EFFECTIVENESS ON TRAINING INFORMATION AND COMMUNICATION TECHNOLOGY BY KHMER LANGUAGE SOFTWARE: A CASE STUDY OF THE NATIONAL INSTITUTE OF EDUCATION CAMBODIA

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ABSTRACT

The objectives of this study on the effectiveness of a training program in information and communication technology using Khmer language software were: 1) to assess the satisfaction of the trainees with the program; 2) to evaluate the learning levels of the trainees in Knowledge, Skill and Attitude; 3) to find out the trainees' behaviors and; 4) to find out the results for the organization conducting training using Khmer language software. The evaluation of the training program was based on Kirkpatrick's Model. Qualitative and quantitative research methodologies were used. The study site, the National Institute of Education (NIE), was selected because the trainees there had received training using Khmer language software. The sample for this study was 80 trainees. In-depth interviews with trainers, trainees, and staff of the program and the director of NIE were conducted. The instruments used for collecting data were a five-point rating questionnaire and an interview form. Descriptive statistics were used to analyze the data and t-test to compare pre- and post-test results of the training program.

The training program using Khmer language software taught trainees to use OpenOffice.org Writer, OpenOffice.org Calc and OpenOffice.org Impress. The goal of the training program was to help the staff at the National Institute of Education to use computers in their pedagogy and administration through the use of Khmer language software. Most of the trainees were satisfied with the program. Knowledge, skill and attitude of the trainees toward Khmer language software improved significantly ($p=0.05$), indicating that the training program was partly suitable and effective. However, the behavior of the trainees after receiving the training was inefficient. Only the IT staff were able to fully apply their learning to their jobs. So the results of the training program for the NIE were highly beneficial in terms of training provided, particularly to IT staff. Moreover, this training also provided knowledge about a changing ways of thinking of the use of ICT in Cambodia. This training could be applied to other organizations.

This research also suggests how future training in information and communication technology using Khmer language software could improve ICT in education and local language software development in Cambodia.

KEY WORDS: SATISFACTION / KNOWLEDGE / SKILL / ATTITUDE / BEHAVIOR/ RESULTS/ ICT

129 pp.

CONTENTS

CONTENTS (contd.)

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

AMIC	Asian Media Information and Communication Centre
APDIP	Asia Pacific Development Information Programme
APNIC	Asia Pacific Network Information Centre
ASEAN	Association of Southeast Asian Nations
ESP	Education Strategic Plan
ESSP	Education Sector Support Programme
FOSRSC	Free and Open Source Research and Support Center
IBM	International Business Machines
ICT	Information and Communication Technology
IDRC	International Development Research Center
IEC	Information Education Communication
ISOC	Internet Society
IT	Information Technology
LCD	Liquid Crystal Display
MoEYS	Ministry of Education Youth and Sports
MS	Microsoft
NGO	Non Government Organization
NiDA	National Information Communications Technology Development Authority
NIE	National Institute of Education
NPO	Non Profit Organization
OFC	Open Forum of Cambodia
PTTC	Provincial Teacher Training Colleges
ROI	Return On Investment
RTTC	Regional Teacher Training Centre
SME	Small and Medium Enterprise
TV	Television
URL	Uniform Resource Locator

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The world is today transforming into one society driven by a phenomenal increase in the amount of communication between civilizations and information shared between individuals, regions and countries. It has truly become an information society in which information and communications technologies (ICT) are playing important and indispensable roles to create, foster, disseminate and promote knowledge. ICTs are a major factor in shaping the new global economy and producing rapid changes in society. It seems with the Open Institute executive director convinced that "technology is basic and necessary infrastructure for development and equality", (Cambodia Weekly newspaper 2007, No.41). Educational systems around the world are under increasing pressure to use the new ICT to teach students the knowledge and skills they need in the 21st century. The computer have the potential to transform the nature of education-where and how learning takes place and the roles of students and teachers in the learning process.

The use of computers in Cambodia has been growing exponentially along the last decade. As there are no computers that fully work in Khmer script (the written language of Cambodia), Cambodians mostly use computers with desktops and applications in English language. It is possible to type Khmer texts with a word processor, but in order to do so the user needs to learn some English first. No software companies have translated their software to Khmer, (Master Plan for Deployment of Free and Open Source Software in Cambodia, 2005).

In order to enter a digital world without forfeiting its culture, a country must do it by using software in its own language. Software in a foreign language exacerbates the digital divide, makes basic computers training difficult and expensive, impoverishes local culture, and blocks computer-based government processes, as the

local language script cannot be used in databases. In Cambodia –after genocide process that almost exterminated Khmer culture (the Khmer Rouge) - This becomes a critical issue. These problems come at a time in which the Khmer linguistic heritage has been weakened. Students have little formal knowledge of the language and there is very little basic definition of important issues such as the number of letters, the order of words in Khmer, recommended spellings, or general linguistic rules. Entering into a computer world that does not assist fixation of Khmer language issues creates further confusion (while bringing in foreign terminology). As support for Khmer script does not exist, no databases that use Khmer language can be developed for governmental use, complicating enormously the work of the administrations as well as and private companies, who desperately need databases of citizens, customers, etc. The transcription of Khmer script to roman letters leads to ambiguity, making the use on transcribed characters very unreliable. A basic level of English is now a pre-requisite for computer training in Cambodia. This makes training very long for those who have not learned the English language before: the poor, people in the provinces, the young in schools and many government officials with the corresponding difficulty for computerizing the administration. Not knowing English is – in fact - a barrier for many jobs that do not require the use of the English language such as doing accounting, correspondence, invoicing or stock tracking for a small business.

With the many obstacles Cambodia needs to overcome in order to provide quality education for all, it may seem that Information and Communication Technology (ICTs) should be low on its list of priorities. On the other hand, unless action is taken soon, the country will fall further behind its neighbors and its young people will lack the skills they need for life in the digital age. Using ICTs can help teachers move towards student centre teaching and learning, **(**Report of policy and strategies on ICT in education, 2005).

The MoEYS is committed to promote the use of ICT in education. All students in teacher colleges are required to attend 2 hours per week in ICT courses, starting in 2003. The number of computers in teacher training institutions increased dramatically during the year 2003. Some of these computers have come from Priority Action Plan (PAP) budget and some from donations from different sources. The recent increase in computer numbers has been significant and all colleges now have a computer room.

In 2003 the average student: computer ratio in Regional Teacher Training Centre (RTTCs) and Provincial Teacher Training Colleges (PTTCs) was 65:1. In 2004 the ratio has been reduced to 32:1. This has enabled colleges to start their courses in ICT. Not all colleges have enough computers to run ICT courses effectively and some have problems with power supply for example having to rely on a generator or having to turn off all other electrical appliances in the college while the computer room is in use, **(**Report of policy and strategies on ICT in education, 2005).

The Open Institute is a non-governmental not-for-profit organization that envisions Cambodia a country where people have equal access to knowledge, information and technology. Its mission is to facilitate communication and knowledge sharing for social development. At present, Khmer Software Initiative is a one of six programs run by Open Institute. Khmer Software Initiative project is to produce and distribute the basic computer technology necessary for Cambodia to enter the age of technology and be prepared for development. The project has translated to Khmer language the necessary Free and Open Source applications, produced training materials and worked on distribution and on ICT policy. It has trained several thousand teachers and government employees. NGOs and government are systematically enabling the use of computers in the central and local governments, while the public education system will only teach Khmer language software.

The National Institute of Education (NIE) in Cambodia is under the Ministry of Education Youth and Sport (MoEYS). NIE is charged with responsibility for the training of Cambodia's school teachers and school administrators. It comprises two departments - the Education Department, which trains lower and upper secondary school teachers in the sciences and social sciences around 500 teacher each year, and the Planning and Management Department, which trains school principals, inspectors, supervisors and office administrators to plan and evaluate the quality of education throughout the country. Conducting training Khmer language software to staff at NIE is part of the agreement between the Open Institute and the Ministry of Education, Youth and Sport of the Royal Government of Cambodia, who are working together to use ICT to improve the quality of education. The main purpose of training programs in NIE are to 1) permit all teacher use computer for their pedagogical and administration work 2) permit the teaching of the use of computers in Khmer

language software in school and 3) supporting all teacher trainees basic computer skills that they can use for their work.

1.2 Rationale of the Study

The last decade has seen a phenomenon that in the preceding one would have been thought as impossible. A community of volunteer computer scientists has put together and maintains a computer operating system, advanced user interfaces (desktops) and a number of applications (including office software, such as word processing or spreadsheets, and Internet tools) that compete in quality, appearance and robustness with some of the most developed proprietary operating systems (such as Microsoft Windows), producing – in some cases – better and safer applications. All this software -grouped under the name of Free and Open Source Software- is in the public domain and can be used or translated by anybody, without having to pay any licenses. Large computer companies such as IBM or Sun Microsystems support the Open Source model and develop Open Source software. Some Open Source user interfaces and applications are now being translated into different languages. Khmer language software is the free open source which translated from Open Source Software that user can use the software in Khmer language.

ICT provide a window of opportunity for educational institutions and other organizations to harness and use technology to complement and support the teaching and learning process. Training in basic ICT skills is an important stage in the development of teachers' ICT capability. At the same time, the revolution of using ICT in education field in Cambodia, the training also take part in project to provide the knowledge and skill to the teacher in learning Khmer language software with open source software to support teaching in classroom environment, researching other document and communication in the world wide web.

In 2007, the Ministry of Education, Youth and Sport has signed an agreement with the Open Institute to create a new joint project (Open Schools Program) that is taking the results of KhmerOS to all the public education system of Cambodia. Through this agreement, all the pre-service teachers (and all ICT teachers who are already working as such) will be trained to the use of Khmer language applications. ICT teachers are also trained for Computer Maintenance. Starting in the 2007-2008 academic year all upper secondary schools, public universities and teacher training

centers (which have computers for education) will teach to their students' computers application in Khmer language. Textbooks for this academic year have been edited and are presently being printed, (report on Stockholm Challenge Award, 2007).

The overall objectives of training Khmer language software include: reduction of the Digital Divide by empowering of the least advantaged to access jobs that require the use of computers; reduction of training time and cost for jobs that require computer skills; facilitating the computerization of the administration, protecting the local language from an excessive entry of foreign terms that complicate training and integration in the work place; permitting training on technology from early stages in the education system; reaching out to rural areas in order to offer to them training on skills similar to those which might be offered in large cities; and empowering the Administration to maintain databases in its own script.

Ever since training Khmer language software was implemented, 110 of trainee who work at NIE were trained in using software. Till now, no formal evaluation of the training Khmer language software program at National Institute of Education in enhancing the quality of using Khmer language software of trainee has been conducted. So, it is high time to conduct a study to find out how the trainee feeling to the training program and their applying newly software into fulfillment jobs by local language software. It is important to evaluate the effectiveness of training ICT by Khmer language software for its worthiness and value in enhancing the using information technology in pedagogical. Worthen and Sanders (1973: 19, cited in Bhasuk, 1990: 7) mentioned that evaluation is important since it provides information which will be used to judge the worth of a thing. "Evaluation is the determination of the worth of a thing. It includes obtaining information for use in judging the worth of a program, product, procedure, or objective, or the potential utility of alternative approaches designed to attain specified objective."

Open institute and MoEYS has plan to institutionalize the Khmer language software to train the various trainee with official staff and other user by over the country. The content or curriculum of training Khmer language software will be used to train the trainee of various organizations in using computer with local software as Khmer language in Cambodia. So it is very important to evaluate the training Khmer

language software program and how it has helped to enhance the using ICT of trainee with Khmer language software.

1.3 Research Objectives

The general objective of this research was to evaluate the effectiveness of training Khmer language Software at National Institute of Education with 4 specific objectives as follows:

1.3.1 To assess the satisfaction of the trainee with the training program.

1.3.2 To evaluate the learning level of the trainees in training program using Khmer language software.

1.3.3 To find out the behavior of trainee after received the training Khmer language software.

1.3.4 To find out the result to organization from conducted training Khmer language software.

1.4 Research Question

1.4.1 How much the trainees were satisfied with the training Khmer language software?

1.4.2 How significantly different are the learning on Khmer language software of trainees before and after the training?

1.4.3 How is the trainee's behavior to Khmer language software in fulfillment job after received training?

1.4.4 What is the result of organization from conduct the training Khmer language software?

1.5 Research Hypothesis

1.5.1 There is high level of trainee's satisfaction on training program.

1.5.2 The training Khmer language software increased the trainee's learning in a statistically significant way after the training.

1.5.3 There is high level of trainee's behavior on applying learning into fulfillment job.

1.5.4 There is high level of organization benefit from conducting the training program to the staff.

1.6 Scope of the Research

This study will mainly emphasize on evaluation of training Khmer language software using Kirkpatrick Model of Evaluation. This research is expected to the Khmer software as a tool in strengthening the institutional capacity of teacher and staff at National Institute of Education, in providing knowledge and efficient implementation of training course in local language with KhmerOS project in Cambodia.

1.7 Limitations of the Research

The using information and Communication Technology in field of education in Cambodia is generally to get the education for all in 2015. At the same time, course for providing the training to support all staffs and teachers be able to use these technology in there fulfillment job. In this research paper will covers only the effecting of teacher and staff training on ICT that learning with Khmer language software at National Institute of Education in Phnom Penh City for period July and August, 2007. The duration for the training course was 20 hours per course such as: Word-processing, Spreadsheet, Presentation. Therefore this study may not generalize whole teacher and staff have been training with open source application in education of Cambodia.

1.8 Operational Definition of Terms

For mutual understanding, the following terms had been defined:

1.8.1 **Satisfaction on Khmer language software Training Course** refers to the state of trainees being satisfied towards the course material, instructors and relevance of job to training Khmer language software after received training program.

1.8.2 **Knowledge on Khmer language software** refers to whether the trainees remembering the fact about content of training Khmer language software by focus on OpenOffice.org Writer, OpenOffice.org Calc, and OpenOffice.org Impress.

1.8.3 **Skill on Khmer language software** refers to the trainee’s ability that is able to use OpenOffice.org Writer, OpenOffice.org Calc, and

OpenOffice.org Impress on their job after they finished training Khmer language software.

1.8.4 **Attitude on Khmer language software** refers to the way of thinking or feeling from the trainees to the software of Khmer language application.

1.8.5 **Behavior on training Khmer language software** refers to the action extent to which trainees applied the learning from training Khmer language software back on the real job fulfillment.

1.8.6 **Result on training Khmer language software** refers to the outcome of training Khmer language software effect on the environment of organization by the trainee.

1.8.7 **Effectiveness on training ICT** is refer to trainee were satisfy with training program, learning is improve about Khmer language software, behavior of trainee has change and the organization get benefit from training ICT.

1.9 Research Contribution

1.9.1 The findings will be useful in providing judgment and worthiness of this training Khmer language software program.

1.9.2 To realize the evaluation of effectiveness on trainees in training Khmer language software with improving of new software into tertiary-level teaching and learning.

1.9.3 To offer benefit to the Open Institute for providing the curriculum to other institution, with its contents being adjusted for the suitability of their circumstances.

1.9.4 To provide effective faculty training in the pedagogical use of ICT and media education by presenting a case on the implementation of a faculty training program.

1.9.5 To show effective of the professional development of individual participants based on the assumption that ICT training can lead to permanent educational change.

1.10 Conceptual Framework

The conceptual framework for this study based on Donald L. Kirkpatrick model of evaluation training is as shown below:

Conceptual Frame Work

Level	Key question	Indicators	Measure
Reaction	What was the participants' reaction to the program?	Satisfaction	Questionnaires
Learning	What did the participants learn?	1) Knowledge 2) Skills 3) Attitudes	Pre-Post testing questionnaires
Behavior	Did the participants' apply learning into fulfillment job?	Trainee's Behavior	In-depth interviews
Results	Did the organization receive benefit from training program?	Organizational result	In-depth interviews

Figure1: Conceptual framework used in the research

CHAPTER 2

LITERATURE REVIEW

The purpose of this research was to study the potential effectiveness of training to teacher in learning information and communication technology (ICT) based on Khmer language with open source application at National Institute of Education (NIE) in Cambodia. It is necessary to review relate literature and researches to find information that could be used for developing research instruments. In this chapter, Literature Review, the research study will discuss and describes some documents and theories that related to the research topic as follow:

2.1 Concepts of Training
2.2 Training Effectiveness
2.3 The Kirkpatrick Model
2.4 Hamblin’s Model
2.5 Jack Phillips: Five Level ROI Framework
2.6 Bloom's Taxonomy Definitions
2.7 Satisfaction
2.8 Learning Theory
2.9 Behavior
2.10 Curriculum for Khmer Language Software Training
2.11 KhmerOS Project
2.12 Master Plan for Deployment of Free & Open Source Software
2.13 Policy and Strategies on ICT in Education in Cambodia
2.14 Relevant Researches

2.1 Concepts of Training

2.1.1 Definition of training

Training is the process by which people are taught skills and given the necessary knowledge or attitude to enable them to carry out their responsibilities to the required standard. It is different from education which imparts general knowledge of a particular subject, as it is focused on the specific requirement of the job. Usually the aims are to improve the performance of current tasks, to instruct in the carrying out of the tasks with which the post holder is not familiar, or to prepare the individual for change that are likely to arise.

2.1.2 Purpose of Training

The main reason for undertaking training is for the organization to ensure that it achieves the best possible return from its investment in its most important (and frequently most expensive) resource: its employees. To this effect, the main aim of any training will be to achieve some kind of change in knowledge, skill, experience, behavior or attitude which enhances the effectiveness of the employee. Specifically, training will be used to:

- develop individual skills and abilities to improve job performance;
- familiarize employees with new systems, procedure and methods of working;
- help employees and new starters to become familiar with the requirements of a particular job and of the organization.

It is generally accepted that the most difficult aspect of training is changing attitudes and behaviors, compared to which improvement in knowledge and skills are relatively straightforward to attain and measure.

2.1.3 Evaluating training and Development

Evaluating the effectiveness of training and development is far from straightforward and is especially difficult in the case of management development. Whereas it may be relatively easy to measure increased output on a production line, it is less easy to measure improved administrative efficiency or better customer relations, and virtually impossible to demonstrate improved managerial competence. However, it is still important to try to ensure that any training and development provided is achieving what it is intended to achieve.

The training evaluation process has the potential to provide useful information to multiple stakeholder groups. By designing an effective training evaluation process, an organization can obtain the information needed to improve both training program delivery and business performance, creating opportunities for continuous organizational improvement.

Evaluations are normally divided into two broad categories: formative and summative.

a) Formative

Formative evaluation (also known as internal) is a method of judging the worth of a program while the program activities are $forming$ (in progress). This part of the evaluation focuses on the process.

Thus, formative evaluations are basically done on the fly. They permit the learner and the instructor to monitor how well the instructional objectives are being met. Its main purpose is to catch deficiencies so that the proper intervention can take place. This allows the learner to master the required skills and knowledge. Formative evaluation is also useful in analyzing learning materials, student learning and achievements, and teacher effectiveness. Formative evaluation is primarily a building process which accumulates a series of components of new materials, skills, and problems into an ultimate meaningful whole.

b) Summative

The summative evaluation (also know as external) is a method of judging the worth of a program at the end of the program activities (summation). The focus is on the outcome.

