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Effectiveness of Implementing Kirkpatrick's First Two Levels to Ensure Fulfilling the Required Results of Training Program.

Case Study: Gaza Syndicate of Engineers.

فعالية تطبيق أول مستويين من نموذج كيريكباتريك لضمان إنجاز النتائج
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يقول تعالى في كتابه العزيز

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

﴿ قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا عَلَّمْتَنَا

﴿ إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

سورة البقرة - الآية 32

Dedication

To whom shared me the happiness for my success ..

I'm dedicating this work

To

My parents

My brothers and sisters especially Manal

My fiancée and My relatives

My friends and colleagues

To All of you Thank you

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Acronyms and Abbreviations

Cipp	Context, Input, Process, Product
DGADR	Director General Alternative Dispute Resolution
CME	Continuing Medical Education
RTO	Registered Training Organisation
TROPIC	Teachers Reflecting On Practices In Contexts
KM	Kirkpatrick Model
ASTD	American Society for Training and Development
HRD	Human resource Development
KSA	Knowledge, Skills, Attitudes
ROI	Return on Investment
ROE	Return of Expectation
HR	Human Resources
GSETC	Gaza syndicate of Engineers Training Centre
SETC	Syndicate of Engineers Training Centres
GSE	Gaza Syndicate of Engineers
SIL	Summer Institute of Linguistics
NVSC	National Volunteer Skills Centre
IBSA	Innovation and Business Skills Australia
MISAC	The Manufacturing Industry Skills Advisory Council Inc. trading
FHWA	Federal Highway Administration

Abstract

The aim of this study is to measure the effectiveness of implementing Kirkpatrick's first two levels represented by reaction level and learning level to ensure fulfilling the required results of training Program. The study was offered to interested engineers in attending training courses in Gaza syndicate of engineers training centre (GSETC).

This study adopted Kirkpatrick Model (KM) of training evaluation focusing on the first level of evaluation (Reaction Level) which assesses the trainees' reaction and satisfaction to training programs, and the second level (Learning Level) which assesses the participants' "learning" or achievement of the course objectives/outcomes. In other words, it measures knowledge and skills of the participants. The study adopted the analytical descriptive technique, the descriptive part attempts to illustrate the concepts and content of KM where the analytical part is to explain and explore the impact of Kirkpatrick's first two levels on training programs. The study targeted 320 participants that attended the training courses including 280 questionnaires that were returned and were suitable for statistical analysis. The questionnaire consisted mainly of two parts, which are personal data and organizational data. It concluded that the training program was effective at the second and third parts of reaction level which are training material and learning environment, hence, it needs to be well-considered and developed. It recommends (a) to improve measuring and transferring knowledge and skills, (b) to provide the training materials with the latest references and engineering books versions, (c) to make classrooms layout suitable for pair work and discussion group work, (d) and to give trainees enough time to practice theoretical data.

ملخص

تهدف هذه الدراسة إلي قياس "فعالية تطبيق أول مستويين من نموذج كيركباتريك الممثلة بمستوي رد الفعل ومستوي التعلم لضمان إنجاز النتائج المطلوبة من البرامج التدريبية المقدمة إلي المهندسين المهتمين بحضور الدورات التدريبية المعقودة في مركز التدريب في نقابة المهندسين في غزة . هذه الدراسة تبنت نموذج كيركباتريك حيث تم التركيز علي المستوي الأول (مستوي رد الفعل) والذي يهدف إلي تقييم رد فعل المتدربين ورضاهم لبرامج التدريب، والمستوي الثاني (مستوي التعلم) والذي يهدف إلي تقييم التعلم أو إنجاز أهداف ومخرجات الدورات التدريبية. بمعنى آخر أنها تقيس المعرفة ومهارة المتدربين. إتمدت الدراسة علي المنهج الوصفي التحليلي، الجزء الوصفي يحاول إيضاح مفهوم ومحتوي نموذج كيركباتريك بينما يحاول الجزء التحليلي إستكشاف وشرح تأثير أول مستويين من نموذج كيركباتريك علي برامج التدريب. تم توزيع 320 استبانة علي الفئة المستهدفة حيث تم إسترجاع 280 استبانة صالحة للتحليل الإحصائي. تكونت استبانة البحث من بندين وهما البيانات الشخصية والبيانات الوظيفية. ووجدت هذه الدراسة بأن البرنامج التدريبي في نقابة المهندسين فعال ومؤثر في الجزء الثاني والثالث من مستوي رد الفعل وهما المادة التدريبية والبيئة التعليمية ولذلك يجب أن يتم أخذهما بعين الاعتبار وتطويرهما بشكل جيد وتوصي هذه الدراسة (أ) بتحسين قياس ونقل المعرفة والمهارة، (ب) و بتزويد المادة التدريبية بأحدث المراجع والبرامج والإصدارات الهندسية الملائمة، (ج) وبتصميم القاعات الدراسية بشكل مناسب لعمل المتدربين علي شكل مجموعات وأزواج مناقشة، (د) وبإعطاء المتدربين الوقت الكافي لممارسة المعلومات النظرية.

Chapter 1

General Framework

1.1- Introduction:

Training evaluation forms are used to evaluate the response of trainees to a training course, as well as the effectiveness of the training on the job. These evaluations are subjective and designed to solicit the opinion of the trainees (Borysowich, 2007).

A template is one of the forms provided for a training effectiveness evaluation form, which is used to help determine if the training is effective based on actual use on the job. Trainees respond to the questions for each skill. Trainees are sometimes evaluated twice. Trainees are evaluated prior to training to determine whether they need the training. They are also evaluated after their training to measure the effectiveness of the training (Borysowich, 2009).

Kirkpatrick Model (KM) also called Kirkpatrick's four-level model developed by Donald Kirkpatrick. The most well-known and used model for measuring the effectiveness of training programs was developed by Donald Kirkpatrick in the late 1950s. It has been adapted and modified by a number of writers such as Phillips and Roger Kuafman; however, the basic structure has well stood the period of time and are as relevant today as they were over four decades ago (Kirkpatrick, 2006). The model clearly defined evaluation as meaning "measuring changes in behavior that occur as a result of training programs." The model itself is composed of four levels of training evaluation. A fifth level, return on investment has been added since then. The fifth level was the brainchild of Dr. Jack J. Phillips, Ph.D., author, and consultant. The Components of KM are reaction level, Learning level, behavior level, result level and return on investment level (Mackenzie, 2008).

Kirkpatrick's framework established the industry standard, shaping the way that performance and training evaluations would be conducted for the next 40 years (Sallander, 2007).

Galloway (2005) described KM as the dominant schemas for evaluating instructor driven corporate training programs effectiveness (Sallander, 2007).

KM is perhaps even more relevant today, as the pressure on training professionals to deliver results, and not just positive "smile sheets," grows greater every year. Several case studies illuminate how the four levels can be applied to a wide variety of training and development programs (Kirkpatrick, 2006).

As noted, the prevalence of syndicates that contain training centers and the emergent role for policymakers and public administrators as well as staff and volunteers are one of the challenges why training evaluation is still being conducted in Gaza syndicate of engineers training center (GSETC) and that is owing to poor training results and lack of well-assessed needs (Alqeeq, 2011). Kirkpatrick's main goal is to clarify what evaluation meant (Mackenzie, 2008), it addresses how one determines whether the goals or objectives were met and what impact the training had on actual performance on the job or in the community. KM creates a pool of readily available and adequate replacements for personnel who may leave or move up in the organization. Adopting KM can help them to be able to demonstrate a real and significant benefit from the training and they provide to gain more resources from important decision-makers to be able to measure results that will help them adapt to such changing circumstances (Koehler, Francisco, 1977).

1.2- Study Problem:

GSETC conducts training courses according to engineers needs. However, training courses being conducted don't mostly achieve desirable results and it is also hard to know whether the results are met or not, that is owing to lack of justified training needs analysis and new models of evaluation; as well as limited evaluation tools, badly structured questionnaires and lack of necessarily needed tools for practical experience lead to unwell-deducted results (Alqeeq and Alajla, 2011). GSETC unintentionally applies some elements of Kirkpatrick's first level, and sometimes it goes for the second level of KM without knowing about it. The study will examine and investigate the ability of the Gaza syndicate of engineers on designing and applying their training programs based on Kirkpatrick's first two levels. The third and the fourth Levels are not applied in the study that is owing to humble dedicated training or human resource department and budget paid for training evaluation, and it is also considered demanding and time-consuming process.

1.3- Study Objectives:

- 1- Identifying the impact of adopting Kirkpatrick's first two levels in training courses in GSETC.
- 2- Improving the evaluation forms in GSETC and making them more comprehensive.
- 3- Suggesting solutions for improving the weakness points in GSETC and applying the first two levels effectively.
- 4- Recognizing the good training evaluation on training courses.

1.4- Study Importance:

1.1- This study is important for the following reasons:

- 1- The study provides good information about KM for new researcher in Gaza strip.
- 2- The study is used as a good reference for Gaza's libraries about training generally and KM particularly.
- 3- Training centers, GSETC and training organizations gain good knowledge and benefits from the KM in training evaluation and how to evaluate training courses properly and according to its importance.

1.5- Variables:

a- Dependent variables

- 1- Training programs

b- Independent variable:

Kirkpatrick's first two levels: (a) Reaction Level (b) Learning Level, and personal data.

❖ Reaction Level

Reaction Level is sub- divided into three components:

- 1- Trainer.
- 2- Training material (Structure of training material).
- 3- Learning environment :
 - a- Time.
 - b- Classroom seating layouts.

❖ **Learning Level**

Learning Level is sub- divided into two components:

- 1- Knowledge.
- 2- Skills.

❖ **Personal Data**

A-Gender.

B- Engineering degree.

C-Experience years.

D- The University.

E- Number of courses attended.

F- Age.

1.6- Study Hypotheses:

1- There is a significant effect at level 5% of reaction level on the results of training program. It is sub-divided into the following three hypotheses:

- 1.1- There is a significant effect at level 5% of trainer on the results of training program.
- 1.2- There is a significant effect at level 5% of training material on the results of training program.
- 1.3- There is a significant effect at level 5% of learning environment on the results of training program. It is sub-divided into the following two Hypotheses:
 - 1.3.1- There is a significant effect at level 5% of time on the results of training program.
 - 1.3.2- There is a significant effect at level 5% of classroom seating layout on the results of training program.

- 2- There is a significant effect at level 5% of learning level on the results of training program. It is sub-divided into the following two Hypotheses:**
- 2.1- There is a significant effect at level 5% of knowledge on the results of training program.
 - 2.2- There is a significant effect at level 5% of skills on the results of training program.
- 3- There is a significant difference of respondents about (Training program) due to results of personal data such as (gender, university degree, years of experience, the university and number of training courses attended).**

1.7- Study Parameters:

Time Horizon:

The study has been prepared during 2011-2012, so the collected data reflected the facts and perspectives during the period located between September, 2011 and July, 2012.

Location:

The study has targeted the Gaza Syndicate of engineers training centre (GSETC) which is considered as the case study.

Subject:

Measuring the effectiveness of implementing Kirkpatrick's first two levels represented by reaction level and learning level to ensure fulfilling the required results of training Program.

1.8- Study Limitations:

The researcher has recognized the following limitations:

- 1- There has been a shortage in the Arabic references since the influence relationship between KM and the training programs has been rarely studied in the Arabic literature.
- 2- Kirkpatrick's third and fourth levels are not applied in this study since they require a well-dedicated human resource department, budget and a long period of time as well as experienced trainers and coaches to conduct the training evaluation properly. The higher the level arrives, the more time and effort it requires.

1.9- Research Structure

The Study has six chapters. Chapter one represents the general framework that includes the study problem, objectives, importance, variables, hypotheses, methodology, parameters, and limitations.

Chapter two introduces the theoretical framework which consists of three sections whereas the first section introduces and defines KM, its advantages, forms and levels, the second section elaborates GSETC general profile, and the third section elaborates training variables definitions and some tips and prerequisites.

Chapter three includes the previous studies. Chapter four exposes and presents the research methodology and explained the research methods adopted in this study, research tool design, data collection procedures, statistical analysis procedures, and research tool tests. Chapter five introduces data analysis and discusses the descriptive and analytical statistics for the research questionnaire and discusses the findings of the study. Finally, chapter six presents the conclusion and recommendations.

In chapter two, the researcher investigates and elaborates the about KM model, GSETC and the variables to discover the importance of applying KM in GSETC and how it affects the training evaluation in training programs. The reason why it is used and chosen in this study refer to its simplicity as it needs no expertise to be applied, as well as it provides a systematic tools as well it provides an easy way to measure skills and knowledge and how to be applied.

Chapter 2

Theoretical

Framework

2-20 Kirkpatrick model:

This section elaborates and investigates the key issues about KM, its advantages, Levels, importance, and foundations.

2.1.1-Introduction:

Donald L Kirkpatrick published his four part series: Parts 1 and 2 in 1959 and Parts 3 and 4 in 1960 (Bumpas and Wade, 1990). KM's theory was first published in the Journal of American Society for Training and Development (ASTD), an organization for which Kirkpatrick has served as president (Prather, 2011). The articles have since been revised by Kirkpatrick in his 1975 book, *Evaluating Training Programs*, with an update of his four levels of training occurring in his 1998 book, in 2006 Kirkpatrick issued his third edition's book in training evaluation, which is contained a chock-full of useful information for evaluating learning according to the four levels. Several case studies illuminate how the four levels can be applied to a wide variety of training and development programs (Kirkpatrick, 2006), *Evaluating Training Programs: The Four Levels*. Kirkpatrick received his BA, MBA, and PhD from the University of Wisconsin where he is a Professor Emeritus (Chapman, 2008).

2.1.2- Description of Theory:

KM theory originated from Donald Kirkpatrick's desire to "make clear the elusive term evaluation". Kirkpatrick noticed that there were not apparent definitions used when recognizing evaluation between different companies, however four distinguished variations and thoughts became evident during his study. The first had evaluation used as a tool to measure the changes in behavior as a result of training (Prather, 2011).

The second had evaluation used as a term to describe the results of a training program. The third observation was the use of comment sheets for data collection. The last used learning in the classroom as the way to increase knowledge, skill improvement, and overall attitudinal change (Prather, 2011). Kirkpatrick believed that all four were correct but was convinced that all four approaches, used in conjunction would yield a superior definition to the term evaluation (Kirkpatrick, 1975).

Kirkpatrick developed a four level sequence that can be used to evaluate a variety of programs each level of the sequence is important and has an impact on the next level. The process of moving from one level to the next is increasingly demanding but the

information gained during the process is invaluable. It is important to never skip a level in order to move to the next level (Prather, 2011). Trainers lose their “control” when their training participants move from levels 1 and 2 to level 3. In other words, while participants are in the classroom or using e-learning methods, the instructor has total control over what is being taught and how it is being presented (Kirkpatrick, 2006).

Good trainers can therefore use their knowledge and skill to make sure that training is comfortable, relevant, and interesting level 1 and that participants learn the objectives that have been set forth level 2 (Kirkpatrick, 2006). Once the actual training is over and the participants go back to their jobs, all that is left for members of the training or learning team to use to achieve successful level 3 measures is influence. They become reliant on others primarily the participants themselves and their supervisors to see that application occurs. This transfer is also a challenge because of the great amount of effort it takes to achieve successful level three measures. However, if the desired outcome does not involve a behavioral change, which occurs at level three, only the first two levels need be used. Even with the use of only the first two levels, an increase in knowledge, skill improvement, and attitudinal change could occur. If the desired outcome is a change in behavior then the use of all four levels is necessary (Kirkpatrick, 2006).

2.1.3- Theory Measurement/Instrumentation:

Prather (2011) identifies several ways to measure Kirkpatrick’s four levels as follow:

Kirkpatrick has measurement tools for each level.

In Level one – Reaction: Reaction/Smile/happiness Sheets which are used together with verbal reaction and post-training surveys and questionnaires (Kirkpatrick, 2006).

In Level two – Learning: classroom performance, performance test, paper and pencil pre-post tests, as well as interviews and/or observations (Plomp, 1996).

In Level three – Behavior: interviews and observation performed overtime are required to ensure that a change has indeed taken place (Plomp, 1996).

In Level four – Results: data collection and retention instruments should already be in place at the company or organization, the data from the process just is simply entered into the entity’s instrument. Moreover, balance scorecard is used to measure the results; training scorecard can be an important tool for showing an organization’s training progress and value. Since implemented, this scorecard has assisted the university in

understanding its operational state and how it can be improved. The metrics that are gathered are used in every quarterly business review or presentation made by the university leadership. It has helped us trend satisfaction data over time and provided a place to other evaluation results (Kirkpatrick, 2006).

