Chapter 24

Bringing TVET up to Speed: Regional Overview of ICT-Enhanced Practices in TVET

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Information and Communications Technology (ICT) has become a megatrend, and is one of the transformative global forces that define the future of the world, with a far-reaching impact in different fields (including education); and it leads social-political, economic processes and demographic trends (Frost & Sullivan 2011; OECD 2013; PwC 2014). The reality defined by this megatrend includes increasing access to information, a dramatic growth in information itself, and a diversity of applications and languages in use. Research studies show that Internet activity and the use of mobile broadband have been rising exponentially worldwide (e.g., OECD 2011, 2013).

Based on an Organisation for Economic Co-operation and Development (OECD) study (OECD 2013), ICT is used as a generic skill by everyone in elementary occupations to managerial positions. As a result, it should be included as a generic foundation skill in training programs. As a specialization, ICT is expected to be a leading industry by 2020 (Frost & Sullivan 2011); computer equipment operators, industrial robot controllers, and multimedia developers will be in great demand. Top emerging industries, such as virtual commerce and cloud computing, will require higher level ICT skills.

In Technical and Vocational Education and Training (TVET), ICT can be a generic skill, a specialization, a pedagogical tool, an access solution, and a management tool.¹ Countries recognized this when they accepted the Qingdao Declaration in May 2015 (UNESCO 2015), wherein approaches to ICT were identified as well as how these can directly assist the unleashing of the full potential of ICT in terms of improving the quality of TVET. In the Declaration, ICT is envisioned as a catalyst that will

¹Herd and Richardson (2015).

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strengthen education systems, knowledge dissemination, information access, quality and effective learning, and more efficient service provision to achieve the sustainable development goal of Inclusive and Equitable Quality Education and Lifelong Learning by 2030.

Issues and Challenges

While ICT has immense potential to drive competitiveness and economic growth, it also comes with challenges. Rapid ICT advancements will inevitably reshape the needs of economies, especially those that are primarily knowledge-based. This would require increased investment in TVET systems, and the promotion of lifelong learning to meet an increased demand for retooling, skills upgrading, and/or continuing professional development. In this regard, education and training systems are compelled to be flexible enough to adjust and improve approaches currently used to deliver and organize TVET and the emphasis we put on the development of particular skills.

However, some Asian countries continue to encounter problems with respect to access to electricity, computers, Internet connectivity, and the capacity of teachers to integrate ICT in teaching (UNESCO UIS 2014). There are also insufficient data on ICT infrastructure in most countries that may be needed to address these challenges on a national or regional scale. If these accessibility issues are not suitably addressed by policymakers, ICT may cause a digital divide or widen the gap between the rich and poor (ITU 2015). Furthermore, while increased connectivity presents many opportunities, it also involves challenges in terms of developing the critical capacity of students to use ICT for learning, and in ensuring the quality and accuracy of information available on the web.

According to Subrahmanyam (2015), there has been positive but uneven progress in the Asia and Pacific region in terms of integrating ICT in TVET.² More private sector partners have been engaged in TVET planning and delivery. Emphasis on fostering innovation-related skills in TVET curriculum development has also been pursued. Training that integrates digital methods and technologies in curricula has been increasingly offered as well. Moreover, numerous countries have also shown notable promise in (i) implementing ICT-related TVET programs (Bhutan, Lao People's Democratic Republic, Palau, Tuvalu), (ii) institutionalizing policies to promote ICT in TVET (Indonesia, Iran, New Zealand, Thailand), (iii) using ICT to improve TVET access and equity (Fiji, India, the Philippines), and (iv) utilizing ICT as a self-help tool for continual skills upgrading (Singapore).³

Nonetheless, countries in the Asia and Pacific region continue to encounter obstacles such as limited finance for TVET (especially in South Asia and the Pacific), a lack of trained staff with relevant knowledge and expertise, and inadequate information

²Subrahmanyam (2015).

³*Ibid.*

technology and other technology-related infrastructure (especially in the Pacific).⁴ A digital divide in the use of ICT in TVET, and differences in skills sets among countries, have also been observed. Scaling up the use of ICT-enhanced innovative pedagogies remains a challenge.

Proposed Solutions⁵

Forging beneficial partnerships among stakeholders, increasing investment, and strengthening governance in TVET may overcome obstacles that hinder the enhancement of TVET systems. Broader and closer partnerships need to be established with the private sector to ensure relevance of TVET and boost its quality. Also, there may be a need to increase the inclusion of young people and parents in both TVET systems and processes to ensure their effectiveness and improve education outcomes.

