonly agreed fact that TVET has high impact on the country's productivity growth; makes its recipients relatively secure from poverty; reduces inequality, filling gaps that would otherwise exist between the rich and the poor; reduces migration and offsets the high costs of brain-drain and TVET perpetuates its benefits into retirement by maintaining or raising income during retirement years. Similarly, Inyang (2012) opined that TVET provides one of the most potent means for development of skilled manpower as required by various sector in the country's economy. India for example possesses Asia's oldest, largest, and most diverse infrastructure for scientific and technical training that has contributed significantly to the country's scientific and industrial development leading to economic growth. As well, Eko, Utting, and Onun (2013) citing Reynolds posited that agricultural development can promote the economic development of the under developed countries. Omawale and Regrigues (cited in Eko, Utting, and Onun, 2013) opined that agriculture has been assigned an important role in national development by most developing countries. It has been seen as means of reducing dependence on certain importations, curtailing food price increases, earning foreign exchange, absorbing many new entrants to the labor market and increasing family incomes in times of severe unemployment and rural poverty.

### **Purpose of the Study**

This study ascertained the role of technical vocational education and training in the diversification of Nigerian economy. Specifically, it sought the:-

1. Roles of technical vocational education and training in the diversification of Nigerian economy.
2. Strategies for diversification of Nigerian economy through technical vocational education and training.

3. Ways of achieving the strategies for diversification of Nigerian economy through technical vocational education and training.

### **Statement of the Problem**

According to Eko, Utting, and Onun (2013), Nigerian economy is mono-cultural, depending on single commodity, oil. Other sectors of the economy have been relegated to the background while the management of oil revenues has proven inefficacious in driving the economy to bring about the needed level of development. This scenario has serious negative implications in the nation's development. After five decades of exploration activities, a good percentage of Nigerians live in abject poverty, unemployment is double-digit, and productivity is at its lowest ebb. Apart from over dependence on oil, Nigeria has remained a consumer of foreign product even to the extent of importing notebooks, biro, toothpicks, toilet rolls, furniture and fuel. Furthermore, the hiring of expatriate in industries operating in Nigeria when majority of Nigerian citizens have not been able to be gainfully employed has adversely affected the Nigerian economy, which has led many Nigerians to suggest the diversification of her economy. The question now is how can Nigeria achieve her economy diversification plans? What will be the role of TVET in the diversification of Nigerian economy? The following research questions were used for the study;

1. What are the roles of technical vocational education and training in the diversification of Nigerian economy as perceived by TVET educators?
2. What are the strategies for diversification of Nigerian economy through technical vocational education and training as perceived by TVET educators?
3. What are the ways of achieving the strategies for diversification of Nigerian economy through technical vocational education and training as perceived by TVET educators?

### **Scope and Significance of the Study**

The study was limited in scope to solicit for information on the role of TVET in the diversification of Nigerian economy from TVET educators from selected universities in Southern Nigeria. TVET educators are academic staff from government owned universities (federal and state) in Nigeria. The findings from this study will be beneficial to TVET Educators; Federal Government of Nigeria; State and Local Government; Communities; Entrepreneurs; Representatives of all the Economic Sectors and future researchers. These beneficiaries will find the study useful because the findings will expose the role of TVET in the diversification of Nigerian economy from over-dependence on the oil sector. Also, future researchers will make the findings of this study a reference point when conducting similar research.

## Methods

Survey research design was used in this study. The population of the study was TVET educators in Nigerian universities. 400 TVET educators were randomly selected using simple balloting technique from selected universities in Southern Nigeria. The instrument for data collection was a 28-item questionnaire on a 4-point scale of Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD) with ranking of 4,3,2, and 1 respectively, titled 'Role of TVET in the Diversification of Nigerian Economy Questionnaire (RTVETDNEQ)'. The questionnaire had 3 sections based on the research questions. Section A, B, and C had 13, 10, and 5 items respectively. RTVETDNEQ was validated by three TVET educators, one each from Delta State University, Nnamdi Azikiwe University, and Rivers State University of Science and Technology respectively. Using Cronbach Alpha technique, 20 copies of the questionnaire were administered to TVET educators from Northern Nigeria universities. Consequently, a reliability coefficient of 0.69 was obtained. Data were collected by the researchers through the aid from 15 research assistants who administered the questionnaire on the selected respondents. Out of the 400 copies of the questionnaire administered, 370 copies of the questionnaire were returned, of which 340 were usable. Data collected were collated and analyzed using simple frequency count and percentage. In taking decision, Strongly Agree (SA) and Agree (A) were grouped as Agree, while Disagree (D) and Strongly Disagree (SD) were grouped as Disagree. Any item with the highest frequency and percentage response was accepted as the decision.

## Results and Discussion

The results were presented sequentially according to the research question.

### **Research Question 1: What are the roles of technical vocational education and training in the diversification of Nigerian economy as perceived by TVET educators?**

TVET has a unique role to play in the diversification of Nigerian economy by providing manpower for all the sectors of Nigerian economy such as the agricultural, construction, transportation, aviation, banking, hospitality, communication, education, manufacturing, entertainment, and power sector (see Table 1). These findings are in line with the goals of TVET as enshrined in the Federal Republic of Nigeria National Policy on Education. As well the views of Iyang (2012), Baryamureeba (2014), Akinseinde (2014) and Reynolds in Eko, Utting, and Onun (2013). These researchers posited that TVET play vital roles in improving economies through the production of skilled manpower for different sectors of the economy. Inyang (2012) opined that TVET provides one of the most potent means for development of skilled manpower as required by various sector in the country's economy. According to Baryamureeba (2014) developing countries have no choice than to embrace TVET as a necessity and precondition for socio-economic transformation which is the major aim to diversify national economy. Baryamureeba further posited that it is now a commonly agreed fact that TVET has high impact on the country's productivity growth; makes its recipients relatively secure from poverty; reduces inequality, filling gaps that would otherwise exist between the rich and the poor; reduces migration and offsets the high costs of the



brain-drain and TVET perpetuates its benefits into retirement by maintaining or raising income during retirement years. Eko, Utting, and Onun (2013) citing Reynolds posited that agricultural development can promote the economic development of the under developed countries. Omawale and Regrigues in Eko, Utting, and Onun (2013) opined that agriculture has been assigned an important role in national development by most developing countries.

Table 1: Frequency and Percentage Response from TVET educators on the roles of technical vocational education and training in the diversification of Nigerian economy

S/N	Item Statements	Response (N=340)				Remark
		SD F(%)	A F(%)	D F(%)	SD F(%)	
	TVET roles in the diversification of Nigerian economy are to produce skilled and competent human resources for the following sectors of the economy :					
1.	Agricultural	120(35.29)	172(50.59)	8(2.35)	40(11.76)	Agree
2.	Construction	134(39.41)	156(45.88)	6(1.76)	44(12.94)	Agree
3.	Transportation	150(44.12)	144(42.35)	5(1.47)	41(12.06)	Agree
4.	Aviation	170(50.00)	118(34.71)	10(2.29)	42(12.35)	Agree
5.	Banking	140(41.18)	125(36.76)	32(9.41)	43(12.65)	Agree
6.	Business	136(40.00)	142(41.76)	8(2.35)	54(15.88)	Agree
7.	Hospitality	178(52.35)	100(29.41)	12(3.53)	50(14.71)	Agree
8.	Communication	131(38.53)	153(45.00)	14(4.12)	42(12.35)	Agree
9.	Education	168(49.41)	99(29.12)	20(5.88)	53(15.59)	Agree
10.	Manufacturing	147(43.24)	143(42.06)	6(1.76)	44(12.94)	Agree
11.	Entertainment	130(38.24)	163(47.94)	4(1.18)	43(12.65)	Agree
12.	Power	138(40.59)	150(44.12)	10(2.94)	42(12.35)	Agree
13.	Entrepreneurial	170(50.00)	123(36.18)	6(1.76)	41(12.06)	Agree

\*Note: N= number of respondents, f= frequency and percentage = (%)

**Research Question 2: What are the strategies for diversification of Nigerian economy through technical vocational education and training as perceived by TVET educators?**

The TVET strategies that will enhance the diversification process of the Nigerian economy include: revitalization of TVET at all levels, establishment of more TVET institutions, retraining of TVET personnel in every TVET institutions, linking TVET institutions with industries, and reviewing of TVET curriculum. As well, establishment of TVET monitoring board at national, state, and local levels (see Table 2). Furthermore, adequate supervision of TVET at all levels and establishment of board to promote enrolment in TVET institutions. This is in agreement with other views of researchers such as Akinseinde (2014) and UNESCO and ILO (2002). TVET is paramount for effective, realizable, and sustainable human resource development (Akinseinde, 2014). In order to ensure a high quality TVET, priority should be given to the recruitment and initial preparation of adequate number of well qualified teachers, instructors/trainers, administrators, and guidance staffs. Also, there should be continuous professional up grading of

teachers throughout their career. Requisite facilities should be available to enable the teachers function effectively (UNESCO & ILO, 2002).

Table 2: Frequency and Percentage Response from TVET educators on the strategies for diversification of Nigerian economy through technical vocational education and training

S/N	Item Statements	Response (N=340)				Remark
		SD F(%)	A F(%)	D F(%)	SD F(%)	
	The following strategies will enhance the diversification of Nigerian economy through TVET:					
1.	Revitalization of TVET at all levels in Nigeria	180(52.94)	115(33.82)	3(0.88)	42(12.35)	Agree
2.	Establishment of at least three TVET institutions in every town	111(32.65)	178(52.35)	7(2.06)	44(12.94)	Agree
3.	Retraining of TVET personnel in all existing TVET institutions	189(55.59)	97(28.53)	11(3.24)	43(12.65)	Agree
4.	Linking TVET institutions with industries/labour market	187(55.00)	110(32.35)	2(0.59)	41(12.06)	Agree
5.	Reviewing TVET curriculum to address the needs of the society	166(48.82)	128(37.65)	4(1.18)	42(12.35)	Agree
6.	Free and compulsory TVET for all	50(14.71)	14(4.12)	100(29.41)	176(51.76)	Disagree
7.	Grant should be given to successful TVET graduates to practice their skills	50(14.71)	34(10.00)	120(35.29)	136(40.00)	Disagree
8.	Establishment of TVET monitoring board at the national, state, and local levels	100(29.41)	179(52.65)	11(3.24)	50(14.71)	Agree
9.	Adequate supervision of TVET at all levels	121(35.59)	163(47.94)	13(3.82)	43(12.65)	Agree
10.	Establishment of board to promote enrollment in TVET institutions	137(40.29)	149(43.82)	4(1.18)	50(14.71)	Agree

\*Note: N= number of respondents, f= frequency and percentage = (%)

### Research Question 3: What are the ways of achieving the strategies for diversification of Nigerian economy through technical vocational education and training as perceived by TVET educators?

Table 3 shows strategies by which the diversification of Nigerian economy through TVET can be realized. The ways include: collection of data of would be TVET practitioners, graduates of TVET institutions be given take-off grants. Also, trade shows should be organized to showcase TVET products for wooing investors and TVET forum be organized to educate the Nigerian society on the need for



diversification of Nigerian economy through TVET. The implication is that embracing TVET alone cannot diversify the economy but synergies need to be put in place to make sure that the products from TVET institutions are well placed in the sector that their skills and knowledge are needed for economic growth and possible diversified economy.

Table 3: Frequency and Percentage Response from TVET Lecturers on the ways of achieving the strategies for diversification of Nigerian economy through technical vocational education and training as perceived by TVET educators

S/N	Item Statements	Response (N=340)				Remark
		SD F(%)	A F(%)	D F(%)	SD F(%)	
	The following are ways of achieving the strategies of diversification of Nigerian economy through TVET:					
1.	Data of those that are interested in TVET should be collected	130(38.24)	153(45.00)	7(2.06)	50(14.71)	Agree
2.	Enrolling those that are interested in TVET institutions	20(5.88)	53(15.59)	140(41.18)	127(37.35)	Disagree
3.	After successful completion of the program, graduates should be given take-off grant to practice	142(41.76)	115(33.82)	19(5.59)	64(18.82)	Agree
4.	Trade shows should be organized to showcase TVET products for wooing investors	141(41.47)	149(43.82)	6(1.76)	44(12.94)	Agree
5.	TVET forum should be organized to educate the society on the need for diversification of Nigerian economy through TVET	103(30.29)	178(52.35)	10(2.94)	49(14.41)	Agree

\*Note: N= number of respondents, f= frequency and percentage = (%)

### Conclusion and Recommendations

For Nigeria to achieve her economy diversification plans, adequate attention should be given to TVET, because of TVET valuable roles in the production of manpower for the various sector of Nigerian economy. Therefore, government at all levels, non-governmental organization, and stakeholders should work collectively to revitalize TVET institutions at all levels in other to produce efficient, employable, and the required manpower needed to diversify Nigerian economy and thereby moving Nigerian economy from developing economy to developed economy of the world.

Based on the findings of the study, it is recommended that:

Stakeholders should work collectively to revitalize TVET at all level in other to produce competent, efficient, and employable manpower for the agricultural, construction, transportation, aviation, banking, business, hospitality, communication, education, manufacturing, entertainment, and power sector.

Government and non-governmental agencies should join resources to establish more TVET institutions across the country such that every town could have at least three TVET institutions in order to increase enrolment so as to prepare adequate manpower needed for the achievement of the economy diversification plans.

Government in collaboration with TVET educators should organize more trade shows to showcase TVET products for wooing investors, as well as organize TVET forum to educate the members of the Nigerian society on the need for diversification of Nigerian economy through TVET. Furthermore, grants should be provided by stakeholders for TVET graduates to practice.