The first three-levels of Kirkpatrick's evaluation reaction, learning, and performance are largely soft measurements; however, decision-makers who approve such training programs, prefer results (returns or impacts). That does not mean the first three are useless, indeed, their use is in tracking problems within the learning package:

- Reaction informs you how relevant the training is to the work the learners perform (it measures how well the training requirement analysis processes worked).
- Learning informs you to the degree of relevance that the training package worked to transfer KSAs from the training material to the learners (it measures how well the design and development processes worked).
- The performance level informs you of the degree that the learning can actually be applied to the learner's job (it measures how well the performance analysis process worked) (Lingham, 2008).

2.1.4- Kirkpatrick's Four Levels Advantages:

Adgate, Ruthford and Hall (1998) recognize many advantages of Kirkpatrick's four levels:

- 1) Students' reaction: This involves low cost and it is easy to administer. It provides insights to audience's personal feelings about the course. Moreover, it provides quick feedback on successes and failures to the training programs.
- 2) Learning results: In comparison to "Reaction", it provides more compelling evidence of whether the training program works or not.
- 3) Behavior in the workplace: Provides stronger evidence that the investment in training yields the desired return. If it is designed in a proper way, it can identify barriers and obstacles to improve performance.
- 4) Business results: It provides strong evidence that training program has a positive / negative impact on the organization. It also addresses whether the performance is

important to the organization's bottom line such as production, safety, sales and more (Nigel, 2009).

2.1.5- The popularity of KM:

Bates (2004) describes Kirkpatrick's four-level training evaluation model and the reasons for its popularity in organizations. Several fundamental limitations of the model are outlined and the potential risks, these limitations raise for evaluation clients and stakeholders are discussed. The model is to guide evaluations bear a close relationship to the effectiveness and utility of those evaluations. Inevitably, there are also ethical dimensions to the models and the ways in which they are used. It is therefore important to subject our model to ongoing reflection and analysis from different perspectives (Schwandt, 1998).

It shows the extent to which the model is consistent with the beneficence or providing benefits to clients and stakeholders when the opportunity to do so is present. The KM has served as the primary organizing design for training evaluations in organizations for over thirty years. The overwhelming popularity of the model can be traced to several factors. First, the model addressed the need of training professionals to understand training evaluation in a systematic way (Shelton & Alliger, 1993). It has provided straightforward system or language for talking about training outcomes and the kinds of information that can be provided to assess the extent to which training programs have achieved certain objectives. Second, Kirkpatrick insisted that information about level four outcomes is perhaps the most valuable or descriptive information about training that can be obtained (Bates, 2004). For training professionals in organizations this bottom-line focus is shown as a justified fit with the competitive benefits orientation of their sponsors. KM has supported means for trainers in organizations to couch and supervise the results of what they do in business terms. Many see this as critical if the training function is to become a true business partner and be seen as an active contributor to organizational success, the popularity of the four levels model is also a function of its potential for simplifying the complex process of training evaluation. The model does this in several ways. First, the model represents a straightforward guide about the kinds of questions that should be asked and the criteria that may be appropriate. Second, the model reduces the

measurement demands for training evaluation (Bates, 2004). Since the model focuses the evaluation process on four classes of outcome data that are generally collected after the training has been completed, it eliminates the need for or at least implies that pre-course measures of learning or job performance measures are not essential for determining training effectiveness are based solely on outcome measures, the model greatly reduces program effectiveness. In addition, because conclusions about the number of variables with which training evaluators need to be concerned. In effect, the model eliminates the need to measure or account for the complex network of factors that surround and interact with the training process (Bates, 2004). It is doubtless that KM has made valuable collaboration to training evaluation thoughts and practice. It helps focusing on training evaluation practice on outcomes (Newstrom, 1995), fostered the recognition that single outcome measures cannot adequately reflect the complexity of organizational training programs, and underscored the importance of examining multiple measures of training effectiveness (Wang, 2003). KM raises the awareness of the importance of thinking about evaluating training in business terms (Wang, 2003). The distinction between learning (level two) and behavior (level three) has drawn increased attention to the importance of the learning transfer process in making training truly effective (Alliger & Janak, 1989) The model has also served system as a useful tool if preliminary heuristic for training evaluators and has been the seed from which a number of other evaluation models have germinated (Alliger & Janak, 1989) .The assumption of causal linkages of KM assumes that the levels of criteria represent a causal chain such that positive reactions lead to greater learning, which produces greater transfer and subsequently more positive organizational results. Although Kirkpatrick is ambiguous about the precise nature of the causal connection between training outputs, KM's articles imply that a simple causal relationship exists between the levels of evaluation (Holton, 1996). In one of Kirkpatrick's more recent publications he states that "if training is going to be effective, it is important that trainees react favorably (Kirkpatrick, 2006), and that without learning, no change in behavior will occur.

2.1.6- Kirkpatrick's Questions (Kirkpatrick, 2006):

1- Did the learners like the training program?

- 2- Did the learners learn the content?
- 3- Did the learners deploy the learning on the job?
- 4- Did the implementation of the training program impact business results?
- 5- Did the training investment pay off?

2.1.7- Purpose of Evaluation:

Kirkpatrick (2006) identifies three reasons to evaluate:

- 1- To justify the existence and budget of the training department by showing how it contributes to the organizational objectives and goals.
- 2- To decide whether to continue or discontinue training programs.
- 3- To gain information on how to improve future training sessions.

2.1.8- Importance of KM for Human Resource Management:

According to Association for the Study and Community Development for the Office of Juvenile Justice and Delinquency Prevention (2003):

- 1- Addressing how one determines whether the goals or objectives were met and what impact the training had on actual performance on the job or in the community.
- 2- Creating internal validity concept in that it reflects how well the participant can perform certain tasks within the specific training venue.
- 3- Creating external validity concept given it requires that the participants are able to transfer their new skills, knowledge, or attitudes to a different situation.
- 4- Offering and enhancing strong indices of how well we progress once we start conducting training.
- 5- Decreasing the risk of training and making it more valuable.
- 6- Establishing a safe start of training evaluation.
- 7- Improving the quality of training and performance of the employees.

- 8- Creating a pool of readily available and adequate replacements for personnel who may leave or move up in the organization.

Technology and Educational Reform of university of Illinois-Urbana (2011) classifies many Kirkpatrick' strengths and weaknesses:

2.1.9- Kirkpatrick's Strengths:

- 1- Simple model.
- 2- Well known, established, and popular in many environments such as industry and professional settings.
- 3- Easy to understand.

2.1.10- Kirkpatrick's Weaknesses:

- 1- Level 1 and 2 could be open to personal interpretation, conclusions may not be accurate.
- 2- Some designs suggest that there should be more levels such as impact on society and return on investment.
- 3- No performance component for revisiting after the "four levels of training" may be considered "old fashioned".
- 4- Levels 3 and 4 are not always being focused on like level 1 and 2, breaking the chain-type connection of the levels.
- 5- Each level is assumed to be associated with the previous and next levels.
- 6- Fails to take into account any intervening variables that may occur.

2.1.11- The Economical Effects of KM on Training Associations :

Due to lack of Arabic references and modern references about the cost and budget dedicated for training programs and numbers about the importance of KM in training programs. The researcher resorts to some American reference which show the importance of training evaluation process in the world of organizations.

According to (Bachler, 1997), "American business invested an estimated \$52 billion in training in 1996." (Bassi, 1996) reported even larger totals for 1995, indicating that employers' total expenditures on training were \$55.3 billion. It seems clear that training and development efforts are big business in the United States. In light of these large

expenditures, managers of both private and public organizations are beginning to more seriously question their return on investment in training. Holton (1995) believed that increasing global competition has led to intense pressure on managers to demonstrate that programs are directly contributing to the bottom line of the organization.

Phillips (1995) wrote that in any direction one chooses to take in the HR field, the pressure to measure the return on investment (ROI) is increasing. Employers "especially want to know what benefits they can expect from it" (Dionne, 1996). They want to analyze the financial costs and benefits of training programs (Parsons, 1995).

In 1999, ASTD found that 45 percent of surveyed organizations only gauged trainees' reactions to courses (Sugrue, 2003). Overall, 93 percent of training courses were evaluated at Level 1, and 52 percent at Level 2. Only 31 percent of training courses were evaluated at Level 3, and 28 percent at Level 4. Since that time, the ASTD shows that the overall percentage of organizations employing Level 1 evaluations has fallen substantially (75%). However, little growth has occurred in the percentage of organizations employing Level 2, 3 and 4 evaluations.

The previous percentages show that training associations are not fully aware of evaluating the training properly, hence it is still unknown whether benefits of training are more or less than the dedicated costs, there is also no concern to have specific budget for proper evaluation. Moreover, training evaluation is normally evaluated by reaction level or sometimes, it goes to level two, with no interest in level three or even level four, thus, value must be created before it can be demonstrated (Kirkpatrick partner, 2011).

Most researchers show that most companies use level one but relatively few do level four (results) (Dick, 2006). It is highly considered that training evaluation should be conducted according to its importance, which means that low funded training programs do not have to apply all levels, especially if it is done for general benefits, however, highly funded training programs have to figure out all levels of training evaluations and know exactly whether required benefits are met or not. Methods for showing the benefits of the training on their departments conduct. They often resort to "smile sheets" or just assume that if the training is based on needs analysis, which is probably effective.

However, these methods cannot tie training activities to the cost considered important by most organizations. This puts managers at a disadvantage when dealing with their more

financially literate colleagues. Organization is likely to know exactly how much training costs but they may have little idea of its value. HR must be able to supply that information if it is to truly become a strategic part of the organization (Kirkpatrick, 2006).

2.1.12 - Four Levels of Evaluation:

The four-levels of evaluation consist of (Kirkpatrick, 2006):

- Reaction - how the learners react to the learning process
- Learning - the extent to which the learners gain knowledge and skills
- Behavior - capability to perform the learned skills while on the job
- Results - includes such items as monetary, efficiency, moral, etc.

2.1.12.1- Level One - Reaction

As the word reaction implies, evaluation at this level measures how the learners react to the training (Kirkpatrick, 2006). This level is often measured with attitude questionnaires that are passed out after most training classes. This level measures one thing: the learner's perception (reaction) of the course (Kirkpatrick, 1975). Learners are often keenly aware of what they need to know to accomplish a task. If the training program fails to satisfy their needs, a determination should be made as to whether it is the fault of the program design or delivery. This level is not indicative of the training's performance potential, as it does not measure what new skills the learners have acquired or what they have learned that will transfer back to the working environment (Kirkpatrick, 1975).

Level one evaluation assists an organization in assessing a participant's reactions to a course's instructor, setting, materials, and learning activities. This level of training evaluation is essential. It involves gaining direct feedback. Many organizations use this level as their sole means of evaluation (Kirkpatrick, 2006).

Level one evaluations measure customer satisfaction specifically to gain feedback on the instructor, course material and learning environment (Kirkpatrick, 2006). Evaluations provide quantitative information and are usually occur immediately upon completion of

the planned event. Though level one evaluations have limited value, they rely on the measurement of attitudes and gauge subjective reactions to the event. A Level one evaluation should be used in combination with other levels of evaluations (FHWA, 2004). This has caused some evaluators to down play its value. However, the interest, attention and motivation of the participants are often critical to the success of any training process. People often learn better, when they react positively to the learning environment by seeing the importance of it (Clark, 2004).

When a learning package is first presented, rather it be e-learning, classroom training, etc., the learner has to make a decision as to whether he or she will pay attention to it. If the goal or task is judged as important and doable, then the learner is normally motivated to engage in it (Markus and Ruvulo, 1990). However, if the task is presented as low-relevance or there is a low probability of success, then a negative effect is generated and motivation for task engagement is low.

This differs somewhat from Kirkpatrick (2006) who writes, "Reaction may best be considered as how well the trainees liked a particular training program." However, the less relevance the learning package is to a learner, then the more effort that has to be put into the design and presentation of the learning package. That is, if it is not relevant to the learner, then the learning package has to hook the learner through slick design, humor, games, etc. This is not to say that design, humor, or games are unimportant; however, their use in a learning package should be to promote or aid the learning process rather than the learning package itself (Thompson and Associates, 2008), And if a learning package is built of sound purpose and design, then it should support the learners in bridging a performance gap. Hence, they should be motivated to learn. If not, something went dreadfully wrong during the planning and building processes. The evaluation sheets are often referred to as Smile Sheets or Happy Sheets. The impact on instructional design is that the evaluation forms should be designed allowing for results to be easily tabulated and utilized to impact future training programs (Clark, 2008).

Per Kirkpatrick (2006) "Evaluating reaction is the same thing as measuring customer satisfaction. If training is going to be effective, it is important that students react favorably to it."

It is important not only to get a reaction but also to get a positive reaction. As just described, the future of a program depends on positive reaction. In addition, if participants do not react favorably, they probably will not be motivated to learn. Positive reaction may not ensure learning, but negative reaction almost certainly reduces the possibility of its occurring (Kirkpatrick, 2006).

2.1.12.1.1 Guidelines for Level One (Kirkpatrick, 2006):

1. Determine what you want to find out.
2. Design a form that will quantify the reactions.
3. Encourage written comments and suggestions.
4. Strive for 100% immediate response.
5. Get honest responses.
6. Develop acceptable standards.
7. Measure reactions against standards, and take appropriate action.
8. Communicate reactions as appropriate.

2.1.12.2.1.2- The Benefits to Conducting Level One Evaluation (Kirkpatrick, 2006):

1. A proxy for customer satisfaction.
2. Immediate and real-time feedback to an investment.
3. A mechanism to measure and manage learning providers, instructors, courses, locations, and learning methodologies.
4. A way to control costs and strategically spend your budget dollars. If done properly, a way to gauge a perceived return on learning investment

2.1.12.2- Level Two - Learning:

Kirkpatrick (2006) defines learning as the extent to which participants change attitudes, improve knowledge, and increase skill as a result of participating in the learning process. It addresses the question: *Did the participants learn anything?* The learning evaluation requires some type of post-testing to ascertain what skills were learned during the training. In addition, the post-testing is only valid when combined with pre-testing, so that you can differentiate between what they already knew prior to training and what they actually learned during the training program (Clark, 2004).

Level II evaluations measure the participants' "learning" or achievement of the course objectives/outcomes. Level II evaluations measure knowledge, skill and attitudes of the participants (FHWA, 2004).

Kirkpatrick cautions that the tests must accurately cover the material presented or it will not be a valid measurement of the effectiveness of the program in terms of learning.

The impact on instructional design is on the training program content and pre/post test construction (Chapman and Alan, 2007).

Clark (2004) said that measuring the learning that takes place in a training program is important in order to validate the learning objectives. Level two is a 'test' to determine if the learning transfer occurred. Per Kirkpatrick (2006), "It is important to measure learning because no change in behavior can be expected unless one or more of these learning objectives have been accomplished. Measuring learning means determining one or more of the following."

What knowledge was acquired?

What skills were developed or enhanced?

What attitudes were changed?

Learner assessments are created to allow a judgment to be made about the learner's capability for performance. There are two parts to this process: the gathering of information or evidence (testing the learner) and the judging of the information (what does the data represent?). This assessment should not be confused with evaluation. Assessment is about the progress and achievements of the individual learners, while evaluation is about the learning program as a whole (Tovey, 1997).

Evaluation in this process comes through the learner assessment that was built in the design phase. Note that the assessment instrument normally has more benefits to the designer than to the learner. For the designer, the building of the assessment helps to define what the learning must produce. For the learner, assessments are statistical instruments that often poorly correlate with the realities of performance on the job and they rate learners low on the "assumed" correlatives of the job requirements

(Gilbert, 1998). Thus, the next level, performance, is the preferred method of assuring that the learning transfers to the job, but sadly, it is quite rarely performed.

2.1.12.2.1- Guidelines for Level Two (Kirkpatrick, 2006):

- Use a control group, if practical.
- Evaluate knowledge, skills, and or attitudes both before and after the program.
- Use a ‘test’ to measure knowledge and attitudes.
- Strive for 100% response.
- Use the results to take corrective actions.

2.1.12.2.2- Barriers to using knowledge and skills on the job (Rouse, 2011):

- The lack of the opportunity to use one's learning.
- The lack of the personal capacity to try out the learning.
- A belief that the effort exerted will not change performance.
- A belief that the desirable performance will lead to outcomes the learner values.
- The extent to which the supervisor or manager actively inhibits the use of the new knowledge and skills, the support or resistance that peers provide when using new approaches.

