



**MASTER OF SCIENCE IN TECHNICAL EDUCATION
ELECTRICAL ENGINEERING**

**A STUDY ON ICT SKILLS OF TVET TRAINEE
TEACHERS OF BANGLADESH AND SAUDI ARABIA**

By

Mubaarak Abdulrahman Abdu Saif

STD ID.123604

M.Sc.T.E (EEE)

THE DEPARTMENT OF TECHNICAL AND VOCATIONAL EDUCATION

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)

THE ORGANIZATION OF ISLAMIC COOPERATION (OIC)

DHAKA-BANGLADESH

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SEPTEMBER, 2014

RECOMMENDATION OF THE BOARD OF EXAMINER

The thesis titled “A Study on ICT Skills of TVET Trainee teachers Of Bangladesh and Saudi Arabia” Submitted by **Mubaarak Abdulrahman Abdu Saif**. Student No **123604** of academic year **2013-2014** has been found satisfactory and accepted as partial fulfillment of the requirement for the degree of Master of Science in Technical Education (M.Sc.T.E) with Specialization in Electrical Engineering on, 2014.

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DECLARATION

This is to certify that the work presented in this thesis is the outcome of the investigation carried out by **Mubaarak Abdulrahman Abdu Saif** under the supervision of **Dr.Faruque A. Haolader** in the department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), Gazipur, Bangladesh.

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DEDICATION

THIS WORK IS DEDICATED TO MY PARENTS

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ABSTRACT

The Information and Communication Technology (ICT) is an important aspect of education. Numerous benefits of using ICT in education have been unearthed therefore; ICT should be widely used in teaching. However, in order to use ICT, TVET teachers have to have certain level of confidence. They have to be prepared to use ICT in their learning /teaching activities. In relation to that, this study sought to identify TVET trainee teachers' competence in using ICT. A test was developed to measure the basic ICT skills of TVET trainee teachers, teachers from Bangladesh and Saudi Arabia. The respondents comprised of 40 trainee teachers of Technical Trainers College (TTC) in Saudi Arabia, Riyadh and 30 trainee teachers of Islamic University of Technology (IUT), Bangladesh. The finding shows that Bangladesh TVET trainee teachers have average level of ICT skills and Saudi TVET trainee teachers have competence in basic ICT skills less average standard of using ICT according to IUT assessment standards (IUT CALANDAR, 2012).

The study also showed a significant difference in the level of basic ICT skills of TVET trainee teachers among two countries.

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LIST OF ACRONYMS

HDE	Higher Diploma in Education
BScTE	Bachelor Science in Technical Education
TVET	Technical and Vocational Education Training
HRD	Human Resource Development
ICT	Information and Communication Technology
KSA	Kingdom Saudi Arabia
TVE	Technical and Vocational Education
OECD	Organization For education Co-operation and Development
TBL	Technology-Based Learning
WWW	World Wide Web
IEA	International Association for the Evaluation of Educational Achievement
TTC	Technical Trainers College
TTTC	Technical teachers training College
IUT	Islamic University of Technology
FMS	Facility Management System
FBS	File Booking System
BCMS	Building Control Management System
RTMS	Resource Tracking and Management System
RFID	Radio Frequency Identification
PAIS	Person Automatic Identification System

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Information and communication technology (ICT) are a diverse set of technology tools and resources used to communicate, and to create, disseminate, store, and manage information. Communication and information are at the very heart of the education process, consequently ICT- use in education has a long history. ICT has played an educational role in formal and non-formal setting, in programs provided by governmental agencies, public and private educational institution, for –profit corporations and non-profit group, and secular and religious communities.

The use of information and communication technology (ICT) is becoming an integral part of education in many parts of the globe (sala, 2004; kuntoro &Al-Hawamdeh, 2003;Leidner & jarvenpaa,1993). Bangladesh is not left behind as ICT gradually finds its way into the educational system (Ajayi, n.d;Darkwa &Mazibuko, 2000; Brown ,2002;Brown,2002;Darkwa & Eskow,2000) despite chronic limitations brought about by economic disadvantages(Adesola,1991). The potentials of information and communication technology (ICT) to facilitate students' learning, improve teaching and enhance institutional administration had been established in literature (Kazu & Yavulzalp , 2008;Kirschner & woperies ,2003). The use of information and communication technology as a tool for enhancing students' learning, teachers' instruction, and as catalyst for improving access to quality education in formal and non-formal settings has become a necessity.

The fundamental strategies of higher education institutions outline the need to form citizens able to participate responsible in all the fields of social life, and act productively and creatively in the development of their function, in addition, they encourage the curricular design centred in

learning and based on competencies ; including proficiency in ICTs, as one of the alternatives that allows achieving the objective of education and pertinence in relation to the transformations occurring in the world.

Huerta, perez and Castellanos (2000), consider that the globalized world requires an increase in the productivity of social actors. They have also highlighted the need for mechanisms that allow changing the educational process with respect to the organization, content and teaching methods in order to connect education more effectively with the real work, to acquire qualified staff capable of responding to the needs of production, technological innovation, the management of ICTs and competition in global markets.

The development of competencies is proposed as an approach that is closer to the needs of the labour market (ben Youssef and Dahmani,2008). It can be said that competent persons, in any given profession, are those who perform well the role that is expected from them. This definition corresponds with Ibarra's(Estevez et al, 2003:5), who define competencies as a “set of abilities ,skills, knowledge ,and attitudes needed for optimal performance in a given occupation or productive role”. Linking this concept to ICT competencies, it can be said that the latter are a group of skills, knowledge and attitudes that are applied to the use of information and communication systems, including the equipment involved, and specifically, according to Godoy (2009), the ability to make web design, manage presentations, databases, graphics software, spreadsheets ,online bibliographic databases, web browsers, e-mail and chat applications , and word processors, among others.

1.2 Statement of the Problem

This study aimed at assessing the level of ICT skills of TVET trainee teachers in Bangladesh and Saudi Arabia of OIC member countries.

1.3 Objectives of the Study

The objectives of this study were to:

1. Find out the level of ICT skills of TVET trainee teachers in selected OIC countries for example , Bangladesh and Saudi Arabia ;
2. Assess the performance of TVET trainee teachers in demonstrating their ICT skills;
3. Highlight the strengths and weaknesses of TVET trainee teachers in demonstrating their ICT skills.

1.4 Research Questions

This study went through searching the answer of the following research questions:

1. What are the levels of ICT skills of TVET trainee teachers in OIC countries for example Bangladesh and Saudi Arabia?
2. Do they differ significantly among the countries?

1.5 Significance of the Study

TVET Teachers must have a good level of ICT skills in order to perform competence in their occupation as TVET teachers/trainers. It helps them to develop their professional competences. ICT skills are also important for the TVET teachers to qualify for the globalized world. Therefore, identifying the strengths and weaknesses of TVET trainee teachers in this area and comparing them at international level will help them in preparing and building self-confidence for their future workplace.

1.6 Scope of the Study

1.6.1 Delimitations

The study mainly focused on capturing the ICT skills of TVET trainee teachers in some selected OIC member countries only. The probable selected countries are Bangladesh/IUT, Gazipur and Saudi Arabia/TTC, Riyadh and. The gathered data will then be assessed between these countries.

1.6.2 Limitations

Although the study aimed to collect data from all the member countries of OIC, but due to time constrained and the limited budget only two countries are selected based on the probability of collecting data successfully.

1.7 Assumptions

The researcher assumed that TVET trainee teachers will take part in taking the ICT Skills Test.

1.8 Definitions of Terms

TVET

Those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic and social life.

TVET Trainee Teachers

TVET trainee teachers are those who have completed at least a diploma/higher diploma in any technology or engineering field and currently pursuing a TVET teacher training programme at bachelor level with the objective to become TVET teachers/trainers.

Skills- An ability to do an activity or job well, especially you have practiced it.

ICT Skills - the ability to make web design, manage presentations, databases, graphics software, spreadsheets ,online bibliographic databases, web browsers, e-mail and chat applications , and word processors, among others.

CHAPTER 2

Theoretical Basis and Review of Related Literature

2.1 Definition of ICT

Pelgrum and Law (2003) state that near the end of the 1980, the term 'computers' was replaced by 'IT'(information technology) signifying a shift of focus from computing technology to the capacity to store and retrieve information. This was followed by the introduction of the term 'ICT'(information and communication technology) around 1992,when e-mail started to become available to the general public(pelgrum,W.,j.,Law,N.,2003).The term ICT refers to the pupils' knowledge and understanding of the technology and their ability to apply it (Pickford and Hassell, 1999, p.3). Asnafi defines ICT as the technologies that help us record, store, process, retrieve, transfer, and receive information. IT and ICT are dependent on each other. IT may refer to the machine and ICT to its products (Asnafi 2005). The concept of IT has been expanded to include electronic communication and the use of the term ICT reflects it ("Information Technology "2008). IT may imply one – way communication. While ICT implies interaction between the user and the data (Zamani 2005). IT can be considered as the convergence point for communication (Mahdavia 2000: 32). Zins defines IT as the scientific study of products, services and information systems (Zins 2007). IT also refers to a set of disciplines and techniques used in handling and processing data (Rahadoust 2007:138). Information and communications technology refers to the computing and communications that support teaching and learning, where the focus is on the curriculum subject being taught, not on the technology skills. ICT is not just about computers: it also covers the use of faxes, tape recorders and cameras.

Ebijuwa (2005) defined ICT as tools used for collection, processing, storage, transmission, and dissemination of information. According to Siraj-Batchford (2003)Information and Communication Technology is 'Anything which allows us to get information, to communicate

with each other, or to have an effect on the environments using electronic or digital equipment' it is the computer-based tools used by people to manage information and communication processing needs of an organization or an individual.

2.2 ICT literacy / ICT Skills

Any discussion of literacy must begin with the concept of information literacy. As defined by the American library Association, “To be information literate, a person must be able to recognize when information ...” (ALA, 1989). Information literacy includes many of the skills associated with conducting research and communication information. In the past these might have been termed “library skills”, but with the Internet the skills are probably more often applied outside of the actual library building (although still using resources available from library staff). There are two types of ICT literacy skill sets. The first is generic ICT literacy skills such as keyboarding, word-processing, using databases, using spread sheets, desktop publishing and using the Internet for research and communication (Kasworm and Londoner, 2000). In this network economy every graduate from TVET programmes needs to possess these essential and generic ICT literacy skills. The second ICT skill sets are the occupationally specific ICT literacy skills. Examples of these skills include the ability to use CNC equipment, work with CAD/CAM, and operate equipment with digital. In this study the author focuses on the generic ICT skills only.

Lowe and McAuley (2002) defined information and communication technology literacy as “the skills and abilities that will enable the use of computers and related information technologies to meet personal, educational and labour market goals”. ICT literacy is the ability to appropriately use digital technology, communication tools, and/or networks to solve information problems in order to function in an information society. This includes having the ability to use technology as a tool to research, organize and communication information and having a fundamental understanding of the ethical /legal issues surrounding accessing and using information (The National Higher Education Information and Communication Technology Initiative, 2004).

As referenced in the State Tech Plan “In 2005, the Programme for International Student Assessment (PISA) defined ICT skills as an individual’s ability to “appropriately use digital technology and communication tools to access, manage, integrate, and evaluate information, construct new knowledge, and communicate with others in order to participate effectively in society.”(ICT in Florida’s Schools, 2005).

2.3 Impact of ICT in Teaching and Learning

Technology has changed the way people live, work, and learns. The use of technology in education is one of the main challenges for education policy makers (Zalzadeh 2006). Traditional methods of education are no longer able to meet the needs of today’s learners .New technologies provide opportunities include the ability to tailor learning to the individual (Aminpoor 2007). There are three approaches to IT and ICT in education that are often discussed:

- IT and ICT in the form of lesson units or workshops for students and teachers.
- IT and ICT as a means of information storage and retrieval and a method of doing research.
- IT and ICT as the channel for delivering instruction

There is no discussion of content in these approaches. The influence that IT can have on teaching methods depends on the knowledge and skills of students and teachers, and the implementation of IT and ICT in courses (Kousha 2006). The effect of IT and ICT varies a cross disciplines, regardless of the discipline, however, the advantage is that students and teachers are not limited by time and place(Fattahian 2004). ICTs are revolutionizing education by removing distance from education and making knowledge more accessible to all (Industry Canada, 1997). Technology-enhanced learning will play a crucial role in the development of a lifelong learning culture and has the capacity to empower learners by providing them with multiple pathways that offer choices and channels to meet their education and training needs (Human Resources Development Canada, 1998). in the context of this (TBL) across the world defined as the array of hardware and software used in the teaching and learning systems that include computer-based training systems, multimedia systems, electronic performance support systems, telecommunications systems, as well as the Internet with World Wide Web (WWW) systems.