If we refer to Kirkpatrick's four levels of evaluation, levels one and two (reactive and learning) are formative evaluations while levels three and four (performance and impact) are summative evaluations. The reactive evaluation is a tool to help determine if the objectives can be reached, the learning evaluation is a tool to help reach the objectives, and the performance evaluation is a tool to see if the objectives have actually been met, while the impact evaluation is a tool to judge the value or worth of the objectives. Thus, there are four major break points.

The various instruments used to collect the data are questionnaires, surveys, interviews, observations, and testing. The model or methodology used to gather the data should be a specified step-by-step procedure. It should be carefully designed and executed to ensure the data is accurate and valid.

Questionnaires are the least expensive procedure for external evaluations and can be used to collect large samples of graduate information. They should be trailed before using to ensure the recipients of the questionnaire understand their operation the way the designer intended. When designing questionnaires, keep in mind the most important feature is the guidance given for its completion. All instructions should be clearly stated...let nothing is taken for granted.

2.2 Training Effectiveness

The effectiveness is a general term, of which “productivity”. One theorist defines productivity as encompassing efficiency, effectiveness, and their symbiotic relationship (Balk 1974). At the same time, the important conceptual distinction between efficiency “doing things right” and effectiveness “doing the right thing”. By far the most common perspective on productivity in the public sector is the production process model, which concentrates upon relating inputs to outputs. Productivity is defined as efficiency (output compared to inputs) and effectiveness (output compared to some standard, usually cost).

Models that recognize the complexity of these issues tend to differentiate at least three kinds of "effectiveness": (a) task effectiveness or goal attainment, including output, results, efficiency, etc; (b) appropriate organizational structure and process, including organizational characteristics, member satisfaction, motivation, communication links, internal conflict resolution, absence of strain between subgroups, etc; and (c) environmental adaptation, including flexibility in the face of change, resource acquisition, longer-term adaptation and survival.

Training effectiveness has focused on measuring trainee reactions to the training program and the degree of learning from the program. Reaction to the training program is measured on the trainee’s satisfaction toward the content, courses, relevance to job and trainers; while the degree of learning is measured by improvement in abilities including knowledge, skills and attitudes.

Reaction and learning are studied as major indicators of training outcomes. Implementation of a training program is intended to improve performance of the corporate organization; however, if the trainees do not have the will to apply the skills or knowledge learned during training, then the implementation of training has failed. As well, organizational factors may hinder the application of newly learned skills or knowledge. Learning achievement encompasses to what degree the trainees learn and improve through the training program in terms of knowledge, skills and attitude for the job task.

2.3 The Kirkpatrick Model

Donald Kirkpatrick became interested in evaluating training programs in 1952 as he wrote his PhD dissertation--"Evaluating a Human Relations Training Program for Foremen and Supervisors."

2.3.1 The Kirkpatrick model for summative evaluation

Assessing training effectiveness often entails a summative evaluation (done after the training is offered) using the four-level model developed by Donald Kirkpatrick. Although originally published in 1995, Kirkpatrick's four level of evaluation are still applicable today. Even though training delivery has changed in the last forty years – from mainly instructor-led to the use of blended and online strategies – the basic concepts and principles to evaluation training has not changed.

This article talks about information and excerpts from a book called Evaluating Training Programs: The Four Levels (Second Edition) by Donald L. Kirkpatrick, 1998.

2.3.2 Importance of learning objectives

"If you do not have well-defined learning objectives, you can not effectively evaluate a course at any of the four levels of evaluation. If you do not know what indicators you are trying to impact before the course is implemented, it makes little sense to define these indicators after the implementation." (Kirkpatrick, 1998)

2.3.3 Kirkpatrick's Four Levels

a) Level One: Reaction

Reaction measures customer satisfaction immediately after the training event and is geared toward continuous improvement in the reaction to learning.

This is often measured using **"smile sheets"** whereby students are asked to evaluate the training after completing the program by means of a survey or questionnaire, delivered online or offline. It is important to evaluate the training itself (reaction to course, content, instructor, relevancy to job).

b) Level Two: Learning

Learning occurs when attitudes are changed, knowledge is increased, or skill is improved.

What the student has learned from the training?

This is often measured by a **test** administered at the completion of training. Level 1: learning objectives can be reworked into "performance"; objective for level 2: evaluation and test items or questions should be truly written to the learning objectives. If possible, do pre- and post-testing or use a control group to evaluate before and after the training, although this is not necessary if learning a new skill. By summarizing the scores of all students, trainers can accurately see the impact that the training intervention had.

c) Level Three: Behavior

Ideally, this measurement is conducted 3 to 6 months after the training program to answer whether or not student's behaviors actually have changed as a result of new learning. By allowing some time to pass, students have the opportunity to implement new skills and retention rates can be checked.

Can the student apply their learning? What do you do differently now compared to before the training?

This is often measured suing a **survey and/or interview** of students & their managers some time after the training (i.e. 2-6 months), sometimes called behavioral scorecards, It attempt to find answers to such things as if students are not applying the training, then why? Are managers inhibiting the use of the training?

This is often the most difficult to measure and probably the most important. It is important to determine whether behavior changes, and if not, understand the reasons why it has not changed.

d) Level Four: Results

This is the final results that occurred because of the training. Level 4 evaluates the business impact of the training program and usually happens 2 to 6 months after the training. Some examples of training programs and the type of business impact data that can be measured include:

a) Sales training- Measure change in sales volume, customer retention, length of sales cycle, profitability on each sale after the training program has been implemented.
a) Technical training – Measure reduction in calls to the help desk; reduced time to complete reports, forms, or tasks; or improved use of software or systems.
b) Quality training – Measure a reduction in number of defects.
c) Safety training – Measure reduction in number of severity of accidents.
d) Management training – Measure increase in engagement levels of direct –report.

There is some indication that evaluation should begin at level 4 to determine and document the organizational consequences/outcomes for training – that training should be closely linked to organizational goals and strategic objectives to add significant value to company.

Summary of Kirkpatrick Model

level	evaluation type	evaluation description and characteristics	examples of evaluation tools and methods	relevance and practicability
1	**Reaction**	- reaction evaluation is how the delegates felt about the training or learning experience	- eg., 'happy sheets', feedback forms - also verbal reaction, post-training surveys or questionnaires	- quick and very easy to obtain, not expensive to gather or to analyze
2	**Learning**	- learning evaluation is the measurement of the increase in knowledge - before and after	- typically assessments or tests before and after the training - interview or observation can also be used	- relatively simple to set up; clear-cut for quantifiable skills - less easy for complex learning
3	**Behavior**	- behavior evaluation is the extent of applied learning back on the job - implementation	- observation and interview over time are required to assess change, relevance of change, and sustainability of change	- measurement of behavior change typically requires cooperation and skill of line-managers
4	**Results**	- results evaluation is the effect on the business or environment by the trainee	- measures are already in place via normal management systems & reporting -challenge is to relate to the trainee.	- individually not difficult; unlike whole organization - process must attribute clear accountabilities.

Figure 2: Kirkpatrick model

According to this model, evaluation should always begin with level one, and then, as time and budget allows, should move sequentially through levels two, three, and four. Information from each prior level serves as a base for the next level's evaluation. Thus, each successive level represents a more precise measure of the effectiveness of the training program, but at the time requires a more rigorous and time-consuming analysis.

2.4 Hamblin's Model

Hamblin's initial model is very similar to that of Kirkpatrick in general terms and suggests five levels:

1) Level 1. Reaction: carried out during, immediately after and some time after the event; the learners' reactions to a range of factors are sought
2) Level 2. Learning: carried out before and after the event; an evaluation of the developmental change that has taken place in knowledge, skills and attitude
3) Level 3. Job behavior: a determination of any change in job performance as a result of the event; carried out before and after the event
4) Level 4. Functioning: a quantification of the effect of the event on the learners' department or organization, preferably in terms of cost benefit analysis
5) Level 5. Ultimate value: the extent to which the event has affected the ultimate profitability and/or survival of the organization.

2.5 Jack Phillips: Five Level ROI Framework

One of the most challenging issues facing organizations is to place a value on the benefits in training and development, human resources, performance improvement, change, quality, and technology. The ROI methodology, developed by Dr. Jack J. Phillips, has proven to be an accurate, credible, and feasible approach to addressing the accountability issues for all types of organizations.

Here are the results of a five-level evaluation:

Level 1: **Reaction & planned action** Measures participant satisfaction with the program and captures planned actions. What are participants' reactions to the program, and what do they plan to do with the material?

Level 2: **Learning** Measures changes in knowledge, skills, and attitudes. What skills, knowledge or attitudes have changed, and by how much?

Level 3: **Application and implementation** measures changes in on-the-job behavior and progress with application. Did the participants apply what they learned on the job?

Level 4: **Business impact** Captures changes in business impact measures. Did the on-the-job application produce measurable results?

Level 5: **Return on investment** Compares program monetary benefits to the program costs. Did the monetary value of the results exceed the cost for the program?

Data for Levels one through four is collected during the training program to accurately determine its effects. This data is then converted to a monetary value. The program cost is then tabulated, based on all resources that contributed to it. The cost is then used to determine the ROI.

2.6 Bloom's Taxonomy Definitions

Bloom's Taxonomy underpins the classical '**Knowledge, Attitude, Skills**' structure of learning method and evaluation, and aside from the even simpler *Kirkpatrick learning evaluation model*, Bloom's Taxonomy of Learning Domains remains the most widely used system of its kind in education particularly, and also industry and corporate training. It's easy to see why, because it is such a simple, clear and effective model, both for explanation and application of learning objectives, teaching and training methods, and measurement of learning outcomes.

Bloom's Taxonomy model is in three parts, or 'overlapping domains'. Again, Bloom used rather academic language, but the meanings are simple to understand:

1. **Cognitive domain** (intellectual capability, ie., **knowledge**, or '**think**')
2. **Affective domain** (feelings, emotions and behavior, ie., **attitude**, or '**feel**')
3. **Psychomotor domain** (manual and physical skills, ie., **skills**, or '**do**')

Summary of Bloom's Taxonomy

Cognitive	Affective	Psychomotor
knowledge	**attitude**	**skills**
1. Recall data	1. Receive (awareness)	1. Imitation (copy)
2. Understand	2. Respond (react)	2. Manipulation (follow instructions)
3. Apply (use)	3. Value (understand and act)	3. Develop Precision
4. Analyze (structure/elements)	4. Organize personal value system	4. Articulation (combine, integrate related skills)
5. Synthesize (create/build)	5. Internalize value system (adopt behavior)	5. Naturalization (automate, become expert)
6. Evaluate (assess, judge in relational terms)		

Figure 3: Detail of Bloom's Taxonomy Domains

2.7 Satisfaction

2.7.1 Definition of satisfaction:

From Dictionary of Encyclopedia mentioned that Satisfaction is the act of satisfying, or the state of being satisfied; gratification of desire; contentment in possession and enjoyment; repose of mind resulting from compliance with its desires or demands.

From Cambridge Advanced Learner's Dictionary mentioned that satisfaction is a pleasant feeling which you get when you receive something you wanted, or when you have done something you wanted to do.

By considering the definitions of knowledge above, it can be summarized that satisfaction is the state of being satisfied when receive something.

2.7.2 Type of satisfaction

There are two types of Satisfaction:

1) Intrinsic satisfaction: Which involves achievement, recognition, and other features associated with the work itself.
2) Extrinsic satisfaction: This involves working conditions, supervision, and other components of the environment context in which the work is performed.

2.7.3 Evaluation satisfaction

According to the Kirkpatrick model (2006), evaluating reaction is the same thing as measuring customer satisfaction.

Trainee satisfaction - The first level of evaluation occurs when trainees are asked for input regarding how well they liked the training. This is the most common type of evaluation conducted - and unfortunately for much training, the only evaluation done. Trainees should be asked about the resource of training, process of training, products of training.

When asking to evaluate the satisfaction on training, it will be providing critical input that helps determine how well the new trainees received training standards were met and whether or not resources were wisely invested. By completing the evaluation form, a trainee is taking an important step in ensuring that the training offered an effective vehicle for imparting the skills and knowledge needed to get the job done. These standards set the norms by which training is measured in three key areas: course material, instructors, and job relevant. The standards provide guidance on how training is to be developed and delivered and apply to all training provided to trainees, whether developed and delivered internally or externally.

The end-of-course or Level 1 reaction form is being standardized for two reasons.

1) Bring the form in line with the new training standards.

As the standards provide specifics about course materials, instructions, and the instructional environment, the form asks your input about these areas. By reviewing the responses, adherence to the standards can be checked.

2) Ensure that all training events are evaluated around the same items.

This allows Customs to compare and contrast data for classes/courses as well as to roll up data to higher level statistics. This provides useful information for training development and delivery. For example, if a class is being taught nationwide and evaluations show that over time it is doing fine in the east, north, and west but is not meeting objectives in the south, the training sponsor is alerted that something needs to be done. If the class is being evaluated using different questions and rating scales in all of these locations, there would be no way to objectively compare the data and make a determination that problems are occurring.

2.8 Learning Theory

Another purpose of training was to facilities trainees to learn and to have desirable attitude. Learning brought about experience and permanent changed of behavior in physical, mental, emotional and social terms. Some of the learning theories were:

Webster's Dictionary (1976: 1286) defined learning as a process of increasing and improving knowledge, skills, habits or expressions, resulting from stimulation through experiences, practice or training.

Roger (Roger, 1986 cited by Suwat Wattanawong, 1995: 38) defined learning as changes that resulted in knowledge and understanding, dependent on memorization ability. There were two aspects of change. One was automatic and the other through purpose and effort, but the two had to be relatively permanent.

Bloom (1962: 7) Chainsri Wiwitthsiri (1984: 122) and Uthumporn Jamornmarn (1998: 1-3) defined learning as behavioral changes in three domains and each domain was subcategorized into smaller behaviors ranging from simple to complex. This categorization facilitated the establishment of tools to measure learners' behaviors. The three domains were as follows:

1) Cognitive domain was a change in knowledge, understanding and thinking process, which were composed of memorization, understanding, application, analysis, synthesis and evaluation.

2) Affective domain was an ability to feel about attitude, beliefs and values. It composed of perception, interest and response, evaluation and values, system organization, and habit formation, e.g muscle manipulation skills, balancing on a string or skillful driving.

3) Psychomotor domain was a change in attitude and the ability to practice or move physically, consisting of imitation, doing according to a model, seeking rightfulness, doing continuously, and doing naturally. These reflected good or bad mental states, such as, an official committing a crime due to bribery or a good driver violating traffic regulation.

In summary, learning was a process to increase knowledge, improve skill, and change attitude with intent and attempted to change behaviors permanently and automatically.

2.8.1 Knowledge

1. Definition of knowledge

Definitions of knowledge given by various people are summarized below.

Benjamin (1971: 271) stated that knowledge is associated with the remembering of some specific or general things. It also includes the way in which certain processes, methods, or situations can be recalled by using the memory.

Carter (1973: 325) mentioned that knowledge refers to the way in which an individual can analyze certain experiences that has been obtained based on the truth or facts as well as the actual details of the situation. The information analyzed in then stored and collected to be used for other useful purposes in the future.

Good (1956) mentioned that knowledge is facts, truth, rules, and detail that an individual collects.

By considering the definitions of knowledge above, it can be summarized that knowledge is remembering the truth or fact that an individual has learned and it also

includes the situations and experiences that the individual has receives, these things are then shown and expressed in the form of a memory.

2. Level of knowledge

Bloom has divided the cognitive domain into 6 different levels as presents below.

1) **Knowledge:** refers to the ability of the human brain to remember or collect certain situations that an individual has received. In order to judge the knowledge or the ability of a person to remember certain things, one must consider that person's ability to choose the things to be remembered.
2) **Comprehensive**: This is ability in communicating a person's will to other people so that they can understand what that person is trying to make them realize. On the other hand, it is also an ability of a person to understand the things or ideas that other people try to communicate.
3) **Application:** is the ability in utilizing the knowledge that has been learned to solve other new or unseen problems. Application, however, is not the learning of methods that can be carried out by copying an already existed example.
4) **Analysis:** is the ability to break down a large and complex problem into many smaller problems that can be solved more easily.
5) **Synthesis:** is the ability to gather many small pieces of information to produce a new story that makes more sense. It is also the ability to consider a certain story or subject in many different ways or from many different angles, then the story or subject can be structured in a totally new way, which is better than the original one.
6) **Evaluation:** is the ability to make a certain decision based on some criterions and standards that have been set before hand.

3. Measurement of knowledge

According to the theory and standard of bloom, knowledge can be measured by using the following tools.

There are many tools that are available for measuring the level of knowledge and each kind of tool is suitable for different characteristics of the problem or

situation in hand. But in this case the utilized tool is one of the most common types, which is the questionnaire.

Questionnaire can be considered as a kind of a stimulator because they stimulate those who answer them to show some kinds of actions or behaviors, such as, speaking, writing, revealing some body languages, etc. These actions can then be noticed or counted to produce some kinds of ranking in order to determine the characteristics of the people that have answered the questionnaires. There are in 3 general patterns or characteristics of the questionnaire, which can be outlined below.

1) Oral test. This is a kind of test where the answer are physically spoken out or it can be just a conversation between the people that are involved, it can simply be called as an interview.
2) Written test. It can be separated into 2 types:
    a. An essay type, this kind of test requires the answers to be written in a form of a long explanation or criticizing certain knowledge.
    b. Short answer type, this type of test consists of questions that the answers have to be compared or certain decisions have to be made concerning the details involved. This type of written test consist of 4 different kinds, which are **'true-false', 'filling out the blanks'**, **'paring'** and **'multiple choice'**.
3) Field test. This kind of test does not want the answers to be written or spoken out but the answers must be achieved by physically carrying the test through certain behaviors.

2.8.2 Skill

1. Definition of skill

From web dictionary mentioned that skill is ability, usually learned and acquired through training, to perform actions which achieve a desired outcome.

According to the Dictionary.com, Skill is an ability that comes from training or practice.

2. Level of skills

Bloom (1956) defines skills in seven major categories are:

1) **Perception**: The ability to use sensory cues to guide motor activity. This ranges from sensory stimulation, through cue selection, to translation.

2) **Set***:* Readiness to act. It includes mental, physical, and emotional sets. These three sets are dispositions that predetermine a person is response to different situations (sometimes called mindsets).
3) **Guided Response**: The early stages in learning a complex skill that includes imitation and trial and error. Adequacy of performance is achieved by practicing.
4) **Mechanism**: This is the intermediate stage in learning a complex skill. Learned responses have become habitual and the movements can be performed with some confidence and proficiency.
5) **Complex Overt Response**: The skillful performance of motor acts that involve complex movement patterns. Proficiency is indicated by a quick, accurate, and highly coordinated performance, requiring a minimum of energy. This category includes performing without hesitation, and automatic performance. For example, players are often utter sounds of satisfaction or expletives as soon as they hit a tennis ball or throw a football, because they can tell by the feel of the act what the result will produce.
6) **Adaptation**: Skills are well developed and the individual can modify movement patterns to fit special requirements.
7) **Origination**: Creating new movement patterns to fit a particular situation or specific problem. Learning outcomes emphasize creativity based upon highly developed skills.