## References

- Akinseinde, S.I. (2014). *Technical vocational education and training as catalyst for human capital development and poverty reduction in Nigeria*. 33rd Inaugural Lectures of Delta State University, Abraka, University Printing Press.
- Alan, G. (2010). Economic diversification in resource rich countries. A Lecture at a Seminar on Natural Resources, Finance and Development: Confronting Old and New Challenges Organized by the Central Bank of Algeria and IMF Institute in Algiers on November 4th-5th 2010. Retrieved from <https://www.imf.org/external/np/seminars/eng/2010/afrfin/pdf/Gelb2.pdf>
- Aminu, U. & Anono, A.Z. (2012). An empirical analysis of the contribution of agriculture and petroleum sector to the growth and development of Nigerian economy from 1960-2010. *International Journal of Social Science and Education*, 2(4), 758-769.
- Anyachie, M.C. & Areji, A.C. (2015). Economic diversification for sustainable development in Nigeria. *Open Journal of Political Science*, 5(1), 87-94.
- Baryamureeba, V. & Nahamya, W.K. (2014). The role of TVET in building regional economies. A Keynote Address Delivered at the IVETA African Regional Conference, Hotel Africana, Kampala, Uganda, 18th-20th June, 2014.
- Eko, S.A., Utting, C.A., & Onun, E.U. (2013). Beyond oil: dual-imperatives for diversifying the Nigerian economy. *Journal of Management and Strategy*, 4(3), 81-93. Retrieved 23rd November, 2014 from <http://dx.doi.org/10.5430/jms.v4n3p81>.
- Federal Republic of Nigeria (2009). *National policy on education*. (5th Ed), Lagos, Nigerian Educational Research and Development Council (NERDC).
- Gyorgy, I.N. (2014). The motivations for the diversification of the Nigerian economy focusing on sustainable agriculture. *Applied Studies in Agribusiness and Commerce, APSTRACT*, 8(1), 7-13.
- Inyang, E. (2012). The role of education on industrial development. Retrieved 20th August 2014 from <http://eagleislandtech.blogspot.com.ng/2012/08/the-role-of-education.....>
- Okezie, C.A. & Amir, B.H. (2011). Economic crossroads: the experiences of Nigeria and lessons from Malaysia. *Journal of Development and Agricultural Economics*, 3(8), 368-378.
- Onodugo, I.C., Amujiri, B.A., & Nwuba, B.N. (2015). Diversification of the economy: a panacea for Nigerian economic development. *International Journal of Multidisciplinary Research and Development*, 2(5), 477-483.
- UNESCO & ILO (2002). *Technical and vocational education and training for the twenty-first century*. UNESCO and ILO Recommendations.

# **Vocational Education and Training Opportunities for Students with Disabilities in Southern Africa: An Exploratory Study**

**Steven McIntosh**

Cuyahoga Falls High School, Ohio, United States

**Davison M. Mupinga**

Kent State University, Ohio, United States

## **Abstract**

Lately, schools in Africa have seen an increase in the number of children with learning disabilities. Technical and vocational education and training (TVET) programs are witnessing large number of students with disabilities. However, there are concerns over the fairness of educational opportunities provided to these students. This exploratory study sought to establish TVET opportunities for students with disabilities in Lesotho, South Africa, and Zimbabwe. Data were collected from four educational programs through observations, interviews with school personnel, and reviews of policy documents. Open coding was used to analyze the qualitative data from the interviews. Inadequate funding, lack of teacher training opportunities, and lack of meaningful community-based work opportunities were identified by all programs as issues that needed improvement. Negative social stigma and lack of community involvement were clearly apparent in all three countries.

*Key Words:* Lesotho, South Africa, students with disabilities, TVET, Zimbabwe

## **Introduction**

Students with disabilities are under-represented in many educational programs. However, due to legislative efforts, such as the UN Convention on the Rights of Persons with Disabilities (CRPD), The Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000 (the Act) in South Africa and the Disabled Persons Act of 1992 in Zimbabwe, there has been an increase in educational opportunities for students with disabilities. While increases in numbers of students with disabilities have been recorded, the parity in educational opportunities is yet to be attained (Moswela & Mukhopadhyay, 2011). Students with disabilities placed among other physically able children tend to develop valuable skills, especially gaining self-help skills, language development, and cognitive and motor skills (Dickson, 2000; Fewell & Oelwin, 1990). However, in certain communities, such educational opportunities are non-existent.

A number of factors contribute to schools not offering educational opportunities to students with disabilities, namely, overcrowded classrooms, poverty, health issues, shortages of experienced teachers, traditional beliefs, lack of teaching materials, school expectations, and motivational issues (Aboyi, 2007). In Africa, traditional beliefs and perception toward students with disabilities play a major role in determining what services students with disabilities will get. For example, in describing people with disabilities in Zimbabwe as the “forgotten tribe” Choruma (2006), observed that:

The disability sector was greatly overlooked and it became almost non-existent. Evidence of this can be found in the lack of information about disabilities in Zimbabwe, the outdated disability policies that are in place, the underfunded and largely invisible national body of people with disabilities, the dysfunctional and fragmented disability sector, and the failure to address the growing needs of people with disabilities (p.7).

While this situation in Zimbabwe may have been a result of other pressing issues affecting the country at that time, it is not uncommon to find a ‘forgotten tribe’ of people with disabilities in other African countries. Franzen (1990) noted that, in some African communities, a person with a disability is rejected by the family or the community because a disability is considered a curse befalling the whole family. Therefore, children who are met by those beliefs and attitudes, can hardly develop to their full potential because, “they get less attention, less stimulation, less education, less medical care, less upbringing and sometimes less nourishment than other children” (Franzen, 1990, cited in WaMunyi, 2012).

Many students with disabilities enroll into technical and vocational education and training (TVET) programs for a number of reasons. TVET programs have a considerable and long lasting positive effect on the employment participation and productivity of people with disabilities (Mavromaras & Polidano, 2011). In addition, the students tend to benefit from the hands-on learning, differentiated instruction, repetition, work-based learning, application of academics to concrete situations, focus on employability skills, as well as real world experiences (Casale-Giannola, 2012; Stair & Moore, 2010). In Africa, for example, many students with disabilities are placed in vocational education programs or life skills programs so that they are better prepared for life in the community (Franck, 2015). Equally important, these programs prepare students directly for employment and can be tailored to a student’s career interest and/or specific tasks within a chosen career.

Effective implementation of any TVET program requires carefully crafted policies, adequate financial resources, appropriate infrastructure, as well as qualified and experienced teachers who have knowledge and understating of students with disabilities. While many TVET teachers are appropriately trained and licensed, they often lack strategies to support and work with students with disabilities (Guskey & Jung, 2009). Providing educational opportunities to students with disabilities also requires the involvement of various stakeholders, such as parents, teachers, employers, legislators and the students (Yssel, Engelbrecht, Oswald, Eloff & Swart, 2007). Therefore, before individuals with disabilities can enter the workforce, vocational schools, various government ministries, and the community as a whole must work together to provide adequate and appropriate education and training opportunities for students with disabilities. According to Clegg, Murphy, Almack and Harvey (2008), community teams should create community interventions: work with families and other local groups to support social outreach and develop activities that are both safe and meaningful for people with disabilities. By doing so, those with disabilities can feel being a part of their culture, have a higher self-worth, and become productive members of society.

## Country Demographics for People with Disabilities

To put the study into context, demographics of people with disabilities for the three countries visited: Lesotho, South Africa, and Zimbabwe were identified. Since perceptions have a direct bearing on the educational services provided, general perceptions toward people with disabilities in each of the countries were also established. A review of literature, policy documents, and newspaper articles was conducted to establish current demographics of people with disabilities in the three countries.

### Lesotho

Approximately 4.2 percent of the population has some form of disability and about one-third of these are children under 15 years (Lesotho Demographic Survey, 2001). According to the Lesotho National Federation of Organizations of the Disabled (LNFOD), an umbrella body of organizations dealing with disability in Lesotho, disabled people in Lesotho are among the poorest, most marginalized and disadvantaged groups in the country (LNFOD, 2012). Lesotho has a high literacy rate of 87 percent; about 40% of children with disabilities (CWDs) between the ages of 5 and 10 do not attend primary school, and about 23 percent of children with disabilities between ages 10 and 20 do not attend high school (Eriamiatoe, 2013 para#1). These figures are significantly higher when compared to children without disabilities in the same age groups. Furthermore, in Lesotho, the discrimination of people with disabilities is said to be rampant, preventing them from accessing equal opportunities in politics, employment, education, health and participating in cultural, recreational and sporting activities (Dube, Chimusoro, Mandimutsira, Chinamasa, Munhangu & Munhangu, 2008). This situation forces people with disabilities to be dependent on relatives or other care-takers. In Lesotho, children with disabilities are perceived as abnormal and it is not desirable to place together with children without disabilities (Eriamiatoe, 2013). Currently, the unemployment rate amongst people with disabilities in Lesotho is approximately 70 percent (LNFOD, 2012).

On a positive note, 1) Lesotho recognizes and celebrates, the International Day of Persons with Disabilities (December 3); 2) the LNFOD advocacy team is working on: i) sign language interpreters in schools; ii) social support for parents of children with severe disabilities; and iii) employment creation for people with disabilities; and 3) LNFOD compiles a monthly e-newsletter, *Disability Lesotho*, for individuals and organizations interested in disability issues in Lesotho. Despite the highlighted progress for people with disabilities in Lesotho, LNFOD continues to advocate for compliance with CRPD and urges the government to remove, modify and eliminate any laws that discriminate against people with disabilities (Sefuthi, 2016).

### South Africa

According to 2011 census data, the national disability prevalence rate is 7.5 percent in South Africa (Statistics South Africa, 2014). South Africa has several legislation protecting and promoting the welfare of people with disabilities. The Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000 (PEPUDA), addresses issues around environmental accessibility as well as reasonable accommodation in the workplace (McClain, 2002). The South African Schools Act of 1996, according to McClain (2002) provides for the inclusion of learners with special educational needs in the mainstream. According to the Act, South African public schools are required to admit all learners and provide the

necessary educational requirements without discrimination. The Integrated National Disability Strategy is the overarching policy on disability issues in South Africa. The policy clearly outlines that people with disabilities should not be seen as objects of pity, but rather as capable individuals who are and can contribute immensely to the development of society (McClain, 2002 para # 5). While there are policies in place, it is unclear if perceptions of the general public toward people with disabilities have changed.

## **Zimbabwe**

Determining the exact numbers of people with disabilities is usually difficult because of how various countries classify disabilities. According to World Health Organization (WHO), in Zimbabwe, about 1.8 million people (about 15 percent of population) have disabilities (WHO, 2011). In Zimbabwe, the welfare of people with disabilities is enshrined in the constitution and the Disabled Persons Act, 1992. For people with disabilities, Zimbabwe's notable developments include: i) commemorating the International Day of Persons with Disabilities (on December 3); ii) hosting annually The Zimbabwe National Paralympic Games (a premier sporting event that brings together athletes with disabilities for a sporting extravaganza [see, <http://www.zimparalympic.org/about-us/>]); and iii) a provision in the Zimbabwean constitution that requires two parliamentary senate seats to represent persons with disabilities (Mugumbate & Nyoni, 2013).

Despite the significant gains in the welfare of people with disabilities, negative attitudes toward people with disabilities continue to exist in Zimbabwe (Nyakanyanga, 2013). According to Shoko (2012, para# 4):

Because of more than a decade of socioeconomic challenges, many children living with disabilities in Zimbabwe are among the most marginalized and excluded groups of children. Compared to their peers, they are less likely to access health, education and other social services.

In general, there have been some positive developments in the provision of services and educational opportunities for people with disabilities in Zimbabwe. Never-the-less, education and training opportunities for people with disabilities in Africa remains a challenge, mainly due to poor economies and negative attitudes toward people with disabilities. Therefore, highlighting any educational programs and services for students with disabilities, from Africa, will assist in raising awareness on the progress or lack of progress when it comes to provision of education and training to students with disabilities. The intent, ultimately, is to provide services, educational and training opportunities that allow full participation by all students, including those with disabilities. This situation challenges communities to address accessibility issues, provide reasonable accommodations and modifications as well as effective individualized support in order to maximize academic and social development of students with disabilities (Eriamiatoe, 2013).

## **Statement of the Problem**

The plight of people with disabilities varies significantly from one country or community to another. While the discrimination of people with disabilities has improved due to improved awareness and legislation protecting the rights of individuals with disabilities, disparities in the provision of educational opportunities for people with disabilities continue to exist (Moswela & Mukhopadhyay, 2011). Commenting



on the dangers of denying students with disabilities educational opportunities in Zimbabwe, Choruma (2006) noted that: “As they get older they continue to be dependent on others, thus becoming an economic drain on their communities simply because they have been denied the opportunity to contribute” (p 5). With many African countries still experiencing negative attitudes toward people with disabilities and lacking financial and human resources for regular education programs, it is necessary to find out the nature of educational opportunities provided to people with disabilities. Without proper educational and training opportunities, people with disabilities will continue to be among the poorest, most marginalized and disadvantaged members of societies.

### **Purpose of Study and Objectives**

This study sought to establish technical and vocational education opportunities for students with disabilities in Africa, specifically in Lesotho, South Africa and Zimbabwe. The following questions guided the study:

- 1) What percentage of the population, in selected countries, is described as having a disability?
- 2) What laws in the selected countries are protecting people with disabilities?
- 3) What vocational education and training opportunities are available to students with disabilities?
- 4) What is the role of stakeholders in the provision of education and training opportunities for students with disabilities?
- 5) What challenges do programs offering vocational education opportunities to students with disabilities face?
- 6) How can the provision of vocational education opportunities for students with disabilities be improved?

### **Method**

This was a case study of four programs offering education and technical training to students with disabilities in three southern African countries: Lesotho, South Africa, and Zimbabwe. The case study approach was considered appropriate because, “it emphasizes detailed contextual analysis of a limited number of events or conditions and their relationships” (Soy, 1997, para #1). While this approach allowed for exploration and explanation of the situation regarding the vocational education opportunities for the students with disabilities in selected countries, by collecting data from multiple sources (triangulation), any inferences of the results to the wider population is limited. The reader is also cautioned against making direct comparisons between the programs visited since these are at different levels.

Data were collected through non-participant observation of selected TVET components (curriculum material, tools & equipment, condition of training facilities, students working on projects) at the four schools: i) a primary school in South Africa, ii) two secondary schools in Lesotho and Zimbabwe, and iii) a post-secondary institution in Lesotho. Additional data were obtained from structured interviews with the respective school administrators and teachers as well as reviews of policy material and information



about the schools/programs on the web. The interviews focused on curriculum and challenges faced by the TVET teachers and administrators. Permission to conduct the exploratory descriptive study was obtained from the relevant Ministry of Education departments and school officials. Before conducting the interviews, all the respondents were asked for permission to participate in the study.

While this approach allowed for exploration and explanation of the situation regarding the vocational education opportunities for the students with disabilities in selected countries, by collecting data from multiple sources (triangulation), any inferences of the results to the wider population is limited. Data from each of the vocational education programs were analyzed through thematic coding in “which data was reduced to a small set of themes that appear to describe the phenomenon that is under investigation (Vikers & Offredy, 2013). To improve the accuracy of the gathered data, member feedback or respondent validation was done.