Countries also need to bolster TVET's role in the national agenda, particularly in the areas of social change (promoting intergenerational equity and inclusion), economic development (inclusive growth), adapting to change (lifelong learning through TVET), and innovation (leveraging the potential of ICT through TVET). At the regional level, the recognition of qualifications (including the validation of formal, informal and nonformal learning) also needs to be supported to safeguard pathways to education and employment in the context of regional integration. The examples below illustrate successful cases of ICT based learning in TVET that have been facilitated by companies (ICT learning product providers). They present different models developed through partnerships that focus on quality, low cost, and accessibility.

Examples of Good Practices

Funzi

Funzi is a free mobile app designed by a Finnish start-up company that provides accessible and high-quality learning via a mobile device. Through mobile learning, it seeks to create opportunities for people who are not employed, not in university, and who do not have access to learning tools and quality education, but are willing to learn. Funzi courses focus on the areas of livelihood, health and wellness, migration, and global citizenship.

Aside from being free, the advantages of Funzi are its accessibility and cost-efficiency, because it may be easily used on a device most people already have—a mobile phone. For example, Funzi has been used in Syria and Nigeria to deliver learning and enhance employability at a cost of \$10 for each job. In South Africa, Funzi helped deliver courses on entrepreneurship. As long as the phone has a browser,

⁴Pavlova (2015).

⁵Subrahmanyam 2015. *op. cit.*

Funzi is able to facilitate learning in three ways: mobile learning, blended learning, and the training of trainers.

As it adopts a Software as a Service model, *Funzi does not produce content*. Instead, it forges partnerships with entities that produce learning content themselves. It seeks a content partner, a local partner who knows the community, and a commercial partner with mutual interests to facilitate learning within that community (e.g., nongovernment organizations, public organizations, or global brands with a social mission).⁶ Then Funzi transforms the learning content to become fun, engaging, and practical. Its services include *course production from existing materials*, course delivery, and targeted user acquisition through digital marketing, as well as real-time reporting and certification of the newly acquired skills.⁷ Given that Funzi thrives in such partnerships, the company strives to collaborate with key stakeholders in every area in which it operates.

In Africa, the company is running the largest mobile entrepreneurship course, which started out with localized content for Swahili-speaking areas (i.e., Kenya, Rwanda, and Tanzania). Funzi also runs an entrepreneurial training program in community centers (with 230 individuals and 32 company participants) in South Africa. In Europe, Funzi provides mobile services to help asylum seekers in the European Union. Its learning package, “About Finland,” consists of five courses relating to Finland, language and communication skills, everyday life, and legal rights. Further, Funzi has an Arabic version of its African entrepreneurship course that is used for integration services for immigrants who speak Arabic.⁸

Funzi has a simple, scalable, and verified business model, which can be launched in 1–4 weeks (from project start to service launch). It has been successful in providing access to learning, as evidenced by 5.5 million all-time users from Africa, Asia, and the Middle East. Twenty-five percent of Funzi’s active users return the next day, and 40% return the next month. It also has 20–40% completion rates in weekly topics. It is notable that 95% of feedback sent by users on Funzi is positive.

Coursera

Coursera is a global leader in online education, which envisions a world where anyone, anywhere can transform his or her life by accessing the world’s best learning experience. It offers more than 2,500 courses that come from over 160 partner university organizations. Coursera has more than 28 million learners around the world taking over 2,500 courses.

Using a combination of market and learner data, content vertical expertise, and skill mapping models, Coursera creates learning programs that transform skills training at scale. As a platform, it has three different parts: the consumer part, wherein anyone can access Coursera and learn; an enterprise part, wherein Coursera works with governments in upskilling employees and companies; and a degree section, wherein Coursera works in the higher education market for a fee.

⁶Pohjavirta (2018).

⁷Funzi. Services. Retrieved from <https://www.funzi.fi/services>.

⁸Pohjavirta (2018).

Some of the largest companies in the world (such as AT&T) are using Coursera to upskill their employees through high-quality learning. Coursera has also embarked on helping countries through its “Coursera for Government and Organizations” initiative, which focuses on deep skilling to provide critical competencies among government officials and partners in national-scale training of citizens in job-relevant skills across countries. For instance, Singapore Civil Service College (CSC), which trains government officials across Singaporean ministries, collaborated with Coursera in curating a curriculum of data science specializations, and in developing and implementing a cohort training model. With more than 600 officials trained each year and a 78% course completion rate, Coursera has made an incredible impact for CSC. The Singaporean Government also partnered with Coursera for its SkillsFuture⁹ program, wherein 607 courses and 82 specialization tracks of the platform may be accessed by every citizen (age 25 + and above) through a S\$500 subsidy from the government.

In Egypt, Coursera collaborated with the government and a third party organization in implementing the Next Technology Leaders (NTL) program, which prepares young, qualified Egyptian preprofessionals for jobs in technology and entrepreneurship. Aside from being one of NTL’s partners in providing up-to-date massive open online courses (MOOCs), Coursera helped develop a blended learning experience. NTL notably yielded a 92% completion rate among its learners.

