IDENTIFYING REQUIREMENTS FOR VOCATIONAL INFORMATION AND COMMUNICATION TECHNOLOGY CURRICULA IN AFGHANISTAN

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ABSTRACT

This paper examines how ICT (Information & Communication Technology) is taught in vocational institutions in developing countries. If the world is truly flat, ICT education in Afghanistan and Namibia would. In the highly-standardized domain of ICT, the vocational education curricula should be similar to what you might find in Estonia and other developed nations. We focus specifically on what ICT with the consideration to the labour market needs, is the focus of this study. Such comparisons are demanding, because of the multiplicity of educational systems. Yet, there are some lessons we can learn from the international experience. CurrentICT qualification standards in Europe. The paper explores also current challenges in Afghanistan's ICT Technical Vocational Education curricula, technical vocational institutes which influence the delivery of teaching and learning in ICT domain, as well as potential mismatch between the supply and demand of ICT-skilled workforce in Afghanistan.

Keywords*: ICT, vocational education, ICT qualifications, curriculum development, developing countries, Standardization, labor market*

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1 Introduction

Developments in ICT over the last 50 years have had a quite remarkable impact on the peoples' lives in developing countries, but more particularly in their work. It has also resulted in the strong growth of a major new industrial sector, and the creation, in a number of countries, of hundreds of thousands, even millions of new jobs in the fields that did not exist before (Barrera, Montaño, & Ramos, 2012).

As ICT field is developing fast, more changes in ICT skill demand are to be expected. In spite of the recent downturn in the ICT markets, this area continues to be expected to provide, in many economies, a large number of new jobs over the coming years. Today, ICTs are very relevant and important in nearly every business sector. So, the demand on the labor market for ICT education and employees with up-to-date ICT end-user skills is always growing.

Therefore, vocational education systems must increasingly take responsibility for providing to the next generation of students an updated set of ICT skills, as the domain knowledge and job profiles change constantly in the field of ICT. This implies the need for sound curriculum innovation in vocational schools, fostered by adequate information on possible future career paths. The differences in characteristics of developing countries labor markets have to be realistically taken into consideration.

To address to the abovementioned challenges, the curriculum development methodologies and practices in vocational schools need to be improved. This paper is examining the curriculum development approaches in ICT domain in vocational education in Afghanistan.

Based on the above, the main objective for this research is the evaluation of issues of developing countries ICT vocational Education curriculum in Kabul University as well as with international qualification standards in ICT field such as e-CF and EUCIP. The institute under study is Afghanistan Technical Vocational Institute (ATVI).

The implications of such a comparison are pertinent to ICT vocational education. Although we are focusing on Afghanistan, this case is not unique and the results of our study can be generalized to many developing nations. The developing world has a great demand for ICT-skilled workforce. As such, computer science and ICT are among the most popular fields of study in Afghanistan's universities and vocational schools. Quality standards are expected to play a central role for transparency and comparability of ICT skills, needed in labor market today and tomorrow.

This study aims to contribute to the improving the curriculum development methods and practices in ICT domain in many developing countries, where situation is similar to that of Afghanistan. This paper will start by analyzing and exploring the context and key characteristics of the vocational education in Afghanistan. To provide an international context for ICT education, two European ICT competence standards are described: eCF and EUCIP. Next, the ICT curricula from three vocational schools of Kabul are analyzed and compared with BA study program on Computer Science offered by Kabul University. To give international comparison, contrasting with vocational ICT curricula in Namibia and Estonia is offered and as a conclusion, recommendations for improving vocational ICT curricula in Afghanistan are drawn.

Vocational education systems are challenged by the dynamics of the labor market around the world. When the curriculum development processes are not effective enough, the ICT study programs may be failing to meet labor market and skill needs. The following section describes the current situation in relation to ICT vocational education structures, existing ICT curriculum at different levels in relation to skill levels in Afghanistan.

2. Context and related research

The volume and quality of ICT-related education across developing countries have been steadily increasing in recent decades. The importance of ICT for the developing countries economy and throughout business, services, domestic and vacation is obvious. Impacts of ICT developments on society create an 'information society' and new opportunities and challenges in all areas of work and life have arisen. In particular, this applies to ICT work itself (Lu, 2009).