## Findings

While this study focused on four programs in Lesotho, South Africa and Zimbabwe, these are not the only programs providing TVET opportunities to people with disabilities. Due to time constraints and easy accessibility, the four programs visited became the focus of this exploratory study. Based on the observations and discussions with the administrators and instructors, the study established great resilience in all the programs; doing their best with limited resources. The TVET programs expressed many concerns and needs, among them, inadequate funding, lackluster special educator training, and negative stigma toward people with disabilities.

### Description of Vocational and Technical Education Programs

#### *Itjareng Vocational Training Center (Maseru, Lesotho)*

Itjareng Vocational Training Center (IVTC) in Maseru, Lesotho is surrounded by the foothills of the Maloti Mountains. The school offers hands-on vocational and independent living skills training for students with physical and intellectual disabilities as well as the hearing impaired. Enrollment into the program is open to anyone between the ages of 18-50 with the aforementioned disabilities. After the initial intake process and interviews, up to 34 students are accepted into the program where they will live, learn, and work for the next two years.

Vocational programs that are currently offered at IVTC include: carpentry, metal and leather work, agriculture, and sewing. Students also receive instruction in literacy, numeracy, sign language, and computer applications. Many of the instructors are former IVTC students who teach alongside those who may have received some form of teacher training prior to working at the center. Along with knowledge of the content and skills that are being taught, instructors at IVTC must demonstrate an understanding of working with individuals with disabilities. This can be a significant barrier for potential instructors since there is no formal training or degree at the local university for people wishing to be special education teachers in Lesotho. As stated by one instructor, “The lack of training opportunities for anyone interested in working with students with disabilities is one of the biggest challenges to overcome at IVTC.”

IVTC provides valuable hands-on training to their students in areas that mirror relevant trades in the current Lesotho job climate. However, the lack of resources and negative social stigma toward individuals with disabilities inhibits many of the opportunities for students currently enrolled in the program and those who have since graduated. While IVTC receives some of its funding from the Ministry of Education, it largely relies on donations, grants, and the selling of goods that are produced at the center in order to remain open. The administration at IVTC identified inadequate funding, lack of teacher training opportunities, and lack of community involvement as the most apparent and taxing struggles facing the school.

#### *St. Catherine Secondary School (Maseru, Lesotho)*

St. Catherine Secondary School is a parochial school that has embraced the concept of inclusion for students with visual impairments. The school provides education to over 600 students. At the time of the visit, there were 21 students with visual impairments who receive instruction in both general education and resource classrooms. Along with the traditional curriculum consisting of mathematics, reading, writing, computer applications, and geography, students with visual impairments also receive life skills and mobility training with the goal of increasing independence.

The students with visual impairments come from all over Lesotho to receive their education at St. Catherine's. While their model of inclusion may not be the ideal form, it was the only school visited that practiced any direct inclusion. When students with visual impairments were not receiving instruction in general education classrooms, they would receive more individualized support from both staff and their typical peers. The school has resource rooms, where text in their books is converted to Braille, other students and volunteer staff read texts to students with visual impairments, and students receive support for a particular course such as math or science. Overall, both the staff and the other general students were very welcoming and supportive to the students with visual impairments. Despite the tremendous progress made at this school to teach this population of students, the administration and staff identified the following concerns:

There is desire to do more for the students with visual impairments. For example, the school would benefit from more trained and qualified special education teachers to support the students currently being served. Many of the teachers who work with these students have no prior experiences working with students with visual impairments prior to being hired at St. Catherine's. While some of the teachers understand how to assist these students or the learning strategies for fostering independence, some assistance becomes too helpful to students with visual impairments. Too much assistance will in turn impede the students' progression towards higher levels of autonomy.

The lack of space and resources for supporting students with visual impairments. Currently there is a great desire to obtain appropriate assistive technology, Braille supported text books, and audio books that will help students with visual impairments succeed in general education classrooms and resource rooms.

Also related to resources was shortage of human and material resources such as sign language interpreters and teachers skilled in braille and sign language.

#### *R.P. Moodley School (Durban, South Africa)*

The school serves primary and secondary school students with a broad range of disabilities including Autism, physical disabilities, multiple disabilities, intellectual disabilities, as well as students with hearing and visual impairments. R.P. Moodley School is located right next to a primary and secondary school for

students who receive a more generalized education. The school is funded largely by private donors and serves students throughout the KwaZulu-Natal province. Some students were said to travel over an hour just to get to school each day.

The classrooms at R.P. Moodley School were most similar to classrooms one would see in many resource and self-contained classrooms in the United States. The primary school students at this school receive a significantly modified curriculum based on their needs and abilities. While the students do not necessarily have Individualized Education Plans (IEPs), the teachers are able to individualize and differentiate instruction to the best of their abilities. While continuing their modified secondary education, older students in the program participate in vocational and job training programs at the school such as woodworking, office-related skills training, food service experiences and other relevant vocational development. One interesting and creative vocational education program at this school was the wheelchair repair program. Students in this class learn the ins and outs of wheelchair maintenance and development. Once they have mastered the skill, the students will then fix the wheelchairs of other students that attend the school. While this school showed great promise with regards to their service of students with a broad scope of disabilities, the staff and school administrators identified some areas of need or concern:

A great need for trained special education teachers. While the previous experience and training that the staff has had with regards to students with disabilities varies, this is the first time many of them have worked with such a diverse and often challenging population of students.

Funding: The school receives enough funds to keep their doors open, additional funding is needed to pay for Internet access (currently unavailable due to cost), special education resources, and transportation to community-based field trips and job training opportunities.

Continued negative stigma toward individuals with disabilities played a large role in the obstruction of developing community-based job training programs or experiences for secondary students with disabilities.

#### *Danhiko Project (Harare, Zimbabwe).*

This program is a registered welfare non-governmental organization that consists of a secondary school and five vocational training units for students with disabilities. Established in 1981, the Danhiko project began as vocational training centers to assist those who had fought in the war of liberation of Zimbabwe or who were significantly injured as a result of the combat. The center currently provides educational and vocational training for children and young adults with visual or physical impairments or those who are significantly economically disadvantaged. The students come from all over Zimbabwe to receive an education through the Danhiko Project. In order for students to be admitted to the program, they must complete an assessment to determine whether they can physically meet the demands of the school, are able to independently feed and bathe themselves, and maintain proper social skills. Of the over 500 students that the Danhiko project services, 40 percent have some form of disability. Roughly 40 percent of all students at the Danhiko project participate in the vocational programs that are available to them.

Currently, the vocational programs that are offered include: clothing technology, wood technology, information technology, electrical engineering/electronics, furniture manufacturing, and garment and shoe production. Students who participate in the vocational programs receive instruction based on what one would see in a community setting. The Danhiko Project maintains regular contact with those

in the industry to make sure that the students are able to meet the same standards when they graduate. When modifications are made to instruction, these are based on what would be made in the real-world as well. The main goal of the program is to ensure that students are as independent as possible when they enter the workforce.

The program has done a superb job in training students for future employment, raising awareness through its partnership with Zimbabwe's Annual Paralympic Games (<http://www.zimparalympic.org/>), and including members of the community by inviting them to purchase items that the students have made. The administrators identified some areas that need improvement:

Unlike other programs visited, where concerns include higher quality instructors or increased training for them, improvement of the social stigma attached to people with disabilities, or the lack of community involvement, the primary desire for the Danhiko Project is to expand and make it almost entirely self-sustaining. Currently the program receives its funding mainly from private donations and tuition waivers through the government. A small part of its funding comes from sales of what the students make.

The lack of funding has made it arduous to add new vocational programs, such as, automotive technology, agriculture, and an art center. Adding these programs to the catalog would ideally improve self-sustainability of the Danhiko Project, as well as increase the student body and increase the number of industry professionals or community members that support their cause.

## **Conclusion and Recommendations**

All of the observed programs, administrators, faculty and staff spoken to should be commended for the wonderful work they are doing given the meager resources they have to work with. Each school was unique in terms of design of the campus, the student body, and the focus of academic or vocational instruction. The main issues identified by all the four programs visited as needing improvement were: i) inadequate funding and ii) lack of professional development opportunities for teachers working with special needs students. At the institutional or societal level, the programs would like to see an improvement of the social stigma and negative attitude toward people with disabilities and increased involvement by respective stakeholders in the educational experiences of students with disabilities. The issue of negative attitudes and lack of community involvement were overtly apparent in all the three countries visited.

While the financial situation that each school is burdened by is an important factor to address, by improving the social stigma of those with disabilities the "funding tides" may turn for those receiving subpar special education services. One of the ways the negative attitude or social stigma towards people with disabilities can improve is to increase their presence in general population schools, in the workforce, and out in the community. While there is no doubt this can be a tasking barrier to maneuver, it is possible to change the negative social stigma that has burdened those with disabilities in Lesotho. Achieving an inclusive school community is dependent on establishing an inclusive school climate and culture and the involvement and collaboration of all role players within a school community (Engelbrecht, Oswald & Forlin, 2006).

Based on the nature of vocational education opportunities for students with disabilities and the challenges expressed by the administrators, teachers and staff, the following recommendations are made:

1. Changing the way people describe those with disabilities will improve the negative stigma toward people with disabilities. Stereotypic language sends a negative message of alienation and apartness which often limit the aspirations of persons with disabilities and lead them to doubt their self-worth (Slapin, 1990). In all three countries, it was common to refer to someone with a disability by their disability, for example, “The blind girl or the deaf boy.” By doing so, there is a culture of negative attitude that surrounds the individual and can greatly affect the way they are perceived at school, work, and in society as a whole. People are encouraged to use “person first language” when discussing those with disabilities, for example, referring to someone with Autism as, “The individual with Autism” or saying, “She teaches students with intellectual disabilities.” Also, there is need to educate those in the media (newspapers, TV and radio, local literature) and school personnel (teachers, counselors, administrators) on using the ‘person-first’ respectful terminology; it will gradually become part of the culture of those with disabilities. In addition to changing the language used when identifying those with disabilities, it is equally important to increase the amount of community exposure for individuals with disabilities. Community exposure changes public attitudes for the better, and this will enhance community acceptance as a long-term strategy (Cummins & Lau, 2003). Changing the community perceptions can be done in many ways such as including those with disabilities in advertisement material and marketing campaigns, encouraging the public to develop partnerships with school and vocational programs that service those with disabilities, and encouraging facilities that work with individuals with disabilities to plan more community-based opportunities.
2. To increase the amount of meaningful community-based work experiences and vocational training opportunities for individuals with disabilities, a more participatory approach by the local community and businesses is needed. After more than a decade of research, empirical evidence confirms that the majority of individuals with severe disabilities who need relatively permanent employment services fare better in supported employment than in sheltered work or other types of day services (Wehman, West & Kane-Johnston, 1997). Examples of businesses that have provided these opportunities for individuals with disabilities include Goodwill Industries (information available at: <http://www.goodwill.org/>) and Rising Tide Car Wash (see, [www.risingtidecarwash.com](http://www.risingtidecarwash.com)). Successful programs actively seek out partnerships with service agencies and organizations in their community to provide the comprehensive array of services needed by youth and young adults with mental health needs (Woolsey & Katz-Leavy, 2008). Therefore, by working collaboratively with local business, students that participate in community-based work experiences and vocational training programs will be better prepared to meet employers’ expectations when they eventually join the general workforce.
3. Involve instructors and other stakeholders in creating educational opportunities and provide them with the necessary support to work effectively with individuals with disabilities. Perhaps the most effective system of support for an individual with special needs is one that draws upon solutions generated by the home and the community as well as systems that have been formalized in the government and private sectors (Nag, 2011). The vocational instructors, through advisory committees can explore and create opportunities for students with disabilities. A number of employers will hire people with disabilities, if they knew what tasks the students with disabilities can be hired to do. By communicating with potential employers and others that are a part of the industries



the students would like to work in, vocational instructors and other stakeholders can be better prepared to provide meaningful learning opportunities that will directly affect their success when they enter the workforce.

## References

- Aboyi, O. (2007, August). Educating children with learning disabilities in Africa. *Learning Disabilities Research & Practice*, 22(3), 196–201.
- Burgstahler, S., & Bellman, S. (2009). Differences in perceived benefits of internships for subgroups of students with disabilities. *Journal of Vocational Rehabilitation*, 31(3), 155-165.
- Clegg, J., Murphy, E., Almack, K., & Harvey, A. (2008). Tensions around inclusion: Reframing the moral horizon. *Journal of Applied Research in Intellectual Disabilities*, 21(1), 81-94
- Casale-Giannola, D. (2012). Comparing inclusion in the secondary vocational and academic classrooms: Strengths, needs, and recommendations. *American Secondary Education*, 40(2), 26-42.
- Choruma, T. (2007). The unforgotten tribe: People with disabilities in Zimbabwe. Retrieved from [http://www.africacampaign.info/uploads/media/forgottribeproggressiozim\\_01.pdf](http://www.africacampaign.info/uploads/media/forgottribeproggressiozim_01.pdf)
- Cummins, R. A., & Lau, A. L. D. (2003). Community integration or community exposure? A review and discussion in relation to people with an intellectual disability. *Journal of Applied Research in Intellectual Disabilities*, 16(2), 145-157.
- Dube, A. K., Chimusoro, A., Mandimutsira, R., Chinamasa, M., Munhangu, M., & Munhangu, D. (2008). Disabled people's organization: Needs assessment research. Retrieved from [http://www.safod.org/SRP\\_Web\\_site/Needs\\_Assessment.pdf](http://www.safod.org/SRP_Web_site/Needs_Assessment.pdf)
- Engelbrecht, P., Oswald, M., & Forlin, C. (2006). Promoting the implementation of inclusive education in primary schools in South Africa. *British Journal of Special Education*, 33(3), 121-129.
- Eriamiatoe, P. (2013). Realizing inclusive education for children with disabilities in Lesotho. Retrieved from <http://africlaw.com/2013/07/15/realising-inclusive-education-for-children-with-disabilities-in-lesotho/>
- LNFOOD, (2012). LNFOOD and UNICEF Collaborate to Launch the 2013 State of the World's Children Report. Press Release, May 27, 2013. Retrieved from [www.lnfod.org.ls/uploads/1/2/2/5/12251792/state\\_of\\_the\\_worlds\\_children\\_launch.pdf](http://www.lnfod.org.ls/uploads/1/2/2/5/12251792/state_of_the_worlds_children_launch.pdf)
- Mavromaras, K., & Polidano, C. (2011, March). Improving the employment rates of people with disabilities through vocational education. Discussion Paper No. 5548. Retrieved from <http://ftp.iza.org/dp5548.pdf>
- McClain, C.V. (2002, January-March). Governance and Legislation in South Africa: A contemporary overview. *Disability World*. 12 (January-March 2002). Retrieved from [http://disabilityworld.org/01-03\\_02/gov/south-africa.shtml](http://disabilityworld.org/01-03_02/gov/south-africa.shtml)
- Moswela, E., & Mukhopadhyay, S. (2011). Asking for too much? The voices of students with disabilities in Botswana. *Disability & Society*, 26(3), 307-319.
- Mugumbate, J., & Nyoni, C. (2013, September). Disability in Zimbabwe under the New Constitution: Demands and Gains of People with Disabilities. Retrieved from [http://www.academia.edu/7762774/Disability\\_in\\_Zimbabwe\\_under\\_the\\_New\\_Constitution\\_Demands\\_and\\_Gains\\_of\\_People\\_with\\_Disabilities](http://www.academia.edu/7762774/Disability_in_Zimbabwe_under_the_New_Constitution_Demands_and_Gains_of_People_with_Disabilities)
- Nag, S. (2011). Re-thinking support: The hidden school-to-work challenges for individuals with special needs. *International Journal for Educational and Vocational Guidance*, 11(2), 125-137.
- Nyakanyanga, S. (2013, December 13). People with Disabilities Deserve Better. *The Herald*. Retrieved from <http://www.herald.co.zw/people-living-with-disabilities-deserve-better/>
- Sefuthi, N. (2016, February 15). The CRPD in Lesotho: No game changer yet. Retrieved from <http://globaldisability.org/2016/02/15/crpd-lesotho-no-game-changer-yet>