The rate at which the Internet is being accessed keeps increasing at lightning speed. TBL can enhance teaching and learning; it has the potential to become cost-effective as it offers greater flexibility regarding time and location of training delivery (Furst-Bowe, 1996). Additionally, TBL may facilitate institutional policy regarding access and equity (Lafreniere, 1997). Technology also provides greater flexibility to adapt teaching and learning to meet learners' cognitive and learning styles.

Attwell (1999) noted: "whilst there is a wealth of studies and debate on the use of information and communication technologies in university and higher education, there has been only limited work on the potential impact for vocational education and training. Under the right conditions, it is believed that ICT can have a monumental impact on the Expansion of learning opportunities for greater and more diverse populations, beyond cultural barriers, and outside the confines of teaching institutions or geographical boundaries (Haddad and Draxler, 2002).

(Shamim Md. R. H, Aktaruzzaman Md, prof Clement. Ch. K. 2011) found that ICT tools should be provided to each polytechnic institution. Teachers should give their attention to use information & communication technology in their teaching learning process. Students should use internet for collecting necessary information for their education. Government should provide enough budgets to ensure the requirement of ICT tools and machineries for each classroom. Government should formulate proper policy to train up the teachers for their respective field as well as in information & communication technology.

2.4 Enhancing the Quality of Education Through The Use Of ICT

Education is the driving force of economic and social development in any country (Cholin, 2005; Mehta and Kalra, 2006). In the current Information society, there is an emergence of lifelong learners as the shelf life of knowledge and information decreases. People have to access knowledge via ICT to keep pace with the latest developments (Plomp, Pelgrum & Law, 2007). In such a scenario, education, which always plays a critical role in any economic and social growth of a country, becomes even more important. Education not only increases the productive skills of the individual but also his earning power. It gives him a sense of well-being as well as capacity to absorb new ideas, increases his social interaction, gives access to improved health and provides several more intangible benefits (Kozma, 2005). The various kinds of ICT products

available and having relevance to education, such as teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counseling, interactive voice response system, audiocassettes and CD ROMs etc have been used in education for different purposes (Sharma, 2003; Sanyal, 2001; Bhattacharya and Sharma, 2007).

Table 1: The four main rationales for introducing ICT in education

Rationale	Basis
Social	Perceived role that technology now plays in society and the need for familiarizing students with technology.
Vocational	Preparing students for jobs that require skills in technology.
Catalytic	Utility of technology to improve performance and effectiveness in teaching, management and many other social activities.
Pedagogical	To utilize technology in enhancing learning ,flexibility and efficiency .in curriculum delivery

(source :Cross and Adam(2007).)

Today ICTs — including laptops wirelessly connected to the Internet, personal digital assistants, low cost video cameras, and cell phones have become affordable, accessible and integrated in large sections of the society throughout the world. It can restructure organizations, promote collaboration, increase democratic participation of citizens, improve the transparency and responsiveness of governmental agencies, make education and health care more widely available, foster cultural creativity, and enhance the development in social integration (Kozma, 2005). It is only through education and the integration of ICT in education that one can teach students to be participants in the growth process in this era of rapid change.

ICT can be used as a tool in the process of education in the following ways:

- **Informative tool:** It provides vast amount of data in various formats such as audio, video, documents.

- **Situating tool:** It creates situations, which the student experiences in real life. Thus, simulation and virtual reality is possible.
- **Constructive tool:** To manipulate the data and generate analysis.
- **Communicative tool:** It can be used to remove communication barriers such as that of space and time (Lim and Chai, 2004).

The following mediums are used for the delivery and for conducting the education process:

- **Voice –** Instructional audio tools that include interactive technologies as well as the passive ones.
- **Video -** Instructional video tools that include still images, prerecorded moving images, and real-time moving images combined with audio conferencing.
- **Print –** instructional print formats that include textbooks, study guides, workbooks and case studies. (Bhattacharya and Sharma, 2007; National Programme on Technology Enhanced Learning,2007).Use of ICT in education develops higher order skills such as collaborating across time and place and solving complex real world problems (Bottino, 2003; Bhattacharya and Sharma, 2007;Mason, 2000; Lim and Hang, 2003). It improves the perception and understanding of the world of the student. Thus, ICT can be used to prepare the workforce for the information society and the new global economy (Kozma, 2005).

E learning has the following advantages:

- Eliminating time barriers in education for learners as well as teachers (Sanyal, 2001; Mooij, 2007; Cross and Adam, 2007; UNESCO, 2002; Bhattacharya and Sharma, 2007);
- Eliminating geographical barriers as learners can log on from any place (Sanyal, 2001; Mooij, 2007; Cross and Adam, 2007; UNESCO, 2002; Bhattacharya and Sharma, 2007);
- Asynchronous interaction is made possible leading to thoughtful and creative interaction (Sanyal, 2001; UNESCO, 2002; Bhattacharya and Sharma, 2007);
- Enhanced group collaboration made possible via ICT (Plomp et al., 2007; Sanyal, 2001; Bhattacharya and Sharma, 2007);
- New educational approaches can be used. (Sanyal, 2001);
- It can provide speedy dissemination of education to target disadvantaged groups (UNESCO,

2002; Chandra and Patkar, 2007);

- It offers the combination of education while balancing family and work life (UNESCO, 2002; Bhattacharya and Sharma, 2007);

- It enhances the international dimension of educational services (UNESCO, 2002);

- It allows for just in time and just enough education for employees in organizations (UNESCO, 2002).

- It can also be used for non-formal education like health campaigns and literacy campaigns (UNESCO, 2002).

E learning allows higher participation and greater interaction. It challenges the concept that Face-to-face traditional education is superior to it (Bhattacharya and Sharma, 2007).

The web and the Internet is the core ICTs to spread education through e-learning It also facilitates inter disciplinary research (Chandra and Patkar, 2007). Plomp et al (2007) state that the experience of many teachers, who are early innovators, is that the use of ICT is motivating for the students as well as for the teachers themselves. Bottino(2003) and Sharma (2003) mention that the use of ICT can improve performance, teaching, administration, and develop relevant skills in the disadvantaged communities. It also improves the quality of education by facilitating learning by doing, real time conversation, delayed time conversation, directed instruction, self-learning, problem solving, information seeking and analysis, and critical thinking, as well as the ability to communicate, collaborate and learn (Yuen et al, 2003).

Casal (2007) mentions that ICTs also provide a platform for sharing information and knowledge used ICT helps researchers by provision of information, networking, online journals, libraries and data. The possibility of real time interaction in all the different aspects of the education system like teaching, collaboration, debates etc. Hold great promise for the future (Mason, 2000). ICT enabled distance education provides environmental benefits, as there is a major reduction in the amount of student travel, Economies of scale in utilization of the campus site are generated, Student housing is not needed which further saves costs (Barrat, 2006).

E-education can provide access to the best gurus and the best practices or knowledge available (UNESCO, 2002). Mooij (2007) states that differentiated ICT based education can be expected to provide greater reliability, validity, and efficiency of data collection and greater ease of analysis, evaluation, and interpretation at any educational level. It also boosts the confidence

level and the self-esteem of the students who acquire the ICT skills through the process of being exposed to such kind of learning (Casal, 2007). Mooij (2007) also puts forth the view that ICT-based registration, evaluation, and administration helps to link different levels of information and facilitate an overall view of the whole educational setup. It increases education provision substantially and can contribute to mass education. It also creates competition among the institutions for providing education and hence improves the quality (Cross and Adam, 2007).

Table 2: Benefits of ICT in education to the main stakeholders

Stakeholder	Benefits
Trainee	<ul style="list-style-type: none"> <input type="checkbox"/> Increased access, <input type="checkbox"/> Flexibility of content and delivery, <input type="checkbox"/> Combination of work and education, <input type="checkbox"/> Learner-centred approach, <input type="checkbox"/> Higher quality of education and new ways of interaction.
Employers	<ul style="list-style-type: none"> <input type="checkbox"/> High quality, cost effective professional development in the workplace, <input type="checkbox"/> Upgrading of employee skills, increased productivity, <input type="checkbox"/> Development of a new learning culture, <input type="checkbox"/> Sharing of costs and of training time with the employees, <input type="checkbox"/> Increased portability of training,
Governments	<ul style="list-style-type: none"> <input type="checkbox"/> Increase the capacity and cost effectiveness of education and training systems, <input type="checkbox"/> To reach target groups with limited access to conventional education and training, <input type="checkbox"/> To support and enhance the quality and relevance of existing educational structures, <input type="checkbox"/> To ensure the connection of educational institutions and curricula to the emerging networks and information resources, <input type="checkbox"/> To promote innovation and opportunities for lifelong learning,

Source: (UNESCO, 2002)

The last two decades have witnessed a revolution caused by the rapid development of Information and Communication Technology (ICT). ICT has changed the dynamics of various industries as well as influenced the way people interact and work in the society (UNESCO, 2002; Bhattacharya and Sharma, 2007; Chandra and Patkar, 2007). Internet usage in home and work place has grown exponentially (McGorry, 2002). ICT has the potential to remove the barriers that are causing the problems of low rate of education in any country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education as well as to overcome time and distance barriers (McGorry, 2002).

2.5 Technology for Citizen

According to Anyakoha (1991), information technology is “the use of man made tools for the collection, generation, communication, recording, re-management and exploitation of information. It includes those applications and commodities, by which information is transferred, recorded, edited, stored, manipulated or disseminated”. Hawkrige (1983) describes information technology as a revolution which has penetrated almost all fields of human activity, thus transforming economic and social life. UNDP (2001) asserts that even if sustainable economic growth facilitates the creation and diffusion of useful innovations, technology is not only the result of growth but can be used to support growth and development. At the heart of technology lie two main or branches of technology: computing and Telecommunication. The technologies covered are the computer system, Internet/electronic mail (e-mail), mobile phone, and fax machine

Computers

Computers were originally used by scientists for calculating numbers, and have gradually become useful in offices and industries. In recent times, simplified models that can be used by almost everybody have become common in schools and homes for accomplishing many varied tasks and applications (Madu 2000). Fapohunda (1999) lists the uses that computers are now commonly put to: writing letters, and reports, printing books, newspapers, and magazines, drawing pictures and diagrams, doing statistics, mathematics and handling

financial records, controlling traffic lights, flying aeroplanes, making and playing music and video, sending messages anywhere in the world. Internet The Internet is a global collection of many types of computers and computer networks that are linked together. It is increasingly becoming the solution to much information, problems, information exchange, and marketing (Adesanya, 2002). Eseyin (1997) describes the Internet as a mixture of many services with the two most commonly used being electronic mail (e-mail for short) and the World Wide Web. It plays a significant role in education, health, political processes, agriculture, economy, businesses and newsgroups. Woherem (2000) states that with Internet connectivity, one can do business all over the world without physical contact with the buyer or the need for a business intermediary.

E-mail

Electronic mail (e-mail) is the exchange of text messages and computer files transmitted via communications networks such as the Internet (Nwosu, 2004). Fapohunda (1999) sees the e-mail system as the equivalent of postal mailing services, with the biggest difference being the time and cost involved. And not only written data, but all sorts of information in the form of video, audio, or photographs, can be sent via e-mail. Oketunji (2000) describes e-mail as an increasing popular method of communication, especially in the workplace.

Mobile Phones

Bittner (1989) defines mobile phones as a telephone system that can move or be moved easily and quickly from place to place. Mobile phones were once the tool of rich and busy executives who could afford both the luxury. Mobile phones are now the ICT that is reshaping and revolutionizing the communications globally. Its impact on the economic activities of nations, businesses, and small entrepreneurs is phenomenal. According to Marcelle (2000), the availability of this new technology has been reshaping the material basis of the society as well as bringing about a profound restructuring of economic, political, and cultural relations among states planning, immunization, prevention and control of endemic diseases. The combination of modern communication devices could play significant roles in the collection and dissemination of global information. Oji-Okoro

(2006) supported this view by stating that mobile telephony usage by individuals enables them to communicate with loved ones, clients and business associates. For large businesses.