Highly-skilled staff is needed to manage business and work processes in the core ICT sector as well as in public organizations and industries in other sectors. To understand, produce and use the new ICT qualifications (computer operation, network technician, database expert, e-commerce, fixed and mobile telecommunications, etc). There is an extensive need to possess a range of ICT competences relevant for different job profiles. These demands can be met by various study programs on both higher education and vocational education institutions (Vaquero, Toro, Martín, &Aregita, 2009).

The situation regarding ICT experts' supply and demand varies across developing countries. The state of development of the ICT economy and of the national systems of higher education and vocational education affect this situation both in qualitative and quantitative terms. However, recent worldwide problems with the new economy have contributed to more reasonable discussion on the demand and the problems of the ICT labor market (Garrido, Sullivan & Gordon, 2010; UNESCO, 2004).

To address the skill gap between expectations of ICT labor market and current study programs offered in vocational schools, the curricula need to be designed in accordance with the skill needs and contents of ICT employment. Though, based on the identified ICT skill needs and contents a didactic and pedagogic reflection is necessary for the decision on an appropriate range and depth of competences of the ICT curriculum.

European policies in vocational ICT education are guided by a set of well-defined job profiles in 14 generic work areas at sub-degree levels. These job profiles have been developed and constantly revised by representatives of educators, employers and standardization bodies in the field of ICT. Yet, we cannot take it for granted that developing countries outside Europe should just copy the ICT job profiles, qualification standards and study programs from Europe, as the job market needs might be quite different there. One of the recent frameworks for curriculum development in ICT across Europe is e-Competence Framework.

The European countries developed the e-Competence Framework (e-CF) from their varied perspectives bringing technical expertise. The European e-CF version 3.0 provides a reference of forty competences as required and applied at the ICT workplace, using a common language for competences, skills and capability levels that can be understood across Europe.

The e-CF is a component of the European Union's strategy on «e-Skills for the 21st Century». It is also supporting key policy objectives of the «Grand Coalition for Digital Jobs» launched in March 2013. It is promoted as a very useful tool to enlarge digital skills and the recognition of competences and qualifications across countries and to foster ICT professionalism in Europe.

Within e-CF version 3.0 five different competence areas are defined which is very sufficient to use for ICT Professionals in all industry sectors: PLAN, BUILD, RUN, ENABLE and MANAGE. Each area of e-CF has sub areas to specify competence definitions. These competence definitions are used as a guiding framework in ICT-related curriculum development in many European countries. Table 1 shows all sub areas within the main areas.

Table 1: e-CF sub areas

A. PLAN	A.1. IS and Business Strategy Alignment
	A.2. Service Level Management
	A.3. Business Plan Development
	A.4. Product/ Service Planning
	A.5. Architecture Design
	A.6. Application Design
	A.7. Technology Trend Monitoring
	A.8. Sustainable Development
	A.9. Innovating
B. BUILD	B.1. Application Development
	B.2. Component Integration
	B.3. Testing
	B.4. Solution Deployment
	B.5. Documentation Production
	B.6. Systems Engineering
C. RUN	C.1. User Support
	C.2. Change Support
	C.3. Service Delivery
	C.4. Problem Management
D. ENABLE	D.1. Information Security Strategy Development
	D.2. ICT Quality Strategy Development
	D.3. Education and Training Provision
	D.4. Purchasing
	D.5. Sales Proposal Development
	D.6. Channel Management
	D.7. Sales Management
	D.8. Contract Management
	D.9. Personnel Development
	D.10. Information and Knowledge Management
	D.11. Needs Identification
	D.12. Digital Marketing
E. MANAGE	E.1. Forecast Development
	E.2. Project and Portfolio Management
	E.3. Risk Management
	E.4. Relationship Management
	E.5. Process Improvement
	E.6. ICT Quality Management
	E.7. Business Change Management
	E.8. Information Security Management
	E.9. IS Governance

The five competence areas of e-CF represent the ICT Business process and its main sub-processes, derived from the mainstream practices of ICT industry. PLAN, BUILD and RUN are the core areas whilst ENABLE and MANAGE describe cross-cutting sets of competence. PLAN and ENABLE represent strategic areas, within companies that conceive, decide, design and set up products, services, actions and policies. BUILD and RUN on the other hand provide operative sub-processes where companies act and do things. Finally, MANAGE represents companies' daily business administration and improvement.