- Shoko, B. (2012). In Zimbabwe, the disability that prevents Munashe from using his hands proves no barrier to his education. Retrieved [http://www.unicef.org/disabilities/zimbabwe\\_67093.html](http://www.unicef.org/disabilities/zimbabwe_67093.html)
- Slapin, B. (1990). *Books without bias: A guide to evaluating children's literature for handicapism* Berkeley, CA: Squeaky Wheels Press.
- Soy, S.K. (1997). The case study as a research method. Unpublished paper, University of Texas at Austin. Retrieved from <https://www.ischool.utexas.edu/~ssoy/usesusers/l391d1b.htm>
- Statistics South Africa, (2014). Profiles of Persons with Disabilities in South Africa. Retrieved from <http://beta2.statssa.gov.za/publications/Report-03-01-59/Report-03-01-592011.pdf>
- Stair, K. S. & Moore, G. E. (2010, April). Including special needs students in ag ed. *Techniques*, 52-55. Retrieved from <http://www.acteonline.org>
- Vickers, P., & Offredy, M. (2013). Developing a Healthcare Research Proposal: An Interactive Student Guide. Retrieved from [http://www.researchproposalsforhealthprofessionals.com/open\\_coding.htm](http://www.researchproposalsforhealthprofessionals.com/open_coding.htm)
- Wa Munyi, C, (2012). Past and present perceptions towards disability: A historical perspective. *Disability Studies Quarterly*, 32(2). Retrieved from <http://dsq-sds.org/article/view/3197/3068>
- Wehman, P., West, M., & Kane-Johnston, K. (1997). Improving access to competitive employment for persons with disabilities as a means of reducing social security expenditures. *Focus on Autism and Other Developmental Disabilities*, 12(1), 23-30.
- Yssel, N., Engelbrecht, P., Oswald, M., Eloff, I & Swart, E. (2007, November/December). Views of inclusion: A comparative study of parents' perceptions in South Africa and the United States, *Remedial and Special Education*, 28(6), 356-365.



# Using E-Portfolios to Achieve Better Learning Outcomes in Professional Training: Views from Teacher Trainees and Supervisors

**Christina Wai Mui Yu**

Hong Kong Institute of Education, China

## **Abstract**

This paper reports a preliminary study on the use of professional e-portfolios to enhance teacher trainees' learning outcomes in teaching practice. Nearly 90percent of the participants were able to follow the suggested guidelines to present their learning outcomes in an e-Portfolio. Some good practices were also identified. Academic staff from three different faculties gained an understanding of how technology applications can be used to support teacher trainees' learning of teaching practice through participation in this study. Recommendations on revising the learning activities in e-Portfolios, providing detailed guidelines on achieving an in-depth critical reflection, and enhancements of the Mahara e-Portfolio platform and technical training are proposed.

*Key Words:* Electronic Portfolio (E-Portfolio), Teaching Practice, Field Experience, Teacher Education, Teacher Trainees, Learning Outcomes

## **Background**

In order to improve the quality of teacher training, a new outcome-based field experience (FE) framework that reflects teacher competence standards in Hong Kong was developed by a research team at the Hong Kong Institute of Education (HKIEd) three years ago. The new FE framework aims to enable teacher trainees (TTs) to understand four key aspects of teachers' work: (1) teaching and learning, (2) learner development, (3) school development, and (4) professional services and development. Also, the framework has identified ten FE intended learning outcomes (FEILOs) and their grade descriptors, learning activities, and assessment items in teaching practice (TP). A professional portfolio in an electronic format constitutes the central assessment in TP. This Professional e-Portfolio (PeP) is expected to enable TTs to provide consolidated evidence of their practice along with reflections on their TP, including theory building. It is expected that TTs will be able to demonstrate their learning with reference to the ten FEILOs through active engagement in the learning activities and reflective journal of the PeP in TP.

In order to ensure a smooth transition to the new framework through large-scale implementation, two cycles of pilot studies were conducted. The first cycle aimed to examine the impacts of the learning activities and the PeP on TTs' performance in TP. This paper mainly reports the key findings of this first cycle study. Moreover, based on the use of the PeP in teacher education programs in HKIEd, this paper will illustrate how to enable TTs to create their own PeP to bridge theory and practice through learning activities and critical reflection. The challenges of using PeP field work training and ways to tackle these challenges will also be discussed.

## **Literature Review**

The teaching profession is becoming more complex. The demands placed upon teachers are increasing and the environments in which they work are more challenging. By referring to the CanMEDS (Canadian Medical Education Directions for Specialists) Physician Competency Framework and applying it in the teaching profession, professionals such as teachers can conduct their teaching within the boundaries of their discipline, personal character/expertise, the classroom setting, students' learning preferences, and the school context (Frank, 2005). Moreover, establishing a normative model of TP and embedding it in daily instructions and professional development is one of the major challenges in teacher education. Many teacher education programs are reviewing the ways in which teachers gain sufficient support in practice and reflection in their TP. Furthermore, with the increasing focus on the outcome-based learning approach to justify the spending of public money on education and training (Stone, 2005), teacher education is placing more emphasis on how TTs capture evidence on multiple measures via e-Portfolios in order to demonstrate their learning outcomes and professional growth. The most common means of collecting evidence about TTs' learning outcomes is observing teaching performance and using e-Portfolios to illustrate professional competence.

E-Portfolios have shown great potential to change the teaching environment and methods. An e-Portfolio is a collection and demonstration of one's learning processes and outcomes, which include knowledge, skills, values, and reflections through an articulation of the relevant artifacts (Buzzetto-More, 2010; Cooper & Love, 2007). According to Wang (2009), an e-Portfolio system should facilitate students to upload artifacts, customize personal presentations, comment on and assess work, communicate and share with teachers and peers, reflect, draw linkages to goals, generate showcases, and prepare administrative reports. In the teaching profession, a significant and integral part of a teacher's engagement with an e-Portfolio is uploading his/her own teaching programs with written reflections on teaching performance as evidence of learning representing a specific learning outcome. The process leads teachers to conduct a continuous reflection on their beliefs and practices and to construct their own pedagogical content knowledge (Khan & Begum, 2012).

In this study, TTs are expected to document and evaluate their significant learning experiences by creating a PeP in order to (1) display their teaching practice and learning activities engaged in during TP, and (2) reflect on their practice and learning activities. Such a PeP is a learning portfolio; in contrast to standard university assessments, it requires TTs to see the connections between their learning experiences by aligning their evidence with the outcomes and reflecting on why the evidence shows their growing proficiency and ability. Otter (1992) defined learning outcomes as typically broad statements describing "what a learner knows or can do as a result of learning" (Otter, 1992, p. 2). Since "outcomes"

are a key component of the new FE framework, the learning activities and reflective journal are designed to help TTs to understand teachers' work, including their educational beliefs and goals (Activity 1), understand the TP school (Activity 2), understand the classroom context and pupils (Activity 3), and to analyze teaching and learning (Activity 4), and professional growth (Activity 5). The learning outcomes of these tasks or activities are close to the current teachers' competence standard requirements. Appendix 1 gives details of the learning activities, tasks, and reflective questions with a consideration of the timeline, number of words, and evidence to be organized and presented by TTs in their PeP.

Barber and Mourshed (2009) emphasized that information and communications technology (ICT) is a transformational force for education, raising students' potential and putting power in their hands through expanding the existing system. An effective system-wide use of ICT will require combining technology (hardware, software, maintenance, and support) and human capacity (teachers and school leaders) with a coherent ICT strategy that includes embedding ICT in day-to-day learning, transparency of learning (gathering and responding to students' feedback), system transparency (managing and using large amounts of data), tailoring to cater for different students' needs, online collaboration through networks, assessment formats and tools, research and development, and valuing human interaction in blending ICT use (Barber & Mourshed, 2009, p. 42). However, TTs may not be able to satisfy such high learning demands without adequate guidance and supervision. In order to achieve system-wide use, the most important procedures for guiding TTs to prepare their PePs are:

1. TTs are invited to attend a 3-hour training workshop. In the workshop, they are informed about the TP learning outcomes they are required to achieve, the expected impacts of PeP use on TP, the supportive learning activities and the Mahara ePortfolio platform, and how to conduct their professional reflection and submit their reflective journal and artifacts via the platform.
2. TTs are then guided to create their own PeP through the training workshop and hands-on practice. The trainer ensures that TTs are able to create their individual PeP on Mahara ePortfolio platform and submit the relevant links to the trainer at the end of the training workshop. As the Mahara ePortfolio users are in control with whom they want to share their work, TP supervisors cannot access the PePs without obtaining TTs' link, therefore the trainer gathers all the PeP links and distributes them to the relevant TP supervisors.
3. TTs are taught to use the same link they created at the workshop as the valid link for PeP submission so that their TP supervisors are able to access their PeP constantly. Moreover, TTs need to notify their TP supervisors if there is any change to their PeP link.
4. TTs keep their portfolios updated throughout the TP and their TP supervisors can check their progress and provide regular guidance and feedback on their work.

TP supervisors receive training on the design rationale of the PeP, and how to communicate and mark PePs via an online platform. To ensure a smooth and successful large-scale implementation, the aforementioned two-cycle pilot study on the use of PePs in the existing system was conducted to achieve the following objectives:

- a. create a collaborative and sustainable learning environment that facilitates a transformation of TTs into competent teachers through outcome-based learning activities and use of PePs in TP;
- b. enable TTs to carry out TP learning activities and present their learning outcomes in their individual PeP;

- c. prepare TP supervisors to use technology applications to support TTs' learning in TP;
- d. ensure that TP supervisors gain a common understanding of the new assessment;
- e. improve technology support for TTs' professional development; and
- f. identify good practices for further revision of the FE learning framework if necessary.

This paper reports the first cycle of the pilot study (that is, the preliminary study); the research questions of the first cycle study are: (1) In what ways do the new learning activities in the PeP enhance TTs' learning outcomes in TP? and (2) How does the PeP demonstrate TTs' learning outcomes? The research design, findings, and discussion of the findings are presented in the sections below.

## Research Design

Mixed research methods were adopted to collect, analyze, and triangulate quantitative and qualitative data. This design was most appropriate because it allows the research team to explore and explain TTs' engagement with the PeP. To answer the first research question, a questionnaire survey with responses on a 4-point Likert-type scale was designed to collect TTs' views. The questionnaire questions covered the new learning activities TT participants engaged in during TP; how much TT participants liked the new learning activities; how the activities can/did enhance their learning of a teacher's work during TP; any concrete evidence to support their enhancement; and whether they had any problems or difficulties in completing those learning activities. The second research question was answered by conducting focus group interviews (FGIs) with two distinct groups: TTs and TP supervisors. The key interview questions were: How did different aspects of the PeP learning activities contribute to TP learning? What were the difficulties involved in completing the activities? What is your view of engaging in the learning activities and PeP to demonstrate the FEILOs? To what extent can/did your PeP facilitate TP learning? Would you continue to use the PeP as a platform for professional development, and why (not)? In addition, a close examination of the PeP was conducted to identify some good practices to guide future revisions and study.

A sample of 34 TTs from three major study groups of the 4-year Bachelor of Education (BED) program at HKIED and 19 TP supervisors from three faculties and departments were involved. A breakdown of the TTs and TP supervisors involved in the study is shown in Table 1.

Table 1 Participants in the study

BEd program (major area)	Year	No. of TT participants	No. of TP supervisors	Department	No. of TT participants involved in FGI	No. of TP supervisors involved in FGI
General Studies	4	20	9	Social Sciences/Sciences	1	3
Liberal Studies	4	10	6	Social Sciences/Sciences	4	3
English	4	4	1	English	3	1
Total		34	19	3	8	8

In the data collection process, all the TT participants were invited to complete the online questionnaire survey. Four FGIs were held (2 for TTs participants and 2 for supervisors). In addition, eight e-Portfolios were randomly selected for review. Qualitative and quantitative analytical approaches were used because they help analyze different aspects of participation as directed by the research questions (Johnson, Onwuegbuzie, & Turner, 2007). The statistical analysis of questionnaires and the coding of interviews and notes examining the PePs were combined and considered to be complementary to each other. Throughout the study, all the procedures and operations, including pre-test questionnaire, data collection, and analysis, were closely monitored by the research team.

### Key Findings of the Questionnaire Survey

Twenty-seven TT completed the questionnaire survey, giving a response rate of 79 percent (27 out of 34), which is in line with the expected outcome. Table 2 shows the percentage of TT participants who completed each of the tasks, completed them on schedule, and completed in the final week (week 8). Around 78-96 percent of TT participants were able to complete learning tasks 1-9 and all completed tasks 10 and 11 of Activity 5. Around one-third were able to complete all the learning tasks on schedule, while another third worked on all the learning tasks in the final week. It was noted that only 26 percent of the TT participants were able to finish Tasks 5 and 7 on schedule.