Fax machine

Tele facsimile systems permit the transaction of images (photos, printed images, maps, drawings) and their reproduction on paper at a remote receiver. Facsimile (fax) is not a new service; however, advances in digital imaging technology and microelectronics have caused a sharp drop in prices with a significant increase in capacities (O'Brien, 1996). “Long distance copying” might be an appropriate nickname for this telecommunication process. Any document, whether it is handwritten, contains pictures, diagrams, graphs, charts or typed text can be transmitted at a great speed for relatively low cost. The fax System is widely available; most organizations have at least one fax machine

2.6 Application of ICT in TVET System

Types of assessment began in the 1960s and have been focused mainly on core subjects, such as mathematics, science and reading. Over time, assessments began to include the use of ICT in education, such as the “Computers in Education” study conducted in the late 1980s and early 1990s, under the auspices of the (IEA) (Pelgrum and Plomp, 1993). The type of international comparative assessments which exist currently include: Project projects by international organizations, i.e. projects funded by the European Commission(Eurydice, 2004) and the World Bank (Hepp et al, 2004) and secondary analyses of assessments conducted by the Organisation for Economic Co-operation and Development (OECD, 2006); and so a study looking at innovative pedagogical practices using ICT (Kozma, 2003); International assessments (e.g. PISA, IEA-TIMSS and IEA-PIRLS) using national representative samples of schools, teachers and/or learners, and focusing on collecting and producing comparative indicators on educational processes and outcomes; and, Regional assessments such as the Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ, n.d.) and the Assessment of Pupils' Skills in English in Eight European Countries (Bonnet, 2004).With the use of computers in

education, ICT was expected to lead to more productive learning. Yet early studies on the impact of ICT on educational outcomes did not produce very consistent results. Recent Meta - analyses (Kulik, 2003; Cox and Abbot, 2004) point to a more positive picture. The overall conclusion of Cox and Abbot is that research has identified positive effects As InfoDev (2005) concluded; there is an absence of "widely accepted standard methodologies and indicators to assess the impact of ICT in education". Traditional curriculum-oriented assessments primarily focus on students as the units of data collection and analysis ('primary indicators'), while 'secondary indicators' are collected at school and teacher levels on aspects related to school conditions, teaching and learning processes. IEA has performed international comparative assessments that focus on measuring student achievement in mathematics, science and reading (such as PIRLS 2001, etc). Information and communication technology has impacted positively on initial and in-service TVET instructional evaluation and delivery. When ICT is used effectively and appropriately in Technical Vocational Education and Training, it can enhance exploratory play, cooperation, discussions, creativity, support, flexible thinking among student, listening and problem solving Mallard (2004). ICT application in the field of education is gaining popularity among educational organisations and their stakeholders (Tondeur, van Keer, van Braak, & Valcke, 2008). TVE in this context is not an exception too; the use of ICTs to foster employability skills is highly recommended (Saud, et-al, 2011). However, the use of Information and Communication Technologies (ICTs) toward the preparation of TVE graduates; and in their mode of training should also incorporate the use of e-learning in teaching learning process. E-learning (ICT based learning environment), enables students, trainees and teachers/instructors interact virtually without physical contact. E-learning or web-based instruction as the name implies refers to The use of electronic technology and media to deliver, support and enhance teaching, learning and assessment. It includes elements of communication within and between communities of learners and teachers, as well as provision of online content, which may be locally generated or developed elsewhere. (O'Leary et., al., 2003) Along with these advancements, the WWW has become the emerging technology for education and training. "Anytime, anywhere learning over the web" is now an essential facet for any education institution. E-Learning, which is the idea of conducting learning and teaching over a network - is a fast, inexpensive and effective alternative to many comparable face-to-face educations. The availability of new technologies has made it easier to develop interactive resources for learning.

In obtaining the integration of ICT into teaching learning process, all ICT frontline staff must understand how education technology can support pedagogy, thus resulting to better student performance (UNESCO, 2005).

In 2008, UNESCO defined its vision for ICT in education: “A world without boundaries where technologies support education to build inclusive knowledge societies”. Information and Communication Technologies (ICT) are fostered by UNESCO-UNEVOC by using its online services as a tool to communicate with the UNEVOC Network and facilitate knowledge exchange in the global TVET community.

2.6.1 Application of ICT in TVET Financial Administrative

The record of purchases budget, grants administration, cash flow, audit and other financial transactions carried proper documentation for reference purpose. These records were kept in hardcopies before the introduction of ICT. Fortunately, the availability and accessibility of ICT and their integration in financial sector makes it possible and easy for accountants and financial administrators to process all transaction online via the system called an e-accounting. Electronic accounting (e-accounting) as the name implies, makes it possible for transactions to be captured, measures, recognized and reported electrically (Razae el at 2009). E-procurement is another new paradigm taking lead into financial administration as a result of development in information technology. E-procurement according to Bof and Prevatali (2010) “is a collective term for a range of different technologies that can be sued to automate the internal and external processes associated with the sourcing and ordering process of goods and services”. They further states that “on-line purchases and payment for goods and services in virtual market constitute crucial elements of e-procurement. Successful adoption leads to potential benefits, which include the reduction of transaction costs, operational efficiencies and a better foundation for decision making”. considering the specialized nature of TVET systems, and its peculiarity in terms of requirement for different varieties of training materials or consumables, e-procurement system can fit and beneficial in dealing with purchases and supply. While e-procurement has impact on cost reduction, efficiency / productivity, effectiveness and transparency, its adaptation in

polytechnic system is essential. Development of ICT in TVET using tools such as e-accounting and e-procurement will to a greater extent make significant impact on the growth and development of the programme. “The benefits of e-procurement in public organizations will be the follow:

1. Accelerations of execution of procedures
2. Reducing the time of the purchasing process
3. Reducing the expenses of announcements management
4. Simplification of process, resulting from a re-engineering of such process
5. The direct and constant monitoring of public spending by conducting comparative analysis between the purchasing of similar products in different administrations.
6. Professional growth of employees
7. The opportunity to spend time out of routinely administration tasks (automated by new tools) through activities with higher adopted value to the functions specific purchases (e.g. marketing intelligence)
8. A major transparency due to the uniformity of access to information without discrimination since the tender documents are online, to the standardization of procedures to ensure that processes can be more easily controlled toy external actors in time and according to the quality of services provided in that each supplier will not be discriminated against (for example information asymmetries)” (Bof and Previtoli, 2010). The above benefits are in line with UNESCO and ILO (2002) recommendations that “administrators should keep up to date with new administrative techniques and friends, especially through relevant lifelong learning programmes. They should receive special training in the methods and problems associated with the specific features of polytechnic programmes such as flexible entry and re-entry patterns, continuous training in the workplace, and relevance to the needs of the world of work. This preparation should include:
 - a. Management methods appreciated to educational administration, including techniques that utilize information and communications technology
 - b. Financial planning methods that facilitate the allocation of available resources, given the objectives and priorities of the various programmes and ensure their efficient utilization.

- c. Contemporary human resources management and development methods (UNESCO and ILO 2002).

Table3: Administrative uses of ICT

USE OF ICT	SPECIFIC FUNCTIONS
Accounting	Budgeting, purchasing, grants administrations, cash flow, account receivable, account payable, audits
Staff administrative services	Human resources management assessing staffing needs, recruiting staff, monitoring staff performance, keeping records, communicating with staff. Human resources development conducting needs assessment, needs analyses and training needs analyses, delivery and assessing employee training
Student administrative services	Recruiting and selecting students, advising students, supporting prior learning assessment and recognition, registration, recording attendance and fee payment.
Support services	Providing programme information calendar featuring programme and course descriptions, pre-requisites and other requirements, keeping records to comply with freedom of access to information, maintaining web site, giving access to administrative units, faculties and departments, managing computer and e-mail accounts for facilities and students.
Research and evaluation	Conducting institutional research, programme evaluation and student assessment of faculties, statistical analyses.

Source: chinien (2003)

2.6.2 Applicability of ICT in TVET Staff Administrative Support Services

Staff administrative support services is achievable through effective ICTs integration. Due to the distinct nature of TVET system, administration support requires ICT tools embedded in them special features meant to take care of the management of training facilities, tools and equipments both in hard and soft copies. Horn and Siew (2011) notes that ICT tools such as Facility FMS, FBS, BCMS and RTMS could help both staff and students to use university facilities conveniently. Though their study was conducted in universities, it is equally important to acknowledge the use of such ICT tools for administrative support for both students and teachers in an academic cycle. In a related study on the “Primary School Teachers’ use of ICT for administration and management The implication for TVET teachers/staff will be on the aspects of online purchase of goods and services (consumables and repairs) and resources record keeping. Record keeping using ICTs help TVET staff especially workshop/laboratory instructors/attendants fast track the movement of tools, equipments and machineries in use by students. This is to avoid double allocation and to reduce the risk of injuries due to congestion in the work spaces. Appropriate safety regulations will also be applied smoothly using appropriate ICT tools in TVET. Mumcu and Usluel (2010) observes that teachers in vocational and technical schools use ICTs most frequently for managerial purposes and least in teaching learning processes.

2.6.3 Applicability of ICT in TVET Trainees Administrative Support services

Trainee’s administrative services using information technologies application packages are too numerous to use of technology in both staff and trainee’s administrative services (Leung et al., 2005). ICT tools such as e-tutor and e-student systems could provide significant atmosphere in the preparation of technical education graduates to face the challenges for the world of work in the 21st century (Seng, 2007). Several ICTs and computer-aided administration application packages highly enriched with current and emerging technologies are readily available and can be found to support student’s activities in schools and colleges. Among these latest ICT tools, RFID system appeared to be one. According to Akpir and Kaptan (2010), “(RFID) is a term that

is used to describe a system that transmits the identity of an object or person in the form of a unique serial number, using radio waves . Apart from its numerous applications that cut across human endeavor, RFID application in educational administration include APIS, class/laboratory/library attendance management, static/dynamic authorization, submission of warnings/ announcements and e-money usage” (Akpınar and Kaptan, 2010). The flexibility and richness of this system Apart from trainee offering TVET courses in schools and colleges, those offering the courses at distance needs support via ICTs in so many ways ranging from registration, result access, documentation, courses information retrieval, inquiries etc. Strong and reliable ICTs network enables students to have access to course material and support services anywhere any time. Wonacott (2002) states that; “Distance students must rely on secure, easily accessible ICT for clear, detailed information about enrolment, modules, courses, requirements, assessments, expectations, and sources of help; the opportunity to enroll, pay fees, and complete all administrative procedures; regular contact and timely response and feedback from instructors; a variety of methods to communicate with teachers (email, online chat, bulletin boards); enrolment information linked to application forms; and online assessments” (Wonacott, 2002)

2.7 The Information Revolution and Globalization

Globalization is a phenomenon that is multi-dimensional and multifaceted. It has economic, political, socio-cultural and educational implications (Robertson, 1992; Guillen, 2000; Obilade, 2003; Yau, 2005). It is the transformation of domestic matter to a matter of international concern. Yau (2005) argues that globalization is all about greater interaction among countries and people. He however fears that this integration is dangerous in many ways because of disparities existing between developed and developing countries particularly as it concerns information and communication technologies, the engine that powers globalization. In line with this, Chang (2008) fears that globalization is a sugar-coated bitter pill which has reduced developing countries to mere appendage of Western super powers. Undoubtedly, globalization has deep economic dimensions; conquest, dominations and trade. The underlying principles of globalization are integration, liberalization and privatization (Cogburn and Adeya, 1999) which have impacted on government policies particularly as it concerns higher education. Therefore,

Gilbert (2007) has reasoned that these developments mean an uncontrollable process of globalization in education system and can at the same time offer new perspectives to solving educational problems. Education is now more concerned with critical thinking and self-directed learning opportunities which will serve the individual over a life time. In the era of globalization, information revolution is a critical factor which is reshaping the education processes. Corburn and Adeye (1999) have noted that the driving force behind the current information revolution is the new technologies that go with information and communications technology (ICT). These technologies continue to provide enabling environment for global education process in which geographical regions are benefiting one way or the other from the vast opportunities in the global education industry (Geleijnse, 1994). However, for this to be made possible Emeagwali (2004) and Yau (2005) posit that critical infrastructures must be in place. These infrastructures include computers and internet connectivity, sustainable power supply, human capacity development and the political will by the government. Peraton and Greed (2000) has identified a numbers of opportunities that the new information environment can provide for scholars and students. These include unlimited access to data bases scattered around the globe through the internet. According to Ite (2004), contact, collaboration and communication have provided veritable environment for linkage programmes between and among University. This has definitely added values to higher education globally. Studies have provided evidences that Africa has the lowest web presence globally (Emeagwali, 1997; Peraton and Creed, 2000; Mutala, 2002; Omekwu, 2003; Yau, 2005). Mutala's study reveals that Africa's global web contribution is about 1.08%. Similarly, Peraton and Creed (2000) are worried that more than 80% of global website is from North America and Europe and more than 85% of scientific publications are also from the same area. The poor global web presence in African countries. Owing to this Akanni (2008) believes that a sure way to respond to the challenges of globalization and information revolution is the provision of virtual library services in higher institutions.