Another European framework for ICT curriculum development is EUCIP (European Certification of Informatics Professionals) that is created by CEPIS: a European consortium of national informatics associations, representing 450,000 ICT and informatics professionals in 32 countries. EUCIP is a competence model, which offers the definitions, which provides for the definition and measurement of ICT skills and is currently used as the basis for the provision of entry-level ICT certification and services in seven countries across Europe. The EUCIP certification program guides ICT competency development scheme, which is intended at informatics professionals and practitioners (Mockler, 2012).

EUCIP defines three different competence areas applied to lower (vocational training) level certification of ICT Professionals: Plan, Build, and Operate. Similar toe-CF, each competence area of EUCIP has sub areas to specify the associated skills and competences. Table 2 shows all sub areas within the main areas of EUCIP.

Table 2. EUCIP Areas

Plan	Build	Operate
Information System Manager	IT System Architect	X-System Engineer
Information System Auditor	Information System Analyst	Telecommunications Architect
Enterprise Solutions Consultant	Web and Multimedia Master	Security Advisor
Business Analyst	System Integration and Testing Engineer	Network Manager
Logistics and Automation Consultant		Data Centre and Configuration Manager
Sales and Application Consultant	Software Developer	
Client Manager	Database Manager	Help Desk Supervisor
Information System Project Manager		IT Trainer

Source: Mockler (2012)

Although EUCIP has only three areas, but it has comparable features with the e-CF areas. While the e-CF is accepted as reference point for IT practitioner competences, EUCIP reflects the associated certification and service offering. Council of European Professional Informatics Societies (CEPIS) aims at aligning EUCIP with e-CF competence model (Bellini, 2011).

3. Vocational education in ICT in developing countries

ICT vocational education systems are challenged by the dynamics of the labour market around the world. When the curriculum development processes are not effective enough, the ICT study programmes may be failing to meet labour market and skill needs.

3.1 ICT education and vocational qualification statement in Afghanistan

The Government of Afghanistan has been trying to reform the education including the reconstruction and renewal of the educational system at all levels. Support in this attempt has been through the cooperation provided by the international community and the return of some three million Afghan refugees with their skills, experiences and determination to rebuild the country. But majority of the vocational schools still miss sufficient investments in infrastructure, revision and quality assurance of curricula, provision of learning materials and human resource development. There is lack of professional teachers in vocational schools (Karunananda, Rajakaruna & Jayalal, 2012).

Afghanistan still remains impoverished and is one of the poorest and least developed countries in the world. Currently 75% of the population lives on less than two dollars a day. The unemployment rate is high at 40%, with the number of non-skilled young people estimated at three millions. Years of instability have resulted in formidable development challenges.

At the heart of this development is the reconstruction and renewal of the educational system at different level. Technical Vocational Education should be part of the Afghan National Development Strategy, but the Constitution of the country states that free education is a right of all citizens. Education system in Afghanistan is divided into distinct but inter-linking sectors like pre-school, primary, secondary, technical-vocational and higher education.

This paper focuses on the vocational education and training in ICT sector, its issues regarding curricula, resources and qualifications of teachers. The linkage between training centers and job market and industry is missing. Although there is no extensive framework classifying vocational qualifications, the organization and delivery of vocational education in Afghanistan can be divided into three subsystems and corresponding qualification levels:

- secondary-based initial vocational education
- technical education for two years (in farsi: *bakalaurea*, equivalent to 2-year college)
- technical institute for four years (in farsi: *lesons*, equivalent to Bachelor degree)

More than 350,000 students at four hundred twenty technical and vocational institutes enrolled in different level in Afghanistan. Technical vocational education provide qualifications on different majors such as English, ICT, business, textile and tailoring, construction, mechanics, agriculture, electronics repair\, carpet weaving(Cameron, &Brickett, 2012).

The majority of students enrolled in Kabul, Nangarhar, and Balkh. In 2010 the government of Afghanistan will construct 200 new technical education district schools and 34 provincial institutes. The classification of these three subsystems into general and vocational education and trainings are shown in Figure 1.