2.1.12.2.3- Level Three - Performance (behavior):

Behavior is defined as the extent to which a change in behavior has occurred because the participants attended the training program (Phillips, 1996). This evaluation involves testing the students capabilities to perform learned skills while on the job, rather than in the classroom. Level three evaluations can be performed formally (testing) or informally (observation). It determines if the correct performance is now occurring by answering the question, “Do people use their newly acquired learning on the job?” (Clark, 2004).

In Kirkpatrick's original four-levels of evaluation, he names this level behavior.

However, behavior is the action that is performed, while the final result of the behavior is the performance. Gilbert (1998) said that performance has two aspects, behavior being the means and its consequence being the end.

Level 3 evaluations measure the participants’ “on-the-job behavior” or application of the knowledge, skill and abilities learned in a planned event.

Level 3 evaluations measure the transfer of knowledge, skills and attitudes to a specific environment (e.g. workplace) (FHWA, 2004).

A level 3 evaluation often involves others (i.e. supervisor, peers) that have noticed a change in behavior or attitude in the training participant. Level 3 is often harder than level 1 or 2 evaluation because behavior changes at the workplace are often harder to measure than reaction and learning directly after the training event. Therefore, time must be factored in to give the behavior time to transfer and collect data at the workplace

If we were only worried about the behavioral aspect, then this could be done in the training environment. However, the consequence of the behavior (performance) is what we are really after; and if the learner can now perform and produce the needed results in the working environment (FHWA, 2004).

It is important to measure performance because the primary purpose of training is to improve results by having the students learn new skills and knowledge and then actually applying them to the job. Learning new skills and knowledge is no good to an organization unless the participants actually use them in their work activities. Since level-three measurements must take place after the learners have returned to their jobs, the actual Level three measurements will typically involve someone closely involved with the learner, such as a supervisor (Kirkpatrick,1994). Although it takes a greater effort to collect this data than it does to collect data during training, its value is important to the training department and organization as the data provides insight into the transfer of learning from the classroom to the work environment and the barriers encountered when attempting to implement the new techniques learned in the program (Bistriz, 2006) .

Per Kirkpatrick, level three evaluates the job impact of training. “What happens when trainees leave the classroom and return to their jobs? How much transfer of knowledge, skill, and attitudes occurs?” Kirkpatrick questions, “In other words, what change in job behaviour occurred because people attended a training program?” (Lingham, 2007).

During the results level, it is important to look at the information collected during the first three levels and use that information to decide whether the objectives have been accomplished. According to Kirkpatrick (2006) change will only occur if the following four conditions occur:

The person must have the desire to change.

The person must know what to do and how to do it.

The person must work in the right climate.

The person must be rewarded for changing.

2.1.12.2.3.1- The Guidelines for Level Three (Kirkpatrick, 2006):

- Use a control group, if practical.
- Allow time for behavior change to take place.
- Evaluate both before and after the program if practical.
- Survey or interview trainees, supervisors, subordinates and others who observe their behavior.
- Strive for 100% response.
- Repeat the evaluation at appropriate times.

• 2.2.3.2 Barriers to Transfer of Training to the Job (Phillips, 2002):

- Immediate manager does not support the training.
- The culture in the work group does not support the training.
- No opportunity to use the skills.
- No time to use the skills.
- Skills could not be applied to the job.
- The systems and processes did not support the use of the skills.
- Didn't have the resources available to use the skills.
- Changed job and the skills no longer apply.
- Skills are not appropriate in our work unit.
- Didn't see a need to apply what was learned.
- Could not change old habits.
- Reward systems don't support new skills.

2.1.12.3.3- The Benefits to Conducting Level Three (Kirkpatrick, 2006):

- An indication of the 'time to job impact'.
- An indication of the types of job impacts occurring (cost, quality, time, productivity).

2.1.12.4- Level Four - Results:

Results can be defined as the final results that occurred because the participants attended the program. The final results can include increased production, improved quality, decreased costs, reduced frequency and/or severity of accidents, increased sales, reduced turnover, and higher profits. It is important to recognize that results like these are the reason for having some training programs. Therefore, the final objectives of the training program need to be stated in these terms (Kirkpatrick, 2006). As we move from level one to level four, the evaluation process becomes more difficult and time-consuming; however, the higher levels provide information that is of increasingly significant value. Perhaps the most frequently type of measurement is Level-one because it is the easiest to measure, yet it provides the least valuable data. Measuring results that affect the organization is often considerably more difficult, thus it is conducted less frequently, although it yields the most valuable information (Kirkpatrick, 1994). Impact informs you of the return the organization receives from the training. Decision-makers prefer this harder result, although not necessarily in dollars and cents. For example, a recent study of financial and information technology executives found that they consider both hard and soft returns when it comes to customer-centric technologies, but give more weight to non-financial metrics (soft), such as customer satisfaction and loyalty (Hayes, 2003). Note the difference in “information” and “returns.” That is, the first three-levels give you information for improving the learning package. While the fourth-level gives you the returns for investing in the learning process (Lingham, 2007). A hard result is generally given in dollars and cents, while soft results are more informational in nature. There are exceptions. For example, if the organizational vision is to provide learning opportunities (perhaps to increase retention), then a level-two or level-three evaluation could be used to provide a soft return (Lingham, 2007). Phillips (1996) writes that the value of information becomes greater as we go up these levels of information (from reaction to results/impacts). For example, the evaluation of results has the highest value of information to the organization, while reaction provides the least information (although like any information, it can be useful), and like most levels of information, the ones that provide the best value are often more difficult to obtain. Thus we readily do the easy ones (levels one and two) and obtain a little

information about our training efforts, while bypassing the more difficult ones (three and four) that would provide the most valuable information for the organization (Clark, 2008). This final measurement of the training program might be met with a more balanced approach or a balanced scorecard (Kaplan and Norton, 2001), which looks at the impact or return from four perspectives:

1. **Financial:** A measurement, such as an ROI, that shows a monetary return, or the impact itself, such as how the output is affected. Financial can be either soft or hard results.
2. **Customer:** Improving an area in which the organization differentiates itself from competitors to attract, retain, and deepen relationships with its targeted customers.
3. **Internal:** Achieve excellence by improving such processes as supply-chain management, production process, or support process.
4. **Innovation and Learning:** Ensuring the learning package supports a climate for organizational change, innovation, and the growth of individuals.

Level Four is “the most important step and perhaps the most difficult of all.” Level Four attempts to look at the business results that accrued because of the training (Clark, 2008).

2.1.12.4.1- The Guidelines for Level Four (Kirkpatrick, 2006):

- Use a control group if practical.
- Allow time for results to be achieved.
- Measure both before and after the program, if practical.
- Repeat the measurement at appropriate time.
- Consider costs versus benefits.
- Be satisfied with evidence if proof not possible.

2.1.13-Kirkpatrick Foundational Principles:

Donald and his son James in their official website (Kirkpatrickpartner, 2011) summarize the foundational principles as follows:

2.1.13.1- The End is the Beginning :

Effective training evaluation begins before the program even starts.

“Trainers must begin with desired results and then determine what behavior is needed to accomplish them. Then trainers must determine the attitudes, knowledge, and skills that are necessary to bring about the desired behavior(s). The final challenge is to present the training program in a way that enables the participants not only to learn what they need to know but also to react favorably to the program.” It is important that the results are defined in measurable terms, so that all involved can see the ultimate destination of the initiative. Clearly defined results will increase the likelihood that resources will be most effectively and efficiently used to accomplish the mission. Attempting to apply the four levels after a program has been developed and delivered makes it difficult, if not impossible, to create significant training value. All four levels need to be considered at every step in the program design, execution, and measurement.

2.1.13.2- Return on Expectations (ROE):

It is the ultimate indicator of value. When executives ask for new training, many learning professionals retreat to their departments and start designing and developing suitable programs. While a cursory needs assessment may be conducted, it is rarely taken to the point that expectations of the training contribution to an overall business initiative are completely clear.

Stakeholder expectations define the value that training professionals are responsible for delivering. Learning professionals must ask the stakeholders questions to clarify and refine their expectations on all four Kirkpatrick levels, starting with Level 4 Results. This is a negotiation process in which the training professional makes sure that the expectations are satisfying to the stakeholder, and realistic to achieve with the resources available.

Once stakeholder expectations are clear, learning professionals then need to convert those typically general wants into observable, measurable success outcomes by asking the question, “What will success look like to you?” Those outcomes then become the Level 4 Results; the targets to which you can sharply focus your collective efforts to accomplish return on expectations.

2.1.13.3- Positive Business partnership ROE:

Study has validated that training events in and of themselves typically produce about 15% on-the-job application. To increase application and therefore program results, additional actions need to happen before and after formal training. Historically, the role of learning professionals has been Levels 1 and 2, or just the training event. Not surprisingly, this is why many learning professionals spend almost all of their time there. The production of ROE, however, requires a strong Level 3 execution plan. Therefore, not only is it critical to call up on business partners to help identify what success will look like, but also to design a cooperative effort throughout the learning and performance processes in order to maximize results.

Before training, learning professionals need to partner with supervisors and managers to prepare participants for training. Even more critical is the role of the supervisor or manager after the training. They are the key people to reinforce newly learned knowledge and skills through support and accountability. The degree to which this reinforcement and coaching happens directly correlates to improved performance and positive outcomes.

2.1.13.4- Value must be Created Before it Can be Demonstrated :

Study suggests that as much as 90% of training resources are spent on the design, development, and delivery of training events that yield 15% on-the-job application (Brinkerhoff, 2006). Reinforcement that occurs after the training event produces the highest level of learning effectiveness, followed by activities that occur before the learning event. Currently learning professionals are putting most of their resources into the part of the training process that produces the lowest level of business results. They are spending relatively little time in the pre-training and follow-up activities that translate into the positive behavior change and subsequent results (Levels 3 and 4) that organizations seek.

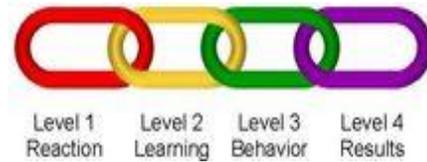
Formal training is the foundation of performance and results. To create ultimate value and ROE, however, strong attention must be given to Level 3 activities. To create maximum value within their organizations, it is therefore essential that learning

professionals redefine their roles and extend their expertise, involvement, and influence into Levels 3 and 4.

Fig (2.1)- Four levels'chain

2.1.13.5- A compelling chain of Evidence

Demonstrates Your Bottom Line Value :



The training industry is on trial, accused by business

source (Kirkpatrick partners, 2011), p.5

leaders of consuming resources in excess of the value delivered to the organization. Following the Kirkpatrick Foundational Principles and using the four levels will create a chain of evidence showing the business value of the entire business partnership effort. It consists of quantitative and qualitative data that sequentially connect the four levels and show the ultimate contribution of learning and reinforcement to the business. When workplace learning professionals work in concert with their key business partners, this chain of evidence supports the partnership effort and shows the business value of working as a team to accomplish the overall mission. The chain of evidence serves to unify the learning and business functions, not isolate training or set it apart. This unity is critical for Level 3 execution, where business value is produced.

2.1.14-Backwards Planning Model:

Many organizations consider this to be an old model as it is not properly arranged so here we come out with a new plan called “Backwards planning”. Thus, planning and analysis needs to work backward by identifying:

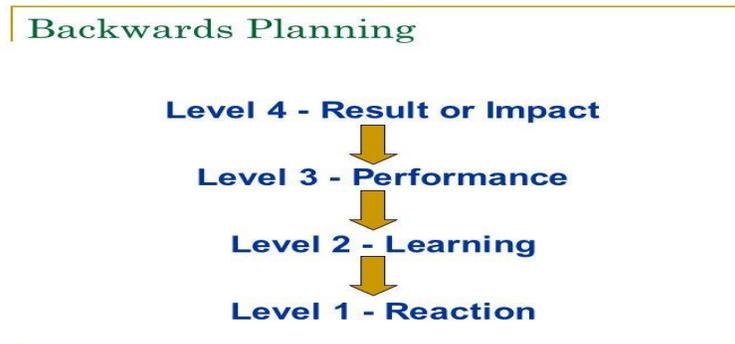
1. The desired impact (outcome or result) that will improve the performance of the business .
2. The level of performance the learners must be able to do to create the impact.
3. The knowledge and skills they need to learn in order to perform What they need to perceive in order to learn (the need to learn) (Kumar, Kunche et al. 2011).

"Trainers must begin with desired results and then determine what behavior is needed to accomplish them" (Kirkpatrick Partners, Berrett-Koehler, 1993). Many schools are going to a design based on backwards planning, starting with what the student will be able to do in the end to plan a lesson. Kirkpatrick's model supports the idea of backwards planning.

Because of its age and with all the new technology advances, the four-level evaluation model is often criticized nowadays for being too old and simple. Yet, almost five decades after its introduction, there has not been a viable option to replace it and this is the reason why is that Kirkpatrick basically nailed it, but presented it wrong. Rather than being just an evaluation tool, it should have been presented as both a planning and evaluation tool. To do this, it needs one simple adjustment. flip it upside-down (Clark, 2008).

That is, rearrange the steps into a “backwards planning” tool by starting with the end in mind:

Fig (2,2) Backwards planning based on KM.

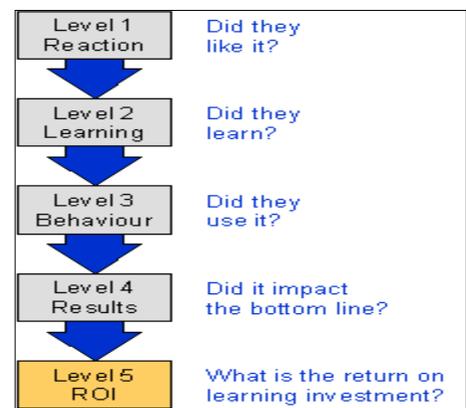


Source: (Clark, 2008) , p.11

2.1.15- Learning Measurement Level 5 (Phillips):

Level five is not a Kirkpatrick step. Kirkpatrick alluded to ROI when he created level Four linking training results to business results. ;However, over time the need to measure the dollar value impact of training became so important to corporations that a fifth level was added by Dr. Phillips who outlines his approach to Level Five in his book Return on Investment in Training and Performance Improvement Programs, Butterworth Einemann Publishers, Inc, Woburn, MA 1997. Dr. Phillips has written extensively on the subject (Mackenzie, 2008).

Figure (2,3)- basic Kirkpatrick structure.



Source: (Mackenzie, 2008) , p.1

Figure (2,4)- Representation of Kirkpatrick's and Phillips' model of learning analytics showing level-wise measurement objectives.



Source: (Chew, 2010) ,p.3.

An evaluation at each level answers whether a fundamental requirement of the training program was met. All levels of evaluation are important. In fact, the focus is on measuring four kinds of outcomes that should result from a highly effective training program (Chew, 2010).

2.1.15.1- Guidelines for Level Five (Phillips, 2001):

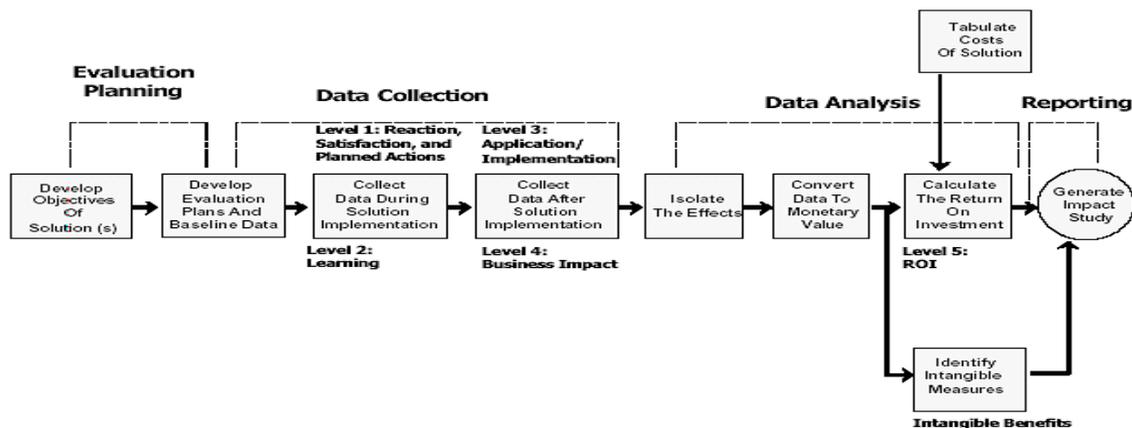
- Use a control group, if practical
- Allow time for results to be achieved
- Determine the direct costs of the training
- Measure a productivity or performance before the training
- Measure productivity or performance after the training
- Measure the productivity or performance increase
- Translate the increase into a dollar value benefit
- Subtract the dollar value benefit from the cost of training
- Calculate the ROI

ROI calculations are being done by a few world-class training organizations. They help these organizations (Mackenzie, 2008):

- Quantify the performance improvements
- Quantify the dollar value benefits
- Compute investment returns
- Make informed decisions based on quantified benefits, returns, and percent return comparisons between learning programs

Dr. Phillips has created an ROI Methodology that he conducts certifications and workshops on and has helped training organizations use the right tools to measure the ROI on organizational learning.