3. Transfer of Learning

Transfer of learning can take place in the following ways:

- Skill to skill: this is where a skill developed in one sport has an influence on a skill in another sport. If the influence is on a new skill being developed then this is said to be **proactive** and if the influence is on a previously learned skill then this is said to be **retroactive**
- Theory to practice: the transfer of theoretical skills into practice
- Training to competition: the transfer of skills developed in training into the competition situation

4. Type of skills

An every project needs to put five kinds of skills to work.

- ❖ Analytical skills
- ❖ Information management skills
- ❖ Technical skills
- ❖ Communication and presentation skills
- ❖ Project management skills

1) **Analytical skills:** Analysis and interpretation skills are necessary at every stage of an information project (or any project, for that matter). They start with problem definition, the process by which an organization describes current symptoms and uncovers the processes, policies, and practices that are contributing factors. At this stage, process analysis, system audits, stakeholder analysis, customer satisfaction surveys, performance reviews, statistical trending, and similar activities are needed. They help answer the question – "what's really wrong here?"
2) **Information management skills:** People skilled in information management know how to treat information as a valuable organizational resource. They know that it's content, quality, format, storage, transmission, accessibility, usability, security, and preservation all contribute to its value. With so many factors to consider, information management skills show up in many job types.
3) **Technical skills:** Depending on the type of problem your organization is facing, higher order technical skills will probably be required to implement the chosen solution. Many information use issues can be solved by:

   managing databases and the individual, program, service, and other data they contain

   designing and implementing systems that are compatible with the existing technical infrastructure

   developing user interfaces that make it easier for users to find and use information

transforming data from one system or format to another so that it can be "fit for use" in new ways

designing and administering networks of computer systems

creating data repositories that integrate information from various sources for easy retrieval and wider use

It takes highly trained technical experts to do these things. Some government organizations have enough of them, but most do not. This is the skill set that you are most likely to have to "buy" from private contractors. And when you make this purchase, you need another kind of skill, contract and contractor management, to make the best use of it.

4) **Communication and presentation skills:** Throughout a project, you need to communicate its goals, progress, issues, and results. Presentations about your project are an ongoing requirement. You may need to meet with legislative or executive leaders to obtain initial and continuing funding and support. Meetings with stakeholders can explain how they will be affected and encourage their buy-in and participation. Newsletters, e-mail lists, and formal reports are all ways to communicate about a project.
5) **Project management skills:** Recently conducted a survey about the information strategy and management skills that all government managers need in order to be effective. Project management was ranked number one by both statewide and agency-level respondents. Why? The size, scope, complexity, and cost of government projects that depend on IT present many risks for failure. These risks can be better understood and managed, or even minimized or avoided, by applying finely honed managerial experience. Books, courses, and whole training businesses are devoted to the topic of project management. Project management skills include the ability to plan, organize, estimate and allocate resources, negotiate, track progress, measure results, troubleshoot and, most importantly, to communicate. Another way to think about project management is the way you handle scope, time, cost, quality, and risk. No matter the size of your

project, these skills will be needed to guide the work to a successful outcome.

5. Assessment on skills

Each skill area in a skills assessment should have three components:

- Written: This identifies the knowledge required for a specific skill.
- Identification: This area assesses knowledge in specific skill areas.
- Performance: This area assesses the critical skills required.

6. Getting the skills to do the job

No organization has the perfect mix of skills, abilities, and experiences for every situation. Start by giving assignments to people with the proper skills to carry them out. Or assign activities to those who have the aptitude, desire, and responsibility to develop the necessary skills. Skills can be acquired through training, mentoring, brokering, contracting, or outsourcing. Consider these sources:

1) **Traditional classroom instruction**: Employees can take seminars, workshops, and classes on any number of subjects. You can send staff to training centers, or have the instructor come to you and provide a more customized lesson to a whole group. Hardware and software vendors usually offer training and technical assistance for their products – be sure you include these features in your contracts with them.
2) **Computer-based training:** This growing trend is often a cost effective option, particularly useful for structured topics. Participants can complete the lessons on their own computers and at their own pace.
3) **Intranet or Web-based classes:** These can have the same features and benefits as computer-based training, but their real value is in programs that add real time and off line interaction among instructors and students.
4) **Learn by doing:** Many people learn best in a practical situation, as long as the situation allows for the inevitable learning curve. When staff acquires a new skill this way, an experienced mentor can make an important difference. Mentors transmit the often tacit contextual knowledge that goes along with a particular skill.

5) **Buy skills:** You can also acquire skills by hiring outside consultants, contractors and vendors. Use their expertise to supplement what already exists in your agency. Let them do the work that you can't, but add contractor management to the list of skills you need to have in-house.
6) **Broker skills:** Government agencies are often in a position to help one another with specific tasks. Small agencies can be assisted by larger ones with more diverse skills and resources. Agencies can share vacant training slots, lend expertise, and form peer review groups to help one another with unusual or risky tasks.

2.8.3 Attitude

1. Definition of attitude

Definitions of attitude given by various people are summarized below.

Thurstione (1967: 119) stated that attitude is the overall feeling of humans, which is associated with hatred, certain thoughts, and degree of frightening towards certain things or objects. Attitude can be shown or revealed though speaking when trying to express an opinion. Therefore if one wishes to measure the level of attitude then it can be carried out by allowing an individual to express the feelings that the individual has towards certain things. Attitude is the level of opinions towards certain things, which can be either in a positive or negative sense.

Good (1956) defined attitude as the predisposition or tendency to react specifically towards an object, situation, or value, usually accompanied by feelings and emotions.

Webster's dictionary (1987) defined attitude as the manner of acting, feeling, or thinking that shows an opinion and tendency to practice.

From the above definitions it can be summarized that attitude is the thinking or feeling of the mind to respond to a certain thing or subject in one way or another.

2. Components of attitude

There are 3 components of attitude to software of Khmer language application:

1) **Cognitive component:** I the perceptual responses and verbal statements of belief. *The Cognitive component* to software of Khmer language application: denotes the perception that Khmer language software enhances work performance. This assesses whether the user finds Khmer

language software to be generally helpful, productive, imaginative, and interesting in relation their work.

2) **Affective component:** sympathetic nervous responses and verbal statements of affect. *The Affective component* to software of Khmer language application: deals with the generalized emotional reaction to Khmer language software and its use, that is, Khmer language software anxiety. This assesses whether the user may have fear, apprehension, discomfort, or hesitation with regards to ICT.
3) **Behavior component:** overt actions and verbal statements concerning behavior. *The Behavior component* to software of Khmer language application: assesses the habitual behavior with regards to Khmer language software and whether a computer is used regularly.

3. Characteristics of attitude

a) Attitude result from learning or experiences; people are not born with it. When an individual learns, he acquires that learned feeling, which results in attitude.
b) Attitude could change if the environment and the situation changes. The attitude of an individual could change from acceptance to non-acceptance or non-acceptance to acceptance.
c) Attitude determines both introvert and extrovert behaviors. Acceptance or non-acceptance attitude could be observed through expressed behaviors, which could be either expression or verbal.
d) Attitude is complex because it depends on many factors, such as experience, perception, feeling, opinion, emotion, environment, etc. Therefore, it can vary.
e) Attitude results from imitation and could be passed on to others. If one individual sees that another's behavior is acceptable, he might imitate it.
f) The quality of attitude varies from most satisfies, moderate to unsatisfactory, in which the concentration depends on this scale. As for the direction, there are 2 directions, which are supportive or positive, and against or negative.

g) Attitude may be either a conscious or unconscious result. When an individual learns or experience something, a complete consciousness is formed since that individual had already observed, through, considered the reasons, analyzed them. In some cases, attitude could be formed unconsciously as a feeling that originated without any consideration, such as parents' feeling forbidden to talk about sex because of a feeling that talking about sex is rude and embarrassing, causing an automatic unconscious non-acceptance attitude.

h) Attitude is somewhat permanent, since it originates from collected knowledge. Although it can change, it does not mean that it can be change within a period of a day. Attitude is difficult to change; even if it could, it would take time to change it, depending on the situation, event, or environment.

i) Each individual would have different attitudes towards the same thing, depending on each person's experience.

4. Attitude evaluation

Since attitude has 3 important components, it has to be assessed in all 3 components, and also in general, by consideration of actions and response towards many stimulant domains, not only from one action or behavior. Attitude evaluation usually has the following ingredients:

1) The study of attitude is the study of an individual's opinions and feelings that are stable or at least steady over period.
2) Attitude cannot be directory observed; therefore, attitude evaluation is an indirect measurement from the tendency to action of a person, not just the individual's direct behaviors.
3) The study the individual's attitude does not only focus on its direction, but also on its intensity.

5. Attitude evaluation concepts

There are 3 basic concepts in the attitude evaluation that need to be understood:

1) Content: attitude evaluation requires stimulants for actions to be expressed. The stimulant in general is the content that needs to be measured, such as the need to measure the attitude towards an individual's

decisions on family life. The stimulating content is the situation of making decisions in family life, for example, choice of spouse, age of marriage, the period of having the first born child and the next one, etc.

2) Direction: attitude evaluation in general determines the direction of the attitude to be straight and continual in the right or positive, or left and negative direction. In other words, the direction would start from mostly agreeable; reduce to indifference, and further to mostly disagreeable. The characteristics of agreement and disagreement are on the same continuous straight line.

3) Intensity: action or feeling expressed towards the stimulant has different qualities. The feelings and actions would be more violent if they are intensified, no matter into which direction, than when they are at moderate intensity.

6. Attitude scale

A tool used in attitude evaluation is called the rating scales. The attitude scale is composed of two parts, which are the attitude statement part and the reply part, which would be similar to making comparisons. There 4 common types of attitude scale i.e. Thurston-type Scale, Likert Scale, Guttman Scale, and Osgood Scale. Each of these scales has different benefits, limits, and appropriateness for use in assessing attitude. Therefore, the choice of attitude scale depends on the situation and the scope of the research.

2.9 Behavior

2.9.1 Definition of behavior

Definitions of behavior given by various people are summarized below.

Suksa Chitphithak (1982:2) stated that a person's behavior is not only shown through the physical actions but it also includes the internal feeling or emotions that the person may have, which cannot be observed by other people, such as, value, attitude, opinion, belief, and taste.

Phrakphapeurn sovarornn (1983:2) gave a meaning of behavior as every action that an individual may perform, does not matter whether or not such an action can be noticed by other people. This includes walking, speaking, thinking, feeling, and interests, etc.

So it may be summarized that behavior refers to every activity that a human may perform in order to respond to the stimulus that exist in the environment, and the actions that are performed are based on knowledge and attitude of the person.

2.9.2 Components of behavior

Cronbach (1972: 14) explained that behavior consists of 7 components, which are:

1) **Goal**: This is the desire or objective that is responsible in creating actions or activities. People carry out various activities in order to satisfy their desires. Certain activities when performed may be able to satisfy a desire straight away while certain desires or objectives may take a long time before they can be accomplished. People usually have so many desires at the same time and in most cases the desires that are the most urgent to be satisfied are carried out and accomplished first while the oeht objectives that are not as important are satisfied later on.
2) **Readiness:** refers to the status or the level of ability that each person has, which is required to carry out certain activities in order to satisfy the desires. A person cannot satisfy every desire that occurs because some of the desires or objectives may be beyond his/her ability to accomplish.
3) **Situation:** is an instance or suitable time that allows certain activities to be performed in order to satisfy the desires.
4) **Interpretation:** Before one chooses to carry out a certain activity, one has to consider the situation that one is in first before deciding to pick a method or activity to perform that is thought to be capable of giving the most satisfying result.
5) **Response:** is the carrying out of activities that have been chosen in the interpretation stage.
6) **Consequence:** is the result that is caused by a performance of a certain activity. The result achieved may confirm the original goal that has been set but on the other hand it may well contradict such a goal or objective.
7) **Reaction to thwarting:** When a person fails to accomplish the goals or objectives that have been set, it may be necessary to reinterpret the situation or the problem and hence selecting a new response to be utilized.

2.9.3 Measurement of behavior

Behaviors of an individual can be separated into two types, namely, external and internal behaviors. There are many methods that can be utilized in order to observe the behaviors of a person. For the external behaviors that an individual reveals, this can be noticed by either direct or indirect observations. But for the internal behaviors, they can not be physically noticed thus some indirect methods have to be applied, such as, interviewing, utilizing questionnaires, and laboratory tests. Therefore in order to measure the level of behavior one can use some kinds of tools such as constructing questionnaires, interviews, and some other sorts of equipment including a blood pressure measuring unit, and a stethoscope, etc.

Somchet suprunsum (1983: 131-136) explained that there were 2 methods that could be applied in the study of behaviors, which were

1) **Direct observation**: can be carried out by the following methods
   a) Direct Observation, for example, a teacher directly observing the behaviors of the students in the class. But the students have to be informed first that the teacher is going to observe the kinds of actions that they do in the class. However, in this kind of observation some students may not reveal their true behaviors that they exhibit.
   b) Naturalistic Observation is a kind of observation that the observers do not reveal themselves and the people that are being observed also do not realized that they are being watched. This type of observation is capable of giving accurate results but there are also some disadvantages, such as, time consuming and it is needed to be repeated for many times.
2) **Indirect observations:** can be performed by many methods, such as,
   a) Interviewing is a method in which the researcher asks questions orally and directly to the members of the sample group with the hope of obtaining the desired information. There are two ways that the interview can be carried out when trying to find out about the interviewees' behaviors. The first one is that the concerned questions are asked directly and straight to the point, while the other way is the indirect interview. The indirect interview is conducted by trying to

make a general conservation with the interviewees and only ask the concerned questions once in a while. A restriction or disadvantage of interviewing is that sometimes the interviewees may not want to reveal some of their details or stories.

b) Utilization of questionnaires. This is a suitable method to be applied when studying the behaviors of a large group of people but the members of the sample group must be able to read and write. Apart from this questionnaires are also capable of obtaining past behaviors of members of the sample group as well as their most likely behaviors in the future. Another advantage of utilizing questionnaires is that the members of the sample group can give the details of their secret behaviors that they would not normally tell anybody.

c) Studying the behaviors by using an experiment. In the experiment, the people being studied are kept in a controlled environment that has been set by the researcher. But in reality this can only be conducted in a laboratory because in the real community, the associated variables are difficult to be controlled. So in some cases this method may not be suitable to be used. But it must be noticed that this method is extremely advantageous when the behaviors of medical personnel are required to be identified.

d) Asking the members of the sample group to write their own diaries. This method allows the personal behaviors of each person in the sample group to be identified. It works especially well when behaviors such as eating, working, etc are needed to be found.

Therefore it can be summarized that behaviors are actions, which are influenced by the internal environment of a person, such as, confidence, attitude, opinions, personality, and experiences. These factors, which are the components of the internal environment, stimulate a person to show some kinds of external behaviors that can be noticed. In this study, the indirect method is applied in the investigation of behaviors with the utilization of questionnaires as assisting tools.

2.10 Curriculum for Khmer Language Software Training

2.10.1 Duration: 20 hours /course

2.10.2 Format:

The best format is probably 5 days with four hours of training a day. It can also be offered as a two-day and half full-time course or as a two week course with two hours of training every day.

2.10.3 Trainers: Teacher and one assistant for every 15 students.

2.10.4 Learning objective:

At the end of the course, students will have learned and being able to:

a) Prepared to teach the creation of professional-looking documents by using a word-processor, a spreadsheet, a presentation tool, or a combination of them.
b) Teach how to type in Khmer Unicode.
c) Teach how to communicate by e-mail in Khmer or in other languages.
d) Teach how to look a specific page in the Internet and how to look for information by using search engines.
e) Install, maintenance and configure on Khmer Software

2.10.5 Content: (to be developed further)

a) Typing in Khmer Unicode
b) Word-processing usage
c) Spreadsheet usage
d) Presentation Tool usage
e) E-mail: being able to effectively communicate through email, send and receive mail, and do basic configuration of the e-mail application.
f) Internet Browsing: being able to access specific URLs, surf through the Internet, do searches using search engines, and configure and the computer's Internet connection.
g) Internet connection.
h) Installation of application.

2.10.6 Software to be used:

Khmer language software (word-processing, spreadsheet, presentation tool, browsing, e-mail). Must be professional quality software that is 100% in Khmer

language (including all help files). Must have standardized training materials in Khmer. Must be able to save files in the open standard formats defined for government usage in the ICT policy draft.

2.10.7 Training materials: Developed by the Open Institute

2.10.8 Hand-outs:

a) CD's with the designated software.

b) Training materials for trainers.

c) User manual book for self-learning the application

2.10.9 Training content for Khmer language software

The training content refers to what the trainees were actually taught during the program. The content of training program is intuitively important as a factor in effective learning and in transferring that learning to job performance.

