

## RE-TRAINING INFORMATION COMMUNICATION TECHNOLOGY TEACHERS TO RAISE INFORMATION TECHNOLOGY LEVEL IN OMAN

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**Abstract.** Due to the rapid changes in information and communication technologies, Information Technology (IT) teachers must be able to cope with these dramatic changes in order to provide adequate education. This paper presents a strategic approach for updating curriculum and technical knowledge of Information Technology through training the IT trainers and teachers. The approach is expected to help update the IT training in Oman by training the IT personnel who are responsible in educating the youth who are at the recipient end of this training. It's expected that proper training of the younger generation has outmost benefits to the country. A combination of traditional teaching methods and modern distance learning techniques were both followed during training the trainees.

**Keywords:** Training, IT teachers, teachers' trainers, development.

### 1 INTRODUCTION

One of the main issues a country is concerned about is supporting its economical system. In the past labor and land (referring to physical production for example: agriculture) were the first economical system that characterized a healthy economy. The discovery of natural and energy resources replaced labor and land in terms of importance to a country's economical system after their dominance for many years ago. Yet, to preserve these valuable resources nations need to use them efficiently and search for alternatives. Hence many countries started to lean toward establishing an economical system based on knowledge and information due to the technological development that occurred in the 20<sup>th</sup> century; that posted the birth of knowledge based economy. Knowledge based economy started to replace both physical based and energy based economies. Knowledge is not restricted to a specific location due to the development in communication. It is worth mentioning that although countries consider knowledge as the backbone of their economical system,

they may still use the labor and energy resources as a support to their economical systems [1].

Nowadays, Information Technology (IT) is seen as a major factor in raising the efficiency in different sectors such as: education, banking, health, and many others. The radical changes in information technology have a significant impact on the economical system of a country and hence it has an effect on the industry. By retraining of IT trainers with the most up-to-date IT knowledge will significantly help in the educational and innovational aspects [2-5].

This paper describes a strategic plan to establish the foundation of knowledge based economy in Oman and encourage formation of essential ingredients to achieve United Nation Millennium Development Goals (MDGs) that requires cooperation with the private and public sectors to make available the benefits of new technologies, especially information and communications technologies [6]. In order to achieve this goal, the project team has targeted to train the trainers using a partial distance teaching approach [7].

### 2 INFORMATION TECHNOLOGY DISSEMINATION STRATEGIC PLAN

There are some statistics in Internet World Statistics, which states that the penetration level of internet usage in Oman population is roughly 10.2%. However, the penetration level of internet usage in U.A.E. and Bahrain level is about 36.0% and 21.6%, respectively [8]. These percentages indicate that the knowledge level of internet among people in Oman is not widely spread comparing to the previous countries. This project has identified and developed a plan to train a segment of the population that is in a front position to transfer this knowledge to others to achieve a massive expansion in the use of IT by all components of the society. This segment was identified as Information Technology instructors of different training departments of various private and public institutions as potential segments.

In cooperation with the Ministry of Education (MOE) and Ministry of Higher Education (MOHE), the project team and both ministries have identified the trainees who are going to participate in this training. The trainees consist of school teachers, and teachers of teachers (trainers). Teachers sent by MOE are taking ICDL (*International Computer Driving License*) training. ICDL is not a training course but rather a standard skill that is recognized through testing [9]. Its aims are mainly to raise the general level of expertise in IT and improve productivity at work.

The IT teachers of primary and secondary schools require a higher training level than other teachers in the institutes. Therefore, IT teachers were identified as dissemination sources of IT information and knowledge in schools. Teachers' trainer will go through the same training to guarantee IT dissemination.

### 3 IT TRAINING

A proper plan was developed by the project team to cover the needed up-dating level to the teachers. The plan consists of:

- 1) **CISCO HP IT Essentials (part I) Program Curriculum**, taught in the first part of the project. This curriculum follows Distance Learning method. It contains online material and discussion groups that help the trainee in his/her studies. Flash animations are used in clarifying some of the online material [10]. The curriculum consists of the following:
  - i. Building a computer.
  - ii. Installing and managing Operating Systems.
  - iii. Knowledge of networking.
  - iv. Connecting computer to LAN and to Internet.

Both teachers and teachers' trainers are enrolled in this course.

- 2) **An IT Syllabus developed by the team members**, which will be followed in the second stage of the project. It is based on tradition teaching. The syllabus will contain introduction to networking, presentation methods, and Multimedia & Web based Techniques. Only school teachers are taking this syllabus.

This plan took into account that the trainers after finishing this curriculum will deliver what they learned to other teachers and students. This will guarantee the dissemination of IT through out the country.