2.8 Factors Influencing the Effective Integration of ICTS in TVET

Several factors have been identified to have influenced effective integration of ICTs in general education by different review studies (Brummelhuis, 1995 in Drent and Meelissen, 2008) and

agencies (BECTA, 2004). Kotsik et al. (2009) observed that integration of ICTs into TVET could be achieved, when the following factors are not neglected; strategic readiness, pedagogical readiness, organizational readiness and technical readiness. Each of these conditions embedded in it some significant and distinctive criteria that must be attained for the smooth integration of the ICTs in TVET. Strategic readiness is the preparation stage that is accomplished by developing a wide-ranging master plan for the incorporation of ICTs into TVET. This preparation should include the vision, mission, values, objectives, strategies, timeframe and the evaluation scheme for ICT initiatives. It should also outline the budget to cover costs related to hardware and software, connectivity, maintenance and staff training. The plan should clearly delineate the purposes of ICT-mediated learning with respect to current practices. It should be widely disseminated amongst all key stakeholders. Pedagogical readiness focuses on the fit between ICTs and current teaching and learning practice. To be pedagogically ready, TVET institution must complete an assessment of the compatibility of ICTs with the current philosophy of learning, an examination of various opportunities for including ICTs in TVET, an assessment of the technological proficiency requirements for teachers and learners, ensuring that ICTs will meet learners' educational needs, and provision that instructors are competent to facilitate ICT-mediated learning. Organizational readiness focuses on teachers' involvement in integrating ICTs into TVET. The following key questions are used to assess organizational readiness. To what extent do TVET institutions embrace innovation and change? Do teachers support the integration of ICTs in TVET? Has the necessary leadership been provided to champion and rally support for ICT integration? Has the existence of training support systems been communicated to TVET teachers? Organizational readiness also ascertains that the necessary actions have been taken to ensure that TVET teachers possess the necessary ICT competencies.

These actions include conducting needs assessments to determine the ICT comfort level of teachers, establishing minimum training standards, developing training plans and establishing appropriate mechanisms to monitor training results. Technical readiness addresses issues related to infrastructural requirements for ICT integration. The following key questions are used to assess technical readiness. Has an overview of existing technologies been established? Have existing technologies been benchmarked against those available in the marketplace? How well does the current technological infrastructure meet the basic requirements for ICT integration in terms of hardware, connectivity, educational software, software licenses, systems maintenance

and staff training? Is it necessary to develop a plan for a new technological infrastructure? Has the existence of technological support systems been communicated to all key stakeholders?

2.9 Previous Research Findings in Measuring ICT Competency

ICT competency can be measured in several ways. The simplest measure is whether a student uses a computer or not. More interesting indicators are the frequency of ICT use – eg: once a week – and the time spent using ICT – eg: one hour a day. Finally, there are measures related to the specific use of ICT, from broader use, eg: Internet, to more precise activities, eg: searching the Internet for school related work. In order to assess the impact of ICT use, one would need a measure of both the specific activities carried out through ICT and the time spent in each activity.

The PISA 2006 survey includes questions about the location and frequency of student computer use. The survey asks students to rate their frequency of computer use at three locations: home, school, and other places. Computer use is rated according to five frequencies: “never”, “once a month or less”, “a few times a month”, “once or twice a week” and “almost every day(OECD, assessing of ICT)”.

Several studies have pointed out that simple measures of ICT use, such as physical access or frequency of use, are not sufficient to assess the impact of ICT on student performances (Wenglinsky,1998). What really matters is the degree of “engagement” with ICT. Engagement refers to a situation, where the user exerts a degree of control and choice over the technology, thus leading to a ‘meaningful use of ICT’ (Bonfadelli, 2002; Silverstone, 1996).

Engagement, therefore, is about how people develop relationships with ICT in a way that its use is useful, fruitful and relevant to them (Garnham, 1997; Jung et al., 2001). Bunz et al., Bunze,U., Curry,G,& W.voon (2007) investigated general operating system skills (related to saving, storing and retrieving files), and email and web skills (related to email and internet applications), asking respondents how much thought the listed activities would require.

Van Braak, J.P. (2004) analysed word processing skills, next to operating system and web skills. Ballantine et al, and McCourt et al,(2007) used several sub-dimensions such as ‘knowledge of

general computing', spread-sheets, word processing, databases, email/internet and presentation software, both as perceptions and in an objective way to measure computer literacy.

S. Poelmans, F. Truyen, Car. Stockman (2012) measured ICT skills in six dimensions: file management, technical issues, legal issues, security, internet use, and risk awareness of one's online traceability. Each measure consists of 4 to 6 items, referring to particular activities that are deemed important. The item pool was generated on the bases of findings of the Information Companion project, In with more than 25 ICT lecturers and researchers were directly involved. The activities were very specific such as moving several files to a different map or location', 'synchronizing folders between several computers', 'setting up a firewall', '(re)formatting a hard disk', 'adding information to a wiki', 'sharing a digital document with several people over the internet', etc. The skills were listed and respondents could answer on a 5-point Likert-type scale containing the categories 'much thought (mental effort)', 'quite some thought', 'some thought, 'a little thought', 'almost no thought at all (automatically)', responding to the question "How much thought or mental effort does it take to execute the tasks or activities?".

New south wales Government is periodically preparing online multiple choice items for measuring ICT skills, It divided ICT skills to five categories, computer operation, word processing, spreadsheet, Internet and email, graphic and multimedia.

Haolader and Usama (2012) measured the ICT competency of TVET trainee teachers and they compared the level of ICT skills among trainee teachers having educational background of electrical department, mechanical department, computer science department of IUT, Bangladesh. They divided ICT competency test to four categories, computer operation and issues, use of office application software, use of internet resource, use of peripheral ICT equipment, they investigated that the level of ICT skills of the trainee teachers with different background, the findings showed that the trainee teachers have average level of competency toward the use of ICT, the mean point of achievement test was 67.228.

ICT played significant role in skilled manpower development, especially in the area of engagement of vocational technical students, development of skilled ICT professionals, establishment of ICT human infrastructures, increased knowledge of computer, acceleration of capacity building, and strengthening vocational technical teaching in (Ben, Camilus Basse and Ashang, Michael Ushie. 2013).

2.10 Summary

From the review of the related literature, the studies show that ICT have critical role to play in education, for example;

- tools to help create equal opportunities,
- catalyst for changes
- means to improve the quality of learning facilities and administration
- ICT skills play key roles in integration /use of ICT.

CHAPTER 3

Method and Procedure

3.1 Introduction

This chapter presents the methods and procedure used in conducting the research, the methodology employed to test. Population, samples, tools of research, test planning and design and a summary of the chapter.

3.2 Population

The population of this research consisted of TVET trainee teachers from two OIC countries: Kingdom of Saudi Arabia (KSA) and Bangladesh. In Saudi Arabia there is one institute providing TVET teachers training programs. This one is Technical Trainers College (TTC) in Riyadh (GIZ. 2014). The TTC in Saudi Arabia admits 250 trainee teachers each year for its 3-Year BScTE program. The qualification requirement for enrolling this program is Higher Diploma. Study programs focus on trainee becoming vocational pedagogy. Technical Trainers College (TTC) has been accredited according to European standards by the Central Agency and Accreditation Agency (ZEvA) Hannover, Germany (TTC A academic Trainees Service, online). In Bangladesh there are two institutes providing TVET teachers training programs. One is in Gazipur, Dhaka and the other one is in Tejgaon, Dhaka. The Islamic University of Technology (IUT) in Gazipur offers TVET teacher training programs through its Department of Technical and Vocational Education. The Department usually admits 15 trainee teachers for DTE 1-year program, 20 for BScTE 2-Year Program, and 15 for BScTE 1-year program. The other one is

Technical Teachers Training College (TTTC) in Tejgaon, Dhaka admits about 30 trainee teachers each year.

3.3 Sampling

The samples of this study were selected based on availability to the researcher. From TTC in Saudi Arabia 40 trainee teachers took the test. From TVE Department of IUT 30 trainee teachers took the test. Although the researcher intended to collect data from TTTC, but due to some administrative problem it was not possible.

3.4 Tools of Research

The research tool consisted of an achievement test. The test was designed to capture the basic ICT skills of TVET trainee teachers. The following Sub-Sections describe the achievement test in detail.

3.4.1 Test Planning and Designing

The objective of the test is to measure the basic ICT skills of trainee teachers. Therefore the test should be designed in such a way that measures mainly basic ICT skills. The time duration of the test is one of the important factors to be fixed before constructing the test instrument. The test processing time was fixed to 50 minutes so that teachers are not tired and bored sitting in the classroom for a long time. The second reason to limit the test duration is that the trainee teacher may not hold the motivation when the test-time is too long. A shorter duration might not be able to capture sufficient information over the ICT skills, the language of the questionnaire and answer is another important factor. As mentioned earlier the trainee teachers are from two counties, Bangladesh and KSA, teachers from both counties should be presented the same questions, however, it has been planned that the language of the questions would be in English, because in both counties English is the medium of instruction. The test items were designed in such a way that the trainee teachers are able to answer to the questions without using pen, paper, and handbook. They will answer the question on soft copies, on online or on offline, and use

only keyboard and mouse. Furthermore, the emphasis was to design questions predominantly as “practical” and “real-world” situation tasks. It has been proved that domain-specific knowledge; the test must integrate enough easy questions. In addition, some general test elements covering related/ other fields of learning should be included which is a prerequisite to cope with future ICT problems. Some test elements should demand relatively higher level knowledge that can only be solved by very good trainee teachers. The simplicity of the English language, correctness were considered for better understanding and to avoid ambiguity/ confusion, as English is the second language of the trainees from both countries.

3.4.2 A Brief Description of the Test Instrument

The test was developed to measure the level of basic ICT skills of TVET trainee teachers. The test consisted of 50 multiple-choice items. Majority of the test items were taken directly from online (Board of studies NSW. Online). However, the researcher developed some of the items. The items were grouped into five categories: Basic Computer Operation, Word Processing Skills, Spreadsheet, Internet and Email (E-communication), Graphics and Multimedia (including power points). Each category consisted of 10 items. Expert teachers were consulted during the test construction phase. The multiple choice items are designed with one correct item out of four to be taken seriously, and three should be clearly wrong. Each item carried 2 marks. The total marks of the five categories were 100. A pilot test was carried out with a small group of trainee teachers in TVE Department of IUT Bangladesh. On the basis of the pilot test results and according to the expert advice, some items were re-constructed, rearranged, explained for better and clearer comprehensibility. The time duration of the test was closely observed during the pilot test phase and the number of items was adjusted according to a predetermined test time. This procedure ensures the optimal time usage. Relevant pictures, tables/ data-sheets were included in order to make the test understandable and attractive to the students. The complete set of the test items is given in the Appendix A.

3.5 Test Validity and Reliability

Validity has been defined by “the extent to which [a test] measures what it claims to measure” (Gregory, 1992, p.117). The focus here is not necessarily on scores or items, but rather inferences made from the test instrument. That is, the behavioral inferences that one can extrapolate from test scores is of immediate focus. In order to be valid, the inferences made from scores need to be “appropriate, meaningful, and useful” (Gregory, 1992, p. 117). These distinctions illuminate the inextricable link between validity and reliability. For example, a testing instrument can reliably measure something other than the supposed construct, but an unreliable measure cannot be valid (Crocker & Algina, 1986; Gregory, 1992). In recent years, more emphasis has been placed on the social utility and bias of interpretation in test scores. Messick (1995) has been at the forefront of this push for the consideration of consequential validity within the context of a measure’s construct validity. Consequential validity refers to the notion that the social consequences of test scores and their subsequent interpretation should consider not only with the original intention of the test, but also cultural norms (Messick, 1995).

3.5.1 Validity of the Test Instrument

To validate the ICT skills test used for this research, the test items were presented to the experts/teachers. These experts/ teachers have a long teaching and /or industry experience in the field of information and communication technology (ICT). Additionally, the experts were provided with a questionnaire for the assessment of the test-items on the basis of a five–point answer scale as shown in Figure 1. They were asked if the content of each individual item was relevant to the basic ICT skills required for TVET teachers. Furthermore, this questionnaire asks: the degree of complexity and comprehensibility.

-Is the content of this question relevant to basic ICT skills	Yes <input type="checkbox"/>	No <input type="checkbox"/>			
	Very low <input type="checkbox"/>	Low <input type="checkbox"/>	Average <input type="checkbox"/>	High <input type="checkbox"/>	Very high <input type="checkbox"/>
-The degree of complexity of the items	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-The degree of comprehensibility of the items	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure1: The questionnaire for assessing the Items used for the basic ICT skills test

Thus the content validity was estimated from the opinion given by teachers/experts. Figure 2 shows the content validity of all the items under all categories in the test. The degree of complexity and comprehension were estimated from the data given by the same experts/teachers. They are as presented in Figure 3 and Figure 4.

