

# Multi-Stakeholder ICT Framework for Technical Vocational Education and Training in Namibia

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**Abstract:** Namibia has been striving to improve its economic and human development through Technical Vocational Education and Training (TVET) for decades. Despite the implementation and application of Information Communication and Technologies (ICT), little is known about how people actually use a full range ICTs in the naturalistic settings of the TVET environment. Despite the set intentions for TVET to strengthen skills development for young people and adults, the performance has widened the gap of income and employability of youths and women and older workers. This gap has brought considerable challenges to TVET to create new opportunities for change and innovation in the environmental setting. With this in mind, ICT has become the hope to resolved issues related to attractiveness, embedding stronger work-based learning, enhancing labour market relevance, developing stronger teaching and learning guidance for sustainable social and economic development in Namibia. A strong link between the regulatory bodies, youth, training providers and labour markets are the essential stakeholders to effectively connect between the world of teaching, learning and the world of work for lifelong learning in TVET. ICT as a tool of collaboration is important to support the TVET practices. The aim of the study is to develop a multi-stakeholder ICT framework for TVET in Namibia. In order to achieve this aim of the study, an examination of the existing usage of ICT to promote cooperation among multi-stakeholders in the TVET environment in Namibian will be conducted through literature review. In addition the challenges of Namibian multi-stakeholders' involvement in TVET is analysed from interviews. Based on the results a proposed ICT multi-stakeholder framework for effective performance of TVET in Namibia will be developed. The research will be based on Diffusion Innovation theory and Stakeholder Network Theory. A case study with a qualitative method will be chosen. The analysis will be done narratively.

**Keywords:** ICT, TVET, Framework, Stakeholders

## 1. Introduction

In Namibia, the Technical Vocational Education and Training (TVET) has been growing very fast over decades according to the Education for All (EFA) Global Monitoring Report (MoE, 2011; UNESCO, 2014). However the unemployment rate still remains high. Despite the set intentions for TVET to strengthen skills development for young people and adults, the performance has widened the gap of income and employability of youths and women and older workers (Naanda, 2012). This gap has brought considerable challenges to TVET to create new opportunities for change and innovation in the environmental setting. With this in mind, ICT has become the hope to resolved issues related to attractiveness, embedding stronger work-based learning, enhancing labour market relevance, developing stronger teaching and learning guidance for sustainable social and economic development in Namibia (Iyambo, 2011).

The Namibian government envisions ICT to cut across all aspects of economic and social development (MoE, 2005). This same point has been asserted by Raihan & Shamim (2013) that ICT responds to the demands that human resources development places through interactions in the education, training and lifelong learning economically and socially. The application of ICT causes major changes in the TVET environment. According to an analytical survey by UNESCO (2003), interaction through ICT has brought great expansion on TVET in the areas of administrative purpose, communication, teaching and learning, curriculum development, assessment, career education and guidance, labour market information, job placement and systems control. These changes have made ICT the core tool for

economic productivity and social development. Changes have also been made internationally whereby ICT is implemented as one of the potential areas in TVET (UNESCO-UNEVOC E-forum, 2013). Nevertheless, the outcomes of the implementations of ICT in TVET are yet to be fully explored. The World Bank (2013) agreed on the same sentiment of the ICT integration but reiterated on the high investment which can contribute to the sustainability of the economy. ICT implementation needs multi-stakeholders to ensure that the demands of performance are achieved for economic and social development in the TVET environment. Hence, consensus can only be formed by multi-stakeholders when ICT is used effectively to promote the transformational change in the TVET environment.

## 2. Background of the Study

From a policy approach, the Ministry of Higher Education, Training and Innovation (MHETI) highlighted a mandate within its legislative framework to provide Higher Education with training in TVET and to innovate research in Science and Technology as pillars for economic development (MoE, 2008). Holistically, these highlights are aimed at producing technical and high-level skilled human resources which contribute to the economic growth and sustainable development in Namibia. In spite of massive spending and government support, Namibia still lags behind in leading countries of the world (Naanda, 2012). As a result, investments to enhance young people's and adults' competencies for skills development in TVET for Namibians remain unaccounted for.