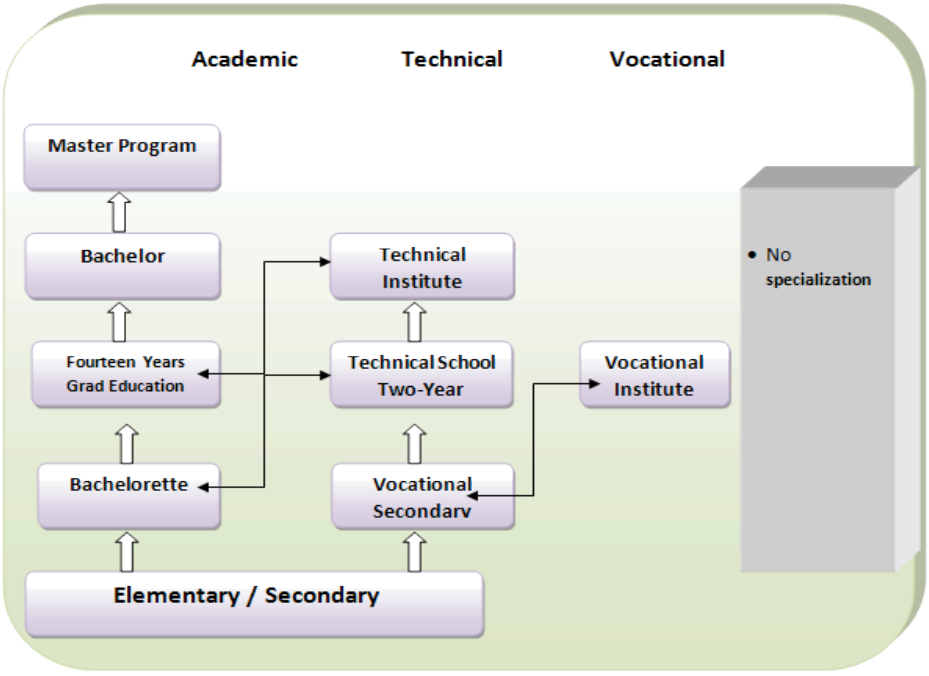

Figure 1. Basic structure of the ICT Vocational Education System in Afghanistan (Source: NESP, 2014)

3.1.1 Afghanistan Technical Vocational Institute (ATVI) current ICT curriculum

ATVI is a public vocational school located in Kabul. ATVI was developed through a collaborative effort between national and International affiliate, with the contribution of the Afghan Government and Ministry of Education. ATVI is providing education to more than eight hundred male and female students from Kabul and other urban and rural regions in Afghanistan.

ICT Department is a major department at ATVI which has sub departments such as Horticulture Department, Business Management Department, Construction Department and Automotive Department as well. ICT vocational programme at ATVI is organized by two years. Table 3 shows the courses taught in the four semesters long programmes.

ATVI offers a two year ICT programme and the curriculum was developed in 2008, when we look to the curriculum it looks that this curriculum is extracted from the Kabul University B.Sc. Programme. Table 4 shows the first two year programmes at Kabul University for comparison.

Table 3: Afghanistan Technical Vocational institute (AVTI) ICT Curriculum Table

First Semester	Second Semester	Third Semester	Fourth Semester
ICS	Programming Concept	OOP using java	Software Engineering
Operating System	Operating System-II	Visual Programming	Database Programming
Computer Application-I	Computer Network-I	Web Designing	Data Structure
Civics-I	Computer Application-II	Database System	Network Administration
Mathematics-I	System Hardware-II	System Administration	Data Communication
Physics-I	Civics-II	Computer Network-II	System Administration-II
English-I	Mathematics-II	Civic Education-III	Project
	English-II	English-III	