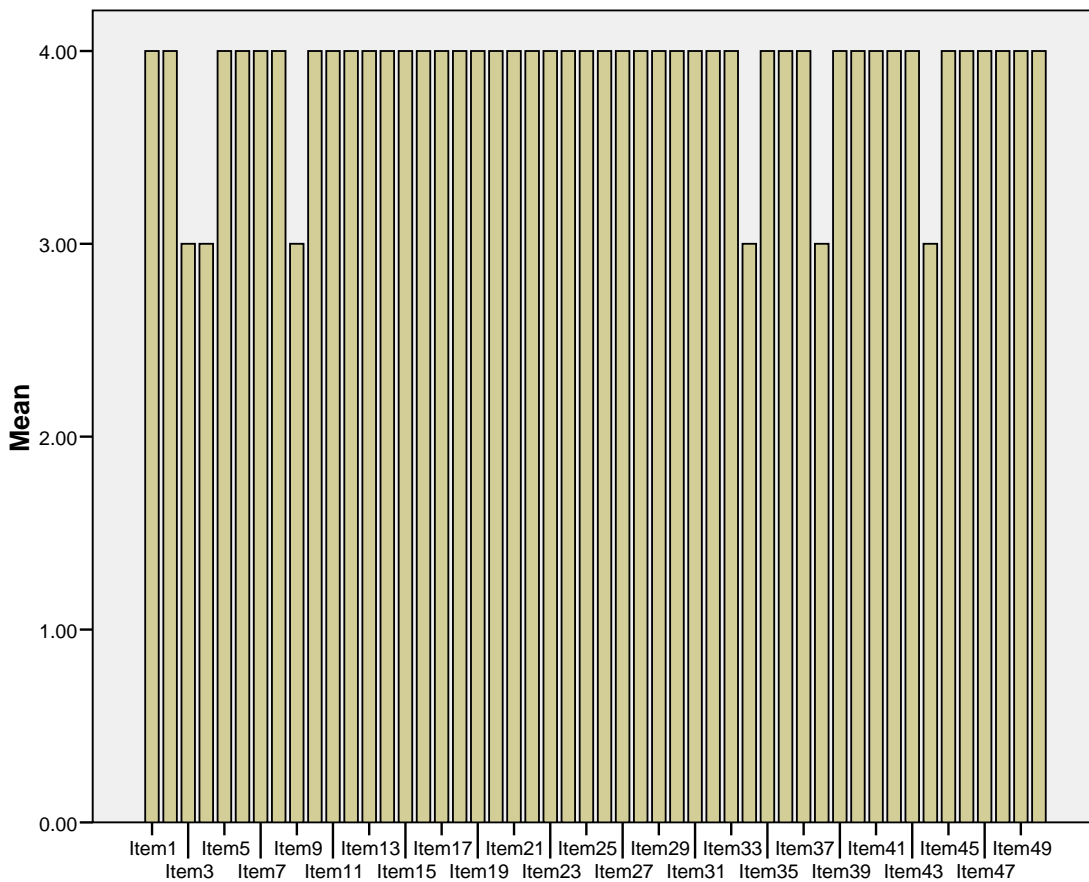


Figure 2: The content validity of the items relevant to basic ICT skills a assessed by expert/teachers

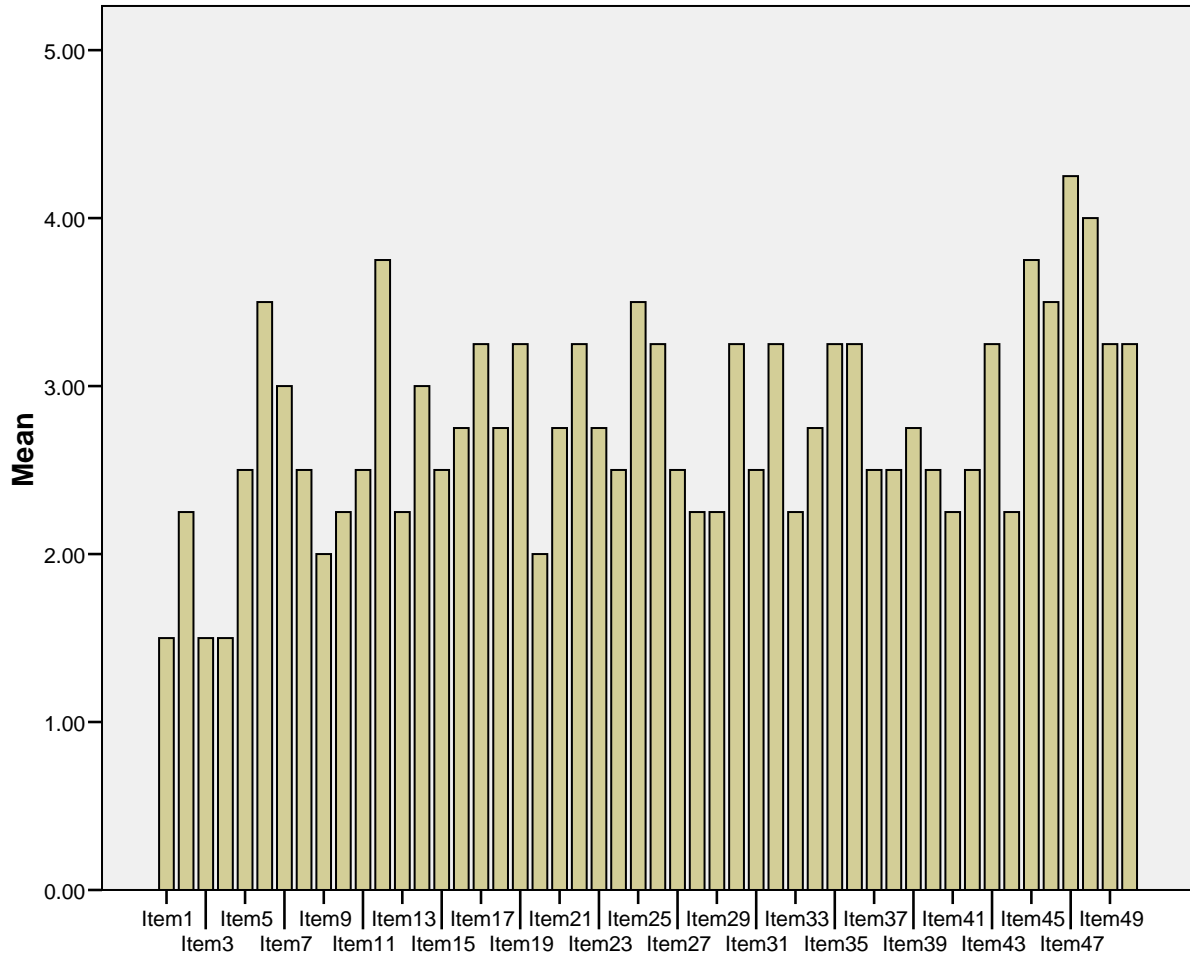


Figure 3: The degree of complexity of the Items assessed by expert/teachers

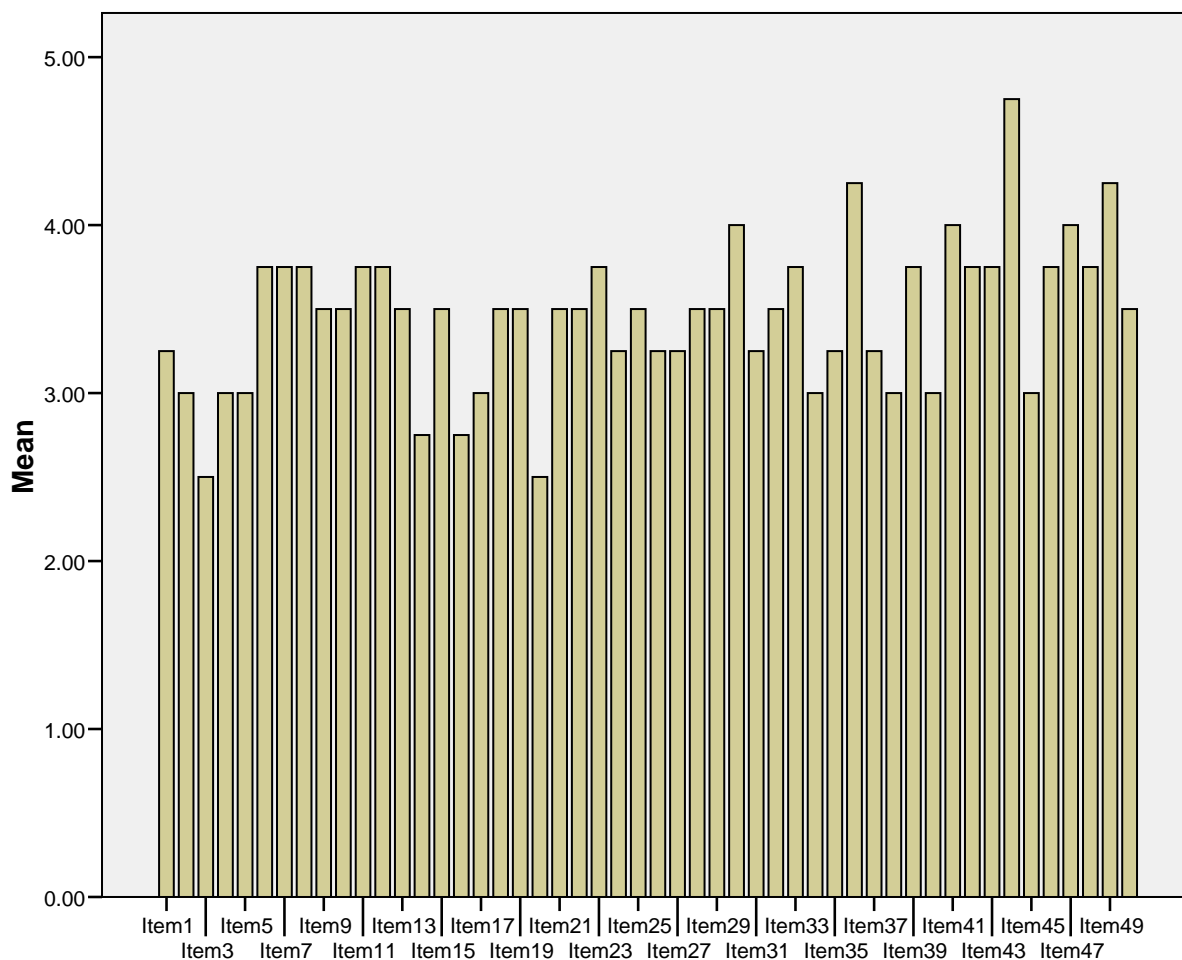


Figure 4: The degree of comprehensibility of the Items assessed by experts/teachers

3.6 Test Administration and Data Collection

As mentioned above a test was developed for measuring the basic ICT skills of trainee teachers. Therefore, the level of trainees' ICT skills was measured through conducting the test. The test was conducted during the period of May and June 2014. The following Sub-Sections describe how the test was administered and the data was collected both in Bangladesh and in KSA.

3.6.1. In Bangladesh

In Bangladesh the author himself administered the test with the help of class teachers during the class period. A total of 30 TVET trainee teachers took the test. They are currently undergoing

teacher training at under-graduate level (first year to final year) in the department of Technical and Vocational Education of IUT. These teachers have the prerequisite qualification of Diploma level with different specializations, such as, 11 TVET trainee teachers have Diploma qualification in Electrical and Electronic Engineering, 9 offering Mechanical Engineering , and 10 offering Computer Science. All the teachers sat in a computer lab and took the test on PCs. The duration of the test was 50 minutes. Sitting arrangements were made allowing enough space between trainees so that one cannot see the answers of others. A class teacher and the author himself were present while the test was running (test monitoring). Before beginning the test, trainee teachers received a brief review as to why they are going to take the test. Also guidelines for taking the test were read out to the trainee teachers as given on the first page of the ICT skills test (Appendix A). At the end of the test the test scripts was assessed and scored out of 100 marks. Although the researcher intended to collect data from Technical Teachers Training College (TTTC) in Dhaka, but due to some administrative problem it was not possible.

3.6.2. In Saudi Arabia

At the beginning of the study it was planned that the test would be administered and conducted under direct supervision of a TTC teacher who promised to work and support this study. Later the author lost contact with this teacher. Failing to establish further contact with another teacher(s) the author planned to take the test online by using Google form with direct participation of TVET trainee teachers studying at TTC in Saudi Arabia. Due to many reasons the author couldn't travel to Saudi Arabia because the allowance was not enough and not provided with extra money to do research. As mentioned in this chapter, section 3.2, the trainee teachers are from the first year to final year. They have a qualification of Higher Diploma (HD) with different specializations, such as 6 trainee teachers in Electrical and Electronic Engineering, 17 trainee teachers in Telecommunication Engineering, 10 trainee teachers in Computer Science, 7 trainee teachers in Mechanical Engineering. All the trainee teachers sat in computer lab and took the test online on PCs. The duration of the test was 50 minutes. At the end of the test the test forms were assessed and scored out of 100 marks.

3.7 Data analysis

As mentioned above the basic ICT skills of TVET trainee teachers were measured through a competence test. The test scores (the data) were analyzed using quantitative approach. IBM SPSS Statistics Version 20.0 tool was used to test the inequality and equality of the mean values of the two groups and also for providing relevant statistics of the data.

3.8 Performance Assessment Bench Mark

We set the bench mark for grading as follows: Very competent = 100 < 85%, Competent = 84 – 70%, Average = 69-55%, Not competent = 54 – 40%, based on IUT's student performance grading system. (IUT CALENDAR. 2012).

3.9 Summary

A summary of data collection indicated how data source (question paper or test) investigated the questions. The procedure for how, when, and where the data was collected and how the data was recorded. A description of how data was gathered from various sources and analyzed. The results of the data analysis are presented in the following chapter 4.