In the process of TVET reform, the Namibia Training Authority (NTA) has been established to take overall

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responsibility for the management of the system under the direction of employers and other stakeholders, and also to devolve greater authority to Vocational Training Centres (VTCs) to improve their management capacity and contextual relevance as per the Vocational Education and Training Act, Act 1 of 2008 (MoE, 2007; Namibia, 2008). The NTA has also been found to greatly support the VTCs by producing curriculum, training materials and delivery guides for instructors as they have incredibly limited resources of this kind in the VTCs. Concerns had been raised that the majority of the vocational centres still lacked sufficient investments in infrastructure, revision and quality assurance of curricula as well as the provision of learning materials for human resource development in the labour markets (Naand, 2012). There is also a lack of professional instructors in vocational centres as well (Karunananda, Rajakaruna & Jayalal, 2012). It has been argued by Shalyefu (2012) that the mismatch between supply and demand of quality graduates and employees in the TVET system in Namibia has been widened. According to Gouws (2008) and Pupkewitz (2006) employers in the industries have shown dissatisfaction in TVETs' inability to equip graduates with entrepreneurship and key industry skills, resulting in acute skills shortages country wide. Moreover, this situation is the reason for the decrease in private sector confidence in the public Vocational Education and Training (VET). To this effect, the NTA needs to re-look into their processes of engagement with stakeholders and find a satisfactory level of all involved in the programmes and competences for skills development in TVET.

### 3. Problem Statement

ICT is a critical tool in empowering the youths for skills development necessary in Namibia (MoE, 2005). When Namibia established the TVET sector, they adopted a multi-stakeholder approach whereby NTA received the mandate to link up with the government, VTCs, universities and industries (MoE, 2007). In the current multi-stakeholder approach, NTA is in the centre to connect the various stakeholders in the TVET environment. However, the current multi-stakeholder approach has not provided the desired results especially as it relates to the gap in terms of the knowledge, skills and attitude of the graduates which in turn contributes to youth and adult unemployment (Naanda, 2012). Cardinal to this problem is capacity building of manpower for social and economic development of Namibia through TVET. In Namibia, for instance, there are investments in VTCs and little is known by way of research about their level and manner of ICT integration (Isaacs, 2009). Secondly, heavy investment is reflected in the procedures and installation of ICT infrastructure, national policy and teacher instructor training initiatives, but little is known on the ICT use to monitor the progression of installations (NTA, 2010). Finally, the labour markets complain of skills deficiency in TVET and its capacity to provide qualified graduates, but little is known by way of research of ICT use by industries engaged in with technical and vocational training (Pupkewitz, 2006). Therefore, the study seeks to develop a multi-stakeholder ICT framework in Namibia for stakeholders to collaborate by ensuring training providers (universities and VTCs), labour (private

and public industries) as well as the governing boards (government, National Qualification Authorities (NQA), NTA) are sharing the same information for youths in need of skills towards human capital development.

## 4. Aims and Objectives

### 4.1 The research aim

The aim of the study is to develop a multi-stakeholder ICT framework for TVET in Namibia.

### 4.2 The research objectives

The objectives of the presented study are to:

4.2.1 Examine the existing usage of ICT to promote cooperation among stakeholders in the TVET environment in Namibia;

4.2.2 Analyse the challenges of Namibian stakeholders' involvement in TVET; and

4.2.3 Develop a proposed ICT multi-stakeholders strategic framework for effective performance of TVET in Namibia.

### 4.3 Research questions

From the above aim and research objectives, the primary question addressed by the study are:

4.3.1 How can a multi-stakeholder ICT framework for TVET in Namibia be developed?

The secondary research questions that have emerged from this question are:

4.1.3.1 What is the existing usage of ICT to promote cooperation among stakeholders in the TVET environment in Namibia?

4.1.3.2 How can the challenges of Namibian stakeholders' involvement in TVET be analysed?

4.1.3.3 What type of conceptual ICT multi-stakeholders framework can be developed for effective performance of TVET in Namibia?