2.10.10 Curriculum contents on training Khmer language software

The training program of Khmer language software was scheduled as show below:

Component	**Definition**	**Items of content**
Part 1: Openoffice.org Writer	The word processor component of the OpenOffice.org software package. Writer is a word processor similar to Microsoft Word, with a roughly equivalent range of features.	**Lesson 1** - How to open ***OpenOffice.org Writer*** - How to change Khmer keyboard - Understanding position of Khmer letter on the key - How to use some keys, type alphabets and vowels - How to type the sign on alphabet, type COEUNG alphabets - Understanding ***Space*** and ***Ctrl*** + ***Shift*** + ***Space*** **Lesson 2** - Understanding about ***OpenOffice.org Writer window*** - How to show/hide toolbar - Understanding Formatting bar - How to align text - How to select text using Mouse, using Keyboard

Component	Definition	Items of content
Part 1: Openoffice.org Writer		- How to use Copy, Cut, Past, Undo, Redo Typing - How to put bullets and Numbering by using icon and using menu bar **Lesson 3** - How to set the Tabs, using Tab sign - How to change Font Name and Font Size - How to change text into default formatting - How to use Format Paintbrush - How to insert Special character **Lesson 4** - How to set the Page and Margin - How to insert Header and Footer, format Header and Footer - How to insert Page number and Number of page - How to change Page number into Khmer - How to use paragraph, insert picture, Wrap picture - How to define space between picture and text - How to insert Title for picture **Lesson 5** - How to set Tabs using menu bar - How to insert Section (Columns) - How to enter text into column - How to break column and Leave from column - How to put line between each columns - How to insert Footnote - How to insert Table, row and column - How to delete Row , column - How to Expand and condense column width - How to Expand and condense row height

Component	Definition	Items of content
Part 1: Openoffice.org Writer		- How to Merge cells, Split cells - How to Preview document - How to Print document
Part 2: Openoffice.org Calc	The spreadsheet component of the OpenOffice.org software package. Calc is similar to Microsoft Excel, with a roughly equivalent range of features. Calc is capable of opening and saving spreadsheets in Microsoft Excel file format. It provides number of features not present in Excel, including a system which automatically defines series for graphing based on the layout of the user's data.	**Lesson 1** - How to open ***OpenOffice.org Cal*** - Understanding ***OpenOffice.org Cal window*** - Understanding Row, Column and Cell - Understanding Cell address - How to move cursor - How to enter and edit data - How to delete data - Understanding data type - How to select Cells, Rows, Columns and Sheets - How to format text in the cells - How to change the size of Rows and Columns - How to insert and delete Rows and Columns - How to calculate in the Cells - How to use SUM and AVERAGE **Lesson 2** - How to rename sheet, inert sheet, delete sheet - How to change Fonts, set Font Effects - How to align text in the cells, set Text orientation - How to put border - How to set Format Number and Format Currency - How to enter Date and set Format Date - How to use User-defined - Understanding the sign for define Format number - Understanding the Format number in Khmer - How to Merge cells

Component	Definition	Item of content
Part 2: Openoffice.org Calc		**Lesson 3** - Using MAX( ), MIN( ), COUNT( ), COUNTA( ), COUNTBLANK( ), RANK( ) - TODAY( ), NOW( ), YEARS( ), MONTHS( ), DAYS( ) - CONCATENATE( ), INT( ), MOD( ) - Reference Cell Address and Absolute Cell Address - COUNTIF( ), IF( ) **Lesson 4** - Using NETWORKDAYS( ) - Using Function Wizard - Using HOUR( ), MINUTE( ), SECOND( ) - Using DAYS360( ) **Lesson 5** - How to Sort data, Filter data - How to use AutoFilter, release AutoFilter - How to use Standard Filter, release Standard Filter - How to drag automatically date
Part 3: Openoffice.org Impress	A part of the Openoffice.org office suite and developed by Sun Microsystems, is a presentation program similar to Ms. PowerPoint. In addition to being able to create PDF files from presentations, it is also able to export presentations to Adobe Flash (SWF) files allowing them to be played on any computer with the Flash player installed.	**Lesson 1** - How to open ***OpenOffice.org Impress*** - Understanding ***OpenOffice.org Impress window*** - How to create Slide Presentation - Understanding Type of presentation - How to select Slide Layouts - Understanding Text Formatting - How to Copy, Paste and Insert new Slide -How to Rename Slide, Hide/ Show Slide - How to Delete Slide, show Slide full screen - How to save, close and exit slide presentation

Component	Definition	Item of content
		Lesson 2 - How to enter text into Slide, How to insert Table - How to inset AutoShapes, add Animation - How to change Animation, remove Animation - Understanding about type of Animation - Understanding about View of Slide Presentation - Understanding about Slide Transaction - How to remove Slide Transaction **Lesson 3** - How to inset Chart, Understanding about Chart Diagram - Edit Data of Chart, Insert Footer into Slide - How to do Slide Master - Good characteristic of Slide Master - Insert Header and Footer into Slide Master - Insert Header and Footer into Notes and Handout - How to create and save Template - How to Print Slide

Figure 4: Curriculum of training Khmer language software

From the above literature on training Khmer language software program, its clear what is Khmer language software program and the purpose of training Khmer language software. The modules and the schedule of Khmer language software program are described to know and understand how training is conducted. The main part of research instruments is constructed based on the above information. The content of training program is intuitively important as a factor in effective learning and in transferring that learning to job performance.

2.11 KhmerOS Project

The following mention as according to the report of KhmerOS project:

2.11.1 Objectives of this project

The aims of this project are:

a) Reduction of the Digital Divide by empowering of the least advantaged to access jobs that require the use of computers.
b) Reduction of training time and cost for jobs that require computer skills.
c) Facilitate the computerization of the Government, allowing it to maintain databases in its own language and script.
d) Permit training on technology from early stages in the education system.
e) Permitting reaching out to rural areas in order to offer to them training on skills similar to those which might be offered in large cities.
f) Protect the local language from an excessive entry of foreign terms that complicate training and integration in the work place. Support the linguistic goals of the Government.
g) Clarification and standardization of the correct use of the Khmer language and of Khmer cultural issues such as word sorting.

In order to fulfill these social goals, the following technical goals need to be fulfilled:

a) Create a set of free computer applications in Khmer that cover most of the people's computer needs (office productivity and Internet), and that will work in both the MS Windows and Linux Operating systems.
b) Development (translation) and deployment in Cambodia of a free end-user computer system (desktop) and its applications that works entirely in Khmer Language (KhmerOS system). This system will open the way to develop specific applications that use interfaces and data in Khmer language, for the Cambodian administration as well as for private sector companies.
c) Production of training materials on the use of the translated applications. These materials will also be free.
d) Provide training for trainers to the use of the applications for those who are presently teaching the use of computers in English.

e) Creation of software development and computer training expertise -based on this software- for computer Cambodian software development companies, computer vendors, universities and private computer training centers.

f) At a first stage, assuring the installation of the tools of at least 80% of the MS Windows based computers sold in Cambodia in the first year after the system is fully functional. To have –three years after deployment- Linux based KhmerOS preinstalled in 80% of new systems sold in Cambodia.

2.11.2 Project Output

The project will produce:

a) **Free high-quality end-user computer applications** that will run in both Windows and Linux platforms. These applications will cover all office functions (word processing, spreadsheet, presentation tool) and communication applications (e-mail, web-mail, Internet browser, chat).

b) A full computer operating system (KhmerOS), with a desktop and all the necessary office and entertainment applications needed by a normal computer user, and all of it entirely in Khmer language. A user will only see Khmer language script in his screen. The system will include full documentation in Khmer, in electronic and paper formats. KhmerOS -based on Open source Software- will be free.

c) Standard (Unicode) Computer Fonts (typefaces), and a Standard Khmer Unicode Keyboard.

d) Training materials addressed to end-users, training for trainer materials and books for self-learning and reference.

e) **Computer trainers prepared** to teach the new Khmer-language applications using the above mentioned materials.

f) University professors, students and software development company personnel trained on advanced Linux and Free and Open Source software and application development using the Khmer script support tools provided by the project. Computer vendor personnel trained on the installation, parameterization and troubleshooting of **KhmerOS**.

g) Creation of a central Open Source Expertise Center.

h) Government personnel trained to work with computers in Khmer language.

2.11.3 Benefits and beneficiaries

a) Cultural: Allowing Cambodia to enter the technological world without forfeiting its culture. Avoiding the entrance of an excessive number of foreign words in the Khmer language. Turning the computer into a tool that reinforces Khmer culture, by producing correct spell-checking, clearly defining and permitting the right ordering of Khmer words, the right format for dates, as well as a number of other cultural issues that computers in a foreign language could change irreversibly, adopting foreign forms.

b) Training: Drastic reduction of the amount of training necessary to empower Cambodian end-users to use a computer system, and therefore, of the cost of such training for the trainee (separation of the “Computer” and the “English” skills). This is especially important for the less economically favored, who will be able to pay for training that might lead to jobs that require the use of computers.

c) Industry development: Facilitating the introduction of computer technology in Cambodian SMEs, large companies and public administrations.

d) Governance: Opening the way for the development of computer systems for the Cambodian national, provincial and district level Administrations that will allow civil servants to work entirely in Khmer language and manage databases of Khmer names and data. Opening the way for decentralization of data (and therefore administration) towards province and district levels. The same applies to utility companies (electricity, water, phone, etc.) which will develop Khmer language databases, reducing costs and giving better service to the citizens.

e) Communication: Allowing Cambodians to communicate through e-mail in their own language.

f) IT industry development: Empowerment of Cambodian Software development companies to work for the Cambodian Administrations and private companies. Empowerment of the local design industry with good fonts. Preparing the Universities to deliver the necessary trained engineers.

The most direct beneficiaries of the project include all Cambodian citizens who wish to have access to computer technology, especially those in rural areas who have very few economical resources that can be dedicated to develop job-oriented skills. Khmer language computer training will also reinforce their culture, instead of undermining it. The infrastructure created by this project will eventually lead to better governance (through computerization of the administrations in their own language), therefore giving better service to the citizens.

Computer programs in Khmer must be considered as an infrastructure project. They open the way for the technological development of the country, including its small and medium size enterprises who cannot afford to train somebody for at least a year before they can use a computer.

A key beneficiary of the project is the Government itself. English language is not a requirement for most Administration officials, but many jobs in the administration will definitely profit from the use of computers. Only if they are in Khmer will computers really be accepted in the workplace, because of the reduced training and perdurability of it. The Government will be able to cut 80% of its computer training costs.

Local language computer programs can be used by the Ministry of Education in all the current programs aimed at starting computer training in secondary education. This would not be possible if the computers are in a foreign language.

2.11.4 The philosophy of project

Distribution of the software that develops is a key issue. As with many other possible tools for reducing poverty, the fact that it has great advantages for the users is not enough: they will only appreciate the advantage if you can reach them.

As Umberto Eco described some time ago, new users, all around the world, approach technology as if they approached magic. They will take the expert’s word and do exactly what the expert says, without any change. The fact that other pieces of software are easier, free or even in their own language, is not enough to make them

change or choose, out of the fear that the magic will stop working, that they will no longer know how to use the computer.

The distribution has to go through the “experts” (gurus) that can reach the people, that is: computer vendors, managers of computer and internet access places, NGOs that work on IT, IT trainers and IT training centers.

As these experts usually know MS Windows quite well, but not Linux, the best strategy is to first distribute free Khmer applications on the MS Windows platform, so that the distribution channels are not forced to change the operating system for people to use the programs (this is a very big change that causes fear even on experts). In a second step, and once all applications are widely in use, and the project have trained the experts on Linux, it will be easier to only change the operating system, while the applications do not change).

The project has to do good, inexpensive marketing, creating a campaign that will make people proud of using Khmer language software, proud of using the t-shirts that will advertise it. In only one year we need to turn all computer software training places into organizations that will train people to use Khmer software… and assure that this is what the users demand when they are looking for training.

The project is creating a user-certification program which ensures that students do have a minimal level of use of the software, and that employers know what their real training level is.

The project believe that – with the language advantage on our side – it is not difficult to penetrate society with these tools that will reduce training time and cost, and open computer using jobs to people who are now in the other side of the digital divide, while ridding Cambodia of the economic problem of software costs.

2.11.5 Plan and state of the KhmerOS project

The KhmerOS initiative was launched in February 2004 by the Open Forum of Cambodia local NGO.

The project has along these two years - translated to Khmer language and distributed – on MS Windows platform - the most important pieces of software for final users (word processor, spreadsheet, browser, e-mail and others). It has also developed training materials for all this software, as well as training-for-trainers materials, and during 2005 more than 250 experienced computer teachers have been

re-trained to teach Khmer language software. A large number of computers all around the country have had the software installed.

Also, in 2005, the project has become a joined project of Open Forum of Cambodia and NiDA (National ICT Development Authority of the Cambodian Government). Since then NiDA has trained several hundred Government officials and students.

The **second development milestone** – planned for October 2006 – will deliver a **complete free Khmer language computer system,** with 100% of the applications used by 80% of the possible users. This system will be based on the Linux Operating system. Documentation and training modules will also be delivered.

Work towards this milestone will include the continuation of translation and development of software, the preparation of an installation CD for distribution, the preparation of a training curriculum for support personnel and of the corresponding training materials.

The **first distribution mileston**e should be reached at the same time. Its conclusion will lead to have 80% of Cambodia's computers able to use Unicode and with the Khmer software installed. 90% of new computers should by that time be delivered with Khmer applications pre-installed. As training is concerned, at least 40% of training institutions are expected to be teaching OpenOffice in Khmer, and most new computer students will be aware of the fact that they have a choice of either learning computers using Khmer language with free software or learning the use of proprietary software in English.

The **second distribution milestone**, scheduled for late 2007, will involve installation of Linux based full-Khmer-language systems in new and already existing computers in Government and civil society, with an emphasis on schools. It will also include the training of teachers on how to teach Linux based Khmer systems and applications, and train Government officials to start migration of the Government to Linux.

The **third development milestone,** expected in June 2007, will deliver a new Linux distribution that includes also computer tools for specific professions, such as the printing industry and web-development, while it improves on language tools (spellchecking and other Khmer language tools).

2.11.6 Project social structure and funding

KhmerOS started as an open and distributed initiative of the local NGO **Open Forum of Cambodia (OFC)**. OFC has before played a key role in bringing technological advance into Cambodia. In particular, **OFC** was the first organization to provide e-mail in Cambodia, back in 1995, running an e-mail operation for NGOs around the country (still used nowadays by many of them). It also deployed the ".kh" country level Internet domain, and was the key player in establishing internal communications between Cambodia's Internet providers. It was strongly involved in the development of the Unicode standard for Khmer language script. In general, it has a history of developing key technological projects with small funds.

In 2005 the KhmerOS initiative was joined by the National ICT Development Authority of the Cambodian Government, who assumed co-ownership of the project and has been working on advocacy and training to Government officials and students. The have also participated in the specification of the needs that the project should comply to in new stages.

OFC remains - nevertheless – the center for development and localization of applications.

The KhmerOS project started on minimal funding, using facilities provided by Open Forum, computers donated by particular donors and two translators hired with small donations received by the project. It grew in 2005 to 6 translators, 4 trainers, a typographer and 2 volunteers working non technical issues. So far, Open Forum has been able to assure the salaries of all the team along 2004 and 2005, through donations from The Internet Society and Inwent (Capacity building Germany), service contracts related to Khmer Unicode and translation of other (non Open Source) computer programs to the Khmer language. It is now looking for funds to run the project along 2006.

OFC is also developing –under a small grouped grant from APDIP, IDRC, ISOC, AMIC and APNIC- an "Open Source Localization Toolkit", so that the knowledge and experience developed within the KhmerOS project can be shared with other countries and regions.

2.12 Master Plan for Deployment of Free & Open Source Software

This Master Plan is an instrument to implement the ICT policy defined by the Government, in the belief that Open Source is the most direct and safe way of reaching many of social and technical objectives, as well as gaining technological independence and minimizing dependency from foreign corporations.

This is an implementation plan. Technical steps - such as translation of software or the creation of support structures - are considered within a framework that looks forward to social goals, including all the necessary actions that will be required in the next four years to fulfill these aims.

2.12.1 Objectives

This Master Plan is a direct response to specific social needs of Cambodian society. Even if the response to these needs is technological (many of these goals are directly attained through Open Source Software localization to Khmer language and culture), it is important to always keep in mind that the aims themselves are social, directed to improving the quality of life of Cambodians by:

a) Reducing the Digital Divide through empowerment of the least advantaged, giving them access to jobs that require the use of computers. Reduction of training time and cost for jobs that require computer skills (but not English). Effective separation of the “English” and “Computer” skills.

b) Permitting training on technology from early stages in the education system (using software in Khmer language). Permitting reaching out to rural areas in order to offer to them training on skills similar to those which might be offered in large cities.

c) Facilitating technology-based communication (e-mail, SMS, chat, web) in Khmer language.

d) Protecting the local language from an excessive entry of foreign terms that complicate training and integration in the work place. Clarification and standardization of the correct use of the Khmer language and of Khmer cultural issues such as alphabetical sorting.

e) Facilitating the computerization of the Government through the use of Khmer language. Improving governance by supporting the Government in the creation and maintenance of databases in Khmer script. Centralizing developments for different Governments, reducing development costs.

f) Promoting the use of information technology in Cambodia, giving citizens much easier access to information and resources.

g) Drastically cutting software costs for final users and for the Government, while promoting the use of legal software and reducing illegal software piracy activities in the country. Decreasing payments to and dependency from foreign proprietary software manufacturers. Decreasing Government costs by assuring that software specifically developed for a given government (such as a provincial government) is reusable in similar administrations and available as Open Source.

h) Creating the necessary expertise for the country to be technologically autonomous on software development, while opening the door to the strengthening of a Cambodian software development industry and to the participation of universities on the construction of this new framework for ICT in the country.

i) Becoming a Regional Center for Open Source Localization Expertise that will help other countries plan and execute effective localization projects.

2.12.2 Applicable policy

This Free and Open Source Deployment Master Plan does not create policy; it is designed as a tool for implementing some of the most important points of the Cambodian Government's ICT policy [insert reference to source]. In particular, the following selected points are considered:

"The country will build up its policies on information and communication technologies to directly or indirectly address human development and poverty alleviation in particular."

"The Government will embrace and integrate ICT as an integral and active part of its socio-economic development strategy."

"The Government will ensure that national heritages; culture; traditions and the environment are adequately safeguarded in its pursuit to ICT development."

"The Government shall promote the use of ICT in both public and private sectors to encourage transparency competitiveness and overall efficiency of their functions and procedures."

"The Government will support the use of ICT for formal and non-formal education, skills development and adult learning regardless of age, gender, ethnicity, disability or location."

"The Government shall mandate the Ministry of Education Youth and Sports to provide all teachers in public and private schools the basic ICT training. The Government shall allocate or mobilize additional resources and facilities to meet this objective."

"The Government shall encourage and support ICT knowledge for all public servants."

"**The Government will promote the use of Open Source** systems in ICT to cut costs in the long term, but also to broaden the skills and capacities of ICT professionals."

"The Government will take appropriate measures to ensure ICT will be used in all sectors for efficiency, privacy, security, safety and reliability based on **international interoperable standards**, for the purpose of rebuilding the country."

"The Government will actively seek the participation of civil society entities such as NGOs and NPOs in national capacity building in ICT."

"The mandate to the National Information Communications Technology Development Authority (NiDA) as a promoter and regulator of ICT services in the country will be re-enforced. Government encourages all agencies to engage NiDA actively in their respective agencies ICT plans."

2.12.3 Strategy

The Master Plan is based on the following strategic considerations:

a) The Master Plan will be coordinated and directed by NiDA, but it will implicate all ministries of the central Government, and will also try to reach provincial and district Governments. Special attention will be given to close coordination with the Ministry of Education Youth and Sport and the Ministry of Labor and Vocational Training.

b) NiDA will work together with civil society, turning the plan into a multi-stakeholder action that will involve the private ICT and ICT-training sectors as well as NGOs. It will try to adapt to the current private ICT distribution channels and work with them to assure that the Plan reaches all the layers of Cambodian society that it possibly can.

c) NiDA will work to reduce the barriers to the acceptance of Open Source Software, through active campaigns and through training. It will try to homogenize training, giving students clear goals to reach and employers clear criteria for what to expect from trained students.

d) NiDA will assure the creation of Open Source expertise in all stakeholders involved in the process, as well as in all user groups, such as bodies of the Government, universities, private software development sector and specific civil society players.

2.12.4 Actions of the master plan

1. NiDA will create a specific unit for Open Source that will be in charge of assuring, promoting and coordinating:

a) Open Source localization efforts leading to end-user software in Khmer language.

b) Capacity building for final Open Source users (users of software in Khmer language) in both civil society and Government.

c) Capacity building on Open Source professionals.

d) Distribution and lowering of barriers to the use of Open Source.

e) Agreements with partners in Government and civil society to assure that as many computers as possible in Cambodia are prepared to work with Khmer Open Source programs.

f) The use of Open Standards all through the Government and assure that applications developed for one administration can be used by others.

g) The development of purchasing policies for the Government that will require considering Open Source in all software purchases, and justification of the purchase of proprietary software, explaining why it is necessary if similar Open Source Software is available.

h) Advocacy on the use of Open Source nationally and internationally.