Table 2 TT participants' completion of tasks

Survey Items	Activity 1 Beliefs & goals		Activity 2 TP school			Activity 3 Class- room con- text and pupils		Activity 4 Teach- ing and learning analysis		Activity 5 Profession- al growth	
	1	2	3	4	5	6	7	8	9	10	11
Learning tasks	1	2	3	4	5	6	7	8	9	10	11
Task completed (percent)	96	89	89	78	85	93	93	93	93	100	100
Task completed on schedule (percent)	33	33	33	30	26	30	26	30	33	44	44
Task completed in final week (percent)	33	33	33	33	33	37	48	48	40	33	33

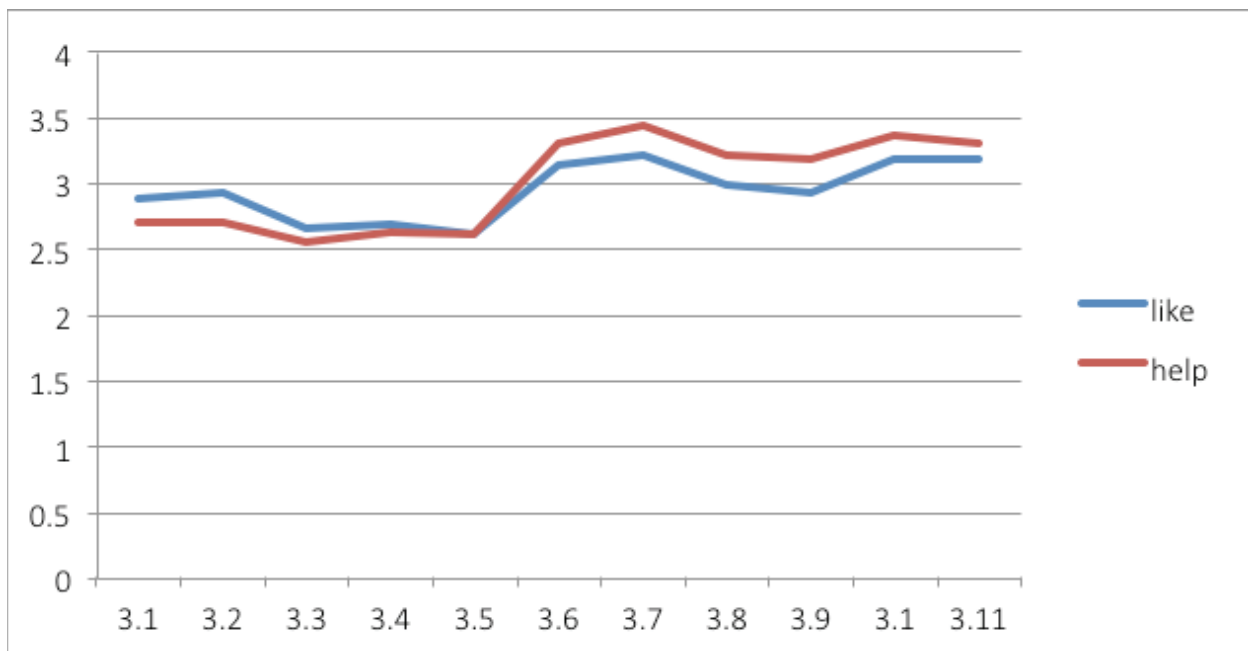
Table 3 and Figure 1 below show the TT participants' perception of the learning tasks' helpfulness and how much they liked them. The mean scores of the learning tasks in Activity 2 were the lowest among all other activities. This finding explains to some extent the lowest completion rate of Task 4 (78 percent) and reflects that the learning tasks in Activity 2 were perceived to be least helpful. The mean scores of "like" and "helpfulness" of the tasks in Activities 3, 4, and 5 were higher than those in Activities 1 and 2.

Another interesting finding is that nearly all the mean scores for "like" were higher than those for "helpfulness" in all the learning tasks of Activities 1 and 2, while the mean scores for "helpfulness" were higher than those for "like" in all the learning tasks of Activities 3, 4, and 5. The learning tasks of Activities 1 and 2 were relatively simple and involved stating personal learning goals and rephrasing the school vision, while the learning tasks of Activities 3, 4, and 5 were reflective in nature and took more time to complete. This finding indicates that reflective learning can facilitate TTs' learning even if they do not like it. Nevertheless, the TT participants enjoyed Activities 3, 4, and 5 as much or more than Activities 1 and 2.

Table 3 TT Participants' perception of the learning tasks

Survey Items	Activity 1		Activity 2			Activity 3		Activity 4		Activity 5	
	1	2	3	4	5	6	7	8	9	10	11
Like	2.89	2.93	2.67	2.7	2.62	3.45	3.22	3.0	2.93	3.19	3.19
Helpfulness	2.7	2.7	2.56	2.63	2.62	3.3	3.44	3.22	3.19	3.37	3.31

Figure 1 TT Participants' perception of the learning activities



Regarding the survey on e-Portfolios, 89 percent of the TT participants set up their own PeP, but of these only 25 percent agreed that it could enhance communication with TP supervisors and peers. Most



of the TT participants reported that their TP supervisors suggested that they use email for communication rather than the e-Portfolio platform. Nearly two-thirds (63 percent) of TT participants agreed that the design of the PeP could support their learning. Reflection was identified to be the most powerful learning process supported by the PeP. Around 74 percent of TT participants agreed that the technical support for use of the PeP is sufficient. However, uploading individual files and storage capacity were identified as the major obstacles in using the Mahara ePortfolio platform. Only 56 percent of TT participants indicated that they were willing to use the PeP as a platform for professional development.

## **Key findings on the Focus Group Interviews**

### *The TT Participants' Views*

The TT participants reported that the learning activities and reflective journal provided a chance to summarize and consolidate their TP learning experiences. The guided questions facilitated reflection and the TT participants could select relevant questions to address their own circumstances and professional growth in TP. Some TT participants found that the learning activities were able to enhance their learning in TP, with the exception of Activity 1. They explained that without a good understanding of day-to-day teaching life in school, it was hard to set sensible goals. Some TT participants indicated that Activity 2 increased their awareness of their school's educational philosophy and policy, which certainly had an impact on their teaching even if they did not like the activity. Some suggested conducting a comparative study of a placement school with their alma mater, which would likely constitute a meaningful learning and reflection exercise. Another suggestion offered by the TT participants was to relax the timeline and word limit of the reflective journal in order to increase flexibility. TTs also wanted to be given more flexibility to design the layout and organize their evidence in the PeP.

Constraints on the technicalities and user-friendliness of the PeP were reported. Chief among them the very limited space for the uploading of materials, requiring complicated work-around solutions, such as uploading to Google Docs and linking the materials to the Mahara ePortfolio platform. Also, Google Docs was not considered user-friendly. Uploading/downloading files was too time-consuming and the TT participants preferred not to use a hyperlink for sharing. It was also noted that supervisors tend to use other means like emails and WhatsApp to interact with TTs instead of Google Docs and/or the Mahara ePortfolio platform.

### *The Supervisor Participants' Views*

Supervisor participants reported that the learning activities and guided questions can facilitate TTs' learning. Most supervisor participants showed concerns about the value of Activity 2 ("About Your TP School") since many TTs simply cut and pasted information from the school website. Moreover, in general, TTs' reflection was superficial, showing little or no connection with theory, presenting inadequate evidence, and lacking a good connection to different activities. Some supervisor participants thought that the word limit could hinder and constrain TTs' in-depth reflection. It is important to consider how to strengthen TTs' profound reflection on their professional development.

Some other concerns raised by the supervisor participants included the fact that it was difficult and time-consuming to search for TTs' artifacts and evidence files without a hyperlink and/or a clear indication of how to access them. Most supervisor participants indicated that there was great pressure to

provide TTs timely feedback on uploaded lesson plans. They suggested that it was important to clarify the expectations regarding feedback on TTs' work. Most supervisor participants shared that TTs needed to gain a comprehensive understanding of the guidelines on creating and using their PeP, conducting learning activities, writing their reflective journal, connecting various parts of the PeP, FEILOs, and the assessment criteria of the FEILOs.

The supervisor participants commented that PeP is user-friendly but some of them were not used to giving comments via electronic means like Google Docs. Some had concerns about the untidy layout of the PePs: they preferred to have a unified layout and a more systematic filing system to allow easier access to TTs' learning outcomes and evidence. Some supervisor participants also suggested expanding the storage capacity for the PeP and incorporating more user-friendly means of communication like WhatsApp for interaction with TTs.

### *Good Practices in the PeP*

In a close examination of the TT participants' PePs, it was found that most could follow the instructions closely to demonstrate their learning outcomes clearly. Some TT participants presented their PePs in a thematic way, for example, presenting the four core learning aspects of reading, writing, listening, and speaking in language teaching, whereas some simply presented their teaching materials in chronological order on a weekly basis. Following a special request by the English department, English major TT participants were able to attach teaching video clips to their PePs, and to interact with peers and supervisors by using Google Docs during TP. These good practices could be introduced to other major study areas.

## **Discussion**

The findings of the questionnaire survey show that TT participants engaged in all the new learning activities but mainly liked Activities 3 to 5, which were directly related to their understanding of pupils, classroom teaching, and gaining their own pedagogical content knowledge in TP. This is not surprising because previous TP activities and assessment practices were mainly focused on TTs' learning and teaching in the classroom context instead of on personal beliefs and school context. However, the school activities in the PeP involved a certain level of in-depth study and interaction with school personnel, which may pose problems and difficulties for TTs as they are rather new to the TP school. These results suggest that further revision of the school activities in the PeP may be needed. For example, Task 5 in Activity 2 could be modified from observing and recording "how the school implements its educational philosophy, policies, or practices" to "how the Principal, Vice Principal, Panel Chairs, or classroom teachers implement the school's education philosophy."

The TT participants also indicated that the reflective journal in the PeP facilitated their learning, even if they did not enjoy writing it because it demanded greater time and effort. Supervisor participants indicated that TTs' reflection was superficial despite the fact that they themselves identified it as a powerful learning process. Kirschner (2015) emphasized that teachers need to develop the practice of critical reflection to avoid unexamined judgments, interpretations, assumptions and expectations. More work on guiding TT participants to engage in in-depth critical reflection is necessary. A more

supportive PeP allowing large uploads and using more interactive communication tools was demanded by both TT and supervisor participants.

Regarding the flexibility issue, TTs should absolutely be given a free hand in creating their unique personal PeP in order to achieve a strongly self-directed learning process. However, this may be too difficult for some TTs and pose problems for TP supervisors who are unfamiliar with the PeP. In addition, from the administrative and quality assurance perspectives, if TTs present their PeP in very different ways it will hinder marking (and its standardization) by almost 300 TP supervisors in large-scale implementation. This is why the supervisor participants requested a more uniform layout and systematic filing systems. The research team decided therefore to relax the timeline and word limit of the reflective journal but not the layout or format of the PeP. However, TTs were encouraged to create a personalized PeP after the final marking. Both TT and supervisor participants were also encouraged to use different means to communicate and interact throughout the TP.

TTs may also want to support their reflective journal entries with relevant and well-documented artifacts of their performance in TP. Clear reference to the exact item is required to illustrate point(s) of argument. However, TTs should avoid including too few or too many artifacts. All such items should be cleared the copyright and attached as appendices. They may take written or multimedia form. Any three-dimensional artifacts or original artwork must be in Jpeg form. TTs are expected to highlight the part(s) most relevant to their reflection and label each item clearly with an appendix number and title.

The above discussion shows that the challenges of using PePs in fieldwork training include a clear distinction of the role and function of the PeP, engagement with core learning activities and in-depth reflection with a systematic organization of artifacts, a balanced use of flexible and rigid approaches in instructional design, and the provision of high-quality training and technical support to trainees and trainers. This study also shows the need for ongoing refinement of the learning activities and guided questions for reflection in the PeP. Likewise, there must be continuous enhancement of the online platform and technical support.

## **Conclusion and Recommendations**

In summary, the findings of this study help to create a collaborative learning environment among various stakeholders and facilitate the transformation of TTs into competent teachers through using PePs in a new FE framework. Nearly 90 percent of the TT participants were able to follow the suggested guidelines to complete the new FE activities and produce a reflective journal, and successfully presented them in their individual PePs. Some good practices have been identified. Moreover, 19 TP supervisors from three faculties and departments in three major study areas gained a better understanding of the framework and how to use technology to support TTs' learning. Both TT and supervisor participants provided insights constituting a firm basis for further revision of the new framework, especially in the areas of learning activities and technical support for the PeP.

The PeP should be explored further as a combined means of guiding and assessing TTs' learning outcomes in TP, and a way of providing high-quality training to TTs and TP supervisors.

## Acknowledgement

This work was supported by the internal research grant of the School Partnership and Field Experience Office at the Hong Kong Institution of Education.

## References

- Barber, M., & Mourshed, M. (2009). *Shaping the future: How good education systems can become great in the decade ahead*. Singapore: Mckinsey & Company.
- Buzzetto-More, N. (2010). Assessing the efficacy and effectiveness of an e-portfolio used for summative assessment. *Interdisciplinary Journal of E-Learning and Learning Objects*, 6: 61-85.
- Cooper, T., & Love, T. (2007). Electronic portfolios in e-learning. In N. Buzzetto-More (Ed.), *Advanced principles of effective e-learning*. Santa Rosa: CA. Informing Science Press.
- Frank, J. R. (Ed.). (2005). *The CanMEDS 2005 physician competency framework: Better standards. Better physicians. Better care*. Ottawa: The Royal College of Physicians and Surgeons of Canada.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1: 112-133.
- Khan, B., & Begum, S. (2012). Portfolio: A professional development and learning tool for teachers. *International Journal of Social Sciences & Education*, 2(3): 363-378.
- Kirschner, P. A. (2015). Do we need teachers as designers of technology enhanced learning? *Instructional Sciences*, 43: 309-322.
- Otter, S. (1992). *Learning outcomes in higher education*. London: UDACE.
- Stone, M. V. (2005, December). *Opening remark*. Paper presented at the Symposium on Outcome-based Approach to Teaching, Learning and Assessment in Higher Education: International Perspectives, Hong Kong.
- Wang, S. (2009). Inquiry directed organization of e-portfolio artifacts for reflection. *International Journal of E-learning and Learning Objects*, 5: 421-433.