## 5. Preliminary Literature Review

The preliminary literature review is in the use of ICT in TVET and the challenges of stakeholder involvement in TVET.

### 5.1 The Use of ICT in TVET

TVET studies in ICT are on extensive exploration of cases in teaching and learning in institutions as well as work experience in the labour markets. According to a study cited by the Analytic Report of United Nations Education, Scientific and Cultural Organization (UNESCO) the following criteria have been identified in five areas of ICT use in teaching and learning in TVET: (1) Technology as curriculum; (2) Technology as organizational mechanism; (3) Technology as delivery mechanism; (4) Technology as complement to instruction and (5) Technology as an instructional tool (UNESCO, 2003). Although studies restate the advantages of ICT in TVET, only a few vocational centres in many countries of the world including Namibia have adopted it (Isaacs, 2007).

The skills required in job markets are becoming more and more digital-based and of both technical and non-technical composition of its competencies (Kim and Park, 2009). It means that information for skills development need to be addressed through ICT integration.

### **5.2 Challenges of Namibian Stakeholders Involvement in TVET**

Developing countries face several challenges when attempting to successfully implement ICT solutions in the education and training sectors. These challenges include, but are not limited to, technological illiteracy and a fear of change among various stakeholders (Keller, 2010; Hovious, 2014). In Namibia, positive initiatives are still accompanied by challenges and obstacles of a diverse nature and magnitude (Pohamba, 2008; Brunette, 2006). Among others the VET system faces the challenge of being highly centralised and not being demand-led (GRN, 2007; MBESC, 1999). The Namibian President Pohamba also noted that TVET should be improved by higher education standards to empower people for global competitiveness (Hambata, 2010; Pohamba, 2008).

Though currently much criticism, such as on the poor quality of education in Namibian VTCs and the weakness of the new TVET programme referred to as Competency-Based Education and Training (CBET), is levelled against the Namibian TVET, there is no conclusive evidence to support such criticism (Likando, Wolhuter, Matengu & Mushaandja, 2011). However, according to MBESC (2005), Pupkewitz (2006), MoE (2007) and Gouws (2008), Namibian VET has been unable to equip graduates with entrepreneurship and key industry skills, resulting in poor performances of graduates and acute skills shortages countrywide for employers.

With regards to TVET management, Kakunawe (2008) and Ekongo (2010) report that even though the NTA has made efforts to provide solutions for VET problems, trainees and employers still regard VTC management as wanting with unqualified instructors. Kakunawe (2008) also said that the CBET system is described by students as useless for national development and an obstacle to their future. Nevertheless, NTA has been mandated to pilot the implementation of the CBET system and the imposition of a vocational education and training levy contested by stakeholders across the country despite the criticism (Mukendwa, 2012; Louw 2013). Thus, challenges which spread among all stakeholders can be solved by collaboration efforts through an ICT framework for multi-stakeholders in the TVET environment.

### **6. Gaps Identified in the Research**

The study identified a gap in the current multi-stakeholder approach of training providers, regulatory boards and labour markets which lack collaboration on skills development deliberations for individuals in the TVET environment. Therefore, the approach has not provided the desired results especially in terms of knowledge, skills and attitude of graduates which contributes to youth unemployment.

### **7. The Guiding Theory of the Research**

The role of this study is to investigate a new theoretical approach in Namibia with a multi-stakeholder approach to development in Namibia. The conceptual framework is based on two theories: the Stakeholder Theory (Freeman, 1984) and the Diffusion of Innovation Theory (Rogers, 1995).

The literature review will be guided by the Stakeholder Theory which proposes that stakeholders are all those identifiable groups or individuals who can affect or are affected by organisational performance in terms of products, policies and work processes on which the organisation depends for its survival (Freeman, 1984). Two important key issues underlined here are: the influence and choice of interest and power on a strategy. In this study the multi-stakeholders play an important role on how their attitudes can influence an expectation or needs of the new phenomenon such as the new approach to ICT use in this study.