Fig (2,5)- Measuring the Return on Investment in Training and Development Certification Materials



Source : Faranani Facilitation Services report Ltd (2010) , p.15

The methodology is a comprehensive approach to training measurement. It begins with planning the project (referred to by Dr. Phillips as an Impact Study). It moves into the tools and techniques to collect data, analyze the data and finally report the data. The end result is not only a Level 5 ROI but also measurements on the Kirkpatrick 4 Levels as well. This yields a balanced scorecard approach to the measurement exercise (Mackenzie, 2008).

2.1.16- Types of Evaluations in Instructional Design:

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

2.1.16.1-Formative evaluation:

A formative evaluation (sometimes referred to as internal) is a method for 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 designers, learners, and instructors to monitor how well the instructional goals and objectives are being met (Guyot, 1978). Its main purpose is to catch deficiencies so that the proper learning interventions can take place that allows the learners 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 (Guyot, 1978).

2.1.16.2- Summative evaluation:

A summative evaluation (sometimes referred to 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. All assessments can be summative (i.e., have the potential to serve a summative function), but only some have the additional capability of serving formative functions (Scriven, 1967). Summative evaluation depends on what you mean by evaluation. Most of them span evaluation during the training event e.g. levels 1 and possibly 2 of Kirkpatrick (Formative Evaluation) and evaluation after the training event e.g. Levels 3 and 4 of Kirkpatrick (Summative Evaluation) (Paterson, 2005).

2.2- Gaza Syndicate of Engineers: (GSE)

2.2.1- Abstract:

This section elaborates and summarizes the details and facts about GSE and its importance in the world of training organizations, generally, and for engineers training particularly. Additionally, all the following details are cited either from GSE official website "www.enggaza.ps" or GSETC annual report, 2011, 2010 and 2009.

GSE was established in Gaza Strip by 1976. The aim of the association is to help the engineers in the Gaza strip and improve their capacity after graduation. In addition, it aims to improve the engineer's works in the region. More than 8414 engineers are registered in the association so far.

The board of directors of the Association of Engineers consists of nine members, four of them are key figures, whom are the chair of the association, vice-chairman, treasurer, and secretary, and the other five members are the heads of the Association's five branches in Gaza Governorates .

2.2.2- Organization Mission:

Engineers syndicate is a Palestinian civil independent nonprofit organization, seeking to develop and building engineer's capacity by providing the best professional services, cooperation with official bodies, and participates actively in community development to serve members and ensure their rights to create an environment motivating to development and innovation according to principles of justice, equality and tolerance.

2.2.3- Organization Objectives:

The syndicate of engineers is considered as the second home for all engineers, and we can point out some of the main objectives of the syndicate of engineers as follows:

1. Work to promote and organize the engineering profession.
2. Ensure a respectable, proper life to engineers.
3. Reinforce the scientific, cultural, and technical levels of engineers by training courses and workshops.

2.2.4- Services Provided to the Members:

1. Training and capacity building in engineering and managerial topics.

2. Social services and financial support to unemployed members.
3. On job training and job creation to fresh graduates.
4. Registration of engineering and consulting offices, and supervise it.
5. Organizing and participate in conferences, seminars, exhibitions and workshops.
6. Auditing and certification of engineering plans.
7. Examination of construction materials, soil and paint in the lab.

2.2.5- Syndicate of Engineers Committees:

GSE has many committees that aims at helping engineers by conducting workshops, training courses and scientific sessions ect.

- 1- Graduates Committee.
- 2- Scientific Committee.
- 3- Social Committee.
- 4- Cultural Committee.
- 5- Construction Committee.
- 6- Electrical Committee .

2.2.6- Syndicate of Engineers Centres and Organizations:

- 1- Engineering Arbitrary Centre.
- 2- Engineer Rights Centre.
- 3- *Training and Developing Centre.*
- 4- Soil Examination Experiment.
- 5- Engineering Companies and Offices Committees.

2.2.7- Syndicate of Engineers Training Centers (SETC):

Syndicate of engineers has many training centers distributed in the areas of Gaza, the north area, the south area and the middle area. Study solely focuses on Gaza syndicate of engineers training centre (GSETC), as it is considered the head centre and the most dominant place by its commitment to engineers rights than the others (GSETC annual report, 2011).

SETC was established since twenty years, to play a pivotal role to achieve the aims of the syndicate in the fields of continuing education and professional development for engineers, currently activates on training and capacity building for colleagues in all specialties, cooperation with the association committees and various institution.

2.2.7.1- Vision:

Excellence in providing training services in all areas of the engineer and the Palestinian community.

2.2.7.2-Mission:

SETC seeks to train and improve engineers' capacities, through investment on physical and human resources available, focus on high quality.

2.2.7.3-Goals:

- 1- Develop the engineer's efficiency in various fields.
- 2- Improve the center performance and achieve high quality in providing services.
- 3- Build a large network with institutions, especially these related to training and continuing education .

2.2.7.4-Courses specifications:

- 1- Engineering
- 2- Computer applications
- 3- Management

2.2.7.5-Trainer's experience:

Emphasis to choose practical experience trainers as well as training experience to be sure that information reaches the trainees properly.

2.2.7.6 Training:

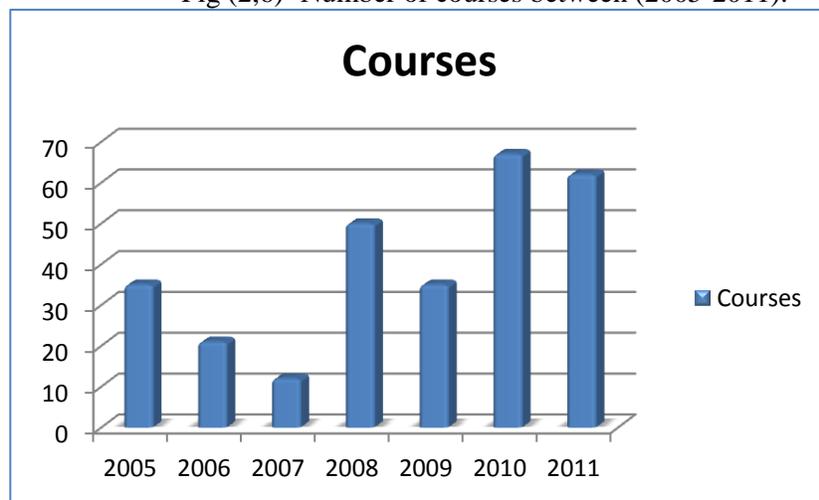
SETC provides effective training programs and sessions that develop engineer's capacity in several fields "management, engineering, computer applications, thus, SETC can respond to the grown training requirement.

2.2.7.7-Aspirations of the center:

- 1- Strengthening internet network and update the website.
- 2- Paying attention to distance learning technology and working to implement some sessions.

- 3- Increasing interaction with the industrial sector to design training programs that fit with their different needs.
- 4- Promoting training programs in sustainable development and environment.
- 5- Working for a library of the center includes:
 - 1- Video library
 - 2- CD-ROM library
 - 3- Basic references
 - 4- Software library.

Fig (2,6)- Number of courses between (2005-2011).



Source: (GSETC annual report,2011) ,p. 5

Fig (2,7)- Trainees number between(2005-2011)



Source: (GSETC annual report, 2011) ,p. 6

SETC normally conducts variant courses according to engineers needs based on highly skilled trainers who could perform and pass down the knowledge quite well and make reasonable results. SETC still offers new kind of courses to keep them in the business markets. These tables show a number of courses given in 2009, 2010 and 2011 in all branches of SETC, they also show how well the training process progresses during the last three years.

Table (2,1) Courses number attended in 2009.

No	Item	Total courses given per hours
1	Total number of hours	3044
2	Total number of trainees	939
3	Total number of courses	79
4	Newly added courses in (2009)	11

Source: (SETC report, 2009), p.6

Table (2,2) Courses number attended in 2010

No	Item	Total courses hours given
1	Total number of hours	3745
2	Total number of trainees	1611
3	Total number of courses	115
4	Newly added courses in 2010	19

Source: (SETC report, 2010), p.9

2.2.8- Gaza syndicate of Engineers Training Centre GSETC:

GSETC is considered as the main centre that SETC relies on. It is a basic source to conduct its activities and that may be seen by supporting and equipping GSETC classrooms with all the necessary tools. Despite the poor income of GSETC .

In 2011, GSETC has conducted a large number of engineering courses for engineers as it will be seen in the following table and appendix 4 that reflects and implies the trust of engineers. GSETC has been conducting engineering programs and computer courses that were noticed to have the largest number of engineers (annual report, 2009).

Table (2,3)-Number of courses conducted during Jun2010 till Aug2011.

No	Item	Total courses hours given
1	Total number of hours	2134
2	Total number of trainees	923
3	Total number of courses	65

Source: (GSETC report, 2011), p.6

2.3- Key variables:

This study aims to examine the variant variables in the training programs

2.3.1- Trainer:

A trainer can be someone who trains people for a particular job or profession or who trains someone in certain varieties of skills (BBC dictionary, 2012).

Trainer is a person who teaches you new skills and trains you for improving your acquiring skills (Sinha, 2008).

Kristie (2005) defines the trainer as a person who works with employees to develop skills and knowledge in a specific area to use on the job.

According to the researcher, trainer is defined as a person who aims at increasing the skills and knowledge of an employee for doing a particular Job. In addition to providing the trainees with as much real world knowledge as possible so the trainee can function and succeed on his/her own.

Tobin and Pettingell (2008), present some of the major tasks for the trainer:

- 1- Determines what others need to learn develops a training program to transmit the required knowledge and skills.
- 2- Presents the developed training or which has been obtained from an internal or external training developer.
- 3- Creates generic training programs for large audiences.
- 4- Focuses on the acquisition of individual knowledge and skills.
- 5- Focuses on the goals of the training program.
- 6- Measures success by how satisfied the employee is with the training experience.

2.3.2- Knowledge:

- 1- **Knowledge** is the information that changes something or somebody either by becoming grounds for actions, or by making an individual (or an institution) capable of different or more effective action (Drucker, 1990).

Davenport and Prusak (1998) define knowledge as, "a fluid mix of framed experience, contextual information, values and expert insight that provides a framework for evaluating and incorporating new experiences and information.

Knowledge is defined as the level of education, experience and training an individual must have at minimum to be considered qualified for the position (Abu-Ghazaleh, 2012). Sabu (2004) defines Knowledge as "information processed by humans and put together contextually". Knowledge refers to learning concepts, principles and information regarding a particular subject(s) by a person through books, media, encyclopedias, academic institutions and other sources (Manisha, 2009).

Drucker (1993) defines Knowledge as one of the most important assets for an organization to create values and hence, sustainable competitive advantage and it is the only meaningful resource today.

Achterbergh and Vriens (2002) further write that the role of knowledge in generating appropriate actions is that it serves as a background for articulating possible courses of

action (articulation), for judging whether courses of action will yield the intended result and for using this judgment in selecting among them (selection), for deciding how actions should be implemented and for actually implementing actions (implementation).”

In federal personnel guidance (2011), knowledge statements refer to an organized body of information usually of a factual or procedural nature which, if applied, makes adequate performance on the job possible. A body of information applied directly to the performance of a function.

According to the researcher, knowledge is defined as one of the most important assets for an organization of composed an organized body of information usually of a factual or procedural nature that creates adequate performance on the job possible.

2.3.3- Skills:

Skill is defined as expertness, practiced ability, facility in doing something, dexterity and tact (Glendon, 1995).

Skill refers to the proficient manual, verbal or mental manipulation of data or things.

Skills can be readily measured by a performance test where quantity and quality of performance are tested, usually within an established time limit (Abu-Ghazaleh, 2012).

Skill refers to the ability of using that information and applying it in a context.

In other words, knowledge refers to theory and skill refers to successfully applying that theory in practice and getting expected results (Manisha, 2009).

Guthrie (1952) defines a skill as the ability to bring about some result with maximum certainty and minimum outlay of energy or of time and energy.

The National Quality Council (2007) defines skill sets as "Those single units or combinations of units which link to a license or regulatory requirement, or defined industry need. National Industry Skills Councils identify skill Sets in Training Packages but Registered Training Organization (RTO) can also identify skill sets in response to the needs of enterprises or individuals".

According to the researcher, skill is defined as a talent or ability that comes from training or practice and helps create values and assets by applying new techniques and methods in the job.

2.3.4- Training materials:

- 2- Training material is defined as written papers used by instructors, facilitators, and students in a training environment, these materials store the information needed by the learner to perform tasks and enhances the employee's performance so that they can perform their tasks properly (AbuShekha, 2001).

A training Package is a set of nationally endorsed standards and qualifications used to recognize and assess the skills and knowledge people need to perform effectively in the workplace (MISAC, 2011).

Trainers and assessors have the freedom to choose which particular Training Package support materials they use to meet the outcomes of the training package and the needs of clients. They can select support materials from a range of sources including from the Training Package developer or other organizations that develop resources, or they can design or adapt their own support materials workplace (MISAC, 2011).

Summer Institute of Linguistics (SIL) International (1999) defines The training material as the content of the training course or workshop.

According to the researcher, training material is defined as an integrated knowledge and skills presented by written papers and documents that are systematically organized and include all the data needed to suit the training needs.

SIL International (1999) establishes some prerequisites and steps for designing training materials:

2.3.4.1- Prerequisites for Designing A training Materials:

1. You need to define the training goals.
2. You need to define the training objectives.
3. You need to consider the pre-training entrance level skills of the trainee candidates.
4. You need to allow adequate time for trainees to master the new material.

Steps

Follow these steps to design a training curriculum:

1. Select the content of the curriculum based on the goals and objectives you have defined.
2. Prioritize training topics.

Written materials may be used for a range of delivery styles and methodologies. It is important to be very clear about how materials are intended to be used when designing and writing materials. In the National Volunteer Skills Centre (NVSC), it has been decided that materials are primarily used for instructor led learning and that in some situations they will be used for self-paced learning. It refer to these materials as training guides (for trainers) or learning guides (for learners). Many find it helpful to think of the learning materials that have been used, especially those who engaged in the learning process and helped achieve significant outcomes (Dobson, 2003).

Australian government for education and training Package department (2007)

issues some indications and scopes about training package:

2.3.4.2-Training Material Suggested Indications:

1. Foundation

Training package support materials must identify and support units of competency from endorsed training packages. Materials should :

1. Clearly identify and accurately support the units of competency from endorsed training package(s) to which it relates.
2. Reflect industry characteristics through use of appropriate industry terminology and good work practice examples.
3. Complement rather than duplicate existing support materials.
4. Complement rather than duplicate information provided in training packages.

Scope

Training package support materials must specify and be appropriate for their purpose, audience and coverage. Materials should:

1. Identify and meet a clear purpose of supporting the acquisition of competency.
2. Identify and relate to its audience/target group(s) with a focus on suitability for

- equity groups.
3. Provide clear examples and explanations of complex ideas or terminology.
 4. Ensure that the complexity of tasks and activities is based on realistic Workplace application.
 5. Indicate any resources needed to support the effectiveness or use of the material.
 6. Provide accurate industry content.
 7. Provide the latest references and versions of the material needed

2.3.5- Learning Environment:

Genn (2001) defines learning environment as context for informal and formal which curricula are embedded.

Learning Environment is the sum of the internal and external circumstances and influences surrounding and affecting a person's learning (Mosby, 2009).

Robens (2005) defines learning environment as matrix that nurtures or inhibits learner growth, it also refers to readily apparent institutional qualities such as size, the quality of its faculty and students, the number and quality of libraries and laboratories, and the schools' mission. Though important, these institutional features do not influence students' learning and professional development to the extent that climate does.

A learning environment is characterized by an interface that allows students to register and take courses, staying within that environment for the duration of the course (Rossett, 2002).

"The place and setting where learning occurs; it is not limited to a physical classroom and includes the characteristics of the setting"(symposium led by Madhoo , 2011).

According to the researcher, learning environment is defined as the place and atmosphere that is strongly affecting the trainees in acquiring skills by external effects that may lead the process to the better and improve the training quality or vice versa.