In the Philippines, Coursera partnered with the Department of Science and Technology to offer courses on emerging field specializations, such as data science and artificial intelligence. Other partner countries/governments are Kazakhstan, Malaysia, Mongolia, Pakistan, and United States.¹⁰

Coursera has notably shown a positive impact on its users, including a new functionality, and/or increased confidence.

Extramarks Education

Extramarks is an educational technology provider that operates in Southeast Asia, Africa, the Middle East, and India, where there are numerous challenges such as connectivity, affordability, teacher/student ratio, and quality of classrooms. By tailoring instruction to each student’s unique needs and interests, while safeguarding sound pedagogy, Extramarks has brought about a fundamental shift to learning through the intelligent adaptive learning approach.¹¹ This learning model utilizes technology to facilitate comprehension and retention, based on the unique needs of the learner. It envisions a solution to what is happening in the classroom and in any learning space. Connectivity helps Extramarks achieve good results at low cost—\$10 per learner a year.

The goal of Extramarks is to produce a cognitive model through data analysis and to provide personalized learning to every child. The model looks into the strengths

⁹SkillsFuture is a national movement that provides Singaporeans with opportunities to develop their fullest potential throughout life, regardless of their starting points.

¹⁰Taber, R. 2017, January 22. Announcing Coursera for Government & Nonprofits. Retrieved from Coursera Website: <https://blog.coursera.org/announcing-coursera-governments-nonprofits/>.

¹¹ADB. 2017, December. Extramarks. Retrieved from ADB Knowledge Event Repository Website: <https://k-learn.adb.org/materials/20171212/extramarks>.

of the learner and considers the capability of the teacher in terms of providing the required and appropriate learning intervention. Through user information that comes in, teachers are able to holistically assess their classes and make small changes in the classroom. At the same time, students will get some intelligent feedback on their learning status that enables them to adapt their natural style of learning. Extramarks is using data from some 9 million learners across the world and about 9,000 schools to continuously enhance the model and produce better results.

Nonetheless, remain a big challenge for the Extramarks model. In an era of mobility and global citizenship, there is an emerging need to capture and easily share such data as the number of hours spent by users, how long it takes to answer a question, as well as capturing data about students who transfer for the purposes of enhancing learning systems. Extramarks is strongly advocating for some sort of standardization for data collection across the world so this outcome becomes possible.

Application of These to Promote Good Practices

The three successful ICT learning models discussed above have thrived because they maintain strong and beneficial partnerships with government, academe, and industry. Their cost-efficiency and ease of access have also made their business models scalable. Ultimately, these practices have resulted in impressive learning outcomes, because they all focus on enhancing and innovating pedagogical methods, while also addressing the needs of their target learners (based on context, culture, language, etc.). A strong focus on the improved livelihood of learners is also an important aspect of these models.

The operation of these particular innovative companies, which effectively develop ICT resources and deliver skills training in different settings, is extremely valuable. However, in addition, a coherent and systematic approach toward integrating ICT in TVET is essential. Key success factors for this integration are enabling national policy and/or support from government; effective ICT infrastructure and high-speed Internet; effective and accessible ICT resources, including software and pedagogy; commitment from institutional managers, individuals, and teachers; professional development for teachers; support of “champions” or advocates; and research on ICT practices (Pavlova 2018).

Implications for the Future

Rapid technological developments, and the Fourth Industrial Revolution, are expected to profoundly alter the needs of the global economy, especially in the skills and employment landscape. As a result, education and training systems are under pressure to prepare learners for the future world of work and to ensure that they have the necessary skills. ICT-enhanced learning provides an opportunity to

develop a whole spectrum of skills from very specialized high-level skills through such courses as artificial intelligence, data science, technology, and entrepreneurship, to life skills and employability skills for marginalized groups, and to generic skills such as twenty-first century skills (a combination of foundational literacies, competencies, and character qualities), as well as flexibility and the capacity to innovate, which are essential at every level. Aside from the need to prepare young people for employment, ICT-based learning can also meet the demand for adult education, retooling, and/or upskilling—in which the TVET sector plays a very critical role.

Conclusion

As ICT-related developments are a megatrend in the Asia and Pacific region, there is an important need to make sure TVET does not lag behind. When developing practices and policies on integrating ICT in TVET, countries need to consider labor market and social orientations, as well as accessibility issues, to prevent a potential digital divide. Stakeholders also need to be mindful of the interface between technologies and pedagogies, as good practices show that cost-efficiency matters (accessibility of resources, quality of learning content, and ease of use for both learners and teachers) are key factors in achieving successful and improved education outcomes for all groups of learners. Finally, maximizing opportunities from government-academe-industry linkages is critical for the establishment of relevant and effective ICT-driven TVET interventions.

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