The other guiding theory by Rogers (1995) who believes that diffusion is the process by which an innovation is adopted by members of a certain community. Rogers explains four major theories that deal with diffusion of innovations: innovation-decision process theory, the individual innovativeness theory, rate of adoption theory and theory of perceived attributes. All of innovation theories are based on time, the ability to adopt an innovation, the rate of adoption process over time and the influence an individual to take decision about whether to adopt or reject an innovation. In this study ICT use will be enhanced by performances of stakeholders by influencing themselves to achieve a common goal for development in TVET. Reconciliation of these theories will be able to demonstrate a new theoretical approach to Namibia. New approaches will be incorporated to provide change in ICT use in relation to communication and social development in TVET in Namibia

By analysing specific cases, the researcher explores other theoretical frameworks. In a developing country such as Bangladesh, the Directorate of Technical Education (DTE) and the Bangladesh Technical Education Board (BTEB) are responsible for setting up the overall policy framework of the entire vocational education and training system. They are responsible for maintaining qualifications for TVET, setting of institutions, accrediting institutions for government and non-government organisations (NGOs). Unfortunately, Bangladesh has insufficient financial support to develop ICT facilities. According to Raihan, (2013), at present, the simple ICT tools with widespread software like graphics software, presentation software, desktop publishing, discipline-specific programmes, simulations, authoring software are used in TVET organizations in Bangladesh. The administrative task of TVET organization in Bangladesh is not fully ICT-based. Computer-based instruction (CBI) and computer-assisted instruction (CAI) are used for teaching and learning and organization have no e-learning systems.

In a developed country such as Korea, TVET plays an important role in the industrialization process. TVET also restructured its systems, reformed TVET programmes and

provides out- of-school vocational training for non-formal education. However, Korea faces new challenges of competition in the changing global economic environment in order to meet the demands of industry. According to Rainhan (2013) Korean TVET organizations broadly used productivity software, word processing, integrated software, spreadsheets, databases, and graphics applications. The administrative tasks are dependent upon the use of different software where there is an ICT-base at the TVET institutions in Korea.

Namibia follows a similar approach to Australia with the Industry Skills Committees (ISCs) as regulatory body for skills development (Namibia, 2008). The culture is for the NTA and different industries to discuss industrial requirements jointly. Unfortunately there has been some limitations and criticism on the approach. According to Quest (2014), Word processing, spreadsheets, internet, databases and presentation applications have been used for teaching , learning and communication by the government.

By incorporating different stakeholders in an analytic framework for TVET, this study attempts to provide an ICT framework for TVET for a basis of satisfaction through collaboration in Namibia. It also allows the researcher to investigate the different multi-stakeholders for social change interventions in projects, policies or actions. Key components of stakeholders will be identified to accommodate all persons affected through the use of ICT in the TVET environment.

## 8. Significance of the Study

A key rationale is to develop an ICT framework to motivate multi-stakeholders in TVET to participate in dialogues, decision making and implementation of solutions to common problems and goals. Positive effects in terms of accountability and governance of VET providers are made for delivery of quality outcomes. It also enables each stakeholder to develop a framework and a set of measures that are suitable to its context and reality.

## 9. Research Methodology

### 9.1 Introduction

This section deals with issues related to the research design and methodology of the study. The general idea of the research design and methodology will be as follows:

Section	Research design	Methodology
9.1.1	Research paradigm	Interpretivist
9.1.2	Research approach	Qualitative
9.1.3	Nature of study	Exploratory
9.1.4	Research setting	Case study

### 9.2 Research paradigm

A research paradigm implies a pattern, structure and framework or system of scientific and academic ideas, values and assumptions (Olsen, Lodwick, & Dunlop, 1992). It means a paradigm is simply a belief system (or theory) that guides the way we do things, or more formally establishes a

set of practices. Three types of paradigms such as critical research, interpretivism (constructivism) and positivism have been identified for information systems research (Gephart, 1999). Interpretivism will be chosen for this study to see the reality as a social construct for multi-stakeholders in their relationships for decision making in TVET. Interpretivism aims at understanding context of the information tool in this study by interpreting the key stakeholders' experiences and challenges from literature review to provide a basis for support of delivery (Slowan & Bowe, 2014).