Chapter 3

Previous Studies

3.1-Global studies :

3.1.1- Arabic studies:

3.1.1.1- Iqbal et al, 2011. “An Empirical Analysis of the relationship between Characteristics and Formative Evaluation of Training based on Kirkpatrick model”

This paper attempted to signify the use of formative training evaluation. The authors carried out a study at three public-sector training institutions to empirically test the predicted relationship between training characteristics and formative training evaluation under the KM i.e. reaction and learning. In addition, to study the causal linkage between components of formative training evaluation, the mediating role of reaction in the relationships between training characteristics and learning was also investigated. The principal finding revealed that a set of seven training characteristics explained 59% and 61% variance in reaction and learning respectively. All training characteristics were found to have positive impact on reaction and learning except training contents. For reaction, the most influencing training characteristic was training method followed by training management, training objectives, training environment, and trainer whereas for learning, the greatest variation was also explained by training methods but followed by trainer, training management, training environment, and training material. Moreover, reaction partially mediated the relationships between each training characteristic and learning. The study recommends improving training management, training objectives, training environment, and trainer. Additionally, conducting future study emphasizing on linking formative evaluation with summative one i.e. behavior and results.

3.1.1.2-Shaukat, Ul-Rehman and Ahmed, 2010. “How Organizations Evaluate their Trainings? An evidence from Pakistani organizations”

This paper is conducted to study training evaluation practices and challenges that are faced by Pakistani organizations. The study sample was 24 organizations from textile composite sector of Pakistan. Questionnaire was used for data collection. The study

findings show that majority of the organizations evaluate their training activities occasionally. The most widely used training evaluation tool is questionnaire. The widely accepted and used model of all organizations is KM four levels of training evaluation. The biggest challenge faced by organizations is time devotion of training evaluation and determining basis of training evaluation. It recommends that an effective training should not only meet the costs of the training but it should also offer valuable return on organization. Even though most training and development programs cause a clear improvement in overall organizational performance.

3.1.1.3- Omar et al, 2009. “training Iranian health managers”.

This paper aims to enhance the role of lower level managers by giving them new responsibilities in a decentralized system. A total of seven short training courses were implemented, three in the United Kingdom and four in Tabriz, with 35 participants. Respondents, like the training course participants, were predominantly from provincial universities, with both health system and academic responsibilities. A detailed evaluation of the courses was undertaken to guide future development of the training programs. A structured questionnaire was administered to 23 participants, out of 35, between one and 13 months after they had attended the courses. Interviews with key informants and ex-trainees provided supplemental information, especially on organizational impact. The Kirkpatrick framework for evaluation of training was used to measure participants' reactions, learning, application to the job, and to a lesser extent, organizational impact. Particular emphasis was put on application of learning to the participants' job, that paper shows that Participants' preferred interactive methods for learning about health planning and management. This study recommends that training evaluations should as a minimum assess participants' reactions and learning for every course. Besides, communication of evaluation results should be designed to ensure that data informs training activities, as well as the health and human resources managers who are investing in the development of their staff.

3.1.1.4- Al-Athari and Zairi, 2002.”Training evaluation: an empirical study in Kuwait”.

This paper is based on a study, which examined the current training evaluation activity, and challenges that face Kuwaiti organizations. The study sample was five UK organizations (recognized as best practice organizations in their Training and development activities) and 77 Kuwaiti organizations (40 government and 37 private). Interviews and questionnaires were used. The study reveals that the majority of respondents, both in government and in private sectors, only evaluate their training program occasionally. The most popular evaluation tools and technique used by government and private sectors were questionnaires. The most common model used by Kuwaiti organizations is the KM, while the most common level of evaluation for both government and private sector is reaction type, moreover. Organizations scarcely conduct training evaluation and mostly common used tool for evaluation is questionnaire form. KM is considered as one of the most common used model in Kuwait associations. This study recommends that manager should understand the value of applying KM other levels very well. Additionally, they should be considered as complementary tools for KM.

3.1.1.5-Agnaia, 1997. “Management training and development within its environment: the case of Libyan industrial companies”

The study focuses on understanding the evaluation needs of the stakeholder groups typically involved in training programs. A training program financed by the European Social Fund in Italy is studied, using both qualitative and quantitative methodologies many courses have been conducted according to training needs analysis and (in-depth interviews and survey study) were done. The study shows and identifies the evaluation elements represented by KM that all stakeholder groups consider important; as well as evaluation elements considered important by one or more stakeholder groups, but not by all of them; and latent variables which orient stakeholder groups in training evaluation. It recommends that KM is a considerable training evaluation model in most training departments since it provides a systematic detailed category of how to organize the training evaluation process.

3.1.2- Foreign Studies:

3.1.2.1- Pineda, Esther and Moreno, 2011." Evaluation of training effectiveness in the Spanish health sector”.

This paper aims to provide a methodological approach to facilitate evaluation of training among large groups. The paper presents the tools and the results of an evaluation of a whole training plan on the rational use of medicines addressed to 1,550 health professionals in Spain. Two questionnaires were administered to the trainees in order to evaluate transfer of training: one questionnaire upon finishing the training session and another one two months later. A total sample of 351 subjects was obtained from 53 different training programs linked with the rational use of medicines.

The study adopts KM as an easily applicable tool that can be used by organizations with few resources available for evaluation. The tool allows evaluation of the maintenance of the acquired learning, the particular changes in professional performance that prevail in time, and the factors that contribute to such changes. This study also contributes relevant information about the health sector and about large organizations with a lot of working offices, which could help advancing towards improving the effectiveness of training. Study recommends using KM to evaluate transfer of training that can be useful for practitioners and as for researcher who wants to evaluate training effectiveness among large groups.

3.1.2.2- Bickford, 2011.” The Effectiveness of Conflict Resolution Training”

The Department of National Defence and Director General Alternative Dispute Resolution (DGADR) commit significant financial and organizational resources to the conflict management program with the aim of reducing workplace conflict and improving organizational effectiveness and efficiencies. This applied study was an extensive literature review that was conducted using a variety of resources including the Athabasca University library, online internet search engines, and contacts with DGADR leadership and training officers. The samples studied were elementary school children and make generalizability difficult; however, these evaluations of level 2 outcomes clearly demonstrate significant positive attitudinal changes as a result of conflict resolution training and it is likely that the DGADR program has this same effect. Coleman and Lim (2001) also study adults when evaluating the effectiveness of the basic practicum in conflict Resolution course at teachers college, Columbia university. Although 124 students were enrolled in the course, only 64 students (aged 20 - 50 years) returned all

required outcome measures. This study provides evidence that conflict resolution training is effective throughout the four levels of Kirkpatrick's training evaluation framework (1979). The main recommendation was provided for the implementation of a comprehensive and evidence based training evaluation program. This program allows DGADR to collect evidence based data that can then be evaluated to determine the effectiveness of their training programs.

3.1.2.3- Rouse, 2011." Employing Kirkpatrick's Evaluation Framework to Determine the Effectiveness of Health Information Management Courses and Programs".

This article uses Kirkpatrick's evaluation framework to present a model that health information management instructors can use to improve upon the standard course evaluation form. The proposed course evaluation model addresses the first three of these levels and focuses on the conditions necessary for transfer of learned knowledge and skills into on-the-job application.

Kirkpatrick's framework for evaluation has been used as a basic model for the identification and targeting of training-specific interventions in business, government, the military, and industry alike. It has been successfully used and developed a pretest and a posttest. Have the students display actual knowledge of the subject before and after instruction. Quantify the results most likely using t -tests. A t -test is a statistical test used to determine if a set of results are statistically significant.

It does provide an overview of how to proceed. The model is still in widespread use. In addition, it is the standard to which other techniques are compared. Finally, adult education practitioners generally hold this approach to be efficacious

It recommends using Kirkpatrick's evaluation framework provides an excellent framework to determine strengths and weaknesses of the instruction.

3.1.2.4- Lonkhuijzen et al, 2010." A systematic review of the effectiveness of training in emergency obstetric care in low-resource environments".

This study aims to assess the effectiveness of training programs aimed at improving emergency obstetric care in low-resource environments. Study strategy selected websites, and manually searched bibliographies of selected articles. Selection criteria All papers describing postgraduate training programs aimed at improving emergency obstetric care in low-resource environments were included data collection and analysis made by two reviewers independently extracted the data and classified these according to the Kirkpatrick's level of the measured effects (reaction of participants, improved knowledge and skills, changes in behavior and outcomes in practice). Any disagreements were resolved by discussion with an author until agreement was reached. The main results of a total of 38 papers were selected. Training programs vary considerably in length, content and design. The evaluation of effects is often hampered by inadequate study design and the use of non-validated measuring instruments. Most papers describe positive reactions, increased knowledge and skills, and improved behavior after training. Outcome is assessed less frequently, and positive effects are not always demonstrated. Measures that can contribute to a positive effect of training programs include hands-on practice, team approaches and follow-up on training efforts. The author conclude that training programs may improve quality of care, but strong evidence is lacking. Study recommends that policymakers need to include evaluation and reporting of effects in project budgets for new training programs.

3.1.2.5- Powell and Yalcin, 2010. "Managerial training effectiveness: A meta-analysis 1952-2002", Personnel Review.

This paper aims to add to the significant contributions of past study by assessing what the overall effectiveness of managerial training has been over a period of 50 years and by identifying changes in overall effectiveness during this time period. Additionally, this study aims to evaluate what the overall findings on the effectiveness of training has been based on study design and subgroups focusing on the equivalent of Kirkpatrick's famous learning, behavior, and results outcomes .This study quantitatively integrates and extends the literature on management training through a meta-analytic procedure. The resulting sample of past study includes studies from the time period between 1952 and 2002, representing 85 interventions and 4,779 subjects. The results do not suggest a great deal of improvement in the effectiveness of managerial training from 1952 through 2002 and

effect sizes have remained moderate. Additionally, outcome subgroup appears to moderate results. Specifically, programs implemented to achieve learning outcomes tended to have the largest effect sizes and were consistently significant relative to programs targeted at behavior and results outcomes. The main contribution of this study is that it covers a large time period. As a result, the analysis offers a more expanded view of managerial training over time. The main recommendation is directly related to the selection of evaluation methods for future studies assessing the effectiveness of managerial training programs as well as abridging possible exclusion of past study and the heterogeneity of assessment methods used in past study, beyond the broad categories of objective and subjective assessment. In addition to identifying the moderating effect of outcomes being measured,

3.1.2.6- Chang, Ya-Hui Elegance, 2010. "An Empirical Study of Kirkpatrick's Evaluation Model in the Hospitality Industry"

This study examined Kirkpatrick's training evaluation model by assessing a sales training program conducted at an organization in the hospitality industry. The study assesses the employees' training outcomes of knowledge and skills, job performance, and the impact of the training upon the organization. By assessing these training outcomes and their relationships, the study demonstrated whether Kirkpatrick's theories are supported and the lower evaluation levels can be used to predict organizational impact. The population for this study was a group of reservations sales agents from a leading luxury hotel chain's reservations center. During the study period from January 2005 to May 2007, sales agents employed in this Global Reservations Center (GRC) 335 reservations.

The training intervention was a two and one-half day classroom-based comprehensive course for reservations sales agents. Study recommends examining the sequential relationships among the four evaluation levels of the KM as found in the literature (Alliger & Janak, 1989). That is, favorable trainee reactions help in assuring learning that assist in applying the learned skills to the job, which finally lead to favorable results in the individual and organizational levels. Moreover, the study further tests Kirkpatrick's theory to its full extend.

3.1.2.7- Steinert, 2010. " A systematic review of faculty development initiatives designed to improve teaching effectiveness in medical education"

This study aims to review the effects of faculty development interventions on the knowledge, attitudes and skills of teachers in medical education, and on the institutions in which they work.

Articles targeted basic and clinical scientists. All study designs that included outcome data beyond participant satisfaction were accepted. From an initial 2777 abstracts, 53 papers met the review criteria. Data were synthesized using Kirkpatrick's four levels of educational outcomes. Findings were grouped by type of intervention and described according to levels of outcome. In addition, 8 high-quality studies were analyzed in a 'focused picture'. All of the reports focused on teaching improvement and the interventions included workshops, seminar series, short courses, longitudinal programs and 'other interventions'. The study designs included 6 randomized controlled trials and 47 quasi-experimental studies, of which 31 used a pre-test-post-test design.

This study shows that faculty development activities appear highly valued by participants, who also report changes in learning and behavior. Notwithstanding the methodological limitations in the literature, certain program characteristics appear to be consistently associated with effectiveness. It recommends to have more attention about behaviour and results levels in order to explore these associations and document outcomes, at the individual and organizational level, is required.

3.1.2.8- Ridde, 2009 .“Program evaluation training for health professionals in Francophone Africa: process, competence acquisition and use”.

The university of Ouagadougou (Burkina Faso) and the university of Montreal (Canada) have partnered to establish, in Burkina Faso, a master's-degree program in population and health with a course in program evaluation. This article describes the four-week (150-hour) course taken by two (2005-2006/2006-2007) of health professionals from 11 francophone African countries. The study discusses how the course came to be, its content, its teaching processes and the master's program results for students. The conceptual framework was adapted from Kirkpatrick's (1996) four-level evaluation model: reaction, learning, behavior, results. Reaction was evaluated based on a standardized questionnaire for all the master's courses and lessons. Learning and behavior competences were assessed by means of a questionnaire (pretest/post-test, one year after). Master's program effects were tested by comparing the difference in mean scores between

times (before, after, one year after) using pretest/post-test designs. Paired sample tests were used to compare mean scores. This study shows the importance of integrating summative evaluation into the learning process. Skills-based teaching is much appreciated and well adapted. Creating a master's program in population and health in Africa and providing training in evaluation to high-level health professionals from many countries augurs well for scaling up the practice of evaluation in African health systems. This study recommends that summative evaluation should be well- considered to the form of evaluation since it complements the effectiveness of evaluation.

3.1.2.9- Smidt, Balandin and Sigafos, 2009. “The Kirkpatrick model: A useful tool for evaluating training outcomes”.

The study focuses on understanding the expected outcomes of communication-based training , six studies published in the last decade that reported the outcomes of communication-based training and six that reported on the outcomes of challenging behavior training were evaluated using the 4-level KM. as a result, comparison of the levels of evidence is made for these 12 studies the KM provides one technique for appraisal of the evidence for any reported training program and could be used to evaluate whether a training program is likely to meet the needs and requirements of both the organization implementing the training and the staff who participate. It recommends using KM that provides a model to evaluate training outcomes and results among large groups.

3.1.2.10- Foreman, 2008.” Kirkpatrick model: Training evaluation practices in the pharmaceutical industry”.

The purpose of this study was to explore the KM of evaluations in the North America pharmaceutical industry. There was a lack of information on training evaluation practices for the pharmaceutical industry. This study selected members of the ASTD who were professionals working in North America pharmaceutical companies' human resources and training departments. The criterion sampling approach confirmed the use of informed participants who were involved in evaluating organizational training programs. The main study question was (a) to what extent are KM valued to measure the effects of training programs in the pharmaceutical industry? Data analysis gathered information on the

amount of evaluation, methods used, reasons for not evaluating, organizational training practices, respondents' perceptions about the value of evaluation, and demographics. Of the 275 in the targeted population, there were 93 survey interviews conducted, a response rate of 34%. The use of descriptive statistics, correlations. This study found that the percentages of usage for Kirkpatrick's four levels were Level 1-67%, Level 2-57%, Level 3-45%, and Level 4-25%. The results indicated that training departments have the knowledge and skills required to perform evaluations. However, organizations seldom required training departments to evaluate, and the time requirements for evaluations seemed to outweigh the benefits. This study recommends that the pharmaceutical industry uses evaluation to improve training programs, as well as to solve the difficulty in barriers that is associated with the level of evaluation conducted in the pharmaceutical industry.

3.1.2.11- khani, 2008.” Impact of Instructional Objectives on e/learning Materials”

This paper argues how instructional objectives impact on e/learning materials. A procedure for systematically planning instruction in which the specification of instructional objectives plays a key role. Objectives are important to both learners and instructors. They help learners plan their study and prepare for examinations. They guide the instructors in planning instruction and devising tests. The study categorizes them into three main taxonomies with their models and characteristics for writing these instructional objectives. Study in these instructions, suggests several ways to improve both learners' and instructors' motivation. Also, we show evaluation is used to provide information about the success of a course of instruction based on KM, The audience is the group of learners that the objective is written for. This is usually written 'the learner' or 'the student' however it could be written as specific as 'The third grade science student'. 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. Study in these instructions recommends several ways to improve both learners' and instructors' motivation.