## Appendix 1

### Guidelines on Completing the Learning Activities, Tasks, and Reflective Journal in PeP

Suggested activities to be completed	Task guidelines	Questions to be considered in writing a reflective journal
<p><b>1 About Your Own Educational Beliefs and Goals</b></p> <p>Be aware of and make explicit the educational beliefs that underpin your teaching strategies and practices so that you know where you want to be and how to get there.</p>	<p><u>Task 1</u> To write a short-term goal statement</p> <p><u>Task 2</u> To write a long-term goal statement</p>	<p>How are your short-term and long-term goals closely connected to your educational beliefs?</p> <p>How do you make explicit the goals you set for the teaching of your major subject of study and/or your own continued professional development? (about 300 words in Week 1)</p>
<p><b>2 About Your TP School</b></p> <p>Record observations of the school's educational philosophy, goals, policies, and practice.</p> <p>Reflect on how you, as a teacher, could contribute to the implementation of the school's vision.</p>	<p><u>Task 3</u> To collect and record the educational philosophy of the school</p> <p><u>Task 4</u> To collect and record the goals or mission of the school</p> <p><u>Task 5</u> To observe and record how the school implements its educational philosophy, policies, or practices</p>	<p>Have you contributed to the implementation of the school's vision and mission during the TP? What have you done?</p> <p>Imagine that you are one of the teachers in your TP school: what other things could you do to help implement the school's vision and mission? (about 500–600 words in Weeks 2–6)</p> <p>Supporting Evidence/Artifacts/Documents: pamphlet, school magazine, web materials</p>
<p><b>3 About the Classroom Context and Your Pupils</b></p> <p>Briefly describe an incident and the pupil's behavior/learning problem you have encountered.</p> <p>Reflect on the effectiveness of your participation or assistance in providing discipline, guidance, and/or counseling to support pupils' learning in the classroom or school.</p>	<p><u>Task 6</u> To identify and describe the characteristics of the learners in the school</p> <p><u>Task 7</u> To describe how the learners impact specific class teaching and learning approaches</p>	<p>What actions have you taken? What measures did you take to solve the problem?</p> <p>Why did you make this decision? Can this decision support students' learning?</p> <p>How would you evaluate the effectiveness of your actions/measures? What have you learned from this incident? (about 500–600 words in Weeks 2–6)</p> <p>Supporting Evidence/Artifacts/Documents: pupils' work, video-taped lesson, case report</p>

<p><b>4 Initial Stage of Reflection (Teaching and Learning)</b></p> <p>Describe the theoretical framework/ learning theories/pedagogical models/research and/or readings that informed your teaching plan.</p> <p>Analyze how and why educational concepts, principles, and theories have been used throughout the planning, teaching, and assessment of your plan and how the plan improves teaching effectiveness.</p>	<p><u>Task 8</u> To describe one lesson (or one unit) which you plan to reflect on and include the lesson plan in the artifacts of teaching.</p> <p><u>Task 9</u> To discuss and analyze why you selected the content, teaching strategies, and teaching resources.</p>	<p>What were the target learning items for the lesson/unit plan? How did the design of your activities develop pupils' knowledge and capabilities? How did their learning impact on your teaching? (about 500–600 words in Weeks 2–6)</p> <p>Supporting Evidence/Artifacts/Documents: pupils' work, lesson planning, teaching supervision form, observation record</p>
<p><b>5 Final Stage of Reflection (Professional Growth)</b></p> <p>Reflect upon the experience gained in your observation of teaching and/or from the supervision of your teaching.</p>	<p><u>Task 10</u> To write an in-depth reflection on your supervised classes.</p> <p><u>Task 11</u> To suggest specific ways to improve the teaching and learning of your class.</p>	<p>How would you evaluate the effectiveness of strategies, measures, and actions in supporting pupil learning? What have you learned from the TP? What strengths and weaknesses in yourself as a teacher trainee have you identified in the TP? What will be your action plan to become a professional teacher? (500–600 words in Weeks 7–8)</p> <p>Supporting Evidence/Artifacts/Documents: pupils' work, lesson planning, sample of assessment instrument, teaching supervision form, observation record</p>



# **Innovation, Sustainability and Leadership in Technical and Vocational Education and Training**

**Rónán Haughey**

The Rónán Haughey Development Partnership, Ireland

## **Abstract**

Innovation is everywhere and nature. We know much more now about our needs than we ever have and are comfortable pushing ourselves environmentally, technically and intelligently more than ever. Innovation is critically dependent on the leading organizations and societies to innovate for good. Innovation is of the masses not just heavily invested research and development projects. We all are innovators. As collectives we don't do so as naturally as we might and must. TVET is no different. Innovation is all about working together, as is sustainability, as is leadership. Sustainability is a huge challenge for all of us. In many countries in Asia, Africa and the Americas meeting the needs of growing populations requires the utilization of technology, human capital and skills like never before. In Europe, there are millions of young people who need new skills. Skills in innovation, creativity and enterprise. Innovation, sustainability and leadership are elements vital in TVET in the 21st century, the transformational age.

*Key Words:* TVET, Innovation, Leadership, Sustainability.

## **Introduction**

Innovation, means many things to many peoples The LEGO Group is a privately held, family-owned global company with headquarters in Billund, Denmark (About The Lego Group, n.d., para 1). Founded in 1932 by Ole Kirk Kristiansen, it is one of the world's leading manufacturers of play materials is still owned by the Kirk Kristiansen family (The Lego Group, n.d., para 1). In 1932 Ole Kirk Kristiansen, master carpenter and joiner, established his business. His firm manufactures stepladders, ironing boards, stools and wooden toys (The Lego Group History, n.d., para 8). Back then life in rural Denmark was difficult. Work was hard to come by and with a large family to support, Kristiansen desperately needed sustainable employment. So Kristiansen began an enterprise which is now a brand name synonymous with Innovation, Creativity and Play. In the late 1950's he created the first and iconic red plastic brick. This period of

creativity quickly followed by innovation after innovation has seen The Lego Group come a long way over the past almost 80 years (The Lego Group History, n.d., para. 3).

Many wonder what the founder of The Lego Group, a destitute unemployed Danish father, has to do with innovation in technical vocational education and training (TVET). Innovation is a new positive response to circumstances with a sustainable quality outcome. This is somewhat different from the standard definitions of innovation such as innovation being the adoption of an existing idea for the first time by a given organization, as distinct from invention, the creation of a new idea (Rogers, 1995). For Ole, this meant how he could feed his family and secure sustainable work. His vision of quality Lego is now described as the challenge of continuous improvement to be the best toy, the best for children and their development and the best to our community and partners (The Lego® Brand, n.d., para. 12). Should TVET not aspire to the Lego vision and the challenge of continuous improvement to be the best at what we do, the best for our learners and their development and for our community and partners? This paper explores the theme of Innovation in TVET. Does it occur? If so, where? What is the relevance of leadership and sustainability? What about technological advancements?

### **Innovation in TVET**

Innovation is everywhere, it's a thing of nature. Innovation in the world of human capital and TVET is as natural as it is in the bio-diverse forests of Borneo. In Borneo, FACE THE FUTURE, is a Rainforest Restoration Project. This project is a model for large-scale rehabilitation through enrichment planting (FACE THE FUTURE – Malaysia, n.d., para# 7). FACE THE FUTURE has been visited by many researchers, project developers, students, conservationists and government officials from all over the world. In addition, the project has offered opportunities for several research projects and numerous technical papers have been published. Capacity Building, for example, through tutored workshops on forests and climate, our employees are trained on best practices. They can ensure knowledge transfer to neighboring forest managers and future generations. The World Wild Life Federation (WWF) describes some of the work that it does as being innovative projects to implement working green economies (Heart of Borneo, n.d., para. 6).

Across the continent is Maslak, Istanbul, Turkey. In this corporate and fast moving suburb of the largest city in Europe there is a state of the art, privately owned, Culinary School called *Mutfak Sanatları Akademisi (MSA)*. This is one vocational school with such a deep commitment to innovation and excellence. To understand the excellence of MSA, one needs to understand the recent transformation in the Turkish economy and society (The World Bank - Turkey, n.d., para. 1). Turkey is the 18th largest economy in the world. In less than a decade, its per capita income has tripled and now exceeds US\$10,000. Although economic growth was slowed by the onset of the global economic crisis in 2008, it has nonetheless remained resilient-making Turkey an example from which other countries in the region can learn (The World Bank - Turkey, n.d., para. 2). Turkey has made considerable advances in competitiveness over the past decade.

So the rapid and sustained growth in Turkey is reflected in the scale at which MSA, which first opened its doors in 2004 and now has a capacity to train over 108 chefs at one time, graduating in excess of 500 hundred professional standard chefs per annum. In 2014 MSA joined forces with the leading international hotel chain, Kempinski, to offer MSA graduates an opportunity to join Kempinski ranks in the kitchen and acquire in-depth professional experience and expertise (MSA, 2014, para. 1). The Ciragan Palace Kempinski has also allowed a selection of its exclusive Tugra Restaurant menu to be available at the MSA culinary school restaurant. This innovative approach to vocational education is fantastic.

Also the Turkish government is taking their role in the transformation very seriously. The Movement of Enhancing Opportunities and Improving Technology, known as FATİH, is among the most significant educational investments globally (Fatih Projesi, 2012, para. 1). The project proposes all schools and pupils across the country to have the latest information technologies and the classes be transformed into computerized classes (Fatih Projesi, 2012, para. 1). That's a total of 42,000 schools and 570,000 classrooms, not to mention how many millions of students that will experience 21st century innovative technology in their school years. Interactive whiteboards and associated software development and tablet technologies for all pupils makes FATİH an ambitious innovative approach to education.

Regarding policy innovation, something major is afoot in Europe. The EU (European Union) is currently recovering, in some member states merely surviving and in others stabilizing in respect of the economic crash of 2008. TVET is now widely accepted at a policy level as being an enabler for competitiveness, recovery and sustainability for Europe, her peoples and communities.

In 2010, The Bruges Communiqué on enhanced European Cooperation in Vocational Education and Training (2010) for the period 2011-2020 was published following a meeting of the European Ministers for Vocational Education and Training, the European Social Partners and the European Commission, held in Bruges, Belgium on December 7, 2010. Current and future challenges are outlined clearly, a vision for the future beyond 2020 is described and the Communiqué is brave, bold and innovative. Under the challenge heading Education and Training for Tomorrow's Europe, the policy is crystal clear (p.2). Europe is trying to recover from a severe economic and financial crisis. Unemployment rates are high particularly amongst young people. The crisis has emphasized the need to reform our economies and societies. Europe wants to become smarter, more sustainable and more inclusive. To achieve this, we need flexible, high quality education and training systems which respond to the needs of today and tomorrow.

Under the challenge, The Right Skill, the Communiqué is clear. Today's students will be in the beginning of their career in 2020 with at least 30 years to go in their professional life, with some in occupations that do not exist today and others in occupations that are disappearing. We need to improve the capacity of TVET to respond to the changing requirements of the labor market.

This clear leadership shown in the Bruges Communiqué is guidance on how we should see the transformation which TVET is very much part of and how we should see our place in the world. We are in the midst of constant change and constant innovation.

## Enabling Change Through Innovation

According to the Organization for Economic Co-Operation and Development (OECD) Centre for Educational Research and Innovation (CERI), *iInnovation* is a driver of growth and well-being (OECD CERI, n.d., para 1). New technologies, products, services and organizations create jobs and rejuvenate industries – while making others obsolete. To reap the gains of innovation, policy makers need to understand how the way we innovate is changing and what this implies for education and training policies. How innovative is our sector? Education is an innovative sector, according to OECD (2014).

The case for education being innovative is clearly made: The idea that public sector organizations are less innovative than business sector organizations does not hold for the education sector. According to the innovation profiles of tertiary graduate jobs, education is one of the most innovative sectors of society. Among the sectors covered, higher education has the largest share of jobs involving innovation of all types, outperforming manufacturing and business activities, while primary and secondary education are close to the average. Although there are large variations across countries, innovation in knowledge or methods is the most prevalent type of educational innovation in all European countries covered by the analysis. If innovation is everywhere, then it exists in all contexts such as in the development of policy, partnership, outcomes, learning resources, assessment strategies, quality assurance etc.

## Innovation Skills Across the Globe

According to INSEAD, World Intellectual Property Organization (2014) Global Innovation Index 2014, Switzerland ranks as the most Innovation country. Ireland ranks 11th, Malaysia 33rd and Sudan the least innovative of the 143 countries ranked.

In the pillar of *Human Capital and Research* which includes education indicators Switzerland is ranked 12th, Ireland 18th, Malaysia 35th and Sudan 141st. The World Economic Forum (2014) Global Competitiveness Report 2014-2015 ranked Switzerland 1st, Ireland 25th and Malaysia 20th. The ranking comprises scores taken from each of the categories within the 12 pillars. Table 1 shows a summary of various country overall scores and category pillar scores.

Table 1: Summary of Select Country Rankings from the World Economic Forum Global Competitiveness Report 2014-2015

Country	Overall Score	12th Pillar: Innovation Category 12.01: Capacity for Innovation	5th Pillar: Higher Education & Training Category 5.03: Quality in Education
Switzerland	1	1	1
Malaysia	20	13	10
Ireland	25	17	5
USA	5	2	27
China	28	40	52

So what makes Switzerland so innovative and has the highest capacity for innovation and higher education and training? The World Economic Forum Global Competitiveness Report 2014-2015 (2015), in the summary challenges for each country the report, declares Switzerland's challenge is an inadequately educated workforce.

According to the *OECD Education at a Glance 2014: OECD Indicators* country paper on Switzerland (OECD, 2014) vocational education plays a major role in the Swiss education system. More than 65 percent of students in upper secondary education are enrolled in pre-vocational or vocational programs, compared with an average of 44 percent across OECD countries. Unlike most OECD countries, where the vast majority of students graduate from upper secondary programs designed to provide access to academic tertiary education (tertiary-type A programs), in Switzerland, more young people graduate from an upper secondary education that leads to tertiary type B or vocational programs. In fact, only 31 percent of young people are expected to graduate from tertiary-type A programs compared with the OECD average of 39 percent, one of the lowest percentages of OECD countries. Fourteen percent of students are expected to graduate from tertiary-type B programs compared to the 11 percent average of the OECD.

According to the Swiss Federal Department of Foreign Affairs (n.d., para. 2) a defining feature of the Swiss VET system is its close correlation with the labor market. Training is geared to the actual demand for vocational qualifications and to the jobs available. Thanks to this direct connection to the labor market, Switzerland has one of the lowest rates of youth unemployment in Europe. Education and innovation are aligned in a single policy agency as demonstrated by The State Secretariat for Education, Research and Innovation (SERI) within the Federal Department of Economic Affairs, Education and Research (EAER). This is a federal government's specialized agency for national and international matters concerning education, research and innovation policy (The State Secretariat for Education, Research and Innovation, n.d., para. 1).

## Leadership and Innovation

As leaders we must advocate for skills. We must encourage and lead on the potential of TVET. According to Llopis (2014) *Leaders* are accountable to assemble teams and lead them to optimal performance outcomes. An effective leader recognizes the importance of embracing differences in people and knows how to connect the dots amongst those differences to get the best outcomes from the team. This is what cultivates a workplace environment of continuous improvements, innovation and initiative.