Table 4. The first two year programme of computer science

Course ID	Course Name	Hours (L-W)	Remarks
	Semester 1		
CSG11	Computer Science I	4-2	
CSG12	Mathematics I	4-2	
CSG13	History	2-0	
CSG14	English Composition I	2-0	
CSG15	Islamic Studies I	2-0	
CSG16	Introduction to Programming	4-2	24
	Semester II		
CSG21	Computer Science II	4-2	
CSG22	Mathematics II	4-0	
CSG23	Physics I (Optic & Electronic)	4-2	
CSG24	English Composition II	2-0	
CSG25	Islamic Studies II	2-0	
CSG26	Software Engineering	4-2	26
	Semester III		
CSG31	DBMS	4-2	
CSG32	Computer Architecture I	4-0	
CSG33	Statistics	4-0	
CSG34	Computer Networks I	4-0	
CSG35	English for Computer Scientists I	2-0	
CSG36	Islamic Studies III	2-0	22
	Semester IV		
CSG41	English for Computer Scientists II	2-0	
CSG42	Islamic IV	2-0	
CSG43	Script Programme	4-0	
CSG44	Physics II	4-2	
CSG45	Computer Network II	4-0	
CSG46	Operating Systems	4-0	22

3.2. Vocational ICT education and related qualifications in Namibia

Just to offer another view on a developing country that tries to raise the standards for its vocational ICT has specific mission and vision should not be the same Universities or higher education, this section describes the situation in Namibia. ICT majors are mainly offered at two different levels in Namibia. The University

of Namibia and the Polytechnic of Namibia are examples of these two mentioned level. Computer Science, which has a heavy emphasis on programming, database management and networking are offered as one of two majors in the Bachelor degree. They offer part-time degree programmes in Computer Engineering, as well as professional programmes such as A+, MCSE, E-Commerce, etc.

The Polytechnic of Namibia on the other hand offers a two-year degree some of the courses omitted from the copied curriculum and duration of study offered in Namibia.

Table 5. ICT Qualification in Polytechnic of Namibia

Qualifications	Duration	
	One year	Two year
Certificate in Information Technology	Yes	No
Diploma in Business Computing	No	Yes
National Diploma in Info Systems and Admin	No	Yes
National Diploma in Software Engineering	No	Yes

This National Qualifications Framework developed in Namibia and South Africa in order to bring systematic social benefits. This framework considered as the educational 'ladder' moving forward from low professional skills and unemployment to well professional competency and full employment. The direction to this would be the integration of education and training through competency and unit standards-based curricula (Chisholm and Leyendecker, 2008).

3.3 Vocational ICT education in Estonia

While Estonia is one of the low-GDP member states of European Union, it is a relatively advanced and developed country in terms of ICT. According to the research undertaken by the World Economic Forum on the use of information technology in 142 countries (The Global Information Technology Report 2012 – The Network Readiness of Nations, www.weforum.org), Estonia ranks 24th in the Networked Readiness Index and is the highest-ranking Central and Eastern European country.

Vocational education in ICT domain has undergone several reforms in Estonia within the last decade, the main drivers of this process have been European standards and needs of local employers. The ICT vocational education offered both on post-primary and post-secondary levels, and in applied higher education as well. Majority of vocational schools offer post-primary ICT qualification in parallel with general upper-secondary education, such as Kehtna School of Economics and Technology, Tallinn School of Transportation and the Tallinn Polytechnic School. Some schools offer 2-year vocational ICT education also to high school graduates, schools as Tallinn School of Transportation, Kohtla Järve Polytechnic School, and Vocational Training Centre of Narva (The Economist Explains, 2013).

The ICT curriculum that has been particularized for vocational education is prepared with consideration of professional standards as well as with the established needs of modular curricula. A recent survey expressed that the process of curriculum development is very quick and easy with Estonian vocational education. They have significant functional national ICT curriculum that has been developed comply with professional standards and as well as labour market requirements. The developed curriculum is outcome-based education and corresponds to the needs of the students and the society (Rekkor, 2011).

Vocational ICT education in Estonia is managed centrally by the Ministry of Education and Research (MoER), as majority of vocational schools belong to the state. The national ICT curricula for vocational schools are outcome-based and compliant with both, EUCIP model and national professional qualification standards for ICT specialists. These standards have been created by Estonian Association of ICT and Telecom Companies (ITL) in collaboration with MoER officials and vocational school teachers. Vocational schools have to create their own study programmes and syllabi so that they match the national ICT curriculum. After passing the vocational ICT programmes, each student has to take a EUCIP-based competency test organized by the Baltic Computer Systems – a computer training company with a role of the external accreditation body. With recent reforms, the employers have requested vocational schools to increase on-the-job training component in the ICT study programmes and this change is currently under way.