3.1.2.12- Sallander , 2007. “ Evaluation of A Class Commercial Truck Drivers Training Program at the Eagle Company”.

This study was to evaluate the company provided training program for class a commercial drivers license. In order to stay competitive in the recruitment of commercial truck drives the Eagle Company created a company training program for new and inexperienced truck drivers. Kirkpatrick's framework was chosen to evaluate the training program at the Eagle Company due to the fact it was highly publicizes and supported in the literature collected. Study goal was to evaluate the effectiveness of the company-training program, and to determine if the training was standardized. The instrument used to collect the necessary data was a 30-question survey. The survey was administered to a group of 14 after classroom training and again three months later after road training.

Study recommendations were made based on the information and data collected for this study to improve the training program for the Eagle Company. The trainees need a clear understanding of why the material provided in the classroom is relevant to their job.

3.1.2.13- Lien, Hung and Mclean, 2007. “ Training evaluation based on cases of Taiwanese benchmarked high-tech companies”

This study aims to measure the effectiveness of training evaluation in the benchmarked Taiwanese organizations, training evaluation methods are basically understood and used by seven Taiwanese companies benchmarked for their excellence by comparing Kirkpatrick's and Swanson's training evaluation models with practices used by the benchmarked Taiwanese organizations from a cross-cultural perspective. Five courses themes emerged from in-depth interviews, extending our understanding of training evaluation in the benchmarked Taiwanese organizations. Although the influence of workplace practices and employees' experiences with training effectiveness has received considerable attention, less is known of the influence of workplace practices on training evaluation methods. It recommends conducting comparative models/studies to identify the weaknesses and the strengths points and to develop one model based on the strengths

points of the other models. In addition, to evaluate training effectiveness among large groups to recognize about their effectiveness.

3.1.2.14- Goldman, 2006.” Teacher reflection on practice: evaluating TROPIC”

The study aims to assist teachers to employ a broader range of strategies particularly in relation to behavior management, and to encourage teachers to be more reflective of their practice and to engage in professional conversation with colleagues using a framework of structured peer observation and feedback. Initial participants in the program are 15 teachers representing eight different vocational training areas. The overarching purpose of the program is to promote professional conversation amongst teachers, by opening teaching practice through a structured non-judgmental peer observation and feedback process. Another important aim of the program is to provide teachers with practical behavior management skills. The initial program named "Teachers Reflecting On Practices in Contexts" (TROPIC) participants have undergone a two day training program to enable them to share with and promote to colleagues. Surveys and case studies framed around KM was used to evaluate the extent to which TROPIC achieved its objectives. Qualitative responses (optional written comments) were mainly positive and participants emphasized the value they placed on peer interaction and discussion. Overall the evaluation indicates that the TROPIC training has provided participants with a shared repertoire of behavior management strategies they did not previously have, and a process for conducting structured peer observation and feedback sessions to reinforce these. TROPIC has achieved its initial aims of establishing a community of practice of teachers engaged in the processes of peer observation and feedback, professional conversation, and sharing of behavior management and other teaching strategies with colleagues. TROPIC observations involve detailed quantitative and qualitative observations of teaching practice, they could themselves provide a platform for study into teaching and learning practices in a range of topics .The main recommendations for further study are apart from tracking the case studies and the development of the TROPIC program over the next 12-18 months, it would be useful to study how teachers learn in the workplace and whether TROPIC can provide a useful framework for enhancing workplace learning, for both beginning and experienced teachers.

3.1.2.15-Downing et al, 2006.” Is your training program adding value to your client's results? A framework and an application”.

This paper addresses the issue of how to evaluate whether a training program adds value to an organization's results. Structured analysis was used to combine Shuttlebeam's CIPP model of evaluation and KM of product evaluation. The objective is to prepare a model for evaluating training programs and to apply it to RTO. As the question to be investigated is whether a training program improves the results of an organization, it has been necessary to establish a model for evaluating the benefits that the organization receives two models were looked at, Stufflebeam's CIPP model of evaluation (Stufflebeam 2000, 2003) and KM of product evaluation (Kirkpatrick, 1998). Structured analysis was then used to combine the CIPP and KM. This was done in two stages, first creating logic models to map the flow of data, and then designing physical models to establish interfaces for the people doing the evaluating to interact with the system. involving a RTO that provides training to the staff of a client, and a university that collaborates with the RTO in the evaluation of the results of the training. Study recommends that client or employer should be able to discover if the improved behavior of the employees is actually improving the results of the organization or whether the trainees are doing the wrong things better. If the latter were the case, the employer may have to change what the organization is doing. Although this may be a painful decision, it is important for the future of the client's organization.

3.1.2.16- Rust, 2006. “The impact of educational development workshops on teachers’ practice”.

This paper reviews the effectiveness of workshops and reports the findings of a study, the effectiveness of 33 workshops delivered by the Oxford centre for staff and learning development over a four-month period. The study used questionnaires at the end of the workshops and four months later, and these were followed up by telephone interviews with a sample of participants. The features of workshops identified in end-of- workshop questionnaires which are linked with likelihood of subsequent change are also reported. The study demonstrates that workshops can lead to changes in practice, and that these changes are themselves deemed successful by those involved. In addition, where at the

end of a workshop participants report that they are likely to make changes this can be used as a reasonably accurate predictor of subsequent change. It recommends that KM is relevant in workshops. In addition, workshops could be of a great use if it focuses on previous mentioned tools .

3.1.2.17- Curran and Fleet. 2005” A review of evaluation outcomes of web-based continuing medical education”.

This study examines the nature and characteristics of the web-based CME evaluative outcomes reported in the peer-reviewed literature since larger numbers of doctors are accessing and using the internet to locate and seek medical information. A search of Medline was undertaken and the level of evaluative outcomes reported was categorized using KM for levels of summative evaluation . The results of this analysis revealed that the majority of evaluative study on web-based CME is based on participant satisfaction data. There was limited study demonstrating performance change in clinical practices and there were no studies reported in the literature that demonstrated that web-based CME was effective in influencing patient or health outcomes. The study recommends to examine in greater detail the nature and characteristics of those web-based learning technologies, environments and systems which are most effective in enhancing practice change and ultimately impacting patient and health outcomes. This is particularly important as the internet grows in popularity as a medium for knowledge transfer.

3.1.2.18- Batley, 1998. “Management training of professional engineers in New Zealand”.

This study aims at reviewing the need for management training for experienced professional engineers in New Zealand has been well- recognized for a long time. Study with professional engineers in New Zealand, including a training needs analysis, has indicated a strong need and high potential benefits from management training, particularly in personal and interpersonal management skills. A list of 25 most appropriate personal and interpersonal skills was developed. A three-day management training workshop was developed as a result of the study for engineers working in small groups. The course has since been run several times per year at the university of Canterbury and has attracted large numbers of engineers. Moreover, KM was adopted and feedback from the course participants has been very positive, saying that it provides

much needed opportunities for self-development and learning. This study shows that all professional engineers aspire to have a senior position in the association and it by far represents administrative positions. Moreover, this study recommends that administrative activities are important items that should be considered, thus most of professional engineers spend a long time in administrative activities furthering their work time.

3.2- Local studies:

3.2.1- Talbani, 2010."Evaluation of the Trainees' perception (Reaction) of the Self Assessment Training Course in Al Azhar University".

The aim of this research is to measure the effectiveness of the self assessment training course that was offered to the selected number of Al Azhar University staff. The research used KM of training evaluation focusing on the first level of evaluation (Reaction level) which assess the trainees' perception (attitudes/Reaction) on the training program that they have attended. The research targeted the 70 participants that attended the training course of which 54 questionnaires were returned and were suitable for statistical analysis. The questionnaire consisted of four parts that assess the participants reaction at the affective, utility, delivery, and instructor level.

The research concluded that the respondents reacted positively to all the dimensions of the reaction level including the affective level, the Utility Level, The delivery Level and the instructor Level. This suggests that the training program was effective at the reaction level. It recommends that these results do not guarantee the transfer of Learning and further evaluation of the effectiveness of the training program under investigation and future programs should be carried out.

3.3-Comments on Previous Studies:

The previous studies examined the effectiveness of using KM in the world of organizations and training centers. In addition to this, they show the KM's importance and its applicability for its four levels among the association and companies.

According to Al-Athari and Zairi (2002), the most widely used level is reaction level and that is consistent with local study done by Al-Talbani (2010), they refer that all the Kirkpatrick's levels are not necessarily needed to be applied since they are costly, demanding and long time consuming.

This study also indicates to assess reaction and leaning levels as they are easily applicable and less costly compared to the third and fourth levels and that is consistent with Iqbal (2011) and Omar et al, (2009) studies , the latter concluded to examine at least the first two levels.

As for Iqbal (2011) findings , training content was found to have no impact as well as Sallander (2007) study which was to evaluate the effectiveness of the company training program and materials, they indicate that foreign studies focus very widely about training content or material but that goes differently with this study's findings as it will be seen later, so GSETC should focus on creating suitable, contemporary and comprehensive training materials.

Pineda, Esther and Moreno (2011), Batley (1998) and smidt,balandin and sigafoos (2009) assert that KM is of great use among workshops and a large group of trainees and that is suitable with GSE whole sample in which interested trainees represent more than 1000 participants and that is considered as a large group .

According to Lien, Hung and Mclean (2007) and Downing (2006), when KM is combined or compared to either other models or associations respectively, such as Shuttle beam's CIPP model, it enhances its accuracy and comprehensiveness, As a result.

The researcher suggests applying KM in a profit organization to compare the results and the differences with GSETC which is non-profit organization to improve deficiencies.

Rouse (2011), Bickford (2011), Agnaia (1997), and Khani (2008) describe KM as an excellent and comprehensive framework which should be used as it provides an overview of systematic procedures of proper evaluation study. GSETC will gain good knowledge and benefits from the KM in training evaluation due to its comprehension and flexibility.

According to Riddle (2009) and Iqbal (2011), there should be valuable outcomes to integrate summative evaluation into the learning process. GSETC only uses formative evaluation since it represents the first two levels; the researcher suggests linking formative evaluation with summative evaluation if the results are important.

According to Foreman (2008). Although the training departments have the knowledge and skills required to perform evaluations, organizations seldom required training departments to evaluate, and the time requirements for evaluations seemed to outweigh the benefits, this shows that managers and decision makers are less aware of the training evaluation importance, similarly, in GSETC, the decision makers are also not interested in training evaluation .

According to Curran and Fleet (2005), their study suggests using KM in e-learning or training -based internet and technology, so GSETC is recommended to use e-training and evaluate it using KM.

Lonkhuijzen et al (2010) and Shaukat , UI-Rehman and Ahmed (2010) indicate that policymakers should dedicate budget for training programs to measure the results and this is what GSETC should do to improve the quality of the training programs.

According to Goldman (2006), trainers and teachers should be assisted to employ a broader range of strategies particularly in relation to behavior management, and to be more reflective of their practice, so GSETC should evaluate the trainers' competencies and learning.

In most case studies, the four levels are applied and outcomes are shown to be positive that is because they have a human resource department and dedicated budget to measure the results, unlike GSETC that lacks for HR departments and evaluation tools.

This is the second local study aiming to evaluate the implementing of KM in GSETC. Moreover, it is the first study that tries to evaluate the effectiveness of training in GSETC by using the first two levels; it also examines and assesses KM's effectiveness in interested engineers who attended training courses.

GSETC needs to improve training evaluation process and training variables represented by Kirkpatrick's first level including the trainer, training material and classroom layout because, if improved and developed properly. Learning level is more likely to have better results.

Chapter 4

Study Methodology

4.1 - Study Method:

The study uses the analytical descriptive method which describes and accesses the impact of the Kirkpatrick's first two levels on training programs. The descriptive method is used to compare, explain and evaluate in order to organize meaningful results.

Where the analytical descriptive technique compares, explains and evaluates in order to generalize meaningful results to enrich knowledge, the study adopted the analytical descriptive technique to sustain quantitative and qualitative measurement and analysis, the descriptive part attempts to illustrate the concepts of KM where the analytical part is to explain and explore the impact of Kirkpatrick's first two level's on training programs (Moore et al, 2003).

4.2- Data Collection:

In this study; primary data and secondary data are collected.

A. The secondary data:

Data is gathered from scientific journals such as the Knowledge Management, the Kirkpatrick partners ,ASTD and others through the electronic data bases such as Emerald and librarywiley ect.

The secondary data includes as well thesis and dissertations accessed through the universities websites. In addition, this kind of data includes text books available on the websites.

B. The primary data:

It is obtained from survey questionnaire developed in accordance with the study questions and hypotheses.

4.3- Study population:

The study population focuses on the GSETC which usually conducts training courses. It targets interested engineers in attending the training courses in GSETC.

4.4- Study Sample:

The researcher targets engineers who are concerned in training programs and previously attended training courses offered by GSETC based on Kirkpatrick's first two levels. The total number of engineers concerned is nearly 1000 engineers (Alajla, 2012), while the target population found 280 engineers. 30 questionnaires were distributed as pilot sample to check the validity test. A total of 320 questionnaires were

distributed while 280 filled and returned within one month which formed a response rate 87.5%.

4.5- Sample Size

$$ss = \frac{Z^2 * (p) * (1-p)}{c^2}$$

Where:

Z = Z value (e.g. 1.96 for 95% confidence level)

p = percentage picking a choice, expressed as decimal
(0.5 used for sample size needed)

c = confidence interval, expressed as decimal
(e.g., .04 = ±4)

$$Ss = \frac{1.96^2 * .05 * (1-.05)}{0.047^2} = 370$$

Correction for Finite Population

$$\text{new ss} = \frac{ss}{1 + \frac{ss-1}{pop}}$$

$$\text{new ss} = \frac{370}{1 + \frac{369}{1000}} = 272$$

Where: pop = population

Study sample converges to 280

4.6- Study Instruments:

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 systematic procedure (Moore et al, 2003). 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. The questionnaires should be trialed (tested) before using to ensure the recipients understand their operation the way the designer intended. When designing questionnaires, the most important feature is the guidance given for its completion (Scriven, 1967).

The study main instrument is survey questionnaire consisted mainly of three parts; first Personal data such as experience, university degree, age and number of courses attended, the second part is consisted of reaction and learning levels, reaction level is consisted of three categories that represent ,trainer ,training material and learning environment ,Learning environment is also composed of time and classroom layout. Learning Level is consisted of two categories and that are Knowledge and skills. The third part measures the effects of reaction and learning levels on KM effectiveness in the training programs. In order to be able to select the appropriate method of analysis, the level of measurement must be understood. For each type of measurement, there is/are an appropriate method/s that can be applied and not others. In this research, ordinal scales were used. Ordinal scale is a ranking or a rating data that normally uses integers in ascending or descending order. The numbers assigned to the important (1,2,3,4,5) do not indicate that the interval between scales are equal, nor do they indicate absolute quantities. They are merely numerical labels. Based on Likert scale we have the following:

Table (4.4)- Likert scale

Item	Strongly agree	Agree	Do not Know	Disagree	Strongly Disagree
Scale	5	4	3	2	1

The questionnaire was formulated in English (Appendix 3) and then back translated to Arabic (Appendix 2) after it has been judged by the experts and academic team (Appendix 1).

4.7- Data validity and Reliability Test:

The questionnaire validity has been examined and measured by two methods

- **The Experts Validation:**

The questionnaire evaluated by number of experts in the field from the university and the final questionnaire has been modified as per the experts' recommendations (see Appendix 1).

- **Pilot Study:**

A pilot study conducted to assess reliability of the questionnaire by distributing the questionnaire on a random sample consist of 30 respondents from the study population where these pilot questionnaires used to assess the validity and reliability of the data. It provides a trial run for the questionnaire, which involves testing the wordings of question, identifying ambiguous questions, testing the techniques that used to collect data, and measuring the effectiveness of standard invitation to respondents. As a result there are two questions show no relationship which are ((1)The eighth item in the Trainer sheet and that that is "GSE trainer has the ability to communicate with trainee", (2)The sixth item in Knowledge sheet and that is "Additional knowledge is added to provide trainees with relevant issues to the topic". As a result, the two items have been eliminated.

4.8- Test of Normality for Each Field:

Table (4.5) shows the results for Kolmogorov-Smirnov test of normality. From Table (4.5), the p-value for each field is greater than 0.05 level of significance, then the distribution for each field is normally distributed. Consequently, Parametric tests will be used to perform the statistical data analysis.