We all have a leadership role in Innovation. It is always difficult and nearly impossible to predict in a situation where ideas are generated and innovation is taking place, which ideas are going to lead to new policy, new practice, new processes, new services or for that matter what is the best source for such ideas. This is the context where all people in all organizations become innovation leaders. Bottom up Innovation can develop leadership where otherwise it may not be found or thrive. If we accept that leadership is a state of mind, an attitude, a culture and not a title or specific managerial role then we begin to understand that innovation and leadership are inextricably linked. Steve Jobs, an innovator and founder of Apple once said that innovation is the difference between a leader and a follower (Mac Stories, 2009).

Organizational sociologists have noted that public sector organizations are usually large bureaucracies

structured to perform their core tasks with stability and consistency, and resist change or disruption of these tasks (Wilson, 1989). Now in 2015, the transformational agenda has in my view dramatically changed the way we see our role as leaders – remembering that in the field of innovation we are all leaders and educationalists whether it be at the coal face, planning, policy or any other capacity. There is so much potential in TVET to be the enabler for so much good. Leadership is needed as we seek to change work practices, adapt to circumstances, seek government and state agency prioritization, adopt new technologies, and respond to local and global situations and needs. Without strong leadership we will not have effective and sustained innovation.

In the context of innovation in TVET the term social innovation is appropriate. Social innovation is described by the European Commission *Guide to Social Innovation* (2013) as the development and implementation of new ideas (products, services and models) for social needs. To implement new ideas we must lead, engage and drive forward this agenda. Why, one might ask? Take a brief look at where the world is today. Various parts of the world each with their own challenges and landscape and commonality and in a way are all joined together in this era of transformation.

### **Innovation and Sustainability**

Currently there is a huge crisis afoot for the youth of Europe. Portugal, Greece, Ireland, Spain, Italy, Slovakia, Macedonia. The list is endless. A sobering description of the crisis for Europe's Youth is contained in the McKinsey Centre for Government Education to Employment: *Getting Europe's Youth into Work* (January 2014). The European Union has the highest unemployment rate of anywhere in the world apart from the Middle East and North Africa. In 2013, almost a quarter of young people in the EU labor market were unemployed. For one of the most developed regions of the world, this is startling—even more so when added to the fact that the youth unemployment rate has been 20 percent or above for 11 of the past 20 years. Youth unemployment has long been a smoldering crisis, but the economic downturn since 2008 has makes it a burning issue. The paper goes on to talk about a lost generation. Europe at this time is becoming determined to become more sustainable, competitive and to stabilize society and prosperity. These are huge challenges. On youth unemployment, the challenge to adapt to the phenomenon is staggering. There are chinks of hope and innovations taking place which are worth noting.

The Irish government is currently conducting an overhaul of the apprenticeship system. Compared internationally the standard of apprentices in Ireland is high. The system in Ireland was biased towards technical and male oriented crafts. Many apprentices from Ireland have been very successful in World Skills such as in aeronautical engineering, construction trades, metal trades. But this problem has been addressed. According to the OECD (2013) VET can ease transition into the labor market. Yet many VET programs make insufficient use of workplace training. Diversifying apprenticeships into more sectors can improve the offer and better meet the demands of the labor market.

As a close observer of the TVET landscape in my home country of Ireland, the government of Ireland has instigated an innovative reform of apprenticeships. A wide ranging consultation took place and a multi stakeholder Apprenticeship Council was established. In March 2015 there was a call for new apprenticeship consortia. It is envisaged that the call and subsequent iterations of this process will



lead to the establishment of apprenticeships for sectors such as information and communication technologies, hospitality and financial services etc. On apprenticeships, Ireland is not structured like other countries such as The UK, Germany and Switzerland who have apprenticeships systems that reflect the labor market and breadth of opportunity in the workplace.

The previously mentioned, *FATIH Project* in Turkey, is a great example of where leadership and innovation are being coupled together to address the transformational agenda doing so sustainably with vision and innovation. *FATIH* is a great example of how innovation can be realized if there is strong and passionate leadership. For instance, a review of The Prime Minister of Malaysia's office website reveals a deep passion and innovative commitment to education in Malaysia (Prime Minister's Office of Malaysia, 2012). "Dato" Sri Najib had a major role in this move to build a world-class education system that is flexible and innovative along with turning the country into a regional education hub and center of excellence. This type of leadership provides the empowerment and focus that leads to realizing a vision for the future, a future of hope, opportunity and excellence. The Prime Minister recently remarked the following regarding the Malaysia Labor Force at the Invest Malaysia 2015 Conference (2015): Malaysia has a young and increasingly well-educated population, among the most dynamic and innovative people you could meet.

General Electric Co (GE) was ranked number 1 in the world by the United Nations Conference on Trade and Development (UNCTAD) in (2013) in the world's top 100 non-financial Trans National Corporations, ranked by foreign assets. GE is synonymous with innovation. Co-founder Thomas Edison, a great leader of innovation once said, "Our greatest weakness lies in never giving up. The most certain way to succeed is always to try just one more time."

Edison had much experience of innovation barriers which are many and varied. GE Global Innovation Barometer (2013) explores how world business leaders view innovation and how those perceptions are influencing business strategies. The Barometer is an international opinion survey of senior business executives actively engaged in the management of their firm's innovation strategy. GE in 2013 surveyed more than 3,000 executives in 25 countries (including Malaysia, Vietnam, China, Ireland and USA). It is the largest global survey of business executives dedicated to innovation.

Under key finding 5 in the survey, *People*, workforce preparation and talent mobility are the top concerns for global business leaders seeking to strengthen innovation. Furthermore, education, development and access to talent are a critical concern for innovation leaders. The creativity and technical prowess of the global workforce is key to unlocking innovation potential. But concerns around the preparedness of the workforce to innovate for tomorrow's economy abound.

There are many drivers and barriers to innovation, in the 2009 report by OECD Working out Change: Systemic Innovation in Vocational Education and Training, innovation enablers and barriers are not universal but rather context specific. This is particularly true of the role of consensus among stakeholders, evidence and political leadership. In particular, evidence can drive the adoption of innovation. Leadership, People, partnership, finance, hard work and risk acceptance are all drivers or if not correctly nurtured can be barriers in Innovation.

As highlighted earlier there is a huge youth unemployment crisis. In 2013, according to The World Bank Data: *Unemployment, youth total (percentage of total labor force ages 15-24) (modeled ILO estimate)* the rate is 60.4 percent in Bosnia and Herzegovina; in Spain it's 57.3 percent; Malaysia 11.1 percent; Ireland 26.7 percent; China 10.1 percent and The USA 15.8 percent.

In Africa, the African Union (AU) is leading in the identification of its continent's challenges and opportunities. The AU Agenda 2063 is both a Vision and an Action Plan (About Agenda 2063, n.d., para. 1). It is a call for action to all segments of African society to work together to build a prosperous and united Africa based on shared values and a common destiny (para. 15). Agenda 2063 is expected to be a source of inspiration for development of national and regional sustainable development plans. In the context of transformation in the 21st century, sustainable development plans are an integral part of TVET. Vocational education and technical training plays a major role at realizing development. TVET occupies an important position in the sustainable development of the nation (Oguntuyi, 2013). The experience of Central America strongly suggests that, unless the population has substantial human capital (especially education), even the —right macroeconomic policies and structural reforms will not be sufficient to create the necessary number of —good jobs (The World Bank, 2012).

The British Council commissioned an Economist Intelligence Unit research paper, *Skills Development in South Asia: Trends in Afghanistan, Bangladesh, India, Nepal, Pakistan and Sri Lanka* which concludes that the region is lacking 96 million of the 100 million trainees currently required to meet the requirements for continued economic growth (British Council, December 2013). Furthermore, one million additional skills training places are needed every month for the next eight years in order to avoid an unsustainable rise in unemployment and recession. Resource constraints have implications on the development of the skills system across South Asia. The potential economic rewards of greater public-sector focus on skills are immense, though the complexity of the challenge and other competing priorities suggest that such efforts must be targeted, guided by data and evidence collaboratively with the private sector. An innovative leap of faith will be essential for the development of a relevant, functioning and sustainable system. In the Asia-Pacific region advancement of societies is predicated on putting knowledge and innovation to work. This requires governments to have appropriate policies and incentives to deepen talent pools and to expand access to market-relevant skills development to the disadvantaged sections of the population.

In Malaysia, The Human Resources Development Fund (HRDF) is fulfilling the nation's aspiration to attain the status of developed country by the year 2020 (About HRDF n.d., para 1). The HRDF was established in 1993 with the aim of developing quality human capital and world-class workforce in order to achieve a high income economy based on knowledge and innovation.

### **Technology and the Digital Era**

Technological and digital advances have a huge part to play and impact on TVET innovation. When we think of the implementation of technology in the classroom/workshop/workplace, eLearning, self-directed and blended learning, and technology is innovation. The rapid and continuous advancement of technologies and the internet for teaching, training, learning, assessment, quality assuring and testing affords a great opportunity to fast track TVET into the 21st century. As Nelson Mandela famously said, "Education is the most powerful weapon which you can use to change the world." It is so true, technology in education can make that change sustainable and far more impactful than might be the case without

technology. Technology makes learning real and current. Technology disperses change quicker and more efficiently. Via everyday channels such as the internet, social media and fixed and mobile devices the impact of technology on TVET can be game changing. In respect of social media, platforms such as Twitter, Facebook, YouTube, Pinterest, and LinkedIn make innovation in TVET social, impactful and above all fun. For example, LinkedIn founded in 2003, connects the world’s professionals to make them more productive and successful (LinkedIn.com LinkedIn Company Page n.d., para 1). A search for professionals, network groups and companies/organizations under specific terms on LinkedIn revealed 347 million users (as of May 11, 2015). Table 2 shows the breadth and depth of networking opportunities based on the search results.

Table 2: Select LinkedIn Professional/Group/Company Data Retrieved

LinkedIn Term Searched	Professionals	Groups	Companies (Organizations)
TVET	5,631	11	40
Vocational Education	269'401	58	2'858
Further Education	703'693	245	4'612
Education	24'789'693	47'910	233'135
Innovation	2'244'438	13'584	99'928

Source: www.linkedin.com

LinkedIn and the myriad of other broad based and specific social networks provide an abundance of opportunity for all persons and stakeholders in TVET to partake in, accelerate and innovate their lifelong learning experience. The author has personally connected with TVET experts across the globe in far off places such as Namibia, Brazil, Bhutan, Turkey, The US, and Fiji.

According to We Are Social Compendium of Global Digital Statistics (January 2015), the global population is 7.21 billion and 42 percent or just over 3 billion people are active internet users, 29 percent or just over two (2) billion people are active social media users, 51 percent (3.649 Billion) are unique mobile phone users of which 1.685 billion have active social mobile accounts. Furthermore, the average number of hours per day spent on digital media is 4.4 hours with 2.7 hours being via mobile devices. The Philippines has the highest per day time spent on the internet of 6.3 hours per day (3.3 on mobile devices), Malaysia 5.1 hours of which 3.7 is mobile related and last in the ranking of 20 countries Japan, with 3.1 hours per day of which 1.0 is on mobile devices.

Examples of Digital and Technological innovation and championing abound in TVET. In the Philippines, DigiBayanihan was initiated by a multi-sectoral group of digital literacy champions to bring together all types of initiatives to create bigger impact and reach. This group is calling on individuals and organizations to become part of DigiBayanihan, to become volunteers and help spread digital literacy. Partners in the venture include the industry, education and government partners.

## Conclusion

According to the joint communication *Rethinking Education: Investing in Skills for Better Socio-Economic Outcomes* by the Commission of the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Region (2012), investment in education and training for skills development is essential to boost growth and competitiveness; skills determine Europe's capacity to increase productivity. In the long-term, skills can trigger innovation and growth, move production up the value chain, stimulate the concentration of higher level skills in the EU and shape the future labor market.

The University of Bristol's graduate school of Education and the Innovation Unit - a UK based Independent social enterprise focused on public sector innovation recently held an innovation workshop in Rwanda as part of a project to support the development of an innovation hub for the Rwandan Education system. After the first morning session, The Minister for Education Professor Silas Lwakabamba concluded the morning session with a few words (InnovationUnit.org 13th January 2015):

We understand the path we have to take. What is innovation? How do we apply innovation to the challenges in education? In just a few hours it has opened our minds... All of us have to understand where we are coming from and where we are going ... We have no choice but to continue innovating in education.

This is the vision and attitude we must have if we are to realize the potential in ourselves and our collectives. In my view we have no choice but to embrace innovation to become much more natural in our approach to the complex challenge and opportunities before us. We need better outcomes, more effective use of technology, partnerships, ideas, willingness to fail but in my perspective and we need innovation leadership and sustainability most of all. If we do not do our best for our children and grandchildren then what is the legacy for future generations?

Leadership regarding innovation is paramount. We must advocate for skills, for change, create better pathways, adapt our thinking around inputs and outcomes, and channel our energies to sustainability. Furthermore, we must have dialogue and implementation lead by stakeholders across the spectrums and hierarchies. Innovation can address these human capital burning issues that bind us together, that is, youth unemployment, underdevelopment, labor market supply and demand, transitioning to knowledge economies and so on.

Innovation in TVET does not imply *change for change sake*. It is a positive affirmation that in this era of transformation innovation in TVET is a tool we must employ. The author believes, to do so will support the skills and sustainability agenda like no other tool. Finally, a thought from the great innovator Thomas Edison to jot down on a Post-it® and put on your fridge door to read every morning before you start your day: "There's a way to do it better—find it."