CHAPTER 4

Analysis and Interpretation of Data

4.1 Level of ICT Skills of TVET Trainee Teachers

Research question I states that:

What are the levels of ICT skills of TVET Trainee teachers in OIC countries for example Bangladesh and Saudi Arabia?

Therefore, **THE HYPOTHESIS (H1)** was formulated as:

TVET trainee teachers, particularly in Bangladesh and Saudi Arabia, are competent enough towards the use of ICT.

In order to examine this research question and prove the hypothesis, the ICT skills were measured through an ICT skills test. As mentioned earlier in Chapter 3, the test included mainly practical relevant questions. The details of the test can be found in Section 3.4.2

4.1.1 Level of ICT Skills of TVET Trainee Teachers in Bangladesh

The Level of ICT skills of Bangladesh TVET trainee teachers was measured by an ICT skills test. The test was taken by 30 TVET trainee teachers undergoing teacher education at the Department of Technical and Vocational Education (TVE) of Islamic University of Technology (IUT) in Bangladesh. The Histogram in Figure 5 shows the result of this test.

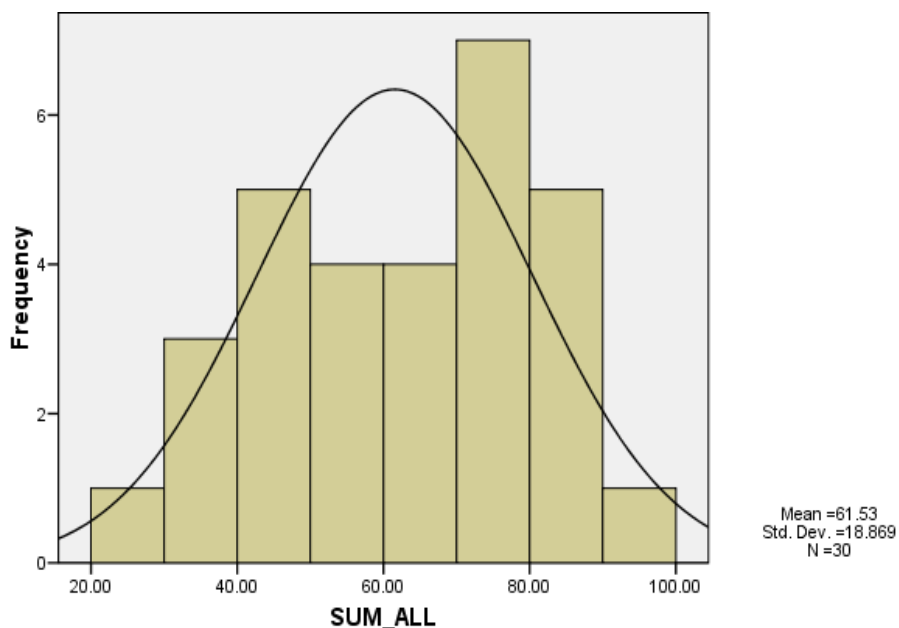


Figure 5: Histogram of TVET trainee teachers' achievement in ICT skills test

The statistics of TVET trainee teachers' achievement in ICT skills test are given in Table 4 and Table 5.

Table 4: Statistics of TVET trainee teachers' achievement in ICT skills test

	N	Mean	Std. Deviation	Minimum	Maximum
SUM_ALL	30	61.53	18.86	22.00	98.00
Valid N (listwise)	30				

As shown in Table 4 the statistics of the overall achievement of TVET trainee teachers in ICT skills test. The result shows that the mean percentage of TVET trainee teachers in ICT skills test was 61.53 out 100 and standard deviation was 18.86. This means the average points achieved by TVET trainee teachers were found above 55%. The result indicates that TVET trainee teachers have average level of competency according to the bench mark

(Very competent = 100<85, competent = 84 - 70, average = 69 - 55 and not competent = 54 - 40%) (IUT CALENDAR, 2012).

The ICT skills test result show that TVET trainee teachers have an average level of competency compared to the bench mark.

So in case of Bangladesh the hypothesis could be proved right that Bangladesh TVET trainee teachers have average competence toward using ICT.

It was also found that the basic ICT skills of Bangladesh TVET Trainee Teachers in all five categories of ICT skills were at most average level (Please see Table 5).

Table 5: Statistics of trainee teachers' achievement in each category of ICT skills test

		Computer operation (Full Marks 20)	Word processing (Full Marks 20)	Spreadsheet (Full Marks 20)	Internet and Email (Full Marks 20)	Graphic and multimedia (Full Marks 20)
N	Valid	30	30	30	30	30
	Missing	0	0	0	0	0
Mean		13.20 (66.0%)	12.93 (64.65%)	10.06 (50.30%)	13.33 (66.65%)	12.00 (60.00%)
Std. Deviation		5.47	4.12	4.47	5.26	4.81

As Shown in Table 5 the average points achieved by Bangladesh TVET trainee teachers in each category ICT Skills are as follows: Computer Operation- Mean value = 13.20 and standard deviation = 5.47, Word processing- Mean value = 12.93 and Standard Deviation = 4.12, Spreadsheet- Mean value = 10.06 and standard deviation= 4.47, Internet and Email- Mean value=13.33 and standard deviation= 5.26, Graphics and Multimedia- Mean value = 12.00 and standard deviation= 4.813.

4.1.2 Level of ICT Skills of TVET Trainee Teachers in Saudi Arabia

The Level of ICT skills of Saudi TVET Trainee Teachers was measured by an ICT skills test. The test was taken by 40 TVET trainee teachers undergoing teacher education at the Technical Trainers College (TTC) in Saudi Arabia. The Histogram in Figure 6 shows the result of this test.

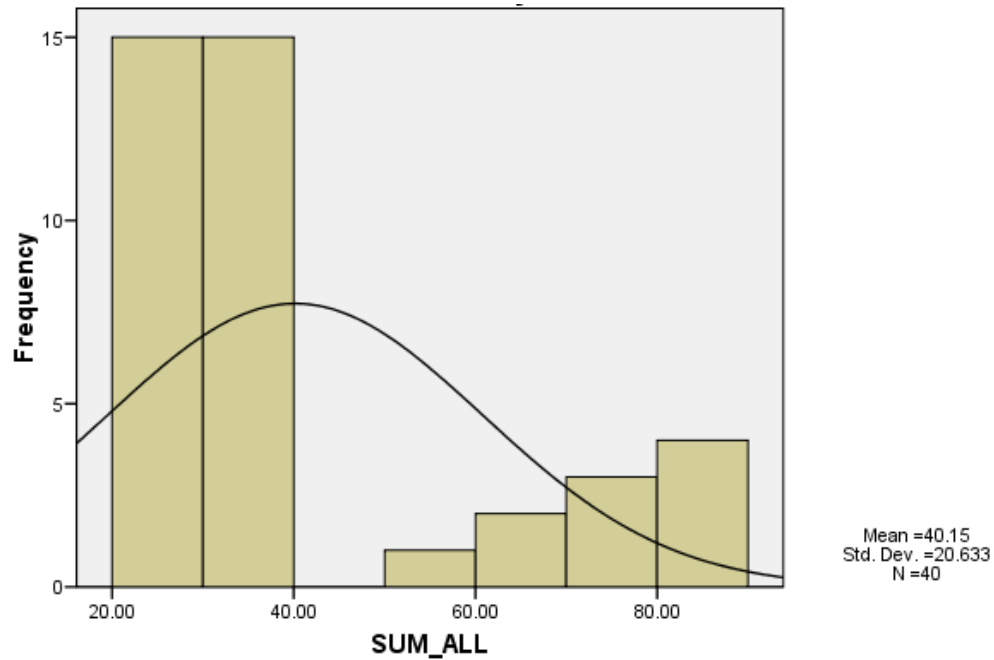


Figure 6: Histogram of TVET trainee teachers' achievement in ICT skills test

The statistics of TVET trainee teachers' achievement in ICT skills test are given in Table 6 and Table 7.

Table 6: Statistics of TVET trainee teachers' achievement in ICT skills test

	N	Mean	Std. Deviation	Minimum	Maximum
SUM_ALL	40	40.15	20.63	20.00	84.00
Valid N (listwise)	40				

As shown in Table 6 the statistic of the overall achievement of TVET trainee teachers in ICT skills test. The result shows that the mean percentage of TVET trainee teachers in ICT skills test was 40.15 out 100 and standard deviation was 20.63. This means the average point achieved by TVET trainee teachers was less than 54%. This result indicates that TVET trainee teachers have competences in basic ICT below the average standard according to the bench mark (Very competent =100<85, competent=84-70, average=69-55 and not competent=54-40%) (IUT CALENDAR, 2012).

So in case of Saudi Arabia the hypothesis could not be proved that means Saudi TVET trainee teachers haven't enough competences toward using ICT.

It was also found that the basic ICT skills in all five categories of ICT skills of Saudi TVET Trainee Teachers were less than 50% (Please see Table 7).

Table 7: Statistics of trainee teachers' achievement in each category of ICT skills test.

		Computer operation (Full Marks 20)	Word processing (Full Marks 20)	Spreadsheet (Full Marks 20)	Internet and Email (Full Marks 20)	Graphic and multimedia (Full Marks 20)
N	Valid	40	40	40	40	40
	Missing	0	0	0	0	0
Mean		8.50 (42.5%)	8.25 (41.25%)	8.65 (43.25%)	8.30 (41.5%)	6.45 (32.25%)
Std. Deviation		5.37	5.02	4.20	4.86	4.86

As Shown in Table7 the average points achieved by Saudi TVET trainee teachers in each category of ICT Skills are as follows: Computer operation - Mean value = 8.50 and standard deviation= 5.37, Word processing - Mean value= 8.25 and standard deviation= 5.02, Spreadsheet- Mean value= 8.65 and standard deviation= 4.20, Internet and Email- Mean value= 8.30 and standard deviation= 4.86, Graphics and Multimedia - Mean value = 6.45 and standard deviation= 4.86.

4.2 The Difference in the Level of ICT Skills among the Countries

Research question II states that:

Do the levels of ICT skills of TVET Trainee Teachers in OIC countries differ significantly among the countries? Therefore, **THE HYPOTHESIS (H2)** was formulated as: *There is no significant difference in the level of ICT skills among the countries.*

In order to investigate whether there is any difference in ICT skills of the trainee teachers among countries, we measured the ICT skills level of the trainee teachers from both countries. The histograms of the results of the ICT skills test are presented in Figure 5 and Figure 6 both for Bangladesh and Saudi Arabia, respectively. The following picture shows the comparative achievements in several categories of ICT skills test.

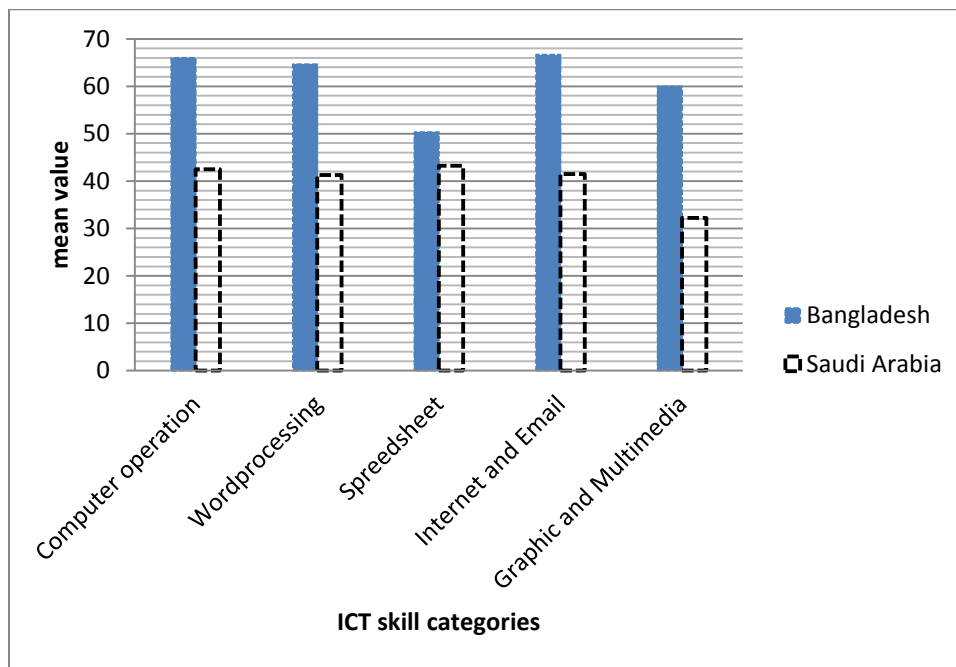


Figure 7: Achievement of trainee teachers in each category of ICT skills test in two countries

As shown in Figure 7 Bangladesh TVET trainee teachers got above 50% marks in each category of ICT skills test. On the other hand, the TVET trainee teachers in Saudi Arabia got less than 50% marks, So that the differ is significant in each category of ICT skills test .