Table (4.5): Kolmogorov-Smirnov test

Field	Kolmogorov-Smirnov	
	Statistic	P-value
The Trainer	1.084	0.191
Training material	0.576	0.895
Classrooms layout	0.824	0.505
Time	0.614	0.845
Learning Environment	1.126	0.158
Reaction Level	0.559	0.913
Knowledge	0.964	0.311
Skills	0.682	0.741
Learning Level	0.654	0.786
KM Effectiveness in the training programs	0.955	0.322
All paragraphs of the questionnaire	0.785	0.569

4.9- Statistical Analysis Tools:

The researcher would use data analysis both qualitative and quantitative data analysis methods. The data analysis will be made utilizing (SPSS 20). The researcher would utilize the following statistical tools:

- 1) Kolmogorov-Smirnov test of normality.
 - 2) Pearson correlation coefficient for validity.
 - 3) Cronbach's Alpha for reliability statistics.
 - 4) Frequency and descriptive analysis.
 - 5) Parametric tests (One-sample T test, independent samples T-test , analysis of variance).
 - 6) Stepwise regression.
- T-test is used to determine if the mean of a paragraph is significantly different from a hypothesized value 3 (Middle value of Likert scale). If the P-value (Sig.) is smaller than

or equal to the level of significance, $\alpha = 0.05$, then the mean of a paragraph is significantly different from a hypothesized value 3. The sign of the Test value indicates whether the mean is significantly greater or smaller than hypothesized value 3. On the other hand, if the P-value (Sig.) is greater than the level of significance $\alpha = 0.05$, then the mean a paragraph is insignificantly different from a hypothesized value 3.

- The Independent Samples T-test is used to examine if there is a statistical significant difference between two means among the respondents toward the KM Effectiveness in the training programs due to (Gender and Educational engineering qualification).
- The One- Way Analysis of Variance (ANOVA) is used to examine if there is a statistical significant difference between several means among the respondents toward the KM Effectiveness in the training programs due to (The University, No of courses attended and Practical Experience).

4.10- Validity of Questionnaire

Validity refers to the degree to which an instrument measures what it is supposed to be measuring. Validity has a number of different aspects and assessment approaches. Statistical validity is used to evaluate instrument validity, which include internal validity and structure validity.

4.11- Internal Validity

Internal validity of the questionnaire is the first statistical test that used to test the validity of the questionnaire. It is measured by a scouting sample, which consisted of 30 questionnaires through measuring the correlation coefficients between each paragraph in one field and the whole filed.

Table (4.6) clarifies the correlation coefficient for each paragraph of the " The Trainer " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measured what it was set for.

Table (4.6): Correlation coefficient of each paragraph of " The Trainer " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	GSE trainer has a deep knowledge about the training course.	.849	0.000*
2.	GSE trainer uses visual materials & handouts effectively.	.502	0.003*
3.	GSE trainer's explanations are clear and concise.	.317	0.047*
4.	GSE trainer Solicits questions and has the answers	.572	0.001*
5.	GSE trainer offers alternative explanations to complex material	.811	0.000*
6.	GSE trainer sets good/practical examples.	.334	0.038*
7.	GSE trainer has interests in sharing information and knowledge.	.867	0.000*
8.	GSE trainer articulates words properly, clearly and unambiguously.	.685	0.000*

* Correlation is significant at the 0.05 level

Table (4.7) clarifies the correlation coefficient for each paragraph of the " Training material " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measured what it was set for.

Table (4.7) Correlation coefficient of each paragraph of " Training material " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	The training materials are relevant to the topics discussed.	.423	0.011*
2.	The training materials are useful for the participants in understanding the issues discussed.	.812	0.000*
3.	The training materials are presented in a clear, systematic and organized manner.	.561	0.001*
4.	The training materials are easy to understand.	.654	0.000*
5.	The amount of training materials covered is highly justified.	.665	0.000*
6.	The training materials are provided with handouts and booklet.	.567	0.001*
7.	The training materials are motivating and interesting.	.380	0.021*
8.	The training materials satisfy the objectives of the course very effectively.	.729	0.000*
9.	The training materials are provided with the latest references and books.	.719	0.000*

* Correlation is significant at the 0.05 level

Table (4.8) clarifies the correlation coefficient for each paragraph of the " Classrooms layout " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measured what it was set for.

Table (4.8) : Correlation coefficient of each paragraph of " Classrooms layout " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	The classroom layout is well suited to share materials based on audiovisual tools.	.732	0.000*
2.	The classroom layout is well suited to the formation of tables and desks that offer the best possible vision.	.793	0.000*
3.	The classroom layout is well suited to pair work.	.771	0.000*
4.	The classroom layout is well suited for discussion group work.	.763	0.000*
5.	The classroom layout is well- suited for practical work.	.680	0.000*
6.	The classroom layout encourages movement of the trainees.	.778	0.000*
7.	The classroom layout creates an interesting and stimulating atmosphere.	.648	0.000*
8.	The classroom layout is highly decorated and painted with colors that distort trainee's attention.	.375	0.023*
9.	Classroom layout is designed to offer a suitable distance between the trainer and the audience.	.585	0.000*

* Correlation is significant at the 0.05 level

Table (4.9) clarifies the correlation coefficient for each paragraph of the " Time " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measured what it was set for.

Table (4.9): Correlation coefficient of each paragraph of " Time " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	Training time is relevant for the schedule of the trainees.	.729	0.000*
2.	Time dedicated for training courses is sufficient to cover the needed material.	.847	0.000*
3.	Time period of each training session is suitable.	.637	0.000*
4.	Time given to allow for each trainee to practice the training items is suitable.	.805	0.000*
5.	Time period for the break is sufficient for the trainees.	.338	0.036*
6.	Time given for the discussions is suitable.	.425	0.011*
7.	Time for each session is divided in a way that brings the interest and breaks the boredom.	.674	0.000*
8.	Starting and ending times are accurately committed by the trainer and training centre administration.	.712	0.000*

* Correlation is significant at the 0.05 level

Table (4.10) clarifies the correlation coefficient for each paragraph of the " Knowledge " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measure what it was set for.

Table (4.10): Correlation coefficient of each paragraph of " Knowledge " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	Pencil and paper, pre and post tests are conducted to measure the knowledge.	.756	0.000*
2.	Pre and post Interviews are conducted to measure the knowledge.	.599	0.000*
3.	There is newly acquired knowledge to counsel someone about the topic covered in the course.	.633	0.000*
4.	Knowledge is relevant to the trainee's jobs.	.485	0.004*
5.	Acquired knowledge meets trainee's expectations.	.671	0.000*
6.	Knowledge is specific enough to match the information that trainees need.	.494	0.003*
7.	Knowledge is accurate, as well as sufficiently comprehensive and specific to the roles of the trainees.	.763	0.000*
8.	Knowledge is imparted during training in ways that support interest and learning by a range of learning styles (including time for discussion, clarification and brainstorming).	.686	0.000*

* Correlation is significant at the 0.05 level

Table (4.11) clarifies the correlation coefficient for each paragraph of the " Skills " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measure what it was set for.

Table (4.11): Correlation coefficient of each paragraph of " Skills " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	Skills are measured by conducting projects at the end of the course.	.794	0.000*
2.	Skills gained are fulfilled more confidently.	.863	0.000*
3.	Skills gained are fulfilled faster.	.863	0.000*
4.	Skills are measured by conducting a performance test.	.883	0.000*
5.	Skills are measured by having trainees involved with practical exercises to the difficulties they face. understand	.759	0.000*
6.	The skills taught in this class are relevant to trainee's personal development.	.790	0.000*
7.	Sufficient skills are provided through instructions to cover the key issues.	.772	0.000*
8.	Skills are comprehensive and specific enough to be imparted.	.652	0.000*
9.	Skills are imparted during training in ways that support interest and learning by a range of learning styles (including time for discussion and clarification).	.738	0.000*

* Correlation is significant at the 0.05 level

Table (4.12) clarifies the correlation coefficient for each paragraph of the " KM Effectiveness in the training programs " and the total of the field. The p-values (Sig.) are less than 0.05, so the correlation coefficients of this field are significant at $\alpha = 0.05$, so it can be said that the paragraphs of this field are consistent and valid to be measured what it was set for.

Table (4.12): Correlation coefficient of each paragraph of " KM Effectiveness in the training programs " and the total of this field

No.	Paragraph	Pearson Correlation Coefficient	P-Value (Sig.)
1.	GSE trainer has a significant effect on KM effectiveness in the training programs.	.816	0.000*
2.	The Training material has a significant effect on KM effectiveness in the training programs.	.810	0.000*
3.	The classroom layout has a significant effect on KM effectiveness in the training programs.	.779	0.000*
4.	Time has a significant effect on KM effectiveness in the training programs.	.852	0.000*
5.	Knowledge has a significant effect on KM effectiveness in the training programs.	.838	0.000*
6.	Skills have a significant effect on KM effectiveness in the training programs.	.852	0.000*
7.	The personal characteristics of GSE trainees (experience, university degree, age and number of courses attended) has a significant effect on KM effectiveness in the training programs.	.726	0.000*

* Correlation is significant at the 0.05 level

4.12- Structure Validity of the Questionnaire:

Structure validity is the second statistical test that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one field and all the fields of the questionnaire that have the same level of liker scale.

Table (4.13) clarifies the correlation coefficient for each field and the whole questionnaire. The p-values (Sig.) are less than 0.05, so the correlation coefficients of all the fields are significant at $\alpha = 0.05$, so it can be said that the fields are valid to be measured what it was set for to achieve the main aim of the study.

Table (4.13): Correlation coefficient of each field and the whole of questionnaire

No.	Field	Pearson Correlation Coefficient	P-Value (Sig.)
1.	The Trainer	.730	0.000*
2.	Training material	.813	0.000*
3.	Classrooms layout	.884	0.000*
4.	Time	.800	0.000*
5.	Learning Environment	.866	0.000*
6.	Reaction Level	.903	0.000*
7.	Knowledge	.903	0.000*
8.	Skills	.963	0.000*
9.	Learning Level	.796	0.000*
10.	KM Effectiveness in the training programs	.730	0.000*

* Correlation is significant at the 0.05 level

4.13-Reliability of the Research

The reliability of an instrument is the degree of consistency which measures the attribute; it is supposed to be measuring (Polit & Hunger,1985). The less variation an instrument produces in repeated measurements of an attribute, the higher its reliability. Reliability can be equated with the stability, consistency, or dependability of a measuring tool. The test is repeated to the same sample of people on two occasions and then compares the scores obtained by computing a reliability coefficient (Polit & Hunger, 1985).

4.14- Cronbach's Coefficient Alpha:

This method is used to measure the reliability of the questionnaire between each field and the mean of the whole fields of the questionnaire. The normal range of Cronbach's coefficient alpha value between 0.0 and + 1.0, and the higher values reflects a higher degree of internal consistency. The Cronbach's coefficient alpha was calculated for each field of the questionnaire.

Table (4.14) shows the values of Cronbach's Alpha for each field of the questionnaire and the entire questionnaire. For the fields, values of Cronbach's Alpha were in the range from 0.780 and 0.933. This range is considered high; the result ensures the reliability of each field of the questionnaire. Cronbach's Alpha equals 0.929 for the entire questionnaire which indicates an excellent reliability of the entire questionnaire.

Table (4.14): Cronbach's Alpha for each field of the questionnaire

No.	Field	Cronbach's Alpha
1.	The Trainer	0.799
2.	Training material	0.780
3.	Classrooms layout	0.852
4.	Time	0.809
5.	Learning Environment	0.866
6.	Reaction Level	0.901
7.	Knowledge	0.789
8.	Skills	0.933
9.	Learning Level	0.930
10.	KM Effectiveness in the training programs	0.922
	All paragraphs of the questionnaire	0.929

Table (4,14) shows that the questionnaire is sustainable and reliable at the rate of 92.9%. Thereby, it can be said that the researcher proved that the questionnaire was valid, reliable, and ready for distribution for the population sample.

Chapter 5

Data Analysis and Discussion

5.1- Introduction:

This chapter was designed to respond to the objectives, and to test hypotheses stated in chapter one. In this chapter, the findings that respond to these objectives are discussed and compared to the findings in the previous studies.

5.2- Personal Data:

5.2.1- Gender:

Table No (5.15) shows that 53.3% of the sample are males and 46.7% of the sample are females. During the distribution of questionnaires process, researcher unintentionally distributed for males more than females, or it may also refer that males tend to attend training programs more than females.

Table (5.15):Gender

Gender	Frequency	Percent
Male	152	53.3
Female	133	46.7
Total	285	100.0

5.2.2- Educational engineering qualification:

Table (5.16) shows that most of interested engineers have bachelor degrees and they are in need to build their experiences through courses, while few percentage of highly educated engineers are interested in attending courses, that is because they gained utmost skills and knowledge during their higher studies programs, that is the reason why they are less interested in attending courses.

Table (5.16):Educational engineering qualification

Educational engineering qualification	Frequency	Percent
Bachelor	262	91.9
postgraduate degree	23	8.1
Total	285	100.0

5.2.3- Graduation Year:

Table (5.17) shows that newly graduate engineers (Less experienced engineers) 82.4% tend to take more courses since they need to gain more skills and knowledge more than the high experienced engineers who gained enough experience and they are no longer interested in developing their skills in computer programs and general skills.

Table (5.17): Graduation year

Graduation Year	Frequency	Percent
Less than 2000	21	7.5
2000 – 2005	28	10
2006 – 2010	132	47.1
2011 and more	99	35.3
Total	280	100.0

5.2.4- The University:

Table (5.18) shows that most graduated engineers are from the Islamic university that is because Islamic university offers engineering degrees for more than 20 years, while engineering departments in others universities are established quite recently and other universities do not have many engineering majors. The Islamic university is compared as one item to other universities which are considered as one item as they all represent a very small percent. In comparison, quantities should be nearly equal and converging.

Table (5.18):The University

The University	Frequency	Percent
The Islamic University	238	83.5
Al Azhar University	7	2.5
Palestine University	6	2.1
Other	34	11.9
Total	285	100.0

5.2.5- Number of courses attended:

Table (5.19) shows that engineers number who attended courses decreases as they take more courses and that is owing to the similarities of the aims and purposes of the courses and limited number of new courses, which restrict their desires to take more courses.

Table (5.19): No of courses attended

No of courses attended	Frequency	Percent
5 and Less	152	53.3
6 – 10	105	36.8
11 and more	28	9.8
Total	285	100.0

5.2.6- Practical Experience:

Table (5.20) enhances and reinforces the result of table (5.17) that newly graduate engineers tend to take more courses than old graduate ones since they still need for new skills and knowledge.

Table (5.20):Practical Experience

Practical Experience	Frequency	Percent
Less than 1 Year	111	38.9
1Year – 2 Years	34	11.9
More than 2 years	140	49.1
Total	285	100.0

5.3- Analysis for each field:

5.3.1- Reaction Level:

The mean of the filed “**Reaction Level**” equals 3.68 (73.68%), Test-value = 30.91, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Reaction Level**”.

Table (5.21): Means and Test values for “Reaction Level”

Filed	Mean	Proportional mean	Test value	P-value (Sig.)
Reaction Level	3.68	73.68	30.91	0.000*

* The mean is significantly different from 3

5.3.1.1-The Trainer

Table (5.22) shows the following results:

- The mean of paragraph #1 “GSE trainer has a deep knowledge about the training course” equals 4.07 (81.40%), Test-value = 25.86, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

- The mean of paragraph #7 “GSE trainer has interests in sharing information and knowledge. (73.90%), Test-value = 15.29, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

1. The mean of the field “**The Trainer**” equals 3.94 (78.73%), Test-value = 37.56, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**The Trainer**”.

GSE trainers have a deep knowledge that they can enlarge engineer's experience.

However, They usually lack methods for an effective communication skills and how to make trainees interested ,so study recommends that all trainers should attend (training of trainers) courses as they help trainers to add interest in courses.

This study is consistent with Al-Talbani (2010) study, that trainers lack for new methods to make trainees interested by adding some new methods to keep the trainees motivated.

Moreover, they are competent to lead the training courses as they have a great knowledge.