### 4 SKILLS SURVEYED

A survey was conducted on the trainees, which consist of teachers sent by the Ministry of Education, to know their knowledge IT skills. A survey was conducted to show the skills of the trainee in web, computer, and networking. These surveys were analyzed and studied by the team to identify the

materials needed to up-date the addressed skills and reconstruct a curriculum to retrain the participants. It was also noted that since most of these teachers need a boost in their IT knowledge, then even teachers of the teachers require retraining in order to maintain the same level of standards for the future teachers.

#### 4.1 Web Skills Knowledge Survey

The web skill survey is not restricted to see the ability the trainees' web browsing skills. It also covers the trainees' ability to design and manipulate web pages using Microsoft FrontPage or any HTML editor and using different programs associated with Web pages design. Many web site designers use programs, such as: Flash or GIF, to add attractive features to their web pages. Distance learning uses flash software is considered as one of the most powerful and helpful programs especially in. Photo manipulation (e.g. photo sharpness, intensity, format, size, or brightness) is considered very vital in terms of managing photos so it will be well presented. Since this project aims to train the trainers, it is very important to know their ability levels of presenting and demonstrating what they have learned through Microsoft Power Point. In summary, the web skills survey included:

1. Web skills, programs and design,
2. Photo manipulation,
3. GIF and Flash animations,
4. Power point graphical, Animation / sound.

The following figure shows the statistical results of the web skills level of the trainees participating in this project.

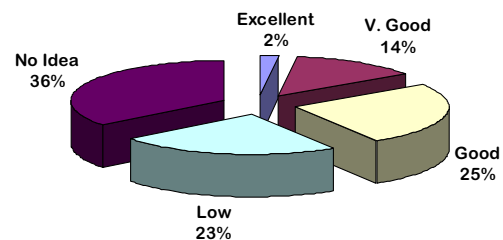


Fig. 1. Web skills knowledge survey analysis results

#### 4.2 Computer Skills Knowledge Survey

Due to the invention of computers, the internet has emerged. Therefore, the knowledge level of the teachers was surveyed to evaluate their computer skills. The survey conducted shows the abilities of trainees in:

1. Computer Assembly and Components Identification (e.g. Network Cards and Memory).
2. Operating Systems Installation and Troubleshooting.
3. Hardware Troubleshooting and configuring Internet Connection of a PC.

The figure shows the statistical results for the knowledge computer Survey.

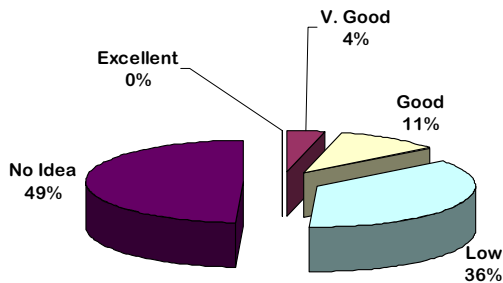


Fig. 2. Statistics of computer skills knowledge survey

#### 4.3 Network Skills Knowledge Survey

It is known that the Internet consists of many networks connected together all over the globe. There are many benefits of having a network such as: file transfer, video conferencing, or voice calling using the network. The survey conducted shows the trainees level in network design, network background theory, implementation, and troubleshooting. Figure 3 shows the statistical results obtained from this survey.

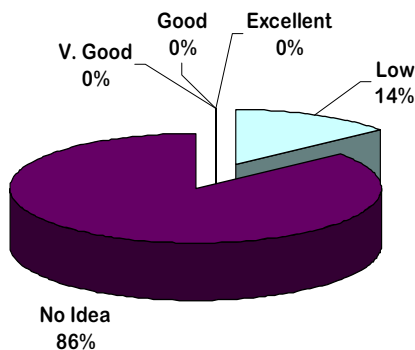


Fig. 3. Statistics of networking skills knowledge survey

From the last three figures it can be noticed that at least 60 % of the teachers have a low or no idea on Web skills, computer skills, and networking skills. This high percentage could be due to the rapid changes in technology and the teachers' familiarization with the internet and accessing the internet. Another factor could be that some teachers have done their studies (*i.e.* undergraduate and/or postgraduate studies) in an Arabic, which might slowed them down to gain new education in an English medium. When looking at the trainees' statistics in network skills, the percentage doesn't appear to be surprising, because out of the whole world population (6 billion people) only 14.6 % of those people knowledge to use the internet, which means that the percentage of people knows how to design a network is below 14.6% [8].

## 5 DISTANCE LEARNING

Distance learning refers to learning for which the instructor and the student are separated by either time or place or both, whereas, traditional learning requires that both students and teachers to be available in the same room at the same time [11]. Distance learning approach was developed for the following reasons:

- To help universities accommodate the large number of students registered in a course.
- To avoid giving these courses to a less number of qualified teachers [12].