The following table shows the comparative statistics of the overall results out of 100 marks.

Table 8: Comparative statistics of the achievement of TVET trainee teachers in two countries

Country	N	Mean (M)	Standard deviation (S)
Bangladesh	30	61.53	18.86
Saudi Arabia	40	40.15	20.63

The mean values of achievement test show that TVET trainee teachers from Saudi Arabia are lagging the TVET trainee teachers from Bangladesh. This indicates that the difference in the level of ICT skills of the TVET trainee teachers between these countries is significant. The hypotheses could not be proved

4.3 Discussion on Findings

The histogram of the results (the performance) of the Bangladesh Trainee Teachers shows that 2/3 (Two – third) of TVET trainee teachers got above 50% of the total marks (please see Figure 5). On the other hand, the histogram of the results (the performance) of the trainee teachers in Saudi Arabia shows that 3/4 (three–fourth) of the total participants got points between 20% to 40% and only 1/4 (one–fourth) of the participant got above 50% (please see Figure 6). This results show that the trainee teachers in Saudi Arabia are lacking ICT skills compared to their Bangladeshi counterparts.

Several factors may have influenced in demonstrating the above performance of the TVET trainee teachers of both countries. The author assumed that the following factors may influence the performance in ICT test:

1. Trainee teachers in TTC Saudi Arabia did not show much interest in taking the ICT skills test and hence they were not so serious in taking the ICT skills test, which may affect the results.
2. In general Saudi people are rich compared to Bangladesh and they live a comfortable life which may be the cause of less motivation towards learning technology.
3. Because Saudi trainee teachers took the test online, the allocated time for them may be too long and they got bored in taking the test.
4. Trainees in TTC Saudi Arabia were not well motivated in taking the test as the author himself was absent.
5. The author found that the Bangladesh TVET trainee teachers took the ICT skills test seriously.
6. Bangladesh TVET trainee teachers were so much motivated to participate the test.
7. Compared to Saudi trainee teachers Bangladesh TVET trainee teachers have a better level in English language skills and stronger background regarding basic ICT skills.

CHAPTER 5

SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATION AND FUTURE WORK

5.1 Summary of the Study

This chapter provides a summary of the study- major findings, conclusions and recommendations. Major finding will be organized that each research question is associated with findings.

The purpose of this study was to assess the level of ICT skills of Bangladesh TVET trainee teachers and Saudi TVET trainee teachers. The second purpose was to find out the difference in the level of ICT skills of trainee teachers among these two countries.

The study included 70 participants' trainee teachers from these participants 40 from TTC Saudi Arabia and 30 from the TVE Department of IUT, Bangladesh. The ICT skills test consisted of 50 Items with five categories: Basic computer operation, word processor, spreadsheet, internet and email, graphic and multimedia.

This study included two research questions:

1. What are the levels of ICT skills of TVET Trainee Teachers in OIC countries for example Bangladesh and Saudi Arabia?
2. Do they (the levels of ICT skills) differ significantly among the countries?

The ICT skills test results (the data) were analyzed by using IBM SPSS (Statistical Package for Social Science) software tool.

5.2 Findings

Research question I

What are the levels of ICT skills of TVET trainee teachers in OIC countries for example Bangladesh and Saudi Arabia?

The finding shows that Bangladesh TVET trainee teachers have average level of ICT skills. Their group mean was 61.3% with standard deviation 18.86 in the achievement test.

The findings also show that the Saudi TVET trainee teachers have competence in basic ICT skills less average standard of using ICT according to IUT assessment standards (IUT CALANDAR, 2012). Their group mean was 40.15% with standard deviation 20.63 in the achievement test.

Research question II

Do the levels of ICT skills of TVET trainee teachers in OIC countries differ significantly among the countries?

The mean values of achievement test show that TVET trainee teachers from Saudi Arabia are lagging the TVET trainee teachers from Bangladesh. So that there is a significant difference in the ICT skills performance level between the two countries.

5.3 Conclusions

Based on analysis of the data and findings of the study, we have found that TVET trainee teachers in both countries have basic ICT skills. However, the study revealed that the Bangladesh TVET trainee teachers undergoing teacher training at the TVE Department of IUT, have average level of competence toward using ICT and the Saudi TVET trainee teachers' competence in basic ICT skills is relatively below the average level according to IUT assessment scale.

5.4 Recommendation and Future Work

5.4.1 Recommendation

This study highlighted that trainee teachers need to be aware of more basic and advanced ICT application. The findings underscore that the TVET trainee teachers in TTC, Saudi Arabia as well as in Bangladesh are required to have more ICT relevant courses and the trainers/ educators should focus more on developing trainees ICT skills and encourage using ICT in learning/ teaching.

5.4.2 Future Work

The goal of this study was to investigate the level of ICT competency of TVET trainee teachers. Data was collected to test the two hypotheses relating to this goal. Many significant findings resulted from the examination of the data.

This competences test measured only the basic ICT competences of the trainee teachers. In-depth ICT competences of these teachers should be measured. The study should include more OIC countries in order to know the status of the current ICT skills of OIC countries.

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APPENDIX A

BASIC ICT SKILLS TEST

THE DEPARTMENT OF TECHNICAL AND VOCATIONAL EDUCATION
ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
THE ORGANIZATION OF ISLAMIC COOPERATION (OIC)
DHAKA-BANGLADESH

-
1. Name of participant (optional)..... 2. Gender: Male/ Female
3. Country..... 4. Academic qualification and area of
specialization
5. Name of current academic program
6. Work of experience (if any)
-

Instructions

- This Test consists of five separate parts covering basic ICT skills in five different Areas, there are

Part I: Basic computer operation

Part II: Word processing

Part III: Spreadsheet

Part IV: Internet and multimedia (E-communication)

Part V: Power point (Graphic and multimedia)

- There are 50 multiple –choice question, please answer all the equations. Each question carries 2 marks, Total 100 marks.
- The test duration is 50 minutes

Example

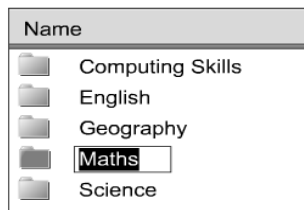
I) _____ b You have opened an old document file and modified it for anew document using word.

Which of the following menu option would keep both versions?

- a) Save
 - b) Save us
 - c) Close
 - d) Properties
- By the same way, please read each question carefully and then print the letter of the Correct answer next to the question, At the end of the test ,please save change to the following location ftp://10.220.20.25/mubarak or you send it to Email: eng.mubaraksaif@hotmail.com

Part I: Basic computer operation

1) _____ The word 'Maths' has been selected as shown.



What does this allow you to do?

- a) Delete the folder.
- b) Rename the folder.
- c) Move the folder.
- d) Browse the folder.

2) ____ What remains if the folder 'Design' is deleted from this file path?

Assignments>Technology>Designs>Bridge. Jpg

- a) Bridge.jpg
- b) Technology> Bridge.jpg
- c) Assignments>Technology
- d) Assignments>Technology>Bridge.jpg

3)____ Which type of software application stores data in cells and uses function for calculation?

- a) Database
- b) Spreadsheet
- c) Browser
- d) Multimedia

4)____ What should you do after you have been working at your computer for almost two hour?

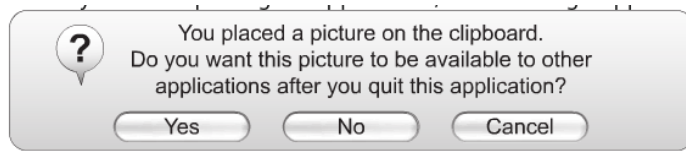
- a) Keep working.
- b) Change computers.
- c) Take a short rest-break.
- d) Play a computer game.

5)____ You have selected a list of name from a spreadsheet.

Which command(s) would you to place this list in a word-processing document?

- a) Copy and paste
- b) New Document
- c) Insert Table
- d) Replace

6) _____ When you were quitting an application, this message appeared.



What is meant by the term 'clipboard'?

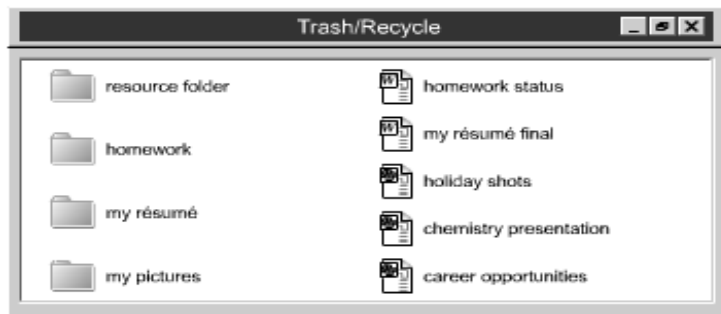
- a) A software application for pictures
- b) A term used to describe a flash disk
- c) Temporary file storage for copied data
- d) A storyboard file showing the order of movie clips

7) _____ You want to be able to store and search numeric, text and image about various countries.

Which type of software application should you use?

- a) Email
- b) Browser
- c) Graphics
- d) Database

8) _____ This screenshot shows the contents of the Trash/Recycle Bin.



How many files are showing in the Trash/Recycle Bin?

- a) 2
- b) 4
- c) 5
- d) 9

9) _____ Which of the following is an acceptable way to shut down the computer?

- a) Press the reset button.
- b) Turn the computer off at the power point.
- c) Select the 'shut Down' option from a menu.
- d) Pull the power cord from the back of the computer.

10) _____ Which alignment has been used to type the text in the following passage?

"Telecommuting now offers workers in some types of jobs the chance to do much of their work from home. Using a personal computer, a modem connected to their telephone line and 'remote access' software they can gain access to the computers in their office and work exactly as if they were present in the office. There are advantages for both employer and employee in terms of savings made in time, transport, clothing and office space. Many workers however, find that they miss the human contact of the office life."

- a) Left
- b) Right
- c) Justified
- d) Centered

Part II: Word processing

11) _____ To identify a document it is helpful include the file name on each page as a

- a) header/footer.
- b) Bibliography.
- c) find/search.
- d) macro.

12) _____ You created and saved a word –processed document at home but when you printed it at school the front looked different.

What is the most likely reason for this?


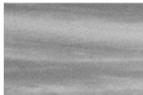
- a) You file became corrupted.
- b) You saved your file in the wrong format.
- c) You saved your file with the wrong name.
- d) The font you used at home was not on the school computer.

13)_____ You want move a paragraph from the beginning of an essay to the end.

After selected the paragraph, which command(s) should you use?

- a) Clear
- b) Delete
- c) Cut + paste
- d) Copy + paste

14)_____ You are making a table to show could type. The cursor, marked x, is shown in the bottom – right cell.

Cloud Type	Image	Features
Cumulus		Low-level cloud, flat base, vertical rolls or towers
Cirrus		High-level cloud, white tufts, made of ice crystals ← X

Which key should you press to add a new row?

- a) Tab
- b) Escape
- c) space bar
- d) caps Lock

15) _____ In an essay use the word the word nice too many times. You do not know what other word to instead of nice.

Which tool could you use to find alternative word?

- a) Thesaurus
- b) cut and paste
- c) Find and Replace
- d) spelling and grammar

16) _____ What term describes text repeated at bottom of each page of a document?

- a) Banner
- b) Footer
- c) Header
- d) Heading

17) _____ In your English essay you notice that the paragraph at bottom of page 1 continues to page 2

You would like to make this paragraph start on page 2. What would be best way to do this?

- a) Press tab
- b) Press Return
- c) Copy and paste
- d) Insert page break

18) _____ what is the meaning of 'justified text'?

- A) The text headings are all in the same style.
- B) All four margins on the page are the same size.
- C) The text aligns with both the right and left margins
- d) The text is the maximum size that will fit on a page

19) _____ You have found two images on a web page that you would like to include in a word – processed document.

What is the best way to transfer each image into the document?

- a) Select both images and email them to yourself
- b) Add both images to Favourites or Bookmarks
- c) Select each image, copy and paste them into the document
- d) Take a screenshot, copy and paste them into the document

20) _____ You wanted to type the sentence in figure 1 but typed it as in figure 2 .

I can see some meat on the plate.

I can sea sum meet on the plaet.

Which error will be identified by the checker?

- a) Sea
- b) Sum
- c) Meet
- d) plaet

Part III: Spreadsheet

21) _____ A formula has been used in cell D2 to calculate student growth.

	A	B	C	D
1	Name	Height (cm) 01/01/06	Height (cm) 01/06/06	Growth (cm)
2	Bob	176	180	4
3	Jean	155	157	2
4	Chelsea	178	179	1
5	Tim	158	161	3

Which formula correctly calculates this value?

- a) C2*B2
- b) C2-B2
- c) C2+B2
- d) C2/B2

22) _____ Which chart type best shows proportions of a whole?