2. NiDA will develop a detailed action plan that will:

a) Assure that – directly or through civil society partners - high-quality basic Open Source applications mostly used by users are localized to Khmer language (office applications, Internet tools, multimedia, etc.). Documentation for these applications in Khmer language will also be developed.

b) Assure that a complete Open Source operating system and all basic applications (a distribution) will be available fully in Khmer language, together with its documentation.

c) Develop training materials for all these applications, together with evaluation materials. Develop a student certification program that will permit assuring levels of knowledge to organizations that will later employ the students. Provide training to present computer trainers and develop the certification program through partnership with existing end user computer training institutions.

d) Develop a distribution plan that will involve computer vendors, software vendors, NGOs and direct action by NiDA; the clear goal will be to assure that most new computers have all the Open Source applications pre-installed, and

e) that most old computers in local Governments, NGOs, SMEs, libraries and Internet cafes are prepared to use applications in Khmer.

f) Provide ICT training to Government officials and promote the use of e-mail in Khmer language all through the Government, facilitating inter-ministry communications.

g) Work with the Ministry of Education Youth and Sports to train teachers on the use of Khmer language Open Source applications and to coordinate the deployment in schools present educational system with e-learning training materials in Khmer. Work with the Ministry of Labor and Vocational Training to prepare ICT related curriculums and learning tools.

h) Create – in collaboration with universities and civil society – a Free and Open Source Research and Support Center (FOSRSC) that will provide Open Source and Khmer script management expertise to Government,

universities and the ICT industry while providing second level support for the development of Open Source based applications for Government and Industry. The FOSRSC will also provide support to final-user through a service network. It will also interact with the international Open Source community to assure that the different projects are well internationalized and prepared to be localized to the Khmer language. It will also take care of upstream integration of Khmer localization into the Open Source projects.

i) Assure - either directly in NiDA or through the FOSRSC – that databases developed for the Government use Open Standards, so that the format does not make the Government dependent on a specific software vendor. As database development efforts will start from the beginning, define a specific standard for all Governments (based on Open Standards) that will later enormously facilitate the exchange of data between local governments.

j) Try to assure that applications developed for different Governments have Open Source status, so that it can be used by similar administrations all over the country. Assure coordination of governments so that knowledge about available applications is accessible.

3. The action plan will span four years, divided in four one-year stages, each of them having very clear goals and deliverables:

Stage 1

a) Localization of multi-platform Open Source office and internet applications (applications that run on both Linux and MS Windows).

b) Development of documentation and training materials.

c) Setup of training certification system.

d) Setup of Open Source structure in NiDA.

e) Specification of needs and goals of a Free and Open Source Research and Support Center. Creation of a network with universities and private ICT industry.

f) Development of a Khmer-Khmer computer dictionary.

g) Assure that support for Khmer script is available for all internationalized applications on Linux.

Stage 2

a) Installation campaign (initially on MS Windows platform) for applications developed in the first stage. Reach out to all public computers in the country, including training centers, cybercafés, libraries, NGOs and anybody who requests it. Agreement with computer vendors for pre-installation in new computers.

b) Launching the certification program. Training existing computer teachers so that they can change to teach Khmer language Open Source applications. Certification of such teachers within the certification program. Reach out to training centers and certification of training centers.

c) Collaborative work with the Ministry of Education Youth and Sports for the training of teachers and starting pilot sites in schools around the country. Collaboration also with the Ministry of Labor and Vocational Training for the creation of ICT curriculums, training materials and training of trainers.

d) Training of public servants to the use of Khmer language Open Source applications is organized by NiDA in all ministries and local governments

e) Development of a full Linux distribution in Khmer language, with all necessary applications.

f) Creation of the Free and Open Source Research and Support Center. Intensive in-house and off-country training. Active participation in the various regional and international Open Source projects directed to assuring that the applications are well prepared for their use with Indic scripts (such as Khmer, Thai or Indian languages), participating in quality assurance procedures for those projects. Consolidation and write-up of localization expertise for sharing with other countries. Participation in international project-specific or localization meetings.

g) Development of local Open Standards, based on international Open Standards, for data exchange and encoding within the government.

Analysis of computer needs of local governments, coordination of possible collaborative developments based on Open Source.

h) Development of software purchasing policies for the government requiring consideration of Open Source options.

Stage 3

a) Installation campaign for the full Linux distribution in Khmer language, using the same applications that were used on Windows before, so only operating system and side applications change. Work with vendors to try to have them offer dual installations in new systems.

b) Retraining of computer teachers to install, use and teach the chosen Khmer language Linux desktop.

c) Developing further the certification program for the inclusion of the use of full Linux based Khmer systems. Correction of faults detected after one year of experience.

d) Start migration of Government computers to Linux.

e) The Free and Open Source Research and Support Center will start training technical personnel in the different ministries and other bodies of the government that require local support, as well as stepping up training of University professors and students, as well as analysts and programmers for private industry. A section for support for final users is developed.

f) Development of two new versions of the Linux-based Khmer distribution, keeping pace with international upgrades, adapting it to user demands and including new applications that might be considered necessary.

g) Implantation of Open Source aware purchase policies.

Stage 4

a) Consolidation of the use of Open Source by final users and Government in Cambodia.

b) Complete migration of Government computers to Linux

c) Evaluation of impact of Certification Program, introduction of corrections for maximization of impact.

d) Follow up on use of Open Standards, establishing control criteria.

e) Establishment of sustainability procedures for the Free and Open Source Research and Support Center.

2.12.5 Expected results

By the end of the second stage, the Government expects:

a) To have converted 80% of its computers to use Khmer language Open Source applications for office and communications, with their users trained to use these tools. Most servers will also be running Open Source Software by that time.
b) To have Open Source applications pre-installed in 80% to 90% of new computers sold inside the country, and that most of old non-obsolete equipments will also be running the applications.
c) Between 200 and 300 experienced computer teachers from private training industry will be prepared to teach the use of Khmer language Open Source applications, and will be certified to issue certifications to students. Over 50 training centers will have become partners of the project. At least 50% of the end-user computer training will be in Khmer language, based on Open Source applications.
d) To have the FOSRSC up and running, having accumulated –through training- sufficient experience to start offering technical training to universities, governments and private industry, either for teaching or for Open Source first level support.
e) To have specified the Open Standards that will be used by the government for the development of applications and databases.

By the end of the fourth stage, the Government expects:

a) To have most Government offices turned completely to Open Source, for office and communication use as well as for specific applications and databases. Proprietary software will only be used for limited, specialized needs for which no Open Source Software of reasonable quality is available.
b) To have most users in the country use Open Source applications for office and communication purposes, as well as for SME management.

c) To strongly reduce the level of software piracy, reaching levels comparable to Western countries, in spite of the economic differences.
d) To have in the country an established software industry that serves the Government, as well as private customers, using Open Source for most of its work, making the country independent from foreign software manufacturers and expensive foreign software development companies.
e) To have in Cambodian Universities a constant provider of ICT professionals well versed on work with Open Source Software tools, assuring the human resources needs of Government and private industry.
f) To have in place a framework for the sustainable maintenance and upgrade of Open Source, supported by Government and/or civil society.

2.13 Policy and Strategies on ICT in Education in Cambodia

The Ministry's articulation of the policy for ICT in education focuses on four main areas:

a) The **first area** is provide access to ICT for all teachers and students, especially at secondary level, ensuring that ICT is used as an enabler to reduce the digital gap between Cambodian schools and other schools in neighboring countries.
b) The **second area** emphasizes the role and function of ICT in education as a teaching and learning tool in different subjects, and as a subject by itself. Access to information on the Internet and increased communication, via email, between schools and individuals can play an important role in the professional development of educators. In addition to radio and television as a teaching and learning tool, this policy stresses the use of the computer for accessing information, knowledge, skills, and communication.
c) The **third area** is to promote education for all regardless of age, gender, ethnicity, disability or location through distance education and self-learning, especially for deprived children, youth and adults who lack access to basic education, literacy and skill training, by integrating ICT with radio, television, printed materials and other media.

d) The **fourth area** emphasizes using ICT to increase productivity, efficiency and effectiveness of education management. Through the use of information management systems, ICT will be extensively used to automate and mechanize work such as the processing of student and teacher records, communication between government and schools, lesson planning, assessment and testing, financial management and the maintenance of inventories.

2.13.1. Current level of ICT access and use

According to an Association of Southeast Asian Nations (ASEAN) Readiness Assessment conducted in 2001, Cambodia ranked eighth out of the 10 ASEAN countries in terms of e-infrastructure, e-society, e-commerce and e-government. As such, it was classified as an "emerging" readiness country, characterized by the need to build basic ICT infrastructure and ICT literate workforce.

Public access to computers and the Internet are limited. An increasing number of Internet cafes have appeared in recent years in urban centre and tourist destinations. There are currently over 100 in Phnom Penh and several in the Siem Reap and Sihanouk ville. Computer courses are popular in the major towns. However, with more than 80 per cent of the population living in rural areas, the majority has little or no access to the computers or the Internet. The rural people rely heavily on radio and television for information.

According to the International Telecommunications Union, as of 2002 Cambodia had the lowest Internet penetration in Southeast Asia and the highest Internet prices.

2.13.2. Current status of ICT in education

Education Strategic Plan (ESP) 2004-08

In its ESP and ESSP 2004-08, MoEYS refers to the role of ICT in improving quality and access to education in Cambodia:

"A cross-cutting strategy for enabling ESP policy implementation will be increased use of Information and Communication Technology (ICT) guided by MoEYS's new policy approved in 2004.

A priority will be to strengthen ICT-based information management at all levels as part of decentralization measures. Access and quality improvement will be

supported by ICT based distance learning opportunities (e.g. distance Masters, teacher development), selective introduction of computer awareness programs into upper-secondary schools and post-secondary institutions. Where it is appropriate, the Ministry will draw on capacity of private sector for multi-media programme planning and delivery, including for its expanded IEC programme and for HIV/AIDs awareness raising."

2.13.3 Human resource development

a) In higher education, public and private, establish a range of courses for ICT professionals
b) In teacher training institutions, train all teacher trainers in the use of ICT for administration and professional development. In addition, train teacher of secondary school teachers to become ICT literate so that they can use of ICT for supporting teaching and learning
c) Update the curriculum for training of primary school teachers to include the use of ICT for administration and professional development
d) Update the curriculum for training of secondary school teachers to include the use of ICT for administration, professional development and as a tool to support teaching and learning
e) Promote ICT-based research activities and independent and lifelong learning in every education institution
f) Train at least one member of staff from each of all educational institutions in computer maintenance and repair.

2.13.4. Hardware and infrastructure

a) Equip all teacher training colleges and universities with the necessary hardware and infrastructure to allow teachers and students to access to computers and the Internet. Provide budget for repair and maintenance.
b) Provide power supply to all secondary schools and equip them with the hardware to give students access to computers, radio and TV for learning. Available resources should be used to the full capacity. For example school computer rooms should also be used by the community and out-of-school children.

c) Provide a mobile ICT learning (m-learning) service to deprived areas where electricity and connectivity is not available.
d) Promote the use of community learning centres, community information centres and community libraries. Expand activities to include the use of video, radio and TV for learning. Work with NGO partners to provide more facilities for out of school youth.
e) Set up an education TV station and a radio station and managed by well trained staff to serve the education system
f) Where possible, provide power supply and the Internet connection to secondary schools.

2.13.5 Development of local contents, and use of open source software

a) Encourage the use of open source software such as Linux and Star Office. Open source software refers any software, which may be copied and used freely, with little or no copyright restrictions.
b) Promote the development of content in Khmer for both formal schools and distance education and equivalency programs by providing an annual award for the best teaching and learning resources submitted to the National Clearing House.
c) Promote the development of the Operating System in the Khmer language, which will greatly facilitate all literate people in Cambodia to use ICT for communication and learning.

2.14 Relevant Researches

The relevant researches on the evaluation of effectiveness on the training Information and Communication Technology were as follows;

Thanin sutheeprasert, (1997: abstract) conducted a study on the training course on environment for the health volunteers in Suphanburi, by assessing the test form on Knowledge, attitude before and after training. He found that the average of the trial group increased with the statistical significance at 0.05. As for the controlled group, there was no difference in the attitude.

Sethapong Puckakarn, (1998:abstract) undertook a research on knowledge, attitude and participation in waste disposal by community; a case study in Ban Bueng, Chonburi. The study found that knowledge changed according to educational level.

Attitude changed according to age, educational level and information. Participation in disposal changed according to the type of membership at 0.05.

Chamnan Wongvinitsorn, (2002: abstract) conducted a study on knowledge, attitude and participation of the local administration in preservation of environment; a case study, Noen Mapran, Pitsanuloke. The study found that different individual factors did not give rise to difference in knowledge, attitude and participation. Information led to change in knowledge and attitude at 0.05.

Kuhne, Gary W.; Frey, Barbara A., (1999: abstract) A study evaluated a faculty presentation skills training program for effectiveness in improving achievement and satisfaction of community college students. Nine female instructors and 352 students participated in the project. A quasi-experimental research design was used. Data from faculty and students were collected prior to and following the faculty training intervention. Pre – and post – training data were compared for significant differences. Through classroom observations, five quantitative voice qualities of instructors were measured: volume, pitch, rate or words per minute, length of pauses after asking questions or waiting time, and fillers per minute. The student achievement measurement was the students' final grade. A Likert scale questionnaire developed by the researcher measure adult student's satisfaction with the instructors' teaching of the course. Results indicated no relationship between instructors' age, years of experience, or level of education and their presentation skills. Overall, faculty training had no significant effect on achievement or satisfaction of learners 25 years and younger. Recommendations for future research were to study how adult age differences affect learning and what barriers prevent evaluation of faculty professional development programs.

Kasper Edwards (2001: abstract) a study on Open source software development is an interesting phenomenon where people contribute to development of
computer software and most often receive no economic reward at all. This paper analyses open source software development as an epistemic community where each individual open source software project is perceived as a single epistemic community. Open source software development is a learning process where the involved parties contribute to, and learn from the community. It is discovered that theory of epistemic communities does indeed contribute to the understanding of open source software

development. But, the important learning process of open source software development is not readily explained by the epistemic community's theory. The paper then introduces situated learning and legitimate peripheral participation as a theoretical perspective. This allows the learning process to be part of the activities in the epistemic community. The combination of situated learning and epistemic communities is shown to be fruitful and capable of explaining some of the empirical observations. In particular the combination of theories can shed light on the motivational issues and group dynamics.

Colette Murphy a; Lillian Greenwood (abstract: 1998) study on Effective delivery of the new information technology (IT) curriculum for student teachers in the United Kingdom, which started in September 1998, is an important challenge for initial teacher training institutions. This article identifies three main obstacles that may limit its successful implementation – student access to computers, the communications and information technology (ICT) policy adopted by initial teacher training providers and the lack of encouragement for students to use ICT on teaching practice. The work is based on a survey carried out in 1997 of lecturers and students in three teacher training institutions in Northern Ireland. The findings have led to the proposal of basic guidelines to contribute towards the development and implementation of an effective ICT policy in initial teacher training institutions.

Kyriacos charalambous, Yiasemina karagiorgi (abstract : 2002) a study on In-service education and training (INSET) is considered a crucial issue for the implementation and institutionalization of new information and communication technologies (ICT) in educational systems worldwide. A pilot programme for ICT implementation has been running since 1994 in a number of Cypriot primary schools. The provision of INSET in relation to this particular programme appears problematic. Therefore, two studies were independently conducted in 1996 and 1998 to highlight teachers' training background and needs. The second study also aimed to investigate the content and form of ICT INSET provision in terms of the categories of professional development identified by McDougall & Squires (1997). Both studies indicate that the majority of teachers are shown to lack an ICT training background while the approach to training appears piecemeal, focused mostly on off-site training and oriented towards the acquisition of basic computer skills. However, teachers

report that they prefer school-based courses, as well as courses that focus on the pedagogical dimension of ICT integration. Based on the outcomes, a national plan for teacher training in ICT is proposed, focusing on coherence, availability, efficiency and diversification.

CHAPTER 3

METHODOLOGY

The main intention of this study is to evaluation of the effectiveness of training Khmer language software at National Institute of Education. The mixed method (quantitative and qualitative) was used in this study. It outlines the population and sample, research instruments, data collection, and data analysis selected to achieve the purpose of this study.

3.1 Population and Sample

The population of this research study for quantitative data were 80 trainees, the teacher and administrative staff who working at National Institute of Education and have trained during the month of July and August, 2007 to the use of Khmer language software such as OpenOffice.org Writer (word-processing), OpenOffice.org Cal (spreadsheet), OpenOffice.org Impress (presentation tool) for finding the satisfaction and learning of the trainee. It was studied from the whole population census.

Other population of this research study for qualitative data by using in-depth interview were trainees, staff of the program, trainer and the Director of National Institute of Education for finding the trainee's behavior and benefit to organization.

3.2 Research Instruments

3.2.1 Quantitative Data

One set of structure questionnaire was developed for trainees to collect the data. This questionnaire consists of 6 parts:

Part 1: Trainees background such as age, gender, education level, experiences in education field, and have been join in training Khmer language software.

Part 2: Rating of reaction to the training Khmer language software. The questions were both positive and negative with 5 rating scales based on Likert's method ranging from very satisfied (5) to very dissatisfied (1). The scores were as follows:

Very Dissatisfied = 1
Dissatisfied = 2
Neutral = 3
Satisfied = 4
Very Satisfied = 5

The interpretations of the mean score applied during the data analysis were as shown below (Best, 1981: 179-187):

$$\frac{\text{Highest Score - Lowest Score}}{\text{No. of Levels}} = \frac{5 - 1}{5} = \frac{4}{5} = 0.80$$

1.00 — 1.80 referred to **Very Dissatisfied**
1.81 — 2.60 referred to **Dissatisfied**
2.61 — 3.40 referred to **Neutral**
3.41 — 4.20 referred to **Satisfied**
4.21 — 5.00 referred to **Very satisfied**

Part 3: The Knowledge of Khmer language software:

The knowledge scale was constructed according to the curriculum of the training Khmer language software such as: OpenOffice.org Writer, OpenOffice.org Calc and OpenOffice.org Impress. The researcher select some important contents from the curriculum to formulate the list. The major question is whether or not the trainees know each of the lists.

This was the questionnaire where the respondents choose an answer out of 2 alternatives: yes or no. It consisted of 34 questions. The total possible scores for the scale range from 0 to 34. The scores are given by awarding 1 point for each "yes" answer and giving 0 points for each "no" answer, with the following assessment criteria (Prajamgid S, 2002:37).

Score level	Level of Knowledge
- Less than or equal to 50% (1-17 scores)	Low
- 51% to 75% (18-26 scores)	Medium
- 76% and above (27-34 scores)	High

Figure 2: Knowledge criteria

Part 4: Rating of skill on Khmer language software by trainee. The questions were both before and after training, and rated by trainees in the five point Likert scale as mentioned below:

1. Poor
2. Fair
3. Good
4. Very Good
5. Excellent

The interpretations of the mean score applied during the data analysis were as shown below:

1.00 — 1.80 referred to **Poor**
1.81 — 2.60 referred to **Fair**
2.61 — 3.40 referred to **Good**
3.41 — 4.20 referred to **Very Good**
4.21 — 5.00 referred to **Excellent**

Part 5: Rating of attitude on the software of Khmer language application by trainee. The questions were both before and after training, and rated by trainees in the five point Likert scale as mentioned below:

1. Strongly disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly agree

The interpretations of the mean score applied during the data analysis were as shown below (Best, 1981: 179-187):

1.00 — 1.80 referred to **Strongly disagree**

1.81 — 2.60 referred to **Disagree**

2.61 — 3.40 referred to **Neutral**

3.41 — 4.20 referred to **Agree**

4.21 — 5.00 referred to **Strongly agree**

Part 6: Open-end question to gather more information about training Khmer language software and providing the recommendation to the training program.