4. Vocational ICT Education the Key Challenges in developing countries

Developing countries should provide high quality education for all learners has motivated countries to develop plans focused on the ICT skills. The drive to promote ICT vocational education has naturally been aligned with broader social goals. In particular, visions of how ICT vocational education can lead to participation in information society and how ICT will improve country economies are explicated in ICT competences. Also, developing countries typically face challenges in terms of capacity, capability and resources to successfully and effectively harness the potential of ICT. These are echoed in literature on challenges facing ICT in labor market. The following sections address each of the issues requires building of capacity at all levels that systemic changes can be planned from the top, creating an enabling environment for bottom-up innovation and development.

4.1. Practices of curriculum design and implementation

Marsh and Willis (2007) have contrasted two alternative approaches to curriculum development: rational-linear and deliberative. The first one is called Tyler Rationale, as it originates from the works published since 1949 by renowned American curriculum theorist Ralph Tyler. Tyler Rationale relies on top-down curriculum design by the experts in pedagogy, psychology and subject matter, who should seek the answers for the following four key questions (Marsh & Willis, 200):

1. What educational purposes should the school need to attain?
1. What educational experiences can be provided that is likely to attain these purposes?
2. How can these educational experiences be effectively organized?
3. How can we determine whether these purposes are being attained?

The answers to these questions will then guide the four phases of curriculum development process:

a) Selecting and defining objectives;
b) Selecting and creating learning experiences;
c) Organizing learning experiences;
d) Curriculum evaluation.

While Tyler Rationale remains influential even today, it has been criticized for ignoring the impact of unplanned learning during the curriculum implementation. One of the viable alternatives to Tyler Rationale is deliberative approach proposed by authors like Walker and Schwab. Schwab in March & Willis (2007) called for iterative, dialogical and participatory process of curriculum development that is grounded in the four commonplaces of curriculum: milieu, teacher, student and subject matter. Participants should be invited from various stakeholder groups and they should offer several alternative curriculum solutions. This approach creates better match between expert knowledge and real-life, while moving decision-making level closer to the classrooms.

It is difficult to relate curriculum development practices in developing countries to any of these curriculum rationales. Based on the analysis of vocational ICT curricula above, we claim that at least in ICT in Afghanistan, the vocational ICT curricula are created through simple extraction of some courses from the university bachelor curriculum. Such practice is not meaningful, nor is it useful for students who need to get hired sooner after his/her graduation. Also the evaluation shows that the current practices of vocational ICT curriculum development do not serve the needs of local and international job market in the ICT sector. Implementing deliberative approach to curriculum development in vocational ICT education would increase the involvement of employers and other stakeholders and cater to their needs.

4.2 Policy Environment

Another factor that affects adaptation and adoption of international qualification standards and curriculum frameworks in a specific national context is the local policy environment, which is often quite different in developing countries compared with EU and USA where the international standards usually originate from. Vocational ICT education should be an integral part of national development strategies in many societies, because it:

(i) enables for quick job market
(ii) impacts on productivity
(iii) and economic development
(iv) supports basic academic and life skills,
(v) related to a specific trade
(vi) prepares for industry-defined work,
(vii) and continuing higher education

Yet, often the developing countries have set their priorities in educational development elsewhere, mainly on the level of general/comprehensive education (raising the level of general literacy, Education for All agenda) or higher education. In the National Education Strategic Plan (NESP)for Afghanistan (NESP for Afghanistan, 2014), the main goal of developing technical and vocational education is ”*to provide relevant and quality technical and vocational educational opportunities for male and female Afghans in order to equip them with marketable skills that meet the needs of the Labour market in Afghanistan and other countries*”. This goal is to be achieved through five priority programme components:

(i) Infrastructure and equipment
(ii) Curriculum development

(iii) Technical capacity building
(iv) Management
(v) Short-term training courses

Curriculum development component sets the following targets:

(i) Conduct specific labour market studies for curriculum improvement.
(ii) Revise the TVET curriculum for eight technical fields by the end of 1386.
(iii) Develop syllabi by 1386.
(iv) Develop 80 textbooks titles and print 8,000 textbooks in 1387-89.

While the NESP does not explicitly mention ICT sector, the demand for qualified ICT specialists in Afghanistan's labour market is significantly higher that potential supply in vocational schools and training centres.