Also distance learning is very convenient for students with disabilities. The UNESCO is now pushing for open and distance learning to ensure that education can reach everyone. Due to the new development of Information and Communication technology, the demands for long life learning have radically increased [2]. There are different types of distance learning, which are:

- Mails courses including normal mail (by sending text books and courses handouts via normal post office) and Internet materials (sending softcopies of the courses and communicating with the instructor using e-mails)
- Video/Audio tapes or live conferencing using broadband connections [13].

Combinations of both traditional teaching and distance learning approach were used in training the trainer. Distance learning is based on Information technology and the daily development of it. The rapid improvements of computers in terms of technical specifications and cost have helped in establishing open and distance learning approach. Compared to the 1970s computer specifications have changed significantly. Today's computers have very fast processors, huge hard disks, and network connectivity with affordable prices.

Some of the technologies used today in conducting distance learning more interactive are:

- **Desktop Video Conferencing:** personal computers, digital cameras, and microphones are used to transport instructions between the student and the teacher. Sometimes conferences are broadcasted live which gives the students similar sensation of attending a normal class. But in this case students can only watch the conference without being able to communicate back with the teacher of the conference.
- **Web based instructions:** in this case, instructions are provided through the Internet/Intranet where student engage in online assignments and participate in class activities via e-mails or discussion boards.
- **Two way audio:** were teachers and students can communicate with each other through telephone conversations. Traditional calls and calls through internet/intranet are examples of this two way

audio communication. In this technique the teacher can only communicate with one student at a time.

- **Two way audio/video:** television, cameras, and microphones are used to convey instructions to students. This is a one way communication, where the teaching is carried out through TV channels [14].

### 5.1 Advantages of Distance Learning

Distance learning is a very effective approach due to the development in information and communication technologies. Distance learning approach is beneficial in terms of:

- 1) **Quantity and Quality:** distance learning allows students enjoy the life outside large cities while giving them the chance to obtain the certificate of their desire. Some degrees are limited to a specific location. With distance learning degrees and topics of interests are not tied to a specific geographical location. This comes useful for those students who are living in the city where they cannot find their degrees of interest within the educational facilities in their city.
- 2) **Flexibility:** distance learning does not constrain the students to a specific location or schedule. Students can access their learning materials from home, library, or even while traveling during the time of the day that best suits them. This comes very effective for students that have personal commitments.
- 3) **Budget saving:** with distance learning, students get to learn from home, and so they will save extra costs for rental room and travel.
- 4) **Support:** contacting educators are easy in distance learning, because the instructor is an e-mail or a phone call away. Online chats, discussion rooms, video conferences, and other interactive means are available to help students communicate with other students.
- 5) **Convenience:** While there is generally a fixed time within which students need to complete a course, they are not forced into a restricted schedule. In traditional teaching, student can only do coursework at a specified time on a specific day. With distance learning, students will be responsible for their schedule. That is, if a student wants to attend a taped lecture at midnight, it's his/her choice [15-17]. However, students in distance learning are required to finish their studies within limited time.

Distance learning also helps the students to be more organized and build their abilities to conduct in long life learning. Since technology and information keeps changing rapidly, students and teachers need to cope with these new information and communication technologies [2].

### 5.2 Distance Learning Challenges

It was noticed that the drop rate of distance learning students is higher than traditional classroom students. This high drop rate is due to the lack of motivation and self-discipline for some students enrolled in distance learning programs. However, there are still many challenges that effect the growth of distance learning approach such as: course material, labs, and exams monitoring [11, 17, 18].

The project team has overcome these obstacles. In term of exams monitoring, the project team has ensured the authenticity of the exams. Extra materials (e.g. presentations) and labs were provided to the trainees to help them get clear understanding of the training course.

## 6 CONCLUSION

The UNESCO has stressed in their medium term strategy 1996-2001 the need to train, upgrade and motivate teachers and other education agents, using innovative approaches such as distance learning. Therefore, the project team intentionally used the distance learning approach as part of training the teachers [2].

It is anticipated that a successful completion of this project shall stimulate extensive use of Information Technology in all areas of the national economy, including industry, education, trade and services ensuring gender equality in ICT. The team undertaking this project is interacting with the Ministries of Education and Higher Education to ensure compatibility of aims and benefits of Information Technology to the community. An efficient and cost effective approach is followed to disseminate ICT knowledge in the Sultanate of Oman.

## ACKNOWLEDGMENT

This work is part of an SQU Strategic Project # ENG/ECED/04/01. The authors would like to thank SQU for allocating funds for this project.

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