3.2.2 Qualitative Data

Guidelines for in-depth interviews will be conducted to collect the opinion of trainee's behavior and the organization result on training Khmer language software from trainees, trainers, staff of the program and the director of NIE who have an observation on the training program.

3.2.3 Validity and reliability of the instruments

1. Validity: The content validity of the questionnaire will be done by consulting with advisor and Co-Director of Open Institute. The comments and recommendations made by advisor will be taken as of great value. The instruments will be finalized upon receiving the feedback and recommendations from the advisor committee.

2. Reliability:

The reliability of the instruments employed in this study will be determined in order to ensure that the responses collected through the instruments are reliable and consistent. Questionnaire will be prepared on the basis of literature review covering all the aspects of effectiveness of the training. From then, the questionnaire was tried out on 30 trainees who were not in the sample group. The reliability value will be calculated by using Cronbach's ($\propto$) in order to ensure whether there is internal consistency within the items.

$$\alpha = \frac{n}{n-1}\left\{1 - \frac{\sum S_i^2}{S_t^2}\right\}$$

Where α = Reliability level

n = Number of questions

S_i^2 = Deviation of each question

S_t^2 = Deviation of the total score

Generally, in social science research situation, the reliability coefficient of .70 or higher is considered 'acceptable'. As such, the researcher will employ the cutoff point .70 as the basis of evaluating reliability. The results of Cronbach's alpha coefficient of this instrument showed in table1.

Table1: The value of Cronbach's alpha

Items	Coefficient
1. Satisfaction	= 0.83
2. Knowledge	= 0.97
3. Skill	= 0.98
4. Attitude	= 0.88

3.3 Quality examination of the instrument

3.3.1 The researcher translated questionnaire from The English version into Cambodian language and adapted some parts of the original version. The translated questionnaire was presented to thesis committee and receives suggestion for improving.

3.3.2 The questionnaire that has been constructed is checked and corrected by the committee of this research in order to improve its quality so that it would be more appropriate and effective.

3.3.3 Submitted the questionnaire draft to a specialist of Khmer language software to check its content validity, correctness and recommendations.

3.4 Data Collection

The researcher got the approval from the director of the NIE to gain access to institute and to gain cooperation from the respondents. One teacher from sampled place will be requested to coordinate in distributing and collecting the questionnaire to teachers. The teacher and staff will be requested to fill up the questionnaire. The questionnaires will be distributed to the teachers of sampled institution through the coordinator. The teachers will be explained about the intention of the study through letter that will further assure their confidentially. The teacher will be given a time-period of 1 week to respond to the questionnaire. Upon completion, the coordinator will be requested to collect them back and hand over to the researcher. For Qualitative data, the researcher will inform and send the question to the interviewee in advance one week.

3.5 Data Analysis

The data obtained from each trainee will be checked out, grouped and tabulated to facilitate the analysis process. The data will be processes and analyzed electronically using computer application software called SPSS (Statistical Package for Social Science). The descriptive statistics will be used to analyze the data. The descriptive statistical analyses that will be employed are percentage, means, and Paired Samples t-test is used for comparing the difference between pre-and post-test scores. Similarly, for qualitative data content analysis method will be applied to analyze. Qualitative data will be analyzed to mention the trainee’s behavior and organization result by doing the in-depth interview.

CHAPTER 4

RESULTS

This section of the research will present the statistical analysis of the data in this study. The data collection was done in two parts. Part 1 was done through questionnaire survey. A total of 80 sample questionnaire were distributed in this study. The response rate obtained was 100 percent. Part 2 was done through in-depth interview with trainers, trainees, staff of the program and the Director of NIE. The collected data were analyzed by **SPSS** and findings are presented as follows:

4.1 Trainee Background

Table 2 shows the overall background of trainee who receive the training Khmer language software at National Institute of Education. 27.5 % of the trainees were within the age group of 21-30. 40 % in 31-40 years old age group and 32.5% in 41-50 years old age group. The minimum age was 24 and maximum age was 50, with mean age at 37.00 and S.D at 7.30.

From gender wise, most of the instructors were male with 62.5% and 37.5 % were female.

Most of the trainees have only high school level qualification with 20.0%, 62.5% had bachelor level qualification and 17.5 of trainees had master degree qualification.

Regarding trainee's experience in education field, 18.8% have only 0-5 years of experience in education, 23.8% have 6 to 10 years of education experience, 28.8% have 11 to 15 years of experience, 13.8% have 16 to 20 years of experience, 8.8% have 21 to 25 years of education experience and only 6.3% have 26 to 30 years of education experience. The minimum experience was 1 year and maximum experience was 29 years, with mean experience at 12.81.00 and S.D at 7.12.

All the 80 of trainees received training Khmer language software at National Institute of Education.

Table 2: Frequency and percentage of the population classifies by trainee's background

(N = 80)

Background			Frequency	Percentage
1.	Age	21-30	22	27.5
		31-40	32	40.0
		41-50	26	32.5
	Min = 24, Max = 50, $\overline{X}$ = 37.00, S.D. = 7.30			
2.	Gender	Male	50	62.5
		Female	30	37.5
3.	Qualification	High school	16	20.0
		Bachelor	50	62.5
		Master	14	17.5
4.	Working Exprience	0-5	15	18.8
		6-10	19	23.8
		11-15	23	28.8
		16-20	11	13.8
		21-25	7	8.8
		26-30	5	6.3
	Min = 1.00, Max = 26, $\overline{X}$ = 12.81, S.D. = 7.12			
5.	Receive Training	Yes	80	100.0

4.2 Effectiveness of Training Program

Table 3 showed overall level of satisfaction from trainee who received training Khmer language software was satisfied with the training program were rate at "satisfied" level.

The learning was substantially enhanced after training program. The results of testing the difference between the average knowledge about training on Khmer language software found that before training the trainee had low knowledge

($\overline{X}$ =0.12) and after training the trainee had high knowledge ($\overline{X}$ =0.71). The analysis of test result on skill toward using Khmer language software reveals that before training the trainee had poor skill ($\overline{X}$ =1.45) and after the trainee had good skill ($\overline{X}$ =2.84). The results of testing the difference between the average attitude to software of Khmer language application found that before training the trainee attitude toward software of Khmer language was rate at "disagree" level ($\overline{X}$ =2.12) while "neutral" level ($\overline{X}$ =3.27) after training.

With the encouragement from the organization, the trainee's behavior still not able applies their learning into fulfillment job by using computer on Khmer language software. Only IT staff in the organization has employed their learning into fulfillment job.

The result to organization from conducting the training program providing the high benefit to NIE in order to improve the quality of job by training information technology to the staff with Khmer language software and support the material such as: computer and LCD projector.

Table 3: Effectiveness of training program

Level	**Description**			
1. Reaction	Satisfied level, $\overline{X}$ = 3.74			
2. Learning	Training	Knowledge	Skill	Attitude
	Before	$\overline{X}$ = 0.12	$\overline{X}$ = 1.45	$\overline{X}$ = 2.12
	After	$\overline{X}$ =0.71	$\overline{X}$ = 2.84	$\overline{X}$ = 3.27
3. Behavior	- Only 11.8% of trainee who work related with information technology has employ learning to their job.			
4. Result	- Get benefit to information technology staff and equipment material.			

4.3 Reaction to Training Program

Evaluation on the level of reaction measures on the trainee's satisfaction to the training program. To measure the satisfaction of trainee include such as: the resource of training, process of training, products of training.

4.3.1 Rating the resource of training

Table 4 showed the overall rating resources of training was at "Satisfied" level ($\overline{X}$ = 3.90). The "handouts will be helpful" was rated highest among the input resources at "Very Satisfied" level ($\overline{X}$ = 4.42) and the "facilities were suitable" were rated lowest at "Satisfied" level ($\overline{X}$ =3.57).

Table 4: Rating the resources of training in terms of mean and standard deviation.

Resource of Training	Mean	S.D.	Level
1. The content of the training was useful	4.05	0.78	Satisfied
2. The content fulfilled your expectations.	3.82	0.74	Satisfied
3. Course objectives were clearly stated and easily understood.	3.70	1.01	Satisfied
4. Course objectives met my need.	3.91	0.66	Satisfied
5. The handouts will be helpful to me.	4.42	0.61	Very Satisfied
6. The audio visual aids were effective.	3.89	0.80	Satisfied
7. The facilities were suitable.	3.57	0.94	Satisfied
8. The trainer's presentational style is effective.	3.74	0.81	Satisfied

Table 4: Rating the resources of training in terms of mean and standard deviation. (Contd.)

Resource of Training	Mean	S.D.	Level
9. The trainer was knowledgeable on the Khmer language software	3.98	0.80	Satisfied
Total Average Value	**3.90**	**0.71**	**Satisfied**

4.3.2 Rating the process of training

Table 5 showed the overall rating the process of training was rated at "Neutral" level ($\overline{X}$ =3.40). The "training course has high responsibility" was rated highest at "Satisfied" level ($\overline{X}$ =3.70) and the "schedule's time was convenient" was rated lowest at "Neutral" level ($\overline{X}$ =2.93).

Table 5: Rating the process of training in terms of mean and standard deviation.

Process of training	Mean	S.D.	Level
10. The schedule's time was convenient to me.	2.93	1.11	Neutral
11. The training process met the easy ways.	3.56	0.97	Satisfied
12. The training course has high responsibility.	3.70	0.89	Satisfied
Total Average Value	**3.40**	**0.41**	**Neutral**

4.3.3 Rating the products of training

Table 6 showed the overall rating products of training was rated at "Satisfied" level ($\overline{X}$ =3.91). The "recommend training to other trainees" was rated highest at "Very Satisfied" level ($\overline{X}$ =4.24) and the "overall program organization was acceptable and satisfactory" was rated lowest at "Satisfied" level ($\overline{X}$ =3.74).

The overall rating of satisfaction in training Khmer language software from the trainee were at "Satisfied" level ($\overline{X}$ =3.74).

Table 6: Rating the products of training in terms of mean and standard deviation.

Products of training	Mean	S.D.	Level
13. I will be able to apply much of the material to my job.	3.79	0.61	Satisfied
14. I feel that the workshop will help me to do my job better.	3.86	0.76	Satisfied
15. I would recommend the training course to other trainees	4.24	0.53	Very Satisfied
16. Overall program organization was acceptable and satisfactory.	3.74	0.87	Satisfied
Total Average Value	**3.91**	**0.69**	**Satisfied**
Total average of Satisfaction	**3.74**	**0.29**	**Satisfied**

4.4 Learning on Using Khmer Language Software

The result from comparing the pre-and post test scores of the knowledge, skill and attitude reveal that their knowledge, skill and attitude had substantially increased after the training. The scores of knowledge before the training were at low level (88.8%) while most of trainee had high level after training (55.0%). Their scores increase substantially after the training, indicating that the training did affect their knowledge in a positive direction. Anyway, the scores of skill test before the training at poor level ($\overline{X}$ =1.45), indicating that the trainees did not able to use Khmer language software in their work place. The scores increase substantially after training at good level ($\overline{X}$ =2.84), indicating that the trainees able to use software in fulfillment their job with information technology. Nevertheless, their pre-test scores of the attitude test were at the disagree level ($\overline{X}$ =2.12), indicating that they had a negative attitude toward training Khmer language software. Post-test scores of the attitude

were at the neutral level ($\overline{X}$ =3.27), indicating that trainees still not sure on important of newly software as local language. The finding supports the research hypothesis in that after the training, their knowledge, skill and attitude toward Khmer language software would increase significantly at the 0.05 level.

4.4.1 Knowledge before and after training program

1. Items of knowledge

Table 7 showed the knowledge about Khmer language software and divided into pre-and post-training.

Knowledge about OpenOffice.org Writer: before training, it was found that most of the trainees had knowledge about “save document” and “undo text” (28.8% and 25.0% respectively). They knew less about “insert picture” and “open the OpenOffice.org Writer” (5.0% and 7.5% respectively). **After training** most of the trainee had knowledge about “save document” and “type alphabets and type vowels” (95.0% and 93.8% respectively). They knew less about “insert picture” and “splits cells” (70.0% and 73.8% respectively).

Knowledge about OpenOffice.org Calc: before training, it was found that most of the trainees had knowledge about “change size of rows and columns” and “rename sheet” (16.3%). They knew less about “set format date” and “use standard filter” (5.0%). **After training** most of the trainee had knowledge about “sort data” and “open the **Openoffice.org Calc**”, “merge cells” (70.0% and 68.8% respectively). They knew less about “set format number” and “use standard filter” (60.0%).

Knowledge about OpenOffice.org Impress: before training, it was found that most of the trainees had knowledge about “open the OpenOffice.org Impress”, “preview slide presentation” and “print slide” (11.3%). They knew less about “insert table into slide” and “add animation”, “insert footer into slide” (3.8% and 6.3%). **After training** most of the trainee had knowledge about “add animation” and “show slide full screen” (71.3% and 67.5% respectively). They knew less about “create template” and “insert table into slide”, “insert chart into slide” (56.3% and 58.8% respectively).

Table 7: Number and percentage of trainee who have the knowledge before and after training Khmer language software.

Knowledge of Khmer language software	**Before Training**			**After Training**		
	n	**%**	**Level**	**n**	**%**	**Level**
A) In OpenOffice.org Writer, you know how to:						
1. Open the **OpenOffice.org Writer**	6	7.5	Low	74	92.5	High
2. Type alphabets and type vowels	18	22.5	Low	75	93.8	High
3. Save document	23	28.8	Low	76	95.0	High
4. Show toolbar	13	16.3	Low	68	85.0	High
5. Undo text	20	25.0	Low	69	86.3	High
6. Put bullets and Numbering	9	11.3	Low	65	81.3	High
7. Change Font Name	13	16.3	Low	73	91.3	High
8. Set page setup	14	17.5	Low	64	80.0	High
9. Insert picture	4	5.0	Low	56	70.0	Medium
10. Insert column	8	10.0	Low	66	82.5	High
11. Splits cells	8	10.0	Low	59	73.8	Medium
12. Print document	18	22.5	Low	60	75.0	Medium

Table 7: Number and percentage of trainee who have the knowledge before and after training Khmer language software. (Contd.)

Knowledge of Khmer language software	**Before Training**			**After Training**		
	n	**%**	**Level**	**n**	**%**	**Level**
B) In OpenOffice.org Calc, I know how to:						
13. Open the **Openoffice.org Calc**	11	13.8	Low	55	68.8	Medium
14. Enter data	8	10.0	Low	53	66.3	Medium
15. Change size of rows and columns	13	16.3	Low	52	65.0	Medium
16. Use function **SUM( )**	9	11.3	Low	53	66.3	Medium
17. Rename sheet	13	16.3	Low	50	62.5	Medium
18. Set format number	6	7.5	Low	48	60.0	Medium
19. Set format date	4	5.0	Low	52	65.0	Medium
20. Merge cells	9	11.3	Low	55	68.8	Medium
21. Sort data	9	11.3	Low	56	70.0	Medium
22. Use standard filter	4	5.0	Low	48	60.0	Medium

Table 7: Number and percentage of trainee who have the knowledge before and after training Khmer language software. (Contd.)

Knowledge of Khmer language software	Before Training			After Training		
	n	%	Level	n	%	Level
C) In OpenOffice.org Impress, I know how to:						
23. Open the OpenOffice.org Impress.	9	11.3	Low	52	65.0	Medium
24. Create slide presentation.	8	10.0	Low	53	66.3	Medium
25. Use slide layout.	6	7.5	Low	49	61.3	Medium
26. Show slide full screen	8	10.0	Low	54	67.5	Medium
27. Close presentation	8	10.0	Low	51	63.8	Medium
28. Insert table into slide	3	3.8	Low	47	58.8	Medium
29. Add animation	5	6.3	Low	57	71.3	Medium
30. Preview slide presentation	9	11.3	Low	48	60.0	Medium
31. Insert chart into slide	6	7.5	Low	47	58.8	Medium
32. Insert footer into slide	5	6.3	Low	48	60.0	Medium
33. Create template	6	7.5	Low	45	56.3	Medium
34. Print slide	9	11.3	Low	51	63.8	Medium

From analysis of the results of testing the sample group's knowledge about Khmer language software before training it was found that 1.3 percent of trainee has a high level, 10.0 percents had a medium level and 88.8 percents had a low level. After training 55.0 percents of the trainees had a high level, 16.3 percents had a medium level and 28.8 had a low level, as table 8.

Table 8: Number and percentage of trainee in the knowledge test before and after training Khmer language software.

Level of Knowledge	**Before Training**		**After Training**	
Total Score=34	**N=80**	**Percentage**	**N=80**	**Percentage**
1. Low (<= 50%)	71	88.8	23	28.8
2. Moderate (51-75%)	8	10.0	13	16.3
3. High (75-100%)	1	1.3	44	55.0
- Before training	Min-score=0.0, Max-score=30.0, $\overline{X}$ =4.02, S.D=7.13			
- After training	Min-score=0.0, Max-score=34.0, $\overline{X}$ =24.11, S.D=10.97			

2. Comparison of knowledge before and after training

Table 9, the analysis of test result on knowledge about training Khmer language software reveals that before the training, the mean score ($\overline{X}$) is 0.12 and standard deviation is 0.21. After the training, the mean score ($\overline{X}$) is 0.71 and standard deviation is 0.32.

From comparing the difference of the knowledge by t-test, it is found that ***t*** is 16.08 and the significant difference at the 0.05 level. The finding indicates that the training program is efficient and the trainee increasing the knowledge and get understanding on Khmer language software.

Table 9: Comparison of pre- and post-test on Knowledge

Trainees	**n**	$\overline{X}$	**SD**	**t**	**Sig.**
Before training	80	0.12	0.21	16.08	0.00*
After training	80	0.71	0.32		

* **P<0.05**

4.4.2 Skill on Khmer language software before and after training program

1 Items of Skill

Table 10, the overall level of skill from the trainee before training was rated at "Poor" level ($\overline{X}$ =1.45) and the overall level of skill from the trainee after the training Khmer language software was rated the higher than before training at "Good" level ($\overline{X}$ =2.84). Among the skill on training Khmer language software, the skill on **writer** before training was rated at "Poor" level ($\overline{X}$ =1.63) and after training was higher than before training rated at "Good" level ($\overline{X}$ =3.11), the skill on **calc** before training was rated at "Poor" level ($\overline{X}$ =1.38) and after training was rated higher than before training at "Good" level ($\overline{X}$ =2.67), and the knowledge on **impress** before training was rated at "Poor" level ($\overline{X}$ =1.29) and after training was rated higher than before training at "Good" level ($\overline{X}$ =2.65).