## References

- About The Lego Group (n.d.) Retrieved from: <http://www.lego.com/en-us/aboutus>
- African Union (n.d.), About Agenda 2063. Retrieved from: <http://agenda2063.au.int/en/about Agenda 2063 AU>
- British Council (December 2013). Asia Skills Report Summary. Manchester, UK. British Council <http://www.britishcouncil.org/sites/britishcouncil.uk2/files/south-asia-skills-report-summary.pdf>
- Commission of the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Region (November 20th 2012) *Rethinking Education: Investing in skills for better socio-economic outcomes* by the Commission of the European Parliament, The Council, The European Economic and Social Committee and the Committee of the Regions retrieved from: [http://www.cedefop.europa.eu/files/com669\\_en.pdf](http://www.cedefop.europa.eu/files/com669_en.pdf)
- DigiBayanihan (n.d.). Retrieved from: <http://digibayanihan.org/>
- European Commission (February 2013), Directorate General Regional and Urban Policy and Directorate General Employment, Social affairs and Inclusion, Guide to Social Innovation Retrieved from: [http://ec.europa.eu/regional\\_policy/sources/docgener/presenta/social\\_innovation/social\\_innovation\\_2013.pdf](http://ec.europa.eu/regional_policy/sources/docgener/presenta/social_innovation/social_innovation_2013.pdf)
- European Ministers for Vocational Education and Training, the European Social Partners and the European Commission (2010), Communiqué of the European Ministers for Vocational Education and Training, the European Social Partners and the European Commission, meeting in Bruges on 7 December 2010 to review the strategic approach and priorities of the Copenhagen process for 2011-2020. Retrieved from: [http://ec.europa.eu/education/policy/vocational-policy/doc/brugescom\\_en.pdf](http://ec.europa.eu/education/policy/vocational-policy/doc/brugescom_en.pdf)
- Face-thefuture.com (n.d.). FACE THE FUTURE MALAYSIA. Retrieved May 11th 2015 from: <http://www.face-thefuture.com/en/projects/malaysia>
- Fatih Projesi, (2012), Home Page, Retrieved May 11, 2015 from: <http://fatihprojesi.meb.gov.tr/tr/english.php>
- Federal Department of Foreign Affairs, (n.d.). Vocational Education and Training. Retrieved on May 12th 2015 from: <https://www.eda.admin.ch/aboutswitzerland/en/home/dossiers.html/content/aboutswitzerland/en/meta/news/umwelt>
- GE (2013), GE Global Innovation Barometer 2013. Retrieved May 10, 2015 from: [http://www.ge.com/sites/default/files/Innovation\\_Overview.pdf](http://www.ge.com/sites/default/files/Innovation_Overview.pdf) GE Global Innovation Barometer 2013
- Jobs, S. (n.d.) A Collection of Inspirational Steve Jobs Quotes About Life, Design & Apple compiled by Federico Viticci & Friends (November 11th 2009). Retrieved May 12, 2015 from: <http://www.macstories.net/roundups/inspirational-steve-jobs-quotes/>
- LinkedIn, LinkedIn Company Page (n.d.,). Retrieved May 15, 2015 from: <https://www.linkedin.com/company/linkedin>
- Llopis, G. (2014, April 7th) 5 Ways Leaders Enable Innovation in their Teams, Leadership. Retrieved from: <http://www.forbes.com/sites/glennllopis/2014/04/07/5-ways-leaders-enable-innovation-in-their-teams/>
- McKinsey Centre for Government, (2014, January). Education to Employment: Getting Europe's Youth into Work, Retrieved from: [http://www.mckinsey.com/insights/social\\_sector/converting\\_education\\_to\\_employment\\_in\\_europe](http://www.mckinsey.com/insights/social_sector/converting_education_to_employment_in_europe)
- MSA News, (2014, February 26), MSA & Çırağan Palace Kempinski İstanbul Join forces for Young Chefs. Retrieved May 11, 2015 from: <http://www.msa.com.tr/item/msa---ciragan-palace-kempinski-i-istanbul-join-forces-for-young-chefs.aspx>
- OECD, (2014). Country Note, Education In a Glance, Switzerland, Retrieved May 12th 2015 from: <http://www.oecd.org/edu/Switzerland-EAG2014-Country-Note.pdf>
- OECD, (July 2014) Education Indicators in Focus, How Innovative is Our Education Sector? Retrieved May 12, 2015 from: <http://www.oecd.org/education/skills-beyond-school/EDIF24-eng%282014%29EN.PDF>
- OECD, (n.d.,) Innovation Strategy for Education and Training, Retrieved May 12, 2015 from: <http://www.oecd.org/edu/ceri/innovationstrategyforeducationandtraining.htm>



- OECD, (June 2013) Education Policy Outlook Ireland, Paris, OECD. Retrieved May 15, 2015 from: [http://www.oecd.org/edu/EDUCATION%20POLICY%20OUTLOOK%20IRELAND\\_EN.pdf](http://www.oecd.org/edu/EDUCATION%20POLICY%20OUTLOOK%20IRELAND_EN.pdf)
- OECD, (2009, November 10th), Working out Change: Systematic Innovation in Vocational Education and Training ISBN: 9789264067158 Paris, France OECD
- Office of the Prime Minister, Putrajaya, Malaysia (December 30th 2012) Biography of The Prime Minister retrieved May 15th 2015 from: <https://www.pmo.gov.my/home.php?menu=page&page=1926> Biography of The Prime Minister
- Office of the Prime Minister, Putrajaya, Malaysia (2015, April 23) Speech to the Invest Malaysia 2015 Conference Mandarin Oriental Hotel, Kuala Lumpur. Retrieved from: [https://www.pmo.gov.my/home.php?menu=speech&page=1676&news\\_id=758&speech\\_cat=2](https://www.pmo.gov.my/home.php?menu=speech&page=1676&news_id=758&speech_cat=2)
- Oguntuyi, A.N (2013). A viable vocational technical education curriculum: A tool for economic and technology development in Nigeria, *Scholarly Journal of Education*, 2(2), 22-26.
- Rogers, E. (1995), Diffusion of Innovations, 4th ed., Free Press, New York, USA.
- The Lego® Brand, (n.d.), Retrieved May 11, 2015 from: [http://www.lego.com/en-us/aboutus/lego-group/the\\_lego\\_brand](http://www.lego.com/en-us/aboutus/lego-group/the_lego_brand)
- The Lego Group (n.d.). Retrieved May 11th 2015 from: <http://www.lego.com/en-us/aboutus/lego-group>
- The Lego Group History, Lego History Timeline (n.d.,). Retrieved May 11th 2015 from: [http://www.lego.com/en-us/aboutus/lego-group/the\\_lego\\_history](http://www.lego.com/en-us/aboutus/lego-group/the_lego_history)
- The Lego Group History, Timeline 1932 – 1939 (n.d.). Retrieved May 11th 2015 from: [http://www.lego.com/en-us/aboutus/lego-group/the\\_lego\\_history/1930](http://www.lego.com/en-us/aboutus/lego-group/the_lego_history/1930)
- The State Secretariat for Education, Research and Innovation, (n.d.). Retrieved May 12th 2015 from: <http://www.sbf.admin.ch/org/index.html?lang=en>
- The World Bank, (2012). Better Jobs in Central America The Role of Human Capital. Human Development Department Latin America and the Caribbean Region. Retrieved from: <http://www.worldbank.org/content/dam/Worldbank/document/Better%20Jobs%20in%20Central%20America.pdf>
- The World Bank (2013) Data: Unemployment – Youth Total, Washington D.C. USA, The World Bank, Retrieved from <http://data.worldbank.org/indicator/SL.UEM.1524.ZS>
- The World Bank, (n.d.), Turkey Overview. Retrieved from: <http://www.worldbank.org/en/country/turkey/overview>
- UNCTAD, The world's top 100 non-financial TNCs, ranked by foreign assets, (2013) retrieved from: <http://unctad.org/en/pages/DIAE/World%20Investment%20Report/Annex-Tables.aspx>
- We Are Social, (January 2015). Compendium of Global Digital Statistics, retrieved 12th of May 2015 from: <http://wearesocial.net/blog/2015/01/digital-social-mobile-worldwide-2015/> We Are Social Compendium of Global Digital Statistics
- Wilson, J. (1989), Bureaucracy: What Government Agencies Do and Why They Do It, Basic Books, New York, NY.
- World Economic Forum, (2014). The Global Competitiveness Report 2014-2015, Switzerland, World Economic Forum.
- World Economic Forum. Cornell University, INSEAD and the World Intellectual Property Organization (2014), The Global Innovation Index 2014, 2014 Country Ranking. Retrieved from: <http://www.globalinnovationindex.org/content.aspx?page=data-analysis>
- WWF – Heart of Borneo, (n.d.), Retrieved May 11th 2015 from: [http://wwf.panda.org/what\\_we\\_do/where\\_we\\_work/borneo\\_forests/](http://wwf.panda.org/what_we_do/where_we_work/borneo_forests/)



# Publication Guidelines for the *International Journal of Vocational Education and Training*

The *International Journal of Vocational Education and Training* reflects regional contributions and is international in scope. Its purposes are to provide a forum for the discussion of vocational education and training issues and practices; to assist in the dissemination of information on research and practice; and to strengthen the lines of communication among individual researchers and practitioners, institutions, and organizations. In addition, it provides a platform for individual views on relevant issues.

The Editorial Board passed a resolution requiring membership in IVETA in order to publish in the Journal, with effect from Volume 14.2. The Journal publishes feature articles on research, theory, and practice broadly related to international vocational education and training. The largest section of the Journal is devoted to empirical research articles. General articles and research manuscripts submitted for publication should be between 1,200 and 5,000 words in length and should adhere to rules in the most recent edition of the Publication Manual of the American Psychological Association (APA) with the exception of placing tables in-column in the text where you prefer them to appear. Articles should deal with some relevant aspect of educational opportunity such as educational research, evaluation, instruction, teaching methods, policy making, or theoretical discourses related to education and training.

In addition, the Journal solicits book, test, and computer hard/software reviews (500-700 words) and research in brief manuscripts (800-1,200 words) with similar publication goals. Authors interested in submitting a manuscript are required to follow the APA format as noted above. Email manuscripts that conform to the required specifications to: [dmupinga@kent.edu](mailto:dmupinga@kent.edu).

## Style and Submission Requirements

**Copies.** Submit electronic copies to: [dmupinga@kent.edu](mailto:dmupinga@kent.edu).

**Style.** Adhere to the most recent APA edition to format your manuscript. Please remember the exception: Place any tables or figures in-column where they should appear. Any paper that does not otherwise follow APA style will not be considered. Make certain that documentation (reference) format rules are double-checked. In addition, avoid footnotes, and do not include your name or affiliation on any page after the title page. No more than 5% of a paper's text should be direct quotations. Insert only one space after punctuation at the end of sentences.

**Tables and Figures.** Tables and figures should relate directly to the content of the manuscript and should not repeat information given in the text. Please remember that the Journal publishes in black and white, not in color. When creating or saving a copy of your manuscript for Journal publication, please create tables and figures in black and white (you may need to return to your original manuscript and configure tables and figures for black and white reproduction). Figures should be provided on high-quality, glossy white paper and should fit on one page. Tables should not exceed one page, and there should be no more than three tables per article. Also, do not place table or figure titles inside the table or figure.

**General Articles and Research Manuscripts.** General articles and research manuscripts must be between 1,200 and 5,000 words long, or not more than 25 typed pages (double-spaced). Authors should keep tables and

figures to a minimum and include them in-column at the appropriate point(s) of insertion. Emphasis is placed particularly upon manuscripts that are research-oriented.

**Cover Page and Title.** Authors must include a removable cover page that is attached to each manuscript. This cover page should include the title of the manuscript and the name, address, phone number, email address, and institutional affiliation of each author. The title should be no more than 12 words.

**Abstract.** An abstract describing the manuscript should be included on a separate sheet. The abstract must be less than 120 words. Please follow APA guidelines when writing the abstract.

**Book Reviews.** Book reviews should be between 500 and 750 words in length and contain the following information: complete bibliographic entry, including cost (hard- and softcover, if available); the thesis of the book; a brief description of the argument (main ideas); sample passages quoted and/or commentary on writing style; shortcomings and strengths; intended audience (whom the book will most benefit in the international education and training community); your opinion of the book; and what you think the book contributes to the international vocational education and training community.

**Test Reviews.** Test reviews should be between 500 and 750 words in length and contain the following information: complete bibliographic entry, including cost; the main purpose(s) of the test; a brief description of the administration and time; shortcomings and strengths; intended audience (whom will the test most benefit in the international education and training community); your opinion of the test (citing similar tests and the pros and cons relative to those tests); and what you think the test contributes to the international vocational education and training community.

**Review Process.** Once your manuscript has been received, it will be checked for conformity to style and Journal requirements, then forwarded to at least three peer review readers who will read your manuscript and make recommendations as to whether to accept or reject it for publication. Unless the manuscript is inappropriate for review due to length and/or topic, manuscripts submitted to the *International Journal of Vocational Education and Training* are anonymously reviewed by a peer review reader group as noted above. You will receive a publication decision within a reasonable amount of time (normally 3 to 5 months). Do not submit manuscripts concurrently under consideration by another publication or manuscripts that were previously published. Indicate a statement on the cover page if the manuscript is being reviewed or has been submitted for publication elsewhere.

## Call For Papers

*The International Journal of Vocational Education and Training (IJVET)* accepts original manuscripts from scholars and practitioners worldwide focusing on Technical Vocational Education and Training (TVET). Authors wishing to have articles reviewed and published in the next volumes are encouraged to submit their manuscripts to: Dr. Robert W. Clark at: [tuf07751@temple.edu](mailto:tuf07751@temple.edu) or Dr. Elizabeth Richard at: [tuf32379@temple.edu](mailto:tuf32379@temple.edu).

Please note that per current requirements, you must be an International Vocational Education and Training Association (IVETA) member to publish in the *IJVET*. However, IVETA membership is easily obtained. Visit <http://www.iveta.org/page-1306693> for details on obtaining membership.

## Topic Areas of Interest

In general, *IJVET* accepts articles on all general aspects of TVET, however, the journal welcomes manuscripts that meet the general criteria of significance and scientific excellence, and will publish: original articles in basic and applied research, case studies and critical reviews, surveys, opinions, commentaries and essays including, but not limited to the following topic areas:

- Information and communication technologies and TVET
- Comparative studies in TVET
- Financing TVET
- Implementation and evaluation of TVET programs or education
- New and emerging practices in TVET
- TVET as continuing or lifelong Learning
- Transfer of Training
- Formal, Informal and Non-formal TVET
- TVET policies at local, national, and international levels
- Occupational competencies and TVET
- National Vocational Qualifications and Occupational Standards
- Occupational Certification, Licensing and Accreditation
- Cost Effectiveness and Quality Based TVET
- Instructional methods and TVET

For guidelines on submitting manuscripts, please visit: <http://www.iveta.org/members/index.php/Members-Information/IVETA-Journal-Publication-Guidelines.html>

## Editorial Board Members

*IJVET* is also seeking members willing to serve as reviewers for the journal. If you are interested in joining our team of reviewers please, send your resume to: Dr. Robert W. Clark at: [tuf07751@temple.edu](mailto:tuf07751@temple.edu) or Dr. Elizabeth Richard at: [tuf32379@temple.edu](mailto:tuf32379@temple.edu).