4.3 Infrastructure

Many Developing countries face unreliable power supply, uncompleted networks for computer lab, coupled with the high cost of energy. Developing countries face the serious challenge of affordable and accessible internet backbone and stable electricity supply at institutions. This lack of affordable and accessible internet backbone and a stable electrical supply impacts on the rollout of ICT Vocational Education and its development initiatives. This has additional implications for the concentration of initiatives in cities due to the wide gap in ICT access between urban and rural areas. Although at institutes, differences in the status of infrastructure have led to different levels of ICT adoption. Knowledge of available infrastructure and awareness of technical options, as well as ongoing maintenance requirements and environmental impact, are important considerations for leaders when making choices about how best to provide ICT education in the vocational level.

4.4 Funding/Budget allocations

Although an ordinary claim that invests in ICT is cost-effective, as well as the continuous refuse in ICT prices, the total cost of ownership of ICT including hardware, software, maintenance, upgrading, skills and development remains high. Investing in ICT education could be apparent as an additional cost, and sustaining meaningful ICT utilization is a problem faced by many institutions, particularly those that rely on donor funding. ICT may not feature high on the list of education institutions' investments or priorities when compared to important items like paying staff salaries or maintaining utilities.

There is also a lack of government funding and these initiatives rely mostly on donor funding. For example, in ATVI, there appears to be limited budget for ICT education, while in NIMA, ICT education for development strategy is strongly dependent on external donor as USAID funded. In Afghanistan case, according to the constitution free education is right of each citizen. So, ICT vocational education cannot collect fees from their students while this is ordinary income of the institutions.

5. Findings

Effective ICT education approaches cannot be copied from developed countries to developing nations without adaptation that consider differences in culture, environment, logistical support, and IT infrastructure. Cultural differences are significant and apply regardless of the approach to education taken. Because students have had little exposure to computers or common applications, the most basic of techniques associated with computer use have to be taught. in developing nations require adaptation for differences in culture, environment, logistical support, and IT infrastructure. Cultural differences are significant and apply regardless of the approach to education taken. The more certificates you have, the better educated you are. In a culture of abject poverty, the students are keenly interested in practical applications and the underlying theory is of no concern to them.

We learned from European examples the importance of having simple and clear transnational standards for ICT qualifications and how they are implemented in curriculum design and implement, but in Afghanistan the ICT vocational curriculum is extracted from a University program.

The vocational curriculum should match with the labor market rather than extracting it from the four year program, and this is the case of Afghanistan. In the country level there should be a specific policy supporting the vocational education, this is missing in Afghanistan. In Afghanistan the most infrastructure and funds are the major obstacles at vocational education.

ATVI offers a two year ICT program and the curriculum developed in 2008, when we look to the curriculum it looks that this curriculum is extracted from the Kabul University B.Sc. Program. Table 3 shows the first two year program at Kabul University. There are some key challenges can be address at ICT vocational education institution in Afghanistan, the following points observed when the author had visited these three institutions:

1. Missing courses in new and emerging areas of ICT
2. Inadequate infrastructure facilities and obsolete equipment
3. Lack of coordination and collaboration with industries
4. Inadequate or non-existence of educational institute polices for capacity building of teachers and the management team.
5. Lack of research and development in the provision of its curriculum and education system
6. Lack of equivalence for employment purposes outside of the country,

6. Conclusion

This paper examined the approaches to designing vocational ICT education curriculum in Afghanistan, Namibia and Europe, suggested differences due to culture, environment, logistical support, and IT infrastructure, and, proposed adaptations to address these differences. The approaches, differences, and adaptations are not intended to be all inclusive but to provide a catalyst for discussion. It is time of great growth and potential for the ICT vocational institutions in developing nations. The effectiveness of that growth depends on our adaptation to their unique needs and situation.

The key findings of the current study were that due to the lack of qualified teaching staff and national standards or guidelines, the curriculum development practices in vocational schools of Afghanistan are poor and largely based on copying the more advanced university curricula. Such curricula are not relevant to learners and result with critical mismatch between the competences of the graduates and needs of the local job market. Our future research will address these issues by designing a framework for collaborative curriculum development that includes in the curriculum process various stakeholders - students, alumni, employers etc.

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