The skill on **writer before** training was rated at "Poor" level ($\overline{X}$ =1.63) and **after** training was rated at "Good" level ($\overline{X}$ =3.11). Under the skill on Writer **before** training the "Save document" was rated highest at "Fair" level ($\overline{X}$ =2.10) and the "Using headers and footers in a document" and "Entering text into a column" were rated lowest at "Poor" level ($\overline{X}$ =1.35). The skill on Writer **after** training the "Open and close document" was rated highest at "Very good" level ($\overline{X}$ =3.64) and the "Entering text into a column" was rated lowest at "Good" level ($\overline{X}$ =2.59).

The skill on **Calc** before training was rated at "Poor" level ($\overline{X}$ =1.38) and after training was rated at "Good" level ($\overline{X}$ =2.67). Under the skill on Calc **before** training the "Insert Rows and columns" was rated highest at "Poor" level ($\overline{X}$ =1.56) and the "Use standard filters" was rated lowest at "Poor" level ($\overline{X}$ =1.21). The skill on Calc **after** training the "Insert Rows and columns" was rated highest at "Good" level ($\overline{X}$ =2.89) and the "Use standard filters" was rated lowest at "Fair" level ($\overline{X}$ =2.41).

The skill on **Impress** before training was rated at "Poor" level ($\overline{X}$ =1.29) and after training was rated at "Good" level ($\overline{X}$ =2.65). Under the skill on Impress **before** training the "Show a slide full screen" was rated highest at "Poor" level ($\overline{X}$ =1.36) and the "Insert a Footer into a slide" was rated lowest at "Poor" level ($\overline{X}$ =1.24). The skill on Impress **after** training the "Show a slide full screen" was rated highest at

"Good" level ($\overline{X}$ =2.92) and the "Create a template" was rated lowest at "Fair" level ($\overline{X}$ =2.42).

Table 10: Level of Skill before and after the training Khmer language software.

Skill of Khmer language software	**Before Training**			**After Training**		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
A) In OpenOffice.org Writer, are you able to:						
1. Create a new document	1.55	0.82	Poor	3.25	0.85	Good
2. Change to the Khmer keyboard	1.49	0.78	Poor	3.32	0.84	Good
3. Type consonants and vowels	1.61	0.82	Poor	3.32	0.88	Good
4. Change Font Name and size	1.71	0.93	Poor	3.35	0.86	Good
5. Open and close document	2.09	1.25	Fair	3.64	0.96	Very Good
6. Save document	2.10	1.31	Fair	3.60	1.05	Very Good
7. Print a document in your printer	2.01	1.18	Fair	3.52	1.07	Very Good
8. Cut, copy and paste text	1.55	0.76	Poor	3.10	1.05	Good
9. Set your own tabs in a document	1.60	0.79	Poor	2.99	0.99	Good
10. Using bullets and numbering in a text	1.47	0.79	Poor	2.82	1.06	Good

Table 10: Level of Skill before and after the training Khmer language software. (Contd).

Skill of Khmer language software	**Before Training**			**After Training**		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
A) In OpenOffice.org Writer, are you able to:						
11. Using headers and footers in a document	1.35	0.68	Poor	2.70	1.09	Good
12. Inserting special character	1.45	0.78	Poor	2.79	1.04	Good
13. Entering text into a column	1.35	0.63	Poor	2.59	0.99	Good
14. Insert a footnote in a document	1.42	0.78	Poor	2.62	1.05	Good
15. Create a table	1.70	0.91	Poor	3.02	1.03	Good
Total average value	**1.63**	**0.88**	**Poor**	**3.11**	**0.99**	**Good**
B) In OpenOffice.org Calc, are you able to:						
16. Change the size of Rows and Columns	1.39	0.75	Poor	2.70	1.12	Good
17. Merge cells	1.46	0.84	Poor	2.82	1.06	Good
18. Insert Rows and Columns	1.56	0.87	Poor	2.89	1.03	Good
19. Insert sheet and Delete sheets	1.46	0.73	Poor	2.77	1.07	Good
20. Use number formatting	1.44	0.78	Poor	2.80	0.97	Good
21. Enter Dates and set Date Format	1.36	0.78	Poor	2.64	1.07	Good

Table 10: Level of Skill before and after the training Khmer language software. (Contd.)

Skill of Khmer language software	Before Training			After Training		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
B) In OpenOffice.org Calc, are you able to:						
22. Use a formula (egA1*B4)	1.26	0.54	Poor	2.56	0.94	Fair
23. Use the functions Max( ), Min( )	1.36	0.71	Poor	2.67	1.08	Good
24. Use the function Count( )	1.26	0.61	Poor	2.45	1.06	Fair
25. Use standard filters	1.21	0.49	Poor	2.41	1.09	Fair
Total average value	**1.38**	**0.71**	**Poor**	**2.67**	**1.04**	**Good**
C) In OpenOffice.org Impress, are you able to:						
26. Create slide presentation	1.30	0.68	Poor	2.69	1.14	Good
27. Use slide layouts	1.31	0.72	Poor	2.70	1.14	Good
28. Copy and paste slide	1.30	0.74	Poor	2.65	1.19	Good
29. Insert a new slide	1.29	0.71	Poor	2.82	1.16	Good
30. Show a Slide full screen	1.36	0.78	Poor	2.92	1.16	Good
31. Enter text into a Slide	1.34	0.73	Poor	2.67	1.20	Good
32. Change Animation	1.26	0.67	Poor	2.75	1.08	Good
33. Remove Slide Transitions	1.25	0.66	Poor	2.57	1.06	Fair
34. Inset a Chart	1.25	0.66	Poor	2.51	1.03	Fair

Table 10: Level of Skill before and after the training Khmer language software. (Contd.)

Skill of Khmer language software	Before Training			After Training		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
C) In OpenOffice.org Impress, are you able to:						
35. Insert a Footer into a Slide	1.24	0.60	Poor	2.46	1.12	Fair
36. Create a Template	1.27	0.69	Poor	2.42	1.17	Fair
37. Print a Slide in a printer	1.34	0.81	Poor	2.67	1.35	Good
Total average value	**1.29**	**0.70**	**Poor**	**2.65**	**1.15**	**Good**
Total average of Skill	**1.45**	**0.23**	**Poor**	**2.84**	**0.33**	**Good**

2. Comparison of skill before and after training

From the above table 11, the analysis of test result on skill toward training Khmer language software reveals that before the training, the mean score ($\overline{X}$) is 53.74 and standard deviation is 23.37. After the training, the mean score ($\overline{X}$) is 105.24 and standard deviation is 32.36.

From comparing the difference of the skill by t-test, it is found that ***t*** is 16.28, with significant difference at the 0.05 level. The finding indicates that the training program is efficient, increasing the skill of trainee on Khmer language software.

Table 11: Comparison of pre- and post-test on skill

Trainees	n	$\overline{X}$	SD	t	Sig.
Before training	80	53.74	23.37	16.28	0.00*
After training	80	105.24	32.36		

* **P<0.05**

4.4.3 Attitude before and after training program

1. Items of Attitude

From the table 12, the overall level of attitude from the trainee to the software of Khmer language application before training was at "Disagree" level ($\overline{X}$ =2.12) and the attitude to the software after the training Khmer language software was rated the higher than before training at "Neutral" level ($\overline{X}$ =3.27).

Among the attitude to software Khmer language application **before** training the "Khmer language software provide the ability to fulfill other work beside routine job" was rated highest at "Disagree" level ($\overline{X}$ =2.40) and the "Working with Khmer language software makes me nervous" was rated lowest at "Strongly disagree" level ($\overline{X}$ =1.70).

The attitude to software **after** training the "I enjoy doing things on a computer with Khmer language software" was rated highest at "Agree" level ($\overline{X}$ =3.96) and the "Working with Khmer language software makes me nervous" was rated lowest at "Disagree" level ($\overline{X}$ =2.02).

Table12: Level of Attitude before and after the training Khmer language software.

Attitude to software	Before Training			After Training		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
1. Khmer language software is easier to use than proprietary software.	2.19	1.24	Disagree	3.51	1.20	Agree
2. Khmer language software is more reliable than proprietary software.	2.21	1.17	Disagree	3.52	1.17	Agree
3. I feel discomfort when I have to use the Khmer Keyboard.	2.09	1.13	Disagree	2.71	1.23	Neutral

Table12: Level of Attitude before and after the training Khmer language software. (Contd.)

Attitude to software	Before Training			After Training		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
4. Khmer language software is difficult to use.	1.97	0.99	Disagree	2.62	1.24	Neutral
5. I am not the type to do well with Khmer language software	2.01	1.05	Disagree	2.71	1.20	Neutral
6. I feel comfortable when I have to use Khmer language software	2.35	1.31	Disagree	3.85	1.11	Agree
7. Khmer language software provide the ability to fulfill other work beside routine job	2.40	1.32	Disagree	3.80	1.18	Agree
8. I feel confident with my abilities to use the OpenOffice.org writer software	2.17	1.19	Disagree	3.69	0.96	Agree
9. I feel confident with my abilities to use the OpenOffice.org calc software	1.97	1.03	Disagree	3.52	0.94	Agree

Table12: Level of Attitude before and after the training Khmer language software. (Contd.)

Attitude to software	Before Training			After Training		
	Mean	**S.D**	**Level**	**Mean**	**S.D**	**Level**
10. I feel confident with my abilities to use the OpenOffice.org impress software	1.95	1.09	Disagree	3.47	0.95	Agree
11. I enjoy doing things on a computer with Khmer language software.	2.34	1.35	Disagree	3.96	0.89	Agree
12. I feel that learning about Khmer language software is a waste of time.	1.85	1.03	Disagree	2.34	1.43	Disagree
13. Working with Khmer language software makes me nervous.	1.70	0.92	Strongly Disagree	2.02	1.24	Disagree
14. Khmer language software is easy to learn.	2.15	1.21	Disagree	3.59	1.17	Agree
15. I feel that Khmer language software is raising efficiency of my work (reducing time, reducing error, so on)	2.39	1.29	Disagree	3.81	1.13	Agree
Total average of Attitude	**2.12**	**1.15**	**Disagree**	**3.27**	**1.14**	**Neutral**

2. Comparison of attitude before and after training

From the above table 13, the analysis of test result on attitude toward software of Khmer language application of the trainees reveals that before the training, the mean score ($\overline{X}$) is 31.75 and standard deviation is 13.70. After the training, the mean score ($\overline{X}$) is 49.15 and standard deviation is 10.86.

From comparing the difference of the attitude by t-test, it is found that ***t*** is 12.69, with significant difference at the 0.05 level. The finding indicates that the training program is efficient, providing the better feeling of the trainee toward software of Khmer language application.

Table 13: Comparison of pre- and post-test on attitude

Trainees	n	$\overline{X}$	SD	t	Sig.
Before training	80	31.75	13.70	12.69	0.00*
After training	80	49.15	10.86		

* **P<0.05**

4.5 Problems, Obstacles and Recommendations in Implementing Training Program

The participation of training Khmer language software has answered the open end questions regarding the recommendation, problems and obstacles. The summary of recommendations, problems and obstacles were grouped into overall. Followings are the conclusion of the answers of the open ended questions:

4.5.1 Problems faced during the training Khmer language software

- Duration of training is too short
- New technical word made the trainee difficult to understand and remember
- Number of trainees in class while training Khmer language software is too big and the training room was too small
- The speed of trainer in teaching and explanation so fast that make the trainee miss understand and not clearly on using Khmer language software.

4.5.2 Recommendation to improve the Khmer language software.

- Increase the duration of training Khmer language software
- Khmer language software should be train into other institution, company and organization in order to getting easier in communication and using ICT in Cambodia, promote Khmer culture and literacy in own language software.
- Number of trainee in room of training would be available with the size of class room.
- The training course should be providing more practical on exercise in the period of training.

4.5.3 Obstacles faced by trainees while applying the new knowledge into their work place.

- Lack of computer to be practice were an obstacles while applying the new knowledge of Khmer language software into their work place.
- When creating file with Khmer language software cannot use and open with other computer because Khmer language software is new software, some place computer not yet set up this software.

4.6 Results from the Qualitative Data

In this study, qualitative data was also collected by conducting in-depth interview to gather the opinion in trainee's behavior and the result to the organization after training Khmer language software. The researcher will do interview by face to face with trainees, staff of the program, trainer and the Director of National Institute of Education who are knowledgeable about behavior of trainees after received training Khmer language software and the result from training to organization.

4.6.1 Behavior of Trainee

The results from conducting in-depth interview reveals that most of the trainees who received training on Khmer language software were not able apply their learning in their job because the lack of technical resources such as computer and software and adaptation of user with newly software. Only 11.8% of trainee who work related with information technology has employed their learning into fulfillment job. They use

Khmer language software in order to teach student, sorting student's name, typing formal letter, typing question for student's examination and creating slide presentation.

The organization have encourage to the trainee after received training Khmer language software. The organization make spread out to urge the trainee use Khmer language software in fulfillment their job and also providing the equipment material such as: computer, software for install Khmer language application, text book on Khmer language software, LCD projector for slide presentation.

4.6.2 Result from Training to Organization

The results from conducting in-depth interview reveals that the outcome of the training program for the NIE were highly beneficial in terms of training provided, particularly IT staff. This may be due to the fact that a training program using Khmer language software related with computer science of open source software and the staff of information technology has background on computer and the climates of job were related with information technology. Moreover, conducting a training program at the National Institute of Education has provided beneficial to the organization such as: capacity building to the staff on Khmer langue software, computer, software, LCD, and good communication with other institutions.

CHAPTER 5

DISCUSSION

This research is the study on the effectiveness on a training program ICTs using Khmer language software at NIE. In this study, both quantitative and qualitative data were collected by questionnaires and in-depth interview from different groups of stakeholders.

Previous chapter was mainly focused on the results obtained from the research by elucidating different variables applied in this study. This part of the study is mainly discussion relevant to the research objectives under the following topic:

5.1 Reaction to Training Program Using Khmer Language Software
5.2 Learning on Using Khmer Language Software
5.3 Trainee’s Behavior to Training Khmer Language Software
5.4 Organization Result

5.1 Reaction to Training Program Using Khmer Language Software

Reaction refers to how trainees react to the training program. Basically, it indicates how the trainees feel about the training. Its significance has been noted by Kirkpatrick (2006: 22): “Positive reaction may not ensure learning, but negative reaction almost certainly reduces the possibility of its occurring”. In the context of training evaluation, reaction measure the trainee’s satisfaction with the program. In this study, the overall rating of satisfaction on training was at “Satisfied” level. It shows that trainees were satisfied with products of training and would recommend the training courses to other trainees. The highest items of satisfaction from the trainee was “Handout” that so much helpful to trainees that the training program provided and the lowest items satisfy from the trainee was “Schedule’s time” in the training course that not convenient to the trainees.

After the training had been implemented, it is revealed that most of the trainees were satisfied with the training because the resources and product of training program were taken into serious consideration when the curriculum was being developed and providing the high responsibility with the training course. Only process of training was rated at neutral level. It corresponded with those of Ratanaphruek (2004: 70) that training content and topics were highly suitable. Furthermore, the trainers were professional and skillful in teaching, motivating trainees and summarizing and simplifying important topics. It is also in line with Noriya (2005: 64) that materials used in operating the project were well prepared and adequate because committee had prepared materials by their needs and budget. It corresponded with those of Ratanaphruek (2004: 70) that training content and topics were highly suitable. Furthermore, the trainers were professional and skillful in teaching, motivating trainees and summarizing and simplifying important topics.

The possible reason for process of training was rated at neutral level would be due to the schedule time of the training. The duration of training was implementing with 20 hours per training course such as: OpenOffice.org Writer, OpenOffice.org Calc and OpenOffice.org Impress. From the training curriculum would be an effect to the process of training have to finish on time.

From the above, it was clear that further improvement were needed in item of "schedule time" for training Khmer language software to make the training program more effectively and efficiently. There was a need to further improve the process of training to ensure that there were well processes in implementing the training program more effectively and to raise the quality of training to the highest level.

5.1.1 Problems faced by trainee during the training

The trainees who received the training Khmer language software at National Institute of Education pointed out the following problems they faced during the training.

Not enough time to complete the assignments as the duration of training program was short and facilities in classroom not suitable.

The training stationeries and equipments provided during the training were not sufficient.

No basic computer skills and it posed as problem for activities which required computer skills.

The explanations of the trainer very fast that cause to the trainee miss understand.

The translations of technical words are very difficult to remember and understand.

The above problems expressed by the trainees during the training need to be tackled and solved in order to enable them to devote their time and full concentration in trainings' activities. This will help in further improvement of the attractiveness of training Khmer language software for the trainee to attend.

5.2 Learning on Using Khmer Language Software

Learning is the degree to which an individual's knowledge was increased and skill has improved and attitudes have changed as a result of training attendance. Measures of learning are objective and quantifiable but are not measures of performance on the job (Goldstein, 1993). Kirkpatrick's second level of evaluation is learning. "Learning is the degree to which participants in the program change attitudes, improve knowledge, or increase skill as a result of the program" (Kirkpatrick, 2006). In this study, trainees' knowledge was increased at high level

after training; skill of the trainees has improved at good level and attitude of the trainees increase significantly at the 0.05 level. So, learning level of the trainee on using Khmer language software was increase significantly after the training.

5.2.1 Knowledge on Khmer language software

Comparison of the pre-and post-test scores of the knowledge reveals that before the training most of trainees had low level of knowledge (88.8%) while most of trainee had high knowledge after training (55.0%). When the pre-and post-test scores were compared, it is found that the average scores of knowledge increased 0.59 and the t-test analysis reveals that the statistic value was higher than the crisis value. The finding indicates that the knowledge of the trainees had significantly increased at the 0.05 level. This is in line with Saeng-ngern (1998:121), revealing that for trainees with solid knowledge on waste disposal, the scores increased a little, but for those with little knowledge before the training, their scores significantly increased after the training. The finding is also in accordance with that of Wanthanee Wanarat's, cited in Ratanaphreuk Pattarawadee (2004: 69), revealing that the knowledge on energy and environmental conservation of high school students increased significantly after the training at the 0.05 level.

The result from comparing the pre-and post-test of the knowledge reveals that their knowledge had substantially increased after the training. Knowledge on using Khmer language software before training reveals that most of the trainees were at the low level, indicating that the trainees did not have much knowledge about Khmer language software. However, their scores increased substantially after the training, indicating that the training did affect their knowledge in a positive direction. The possible reason that level of knowledge of the trainee before training were rate at low level due to Khmer language software is the newly software with local language and implement the first training to staff who work at NIE.

5.2.2 Skill on Khmer language software

Comparison of the pre-and post-test scores of the skill reveals that before the training, the mean and standard deviation were 53.74 and 23.37, whereas those after the training were 105.24 and 32.36 respectively. When the pre-and post-test scores were compared, it is found that the average scores of skill increased 51.50 and the t-

test analysis reveals that the statistic value was higher than the crisis value. The finding indicates that the skill of the trainees had significantly increased at the 0.05 level. Their average post-test scores were significantly higher than their pre-test scores at the 0.05 level. According to the Schermerhorn (2005: 14), a skill is an ability to translate the knowledge into action that results in a desired performance. Robert Katz cited in Schermerhorn (2005: 14), mentioned that “a technical skill is an ability to perform specialized tasks. Such ability derives from knowledge or expertise gained from education or experience”.