- a) Combination
- b) Line
- c) Pie
- d) Scatter

23) _____ Which formula should be entered in f12?

	A	B	C	D	E	F
1	YEAR 10 FUNDRAISING 2002					
2						
3		Term 1	Term 2	Term 3	Term 4	TOTAL
4						
5	Garage Sale	\$210			\$189	\$399
6	Trivia Night		\$431			\$431
7	Car Wash			\$63		\$63
8	Slave for a Day			\$55		\$55
9	Dance Party	\$342		\$387		\$729
10						
11						
12			TOTAL AMOUNT RAISED			
13						

- a) =F5+F6+F7+F8
- b) =Sum (F5:F9)
- c) =COUNT (F5:F9)
- b) =AMT (F5:F9)

24) _____ What is formula used to obtain the value in cell F4?

	A	B	C	D	E	F
1	Sports	From	To	Hours per week training	Hours per week game time	Total hours per week
2						
3						
4	Basketball	January	March	2	1	3
5	Netball	November	February	2	1	3
6	Hockey	June	August	1	1.5	2.5
7	Waterpolo	October	December	2.5	0.5	3
8	Cricket	November	March	1.5	3	4.5
9	Rugby	June	August	2	1.5	3.5
10	Soccer	June	August	1.5	1.5	3
11						
12			Total Hours	12.5	10	22.5
13						

a) =AMT (D4:E4)

b) = (D4+E4)

c) =D4+E4

d) = (2+1)

25) _____ When you enter the population figure for China into spreadsheet, this is the result.

Why does cell show #####?

- a) The digits are centre – aligned.
- b) You can only enter up to 9 digits in a column.
- c) The column is formatted as ‘text’ not ‘number’.
- d) The column is not wide enough to display the number.

26) _____ Part of a spreadsheet is show. The active cell is not visible.

	A	B	C	D
1	SPORT	BOYS	GIRLS	TOTAL
2	Swimming	28	35	63
3	Soccer	34	16	50
4	Tennis	14	12	26
5	Athletics	9	12	21
6	Basketball	21	19	40

Which of these could be the active cell?

- a) A8
- b) E1
- c) C9
- d) D7

27) _____ This spreadsheet show the time taken a group of student to each walk 50 metres. The speed of each student was calculated using a formula.

	A	B	C
1	Name	Time (s)	Speed (m/s)
2	Sarah	25	2.00
3	Ben	22	2.27
4	Alex	27	1.85
5	Cynthia	30	1.67
6	Rhys	18	2.78
7	Michael	19	2.63
8	Ellen	20	2.50
9	Maria	16	3.13

After entering the formula into cell C2, Which option allowed the formula to be copied into the remaining cells?

- a) Cut and paste
- b) Fill Down
- c) Replace
- d) Sort

28) _____ You enter the formula =sum (B2:D2) in cell E2 to calculate the total, and then copied into the three cell below E2.

E2		fx =SUM(B2:D2)			
	A	B	C	D	E
1	Swimmer	Freestyle	Backstroke	Butterfly	Total
2	Blue	5	4	4	13
3	Red	4	5	3	12
4	Green	2	2	5	9
5	Yellow	3	4	2	9

What formula is in E5?

- a) =Sum(B5:D5)
- b) =Sum(B2:D2)
- c) =Sum(E2:E5)
- d) Sum(B2:B5)

29) _____ A formula has been entered into cell A4.

	A	B	C	D
1	2			
2	2			
3	6			
4	10			
5				

If the value in cell A1 is changed to 5, what will appear in cell a4?

- a) 5
- b) 13
- c) #REF
- d) =Sum(A1:A4)

30) _____ The formula =\$B\$6*2 was used in a spreadsheet.

What does this formula do?

- a) Displays the numbers 12
- b) Multiplies the number in cell B6 by two
- c) Adds the numbers in cell B6 and cell B2
- d) Display the number in cell B6 in currency format

Part IV: Internet and Multimedia (E-Communication)

31) _____ While researching the Geography assignment, you find a useful website what is the most efficient way to access the site at a later time?

- a) Save it to a floppy disk.
- b) Write it down on a piece of paper.
- c) Add it to 'Favourites' or Bookmarks.
- d) Cut and paste it to a word processor document.

32) _____ You teacher displays group project work on the school intranet.

What benefit does this provide over publish the work on the internet?

- a) The project remains private within the school.
- b) Hyperlinks to other website cannot be used.
- c) The intranet is safe from viruses.
- d) Work cannot be copied.

33) _____ Why is best practice to include a subject in the header section of an email?

- a) To ensure that the email is sent
- b) To prevent viruses being attached to the email
- c) To help the recipient determine the relevance of the message
- d) To ensure the email reaches its destination in the shortest time

34) _____ You are conducting research for a Geography assignment. The raw facts you collect are called

- a) Data.
- b) Document
- c) Information
- d) Text

35) _____ You are completing research for a school assignment. You write an email to an organization, asking for information.

Which of the following will quickly let the receiver of the email know what you want?

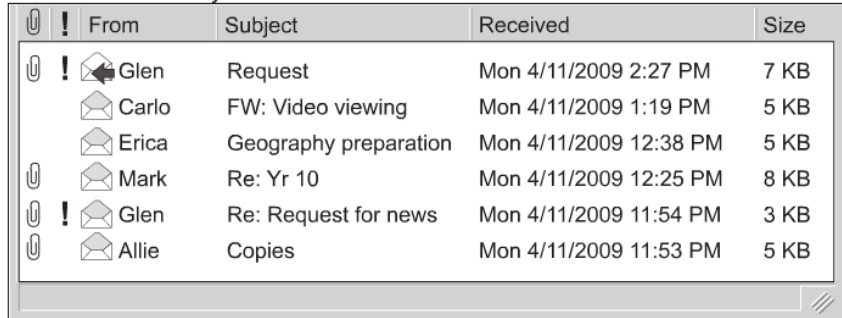
- a) Send a cc to the same person.
- b) Use upper case in the email message.
- c) Compose a lengthy and very detailed message.
- d) Ensure that the subject line clearly states what you are seeking.

36) _____ 'strong' passwords are recommended when using internet banking. A 'strong' password is one That is difficult to guess.

Which of these would be the 'strongest' password?

- a) e 7jm51
- b) fruits
- c) ABC123
- d) 120692

37) _____ The screen shows your email in box.

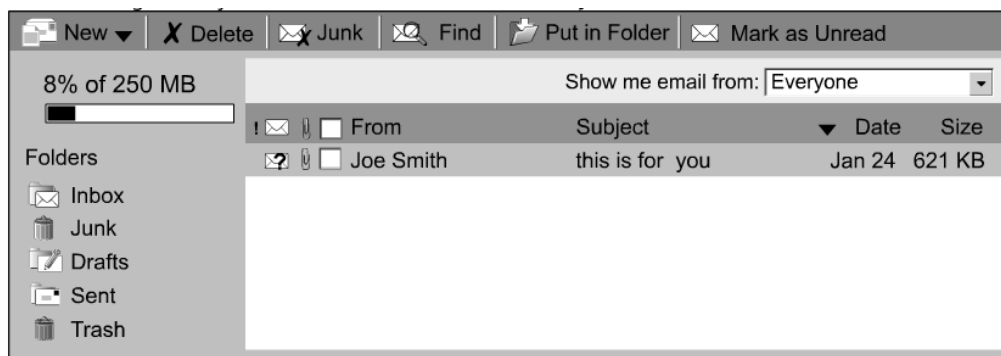


	From	Subject	Received	Size
!	Glen	Request	Mon 4/11/2009 2:27 PM	7 KB
	Carlo	FW: Video viewing	Mon 4/11/2009 1:19 PM	5 KB
	Erica	Geography preparation	Mon 4/11/2009 12:38 PM	5 KB
	Mark	Re: Yr 10	Mon 4/11/2009 12:25 PM	8 KB
!	Glen	Re: Request for news	Mon 4/11/2009 11:54 PM	3 KB
	Allie	Copies	Mon 4/11/2009 11:53 PM	5 KB

How many of these emails were sent by someone answering an email from, without changing the subject of the email?

- a) 1
- b) 2
- c) 4
- d) 6

38) _____ This message is in your email. You do not know joe smith.



What is the best course of action?

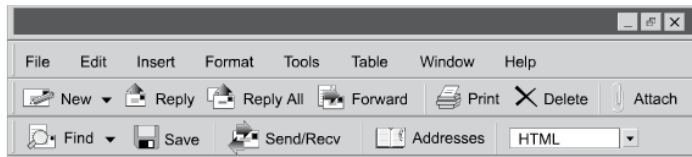
- a) Rename the file.
- b) Delete the email.
- c) Return the email to joe smith.
- d) Open the email and the attachment

39) _____ You are sitting at a computer waiting for a web page to but it seem it seem to be taking much longer than usual

What could you do to load the page faster?

- a) Click the back icon.
- b) Turn off the computer.
- c) Click the History icon.
- d) Click the Refresh icon.

40) _____ This screenshot has been taken from the inbox of a mail program.



What option shown in the screenshot will allow an email message has been received to be passed on to someone else?

- a) Forward
- b) Replay
- c) Replay All
- d) Send/recv

Part V: Power point (Graphic and multimedia)

41) _____ You are collecting printed photos of World War 1 to use in a multimedia presentation.

What device will convert the photos to digital form?

- a) A mouse
- b) A scanner
- c) A laser printer
- d) A graphics tablet

42) _____ You want to save the changed photograph in Figure 2.



Figure 1

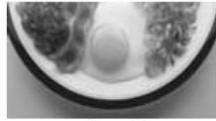


Figure 2

Which of the following file formats would be most suitable?

- a) Jpeg format(jpg)
- b) Html format(htm)
- c) Drawing format(drw)
- d) Document format(doc)

43) _____ You are required to develop an interactive slideshow.

Select the most suitable type of program for this task.

- a) Database
- b) Draw and paint
- c) Word processing
- d) Presentation software

44) _____ You are going to send four images to a friend in four separate emails.



Hill End.jpg
3.2 MB



Broken Hill.jpg
240 KB



Bourke.jpg
430 KB

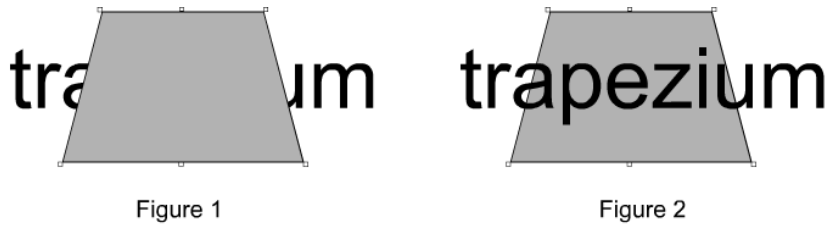


Bathurst.jpg
2.4 MB

Which one of these images would you expect to be sent the fastest?

- a) 1
- b) 2
- c) 3
- d) 4

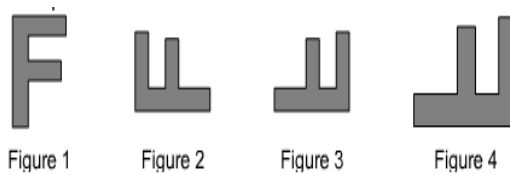
45) _____ The layout of the text and graphics in figure 1 has been changed to that shown in figure 2.



What was selected and what process was performed?

- a) Graphic, and 'send to back'
- b) Graphic, and 'bring to front'
- c) Text, and 'bring to back'
- d) Text, and 'bring to front'

46) _____ Starting with the letter in Figure 1, and following the changes show, what sequence was used to complete the task?



- a) Rotate vertical, flip right, distort
- b) Rotate left, flip horizontal, resize
- c) Rotate horizontal, flip right, resize
- d) Rotate right, flip horizontal, distort

47) _____ What type of program allows an object within an image to be edited without affecting other objects?

- a) Paint program
- b) Draw program
- c) Filtering program
- d) Animation program

48) _____ You successfully created a slideshow with on your home computer. However, when you run the slideshow at school using the same version of the program, the sound file cannot be found.

- a) The sound file was linked rather than embedded.
- b) Speakers have not been connected to the school computer.
- c) The sound file is the wrong format for the school computers
- d) The slideshow program need to be a newer version to play the file

49) _____ Which process was used to change image 1 to image 2?

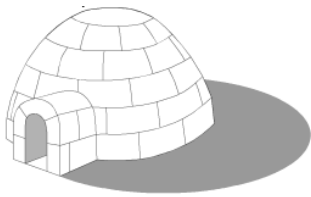


Image 1



Image 2

- a) Crop
- b) Skew
- c) Stretch
- d) Flip Horizontal

50) _____ A user has over 500 songs in a digital music collection.

Why might this user create a playlist?

- a) To list all 500 songs
- b) To store recently played songs
- c) To purchase music from an online shop
- d) To group songs for a particular purpose

THANKS A LOT FOR YOUR TIME MAY

GOD BLESSES YOU