### 9.3 Research approach

Generally, two research approaches are used in ICT studies. These are quantitative and qualitative research approaches. Quantitative research is theory-oriented and involves examining relationships among variables by using statistical procedures to analyse numbers (Creswell, 2009). Qualitative research aims at the collection, analysis and interpretation of the phenomenon of a particular phenomenon of interest. The rationale for conducting a qualitative case study is to allow the researcher to describe a phenomenon without measuring any behaviors (Stake, 2010; Yin, 2014). Therefore, a qualitative approach will be considered for this study to examine the multi-stakeholders in order to gain a better understanding of the existing use of ICT to promote cooperation in the TVET environment.

### 9.4 Nature of the study

The three common forms of research used in information systems are exploratory, explanatory and descriptive studies (Babbie & Mouton 2001). The defining feature of this research study is focuses on the "how" and "why" and for that reason an exploratory study is appropriate. Emphasis will be on investigation in which contextual factors moderate the relationship between the work of humans (such as the multi-stakeholder in TVET) and the non-human actors (such as the ICT usage). Therefore present research will be exploratory in this study due to the involvement of the Namibian stakeholders with their challenges.

### 9.5 Research setting

#### 9.5.1 Case study methods

An in-depth investigation of the ICT use for multi-stakeholders in TVET in Namibia will be done. It is also supported by Yin (2014) who said that using a case study is vital when exploring contemporary events because researchers cannot manipulate the relevant behaviours. Using the case study method, it endeavoured to understand the role of the multi-stakeholders play in the shaping and implementing of how and why multi-stakeholders deliberate ICT needs such as policies, time and finances among others, in order to develop an ICT framework for TVET in Namibia. Therefore, the focus is on a case study method to receive in-depth views from participants.

#### 9.5.2 Population and Sample

The population for this study comprises of regulatory boards, youths, and training providers in the labour markets in Namibia. However, a sample of three VTCs' will be

drawn from eight VTCs' (who met the criteria explained in the sampling procedure). Thirty three participants will be chosen with a purpose to provide significant understanding of relevant data that enables the researcher to address the research questions and form arguments to support the findings. The population will include three members from the regulatory board, three lecturers from universities, three employers from labour markets and three instructors from each VTCs and three trainees from each of three VTCs. Guest, Bunce, and Johnson (2006) suggest that a sample between 6 and 12 interviewees is adequate, if the selected group is homogenous, in order to understand and achieve the objective of the research. However, the researcher in this study seeks a target of 33 participants to ensure enough sample diversity and size to allow completion of an adequate number of interviews.

### 9.5.3 Sampling procedure

A purposive sampling procedure will be used in order to select the participants. It is a process of selecting a sample from a given population that serves a specific purpose (Gay, Mills & Airasian, 2009). Furthermore, convenience sampling will be used for the availability and willingness of participants. In other words, the sampling of instructors, regulatory board members, trainees, employers and lecturers will be organised to ensure proportional representation of a number of stakeholders in the study. The instructor population will be sampled the same way as the vocational centres which means that three instructors will be selected for each vocational centre. Snowball sampling will be used for recruiting learners according suitable characteristics (by ICT as in their subject choices) for the study. Trainees in each vocational centre will be divided into 12 participants respectively. Three employers will be there from the industries, three instructors and three lecturers from the TVT departments in universities and three regulatory members in government dealing with TVET related issues. A small sample 33 participants will provide in-depth understanding of the determinants in the TVET environment.

### 9.5.4 Research instruments

The research instruments can adopt the use of multiple sources such as audio-recorded classroom observations, field notes, documentation, interviews, and demographic responses enhanced the in-depth perceptions. (Yin, 2014). Observations, interviews and documentation will be used for this study. Observation will focus on the involvement of the use ICT tools available at the research sites of the study. The goal of the interviews is to provide participants with the opportunity to speak, and the role of the researcher is to understand the meaning of respondents' experiences and life worlds (Warren, 2002). Documentation will provide information regarding the ICT policies and training materials from the government.