The result from comparing the pre- and post test of the skill reveals that their skill had increased after the training program. The skill before the training was at the poor level, indicating that the trainee did not have any skill about Khmer language software. However, their level increased after the training was rated at good level, indicating that there was enhancement of skills after the training program. The possible reasons that after training program enhance level of skill at good level could be because of most of the trainee have no computer to practice more after the training and some trainee make adaptation their skill from Microsoft office with Khmer language software as newly software.

From the above, it was clear that further improvement were needed in “OpenOffice.org Writer”, “OpenOffice.org Calc” and “OpenOffice.org Impress” on training Khmer language software to make the trainee became professional, relevant and applicable in their work place. Moreover, the improvement of the training can support to the training program efficiently and effectively.

However the trainees mentioned the following obstacles in applying the newly acquired information technology skills in their workplace:

> Lack of proper room, not sufficient computer for using. It corresponded with Bhasuk (1990: 174) that teachers frequently had problems concerning lack of resources and supplementary materials.
>
> Slow leaner need more training to improve capacity building with information technology by Khmer language software.

Not enough the installation of Khmer language software to any computer at the work place.

Most of the trainee's duties not work close with the information technology and computer, so they can miss understand on newly software and have no interesting.

The habit of trainee that fulfillment job with computer by using Microsoft office software. When they turn to use Khmer language software the performance of job can be slowly.

5.2.3 Attitude to software of Khmer language application

Comparison of the pre-and post-test scores of the attitude reveals that before the training, the mean and standard deviation were 31.75 and 13.70, while those after the training were 49.15 and 10.86 respectively. When the pre- and post-test scores were compared, it is found that the average scores of the attitude increased 17.40, and the t-test analysis reveals that the statistics value was higher than the crisis value, indicating that the attitude of the trainees to the software of Khmer language application increased significantly at the 0.05 level. The finding is in line with that of Kanchanarak (2002: 63), revealing that most of the officers had positive attitude toward training desirable competency base of trainers increased significantly after the training at the 0.05 level. Its also in line with that of Wirote Nakthae's, cited in Ratanaphreuk (2004: 69), revealing that the attitude toward forest resources and wildlife of the forest rangers increased significantly after the training at the 0.05 level.

The result from comparing the pre- and post-test of the attitude reveals that their attitude had increased after the training. The levels of attitude before the training was rated at disagree level, indicating that the trainee did not think to the software of Khmer language. However, their scores increased after the training was rated at neutral level, indicating that the training did affect their attitude in a positive direction. The reason that after training program affect level of attitude at neutral level due to the newly software of Khmer language software just spread out the first time with MoEYS. Other reasons, most of the trainees had no background on information technology.

From the above, the attitude to the software of the trainees before training revealed that they are not interesting with the Khmer language software and after training the attitude of trainees to the software still undecided. It shown that the training program would be more improve and publish the Khmer language software widely in the country.

5.3 Trainees' Behavior to training Khmer language software

Behavior is referred to what was learned is being applied on the job. "Behavior is the degree to which learners have changed their behavior outside of the learning environment because of their participation in the learning activities" (Kirkpatrick, 2006). In other words, behavior refers to whether the learners are actually using what they learned.

The objectives of a training program using Khmer language software were to promote teacher trainer use of computer in Khmer language software for their pedagogy, administration work and train to the teacher trainers with basic computer skills. Moreover, its can ensure that training across the public education system can be done in Khmer language software and build information and communication technology infrastructure.

As a result from conducting in-depth interview reveals that most of the trainees who received a training program using Khmer language software were not able apply their learning in their job because the lack of technical resources such as computer and software and adaptation of user with newly software. Only information technology staffs were able to fully apply their learning to their job. This may be due to the fact that staff of information technology had background with computer and the condition of job need to train into other teacher trainee at the institution. So, it is more suitable in applying their learning in Khmer language software to their job.

The behavior of the trainees after received a training program using Khmer language software still at the concerning level because most of the trainee were not able apply their learning into fulfillment of their job. Many reasons that can be obstacles for interrupt the trainees were able to fully apply their learning in work place such as: the climate of trainees' job did not using computer in their working,

lack of computer for practice, lack of human resources for technical support and newly software in local language application. It is also according to the Kirkpatrick (2006: 72), mentioned that “the reason for no change in behavior was lack of learning or negative job climate”.

The evaluation on behavior of the trainees is still concerning level to reach the high potential that need more supporting and encouragement to achieve the improving of using Khmer language software in education of Cambodia.

5.4 Organizational Result

Organizational result referred to the results from conducting a training program based on what did the change in behavior positively affect the organization. “Results refer to the degree to which the output of the participant’s workgroup or organization has improved because of the learning program” (Kirkpatrick, 2006).

The results from conducting in-depth interview reveals that information technologies’ staff has high benefit from the training program. This may be due to the fact that a training program using Khmer language software related with computer science of open source software and the staff of information technology has background on computer and the climates of job were related with information technology.

Other benefit to organization from the trainees can be performing the quality of job with information technology in fulfillment their job. “Technical training — measure reduction in calls to the help desk; reduced time to complete reports, forms, or tasks; or improved use of software or systems” (Kirkpatrick, 2006). The National Institute of Education has the benefit from the training Khmer language software and also improving of using ICT in the organization. The outcome after conducting the training to the institution such as:

> Capacity building to staff in using information technology by Khmer language software.
>
> All teacher trainees have knowledge on Khmer language software.
>
> Good communication with other educational institution by sharing training on Khmer language software.

The first institution under Ministry of education that apply local language software.

Increase quality of job with faster and standardize.

Supporting on information technology material, computer, LCD.

However, the training Khmer language software provides benefit to improve the quality of job and information technology but changing always met obstacles and time spending to adapt with the new knowledge and adapt the condition of job. In generally, the trainees used computer with Microsoft software. So, in order to encourage the newly software in local language software the trainee need more time on the reliable of software to apply on job achievement.

From the above discussions it was clear that there was enhancement of satisfaction to training program, knowledge, skill, attitude, behavior to software and the benefit as a result after training Khmer language software. The evaluation also indicated that the outcomes were contingent upon satisfaction and learning.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

This chapter aims to conclude the overall study, recommend for improvement of training Khmer language software and list the recommend for further study related to training information and communication technology. The mentioned points were presented as follows:

6.1 Conclusion

6.2 Recommendations

6.1 Conclusion

The objectives of this study on the effectiveness of a training program in information and communication technology using Khmer language software were: 1) to assess the satisfaction of the trainees with the program; 2) to evaluate the learning of the trainees in Knowledge, Skill and Attitude; 3) to find out the trainees' behavior and; 4) to find out the result for the organization conducting training using Khmer language software. The evaluation of the training program was based on Kirkpatrick's model. Qualitative and quantitative research methodologies were used. For quantitative, collected data from the trainee who received the training program and sample group for this study were 80 trainees. For qualitative, collected data using in-depth interview form with trainees, trainers, staff of the program and the Director of NIE. The data were processed and analyzed by using SPSS. Descriptive statistics were used to describe the information through frequency, percentage, mean, standard deviation and t-test to compare before and after training. The results were summarized as shown below:

The results of evaluating the satisfaction of trainees to the training program reveal that most of the trainees were satisfied with the training program. The assess e t was on the resources of training, products of training and process of training.

After the training curriculum had been implemented, it is revealed that knowledge, skill and attitude of the trainees were substantially enhanced. For the knowledge, the average pre-test score was 0.12 and the average post-test score was 0.71. The difference of the pre-and post-test score was 0.59, with the t-test analysis result of 16.08. As for the skill, the average pre-test score was 53.74 and the average post-test score was 105.24. The difference of the pre-and post test score was 51.50, with the t-test analysis result of 16.28. For the attitude, the average pre-test score was 31.75 and the average post-test score was 49.15. The difference of the pre-and post test score was 17.40, with the t-test analysis result of 12.69. The finding indicates that after the training, knowledge, skill and attitude toward using Khmer language software were significantly higher before the training at the 0.05 level.

The evaluation of the trainees' behavior to using Khmer language software reveal that most of the trainees were not able applies their learning in their job. Only the staffs of information technology were able to fully apply their learning to their jobs.

The evaluation of the organizational result from conducting training at NIE reveals that the staff of information technology received high beneficial from training program and other benefit to the organization such as: capacity building to the staff on Khmer langue software, computer, software, LCD, and good communication with other institutions.

6.2 Recommendations

The research findings, demonstrated that the trainees who work at National Institute of Education (NIE) has received a training program using Khmer language software were satisfied level for both hygiene and motivation aspects. Therefore, in order to maintain the level of satisfaction in long run, the following points are recommended.

1) Increase the duration of training Khmer language software so that the trainees have adequate time for more practices, asking for more explanation in case of miss understanding the new technology in Khmer language and for various activities of training program.
2) Translation of technical word would be easy to understand and remember.

3) To provide adequate training resources like equipment, materials and software through proper resource planning.
4) Proper training hall need to be identified for training and at appropriate location.

6.2.3 Recommendations for Further Studies

1) Since the current research had covered only training ICT by Khmer language software at one organization, a further study is recommended to extend other organizations to represent the status of effectiveness on training ICT by Khmer language software at the national level.
2) It would be interesting to conduct research on the effective integration of information and communications technology in teacher education.
3) It is suggested to include qualitative design if ever replicate the study to get more relevant information about the training ICT.
4) Study the impact of learning ICT on education quality.
5) To conduct the study on training and professional development of teachers for effective use of ICT in improving teaching and learning.
6) Study on the comparison of ICT training and media education as keys to facilitating educational change in higher education.

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APPENDIX

QUESTIONNAIRES

I am a senior student of educational management international program at Mahidol University, Thailand. Now I am conducting a research on the effectiveness on training information and communication technology by Khmer language software at National Institute of Education. Accordingly, I would like you to spend your valuable time to answer all the questions in my questionnaire. With respect to your information that I collected from you, I would use it to analyze with my study and helpful to me in order to find out the effectiveness and efficiency from the training course. Moreover, your participation in answering the question can be the benefit to improve other training course with Khmer language software and the useful information to expand the using Information and Communication technology (ICT) by Khmer language software in Cambodia.

I am grateful for your participation in completing my questionnaires.

Part 1 Individual Characteristics

Direction: Fill in the blank and circle of your choice.

1. Age: ……Years

2. Gender: a. Male b. Female

3. Level of Education

a. High School b. Bachelor c. Master d. Ph.D

4. Years of experience in working with education field:…….Years

5. Have you ever been joined in training on Khmer language software?

a. **Yes**. (If yes, please continue to answer all next parts)

b. **No**. (If no, please **stop** here).

Part 2: Questionnaire on Satisfaction in training Khmer language software

Direction: After you receive the training Khmer language software, how do you feel about the training? Please read each item carefully and choose the number that corresponding to your feeling.

1. Very Dissatisfied
2. Dissatisfied
3. Neutral
4. Satisfied
5. Very Satisfied

Items	1	2	3	4	5
Resource of training					
1. The content of the training was useful					
2. The content fulfilled your expectations.					
3. Course objectives were clearly stated and easily understood.					
4. Course objectives met my need.					
5. The handouts will be helpful to me					
6. The audio visual aids were effective.					
7. The facilities were suitable.					
8. The trainer's presentational style is effective.					
9. The trainer was knowledgeable on the Khmer Language Software.					

Items	1	2	3	4	5
Process of training					
10. The schedule's time was convenient to me.					
11. The training process met the easy ways.					
12. The training course has high responsibility.					
Products of training					
13. I will be able to apply much of the material to my job					
14. I feel that the workshop will help me to do my job better					
15. I would recommend the training course to other trainees					
16. Overall program organization was acceptable and satisfactory					

Part 3: Questionnaire on the Knowledge of Khmer language software

Direction: The following is the list of the statements to compare the knowledge before and after you received the training Khmer language software. Do you know the content of each statement? This information is for statistical purposes only and we ask that you be honest when answering. Please read each item carefully and choose the number that corresponding to your knowledge.

Items	Before Training		After Training	
	Yes	**No**	**Yes**	**No**
A) In OpenOffice.org Writer, you know how to:				
1. Open the **OpenOffice.org Writer**				
2. Type alphabets and type vowels				
3. Save document				
4. Show toolbar				
5. Undo text				
6. Put bullets and Numbering				
7. Change Font Name				
8. Set page setup				
9. Insert picture				
10. Insert column				
11. Splits cells				
12. Print document				

Items	Before Training		After Training	
	Yes	**No**	**Yes**	**No**
B) In OpenOffice.org Calc, I know how to:				
13. Open the **Openoffice.org Calc**				
14. Enter data				
15. Change size of rows and columns				
16. Use function **SUM( )**				
17. Rename sheet				
18. Set format number				
19. Set format date				
20. Merge cells				
21. Sort data				
22. Use standard filter				
C) In OpenOffice.org Impress, I know how to:				
23. Open the OpenOffice.org Impress				
24. Create slide presentation				
25. Use slide layout				
26. Show slide full screen				

Items	Before Training		After Training	
	Yes	**No**	**Yes**	**No**
C) In OpenOffice.org Impress, I know how to:				
27. Close presentation				
28. Insert table into slide				
29. Add animation				
30. Preview slide presentation				
31. Insert chart into slide				
32. Insert footer into slide				
33. Create template				
34. Print slide				

Part 4: Questionnaire on the Skill of Khmer language software

Direction: The following is the list of the statements to compare the skill before and after you received the training Khmer language software, which level of skill do you able to use Khmer language software? This information is for statistical purposes only and we ask that you be honest when answering. Please read each item carefully and choose the number that corresponding to your skill.

1. Poor
2. Fair
3. Good
4. Very Good
5. Excellence

Items	Before Training					After Training				
	1	2	3	4	5	1	2	3	4	5
A) In OpenOffice.org Writer, are you able to:										
1. Create a new document										
2. Change to the Khmer keyboard										
3. Type consonants and vowels										
4. Change Font Name and Size										
5. Open and close document										
6. Save document										
7. Print a document in your printer										
8. Cut, copy and paste text										
9. Set your own tabs in a document										

Items	Before Training					After Training				
	1	2	3	4	5	1	2	3	4	5
A) In OpenOffice.org Writer, are you able to:										
10. Using bullets and numbering in a text										
11. Using headers and footers in a document										
12. Inserting special character										
13. Entering text into a column										
14. Insert a footnote in a document										
15. Create a table										
B) In OpenOffice.org Calc, are you able to:										
16. Change the size of Rows and Columns										
17. Merge cells										
18. Insert Rows and Columns										
19. Insert sheet and Delete sheets										
20. Use number formatting										
21. Enter Dates and set Date Format										
22. Use a formula (eg A1*B4)										
23. Use the functions Max( ), Min( )										
24. Use the function Count( )										
25. Use standard filters										

Items	Before Training					After Training				
	1	2	3	4	5	1	2	3	4	5
C) In OpenOffice.org Impress, are you able to:										
26. Create slide presentation										
27. Use slide layouts										
28. Copy and paste slide										
29. Insert a new slide										
30. Show a Slide full screen										
31. Enter text into a Slide										
32. Change Animation										
33. Remove Slide Transitions										
34. Inset a Chart										
35. Insert a Footer into a Slide										
36. Create a Template										
37. Print a Slide in a printer										

Part 5: Questionnaire on the Attitude of Khmer language software

Direction: The following is the list of the statements to compare the attitude before and after you received the training Khmer language software, how do you feel to the software of Khmer language application? This information is for statistical purposes only and we ask that you be honest when answering. Please read each item carefully and choose the number that corresponding to your feeling.

1. Strongly Disagree
2. Disagree
3. Moderate
4. Agree
5. Strongly Agree

Items	Before Training					After Training				
	1	2	3	4	5	1	2	3	4	5
1. Khmer language software is easier to use than proprietary software.										
2. Khmer language software is more reliable than proprietary software.										
3. I feel discomfort when I have to use the Khmer Keyboard.										
4. Khmer language software is difficult to use.										
5. I am not the type to do well with Khmer language software										
6. I feel comfortable when I have to use Khmer language software										
7. Khmer language software provide the ability to fulfill other work beside routine job										

Items	Before Training					After Training				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
8. I feel confident with my abilities to use the OpenOffice.org writer software										
9. I feel confident with my abilities to use the OpenOffice.org calc software										
10. I feel confident with my abilities to use the OpenOffice.org impress software										
11. I enjoy doing things on a computer with Khmer language software.										
12. I feel that learning about Khmer language software is a waste of time.										
13. Working with Khmer language software makes me nervous.										
14. Khmer language software is easy to learn.										
15. I feel that Khmer language software is raising efficiency of my work (reducing time, reducing error, so on)										

Part 6: Open-End Questions

Please answer the following questions to the best of your knowledge on the training program.

1. What are the benefits that you got from training Khmer language software?

1.1……
……

1.2……
……..

1.3.……
……..……

2. What background would you consider necessary to understand the Khmer language software?

2.1……
……

2.2……
……..

2.3.……
……..……

3. What are the difficulties that you encountered when learning to use the Khmer language software? Why?

3.1……
……

3.2……
……..

3.3.……
……..……

4. Do you think that this training should be training into other institution? Why?

4.1……
……

4.2……
……..

4.3……
……..……

5. What are your recommendations to improve the Khmer language software?

5.1……
……

5.2……
……..

5.3……
……..……

Thank you!

Guidelines for in-depth interview

I am a senior student of educational management international program at Mahidol University, Thailand. Now I am conducting a research on the effectiveness on training information and communication technology by Khmer language software at National Institute of Education. Accordingly, I would like you to spend your valuable time to answer all the questions in my in-depth interview. With respect to your information that I collected from you, I would use it to analyze with my study and helpful to me in order to find out the effectiveness and efficiency from the training course. More over, your participation in answering the question can be the benefit to improve other training course with Khmer language software and the useful information to expand the using Information and Communication technology (ICT) by Khmer language software in Cambodia.

I am grateful for your participation in answering my interview.

Part 1 Individual Characteristics

1. Age: ……Years

2. Gender: a. Male b. Female

3. Level of Education

a. High School b. Bachelor c. Master d. Ph.D

4. Present Position:……

5. Years of experience in working with education field:…….Years

Part 2 Opinion on trainee's behavior

Direction: The purpose of this questionnaire is to determine the extent to which those who attended the training program on Khmer language software have applied the learning to the job. The results of the survey will help us to assess the effectiveness of the program and identify way in which it can be made more practical for those who attend. Please be frank and honest in your answers.

1. By overview, to what extent do you found that the trainees applied their learning back in fulfillment their jobs as a result of the training Khmer language software at NIE? Which part of trainee's job that you specify about the apply learning into the job?

2. Do you found that the trainees have received some encouragement to use Khmer language software when they return to the job from the training class?

Part 3 Opinion on organizational result

Direction: The purpose of this questionnaire is to determine the extent to which those who attended the training program on Khmer language software have benefit from the training to organization. The results of the survey will help us to assess the effectiveness of the program and identify way in which it can be made more practical for those who attend. Please be frank and honest in your answers.

1. How much did quality improve on job fulfillment in organization after the trainees received the training by Khmer language software?

2. What is the benefit to organization from the trainee by training Khmer language software?

3. Base on your own opinion, training ICT by Khmer language software should be training into other institutions or not? Why?

BIOGRAPHY

NAME	**:**	Mr. Chheang Sangvath
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