### 9.5.5 Data collection procedures

Data will be collected through interviews. Stakeholders will be requested to answer questions asked by the researcher during the interview for approximately 30 minutes for each participant. All interviews will be audio taped after obtaining informed consent from the participants. Finally, all the recorded interviews will be transcribed

verbatim. Observations and documentation will be collected through a checklist.

### 9.5.6 Data analysis

Data analysis is an attempt by a researcher to summarize data collected for the study (Gay, Mills and Airasian, 2009). Content analysis will be performed by delineating relevant units of general meanings from the research questions (Gubrium and Holstein, 2002). These units will then be matched with the relevant interview questions and categorized according to emergent themes. Interviews will be organised to present viable interpretations of the findings collected. Firstly, content analysis will be used to analyse interview questions. Secondly, written data will be categorised according to the major themes that came up from the content being analysed. Themes, categories and codes will be given for the examined data to provide a description of setting, participants and activities. Bloor and Wood (2006, p.166) define transcription as "a technical typing procedure for representing spoken discourse in the text". The recording of the interview will be transcribed with reference to Gubrium and Holstein's (2002) guide on transcription notations before the data will be interpreted. The observations will be analysed through checks of communication via emails, forums, official web sites and blogs for communication. ICT documentation such as policies, curriculums, reports and modules will be checked.

## 10. Delimitations and Limitations of the Study

More vocational centres could have been covered for collaboration of stakeholders' perspectives. However the study was limited to three vocational centres.

The study is limited to only those participants in the TVET environment. The allocated time has to fit in the time for the field work. Financial constraints is another factor that hinders conducting interviews with participants from different case cites in the regions for a sparsely populated country like Namibia. The present study will be limited to three vocational centres in Namibia to meet the needs of stakeholders' participation. The study will prove difficult if conducted by participants lacking technical vocational education and training experience.

## 11. Assumption

The study assumes the following:

- Opinions from different perspectives will provide unique insights for problem-solving issues.
- Multiple-stakeholders will take part in discussions and dialogues which contribute to human development.
- The theoretical framework will offer an understanding of challenges faced multi-stakeholders using ICT in TVET to meet competitive labour demands.
- If the framework is applied, graduates will complete their studies with relevant skills needed by industry.

## 12. Ethical Consideration

Ethical clearance will be obtained from MHETI and training providers. Ethical issues will be considered at all times in order to keep the participants and the researcher in accordance with the best practice (Cohen, Mannion & Morrison, 2000). The participants will be assured that the information obtained from the interviews will be treated confidentially and that it will only be used for the purpose of the study (Denzin & Lincoln, 2000; Seale, Gobo, Gubrium, & Silverman, 2004). Secondly, permission to tape-record the interviews will be sought from the participants. Thirdly, participants will receive the proposal and an informed consent sheet to sign that clearly states that their participation in the study will be voluntary (Ritchie & Lewis, 2003). Finally, the real names of the participants and vocational centres will not use real but fictitious names given to training providers and regulatory board members. Participants will then be given fictitious names (Ritchie & Lewis, 2003).

The following procedures will be used to collect data. First, the researcher obtained permission from the MHETI to conduct the study at selected VTCs. Secondly, permission will also be obtained by the VTC principals to conduct interviews. Thirdly, the researcher will explain the purpose of the study to the participants. Finally, the researcher will interview the participants after the explanation of the interview questions.

### 13. Conclusion

The proposal has provided background information to collaborate efforts from multiple stakeholders for skills development in the TVET environment for Namibia. It began with a short introduction and background that despite the implementation of policy initiatives no desired results have been provided in terms of skills, knowledge and attitudes of graduates.

The literature has been reviewed on existing surveys of ICT usage to promote cooperation among stakeholders in the TVET environment in Namibia. The literature concluded with analyses of challenges for Namibian stakeholders' involvement in TVET.

The research methodology has employed a qualitative research study. The research design has been interpretive to understand the context of the information tool. A qualitative approach has been used to provide descriptive data of the phenomenon. The nature of the study has been exploratory to understand how and why the information tool has been used. A case study has been used to provide in-depth investigation of the phenomenon. The proposal concluded with delimitations and limitations, as well as assumptions and ethical consideration of the study.

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