Table (5.22): Means and Test values for “The Trainer”

	Item	Mean	Proportional mean	Test value	P-value (Sig.)	Rank
1.	GSE trainer has a deep knowledge about the training course.	4.07	81.40	25.86	0.000*	1
2.	GSE trainer uses visual materials & handouts effectively.	3.88	77.54	22.35	0.000*	6
3.	GSE trainer’s explanations are clear and concise.	3.96	79.22	26.55	0.000*	5
4.	GSE trainer Solicits questions and has the answers	4.00	79.93	28.09	0.000*	3
5.	GSE trainer offers alternative explanations to complex material	3.88	77.54	21.42	0.000*	7
6.	GSE trainer sets good/practical examples.	3.97	79.37	25.50	0.000*	4
7.	GSE trainer has interests in sharing information and knowledge.	3.70	73.90	15.29	0.000*	8
8.	GSE trainer articulates words properly, clearly and unambiguously.	4.04	80.84	28.87	0.000*	2
	All paragraphs of the filed	3.94	78.73	37.56	0.000*	

* The mean is significantly different from 3

5.3.1.2-Training material:

Table (5.23) shows the following results:

- The mean of paragraph #1 “The training materials are relevant to the topics discussed” equals 4.08 (81.54%), Test-value = 36.04 and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the

mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

- The mean of paragraph #9 “The training materials are provided with the latest references and books” equals 3.21 (64.16%), Test-value = 3.51, and P-value = 0.001 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

2. The mean of the field “**Training material**” equals 3.72 (74.38%), Test-value = 27.00, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Training material**”.

It is highly agreed that training materials are relevant to the topics discussed as it is shown in table (5.23) and that is consistent with Al-Talbani study (2010), in both studies it is ranked as the first that trainees agreed on. However, trainers and training centre should improve the training materials to make it consistent with the latest references, engineering software programs, engineering books' versions and methods used.

Table (5.23): Means and Test values for “Training material”

	Item	Mean	Proportional mean	Test value	P-value (Sig.)	Rank
1.	The training materials are relevant to the topics discussed.	4.08	81.54	36.04	0.000*	1

2.	The training materials are useful for the participants in understanding the issues discussed.	3.95	78.94	22.92	0.000*	3
3.	The training materials are presented in a clear, systematic and organized manner.	3.97	79.44	23.39	0.000*	2
4.	The training materials are easy to understand.	3.74	74.73	17.43	0.000*	6
5.	The amount of training materials covered is highly justified.	3.46	69.26	9.24	0.000*	7
6.	The training materials are provided with handouts and booklet.	3.42	68.48	7.41	0.000*	8
7.	The training materials are motivating and interesting.	3.81	76.14	20.11	0.000*	5
8.	The training materials satisfy the objectives of the course very effectively.	3.82	76.47	20.01	0.000*	4
9.	The training materials are provided with the latest references and books.	3.21	64.16	3.51	0.001*	9
	All paragraphs of the filed	3.72	74.38	27.00	0.000*	

* The mean is significantly different from 3

5.3.1.3-Learning Environment:

The mean of the filed “**Learning Environment**” equals 3.55 (70.94%), Test-value = 19.51, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Learning Environment**”.

Table (5.24): Means and Test values for “Learning Environment”

Filed	Mean	Proportional mean	Test value	P-value (Sig.)
Learning Environment	3.55	70.94	19.51	0.000*

* The mean is significantly different from 3

5.3.1.3 A-Classrooms Layout:

Table (5.25) shows the following results:

- The mean of paragraph #1 “The classroom layout is well suited to share materials based on audiovisual tools” equals 3.81 (76.28%), Test-value = 16.17, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

- The mean of paragraph #8 “The classroom layout is highly decorated and painted with colors that distort trainee's attention” equals 2.63 (52.56%), Test-value = -5.77, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is negative, so the mean of this paragraph is significantly smaller than the hypothesized value 3 . We conclude that the respondents disagreed to this paragraph.

3. The mean of the filed “**Classrooms layout**” equals 3.44 (68.78%), Test-value = 12.02, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the

hypothesized value 3. We conclude that the respondents agreed to field of “**Classrooms layout**”.

It is highly agreed that classroom layout is provided with suitable audiovisual tools, as well as it is painted with (white and blue colors) that are suitable to trainee's attention. However, the classroom layout for discussion group and pair work needs to be improved and considered.

Table (5.25): Means and Test values for “Classrooms layout”

	Item	Mean	Proportional mean	Test value	P-value (Sig.)	Rank
1.	The classroom layout is well suited to share materials based on audiovisual tools.	3.81	76.28	16.17	0.000*	1
2.	The classroom layout is well suited to the formation of tables and desks that offer the best possible vision.	3.80	76.07	14.26	0.000*	2
3.	The classroom layout is well suited to pair work.	3.28	65.57	5.04	0.000*	8
4.	The classroom layout is well suited for discussion group work.	3.38	67.56	6.64	0.000*	7
5.	The classroom layout is well- suited for practical work.	3.39	67.72	7.04	0.000*	6
6.	The classroom layout encourages movement of the trainees.	3.62	72.44	11.83	0.000*	3
7.	The classroom layout creates an interesting and stimulating atmosphere.	3.47	69.47	8.64	0.000*	5
8.	The classroom layout is highly decorated and painted with colors that distort trainee's attention.	2.63	52.56	-5.77	0.000*	9
9.	Classroom layout is designed to offer a suitable distance between the trainer and the audience.	3.56	71.16	10.79	0.000*	4
	All paragraphs of the filed	3.44	68.78	12.02	0.000*	

* The mean is significantly different from 3

5.3.1.3 B-Time

Table (5.26) shows the following results:

- The mean of paragraph #8 “Starting and ending times are accurately committed by the trainer and training centre administration” equals 3.82 (76.49%), Test-value = 17.33, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

- The mean of paragraph #4 “Time given to allow for each trainee to practice the training items is suitable” equals 3.44 (68.84%), Test-value = 9.22, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

4. The mean of the field “**Time** ” equals 3.67 (73.37%), Test-value = 23.22, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Time** ”.

It is agreed that the trainers accurately commit to starting and ending times, trainers have a high level of commitment to come on time. It is however recommended to increase the time given to allow each trainee to practice the training items as well as increasing the dedicated time to cover the needed materials.

Table (5.26): Means and Test values for “Time ”

	Item	Mean	Proportional mean	Test value	P-value (Sig.)	Rank
1.	Training time is relevant for the schedule of the trainees.	3.80	76.07	19.25	0.000*	2
2.	Time dedicated for training courses is sufficient to cover the needed material.	3.57	71.37	11.86	0.000*	7
3.	Time period of each training session is suitable.	3.63	72.53	14.26	0.000*	6
4.	Time given to allow for each trainee to practice the training items is suitable.	3.44	68.84	9.22	0.000*	8
5.	Time period for the break is sufficient for the trainees.	3.74	74.81	15.25	0.000*	3
6.	Time given for the discussions is suitable.	3.64	72.70	12.65	0.000*	5
7.	Time for each session is divided in a way that brings the interest and breaks the boredom.	3.71	74.18	15.80	0.000*	4
8.	Starting and ending times are accurately committed by the trainer and training centre administration.	3.82	76.49	17.33	0.000*	1
	All paragraphs of the filed	3.67	73.37	23.22	0.000*	

* The mean is significantly different from 3

5.3.2-Learning Level:

The mean of the filed “**Learning Level**” equals 3.49 (69.76%), Test-value = 14.85, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Reaction Level**”.

Table (5.27): Means and Test values for “Learning Level”

Filed	Mean	Proportional mean (%)	Test value	P-value (Sig.)
Learning Level	3.49	69.76	14.85	0.000*

* The mean is significantly different from 3

5.3.2.1-Knowledge

Table (5.28) shows the following results:

- The mean of paragraph #4 “Knowledge is relevant to the trainee's jobs” equals 3.80 (75.93%), Test-value = 19.14, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.
 - The mean of paragraph #2 “Pre and post Interviews are conducted to measure the knowledge” equals 3.01 (60.28%), Test-value = 0.22, and P-value = 0.825 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this paragraph is insignificantly different from the hypothesized value 3. We conclude that the respondents (Do not know, neutral) to this paragraph.
5. The mean of the filed “**Knowledge**” equals 3.48 (69.52%), Test-value = 14.64, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Knowledge**”.

the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Knowledge**”.

It is clear that Knowledge is suitable for the trainees' jobs. It is however recommended to conduct pre and post interview/test to measure knowledge and it is consistent with (Plomp, 1996).

Table (5.28): Means and Test values for “Knowledge”

	Item	Mean	Proportional mean	Test value	P-value (Sig.)	Rank
1.	Pencil and paper, pre and post tests are conducted to measure the knowledge.	3.16	63.30	2.73	0.007*	7
2.	Pre and post Interviews are conducted to measure the knowledge.	3.01	60.28	0.22	0.825	8
3.	There is newly acquired knowledge to counsel someone about the topic covered in the course.	3.56	71.30	12.11	0.000*	3
4.	Knowledge is relevant to the trainee's jobs.	3.80	75.93	19.14	0.000*	1
5.	Acquired knowledge meets trainee's expectations.	3.60	72.07	14.01	0.000*	2
6.	Knowledge is specific enough to match the information that trainees need.	3.54	70.88	11.38	0.000*	6
7.	Knowledge is accurate, as well as sufficiently comprehensive and specific to the roles of the trainees.	3.56	71.11	12.27	0.000*	5
8.	Knowledge is imparted during training in ways that support interest and learning by a range of learning styles (including time for discussion, clarification and brainstorming).	3.56	71.24	9.81	0.000*	4
	All paragraphs of the filed	3.48	69.52	14.64	0.000*	

* The mean is significantly different from 3.

5.3.2.2-Skills

Table (5.29) shows the following results:

- The mean of paragraph #7 “Sufficient skills are provided through instructions to cover the key issues” equals 3.76 (75.23%), Test-value = 14.68, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

- The mean of paragraph #4 “Skills are measured by conducting a performance test” equals 3.13 (62.61%), Test-value = 2.21, and P-value = 0.028 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

6. The mean of the field “**Skills**” equals 3.50 (69.94%), Test-value = 12.98, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**Skills**”.

It is clear that skills are sufficient to cover the key issues for the trainee's jobs. It is recommended to conduct tests such as performance test and projects at the end of the course to measure skills and get the trainees involved with practical experience to find the difficulties and set the solutions that is consistent with Plomb (1995) study

Table (5.29): Means and Test values for “Skills”

	Item	Mean	Proportional mean	Test value	P-value (Sig.)	Rank
1.	Skills are measured by conducting projects at the end of the course.	3.30	66.04	4.71	0.000*	8
2.	Skills gained are fulfilled more confidently.	3.48	69.61	9.79	0.000*	5
3.	Skills gained are fulfilled faster.	3.45	68.94	9.23	0.000*	6
4.	Skills are measured by conducting a performance test.	3.13	62.61	2.21	0.028*	9
5.	Skills are measured by having trainees involved with practical exercises to the difficulties they face. understand	3.44	68.70	7.74	0.000*	7
6.	The skills taught in this class are relevant to trainee's personal development.	3.65	73.00	13.31	0.000*	3
7.	Sufficient skills are provided through instructions to cover the key issues.	3.76	75.23	14.68	0.000*	1
8.	Skills are comprehensive and specific enough to be imparted.	3.68	73.68	16.25	0.000*	2
9.	Skills are imparted during training in ways that support interest and learning by a range of learning styles (including time for discussion and clarification).	3.59	71.72	10.40	0.000*	4
	All paragraphs of the filed	3.50	69.94	12.98	0.000*	

* The mean is significantly different from 3

5.3.3-KM Effectiveness in the Training Programs:

Table (5.30) shows the following results:

- The mean of paragraph #1 “GSE trainer has a significant effect on KM effectiveness in the training programs” equals 3.75 (75.02%), Test-value = 15.66, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

- The mean of paragraph #3 “The classroom layout has a significant effect on KM effectiveness in the training programs” equals 3.40 (68.01%), Test-value = 8.11, and P-value = 0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this paragraph is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to this paragraph.

7. The mean of the field “**KM Effectiveness in the training programs**” equals 3.52 (70.34%), Test-value = 12.20, and P-value=0.000 which is smaller than the level of significance $\alpha = 0.05$. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. We conclude that the respondents agreed to field of “**KM Effectiveness in the training programs**”.

GSE trainer has the highest effect on KM effectiveness in the training programs, while The classroom layout has the lowest effect on KM effectiveness in the training programs. Study recommends that trainers should add interest and fun during training sessions and to set different solutions for the problems.

Table (5.30): Means and Test values for “KM Effectiveness in the training programs”

	Item	Mean	Proportional mean (%)	Test value	P-value (Sig.)	Rank
1.	GSE trainer has a significant effect on KM effectiveness in the training programs.	3.75	75.02	15.66	0.000*	1
2.	The Training material has a significant effect on KM effectiveness in the training programs.	3.61	72.27	14.36	0.000*	2
3.	The classroom layout has a significant effect on KM effectiveness in the training programs.	3.40	68.01	8.11	0.000*	7
4.	Time has a significant effect on KM effectiveness in the training programs.	3.49	69.82	9.41	0.000*	3
5.	Knowledge has a significant effect on KM effectiveness in the training programs.	3.47	69.34	8.21	0.000*	4
6.	Skills have a significant effect on KM effectiveness in the training programs.	3.45	68.95	8.19	0.000*	6
7.	The personal characteristics of GSE trainees (experience, university degree, age and number of courses attended) has a significant effect on KM effectiveness in the training programs.	3.46	69.24	6.88	0.000*	5
	All paragraphs of the filed	3.52	70.34	12.20	0.000*	

* The mean is significantly different from 3

5.4- Study Hypothesis:

We use Stepwise regression and obtain the following results:

R Square = 0.164, this means 16.4% of the variation in the KM Effectiveness in the training programs is explained by "training material and learning environment".

Table (5.31) shows the analysis of variance for the regression model. Sig. = 0.000, so there is a significant relationship between the dependent variable " KM Effectiveness in the training programs" and independent variables " training material and learning environment " .

Training material and Learning environment have significant relationship when they are considered among all other fields as

Table (5.31) ANOVA for Regression

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	22.491	2	11.245	26.873	.000
Residual	114.660	274	0.418		
Total	137.151	276			

Table (5.32) shows the regression coefficients and their P-values (Sig.). Based on the Standardized Coefficients, the significant independent variable is " training material and learning environment " .

The regression equation is:

KM Effectiveness in the training programs = 0.708+ 0.490* (Training Material) + 0.274* (Learning Environment).

Table (5.32):The Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.708	0.388		1.828	0.069
Training material	0.490	0.097	0.303	5.061	0.000
Learning Environment	0.274	0.093	0.176	2.940	0.004

5.4.1-Gender:

Table (5.33) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the field “Reaction Level”, then this is significant difference in respondents' answers toward this field due to Gender. We conclude that the characteristic of the Gender has an effect on this field.

Table (5.33) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for the other fields, then there is insignificant difference in respondents' answers toward these fields due to Gender. We conclude that the characteristic of the Gender has no effect on these fields.

Table (5.33): Independent Samples T-Test of the fields and their p-values for Gender

No	Field	Test Value	P-value(Sig.)
1.	Reaction Level	-3.123	0.002*
2.	Learning Level	0.421	0.674
3.	KM Effectiveness in the training programs	1.311	0.191
	All fields together	-1.308	0.192

* The mean difference is significant at 0,05 level

Table (5.34) shows the mean for each field for Gender. For the field " Reaction Level ", the mean for respondents with Gender of " Female " is higher than "Male".

In reaction level, females have a greater effect than males as they are more committed in attending the training courses and paying more attention, thus they realize the effects of reaction level more clearly and sensibly.

Table (5.34): Mean for each field of Gender

No	Field	Means	
		Male	Female
1.	Reaction Level	3.62	3.76
2.	Learning Level	3.50	3.47
3.	KM Effectiveness in the training programs	3.57	3.46
	All fields together	3.58	3.64

5.4.2- Educational engineering qualification:

Table (5.35) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields "Reaction Level, Learning Level and All fields together", then these are significant differences in respondents' answers toward these fields due to educational engineering qualification. We conclude that the characteristic of the educational engineering qualification has an effect on these fields.

Table (5.35) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for the field "KM effectiveness in the training programs", then this is insignificant difference in respondents' answers toward this field due to educational engineering

qualification. We conclude that the characteristic of the educational engineering qualification has no effect on this field.

Table (5.35): Independent Samples T-Test of the fields and their p-values for Educational engineering qualification

No	Field	Test Value	P-value(Sig.)
1.	Reaction Level	3.817	0.000*
2.	Learning Level	5.653	0.000*
3.	KM Effectiveness in the training programs	-0.415	0.678
	All fields together	4.554	0.000*

* The mean difference is significant a 0,05 level

Table (5.36) shows the mean for each field for Educational engineering qualification. For the fields " Reaction Level, Learning Level and All fields together ", the mean for respondents with educational engineering qualification of " Bachelor degree "is higher than "postgraduate degree".

Engineers who have bachelor degrees have more effects than those who have postgraduate degrees since they are less experienced and aware, thus they tend to agree more on the effects of these variables on training programs .

Table (5.36): Mean for each field of Educational engineering qualification

No	Field	Means	
		Bachelor degree	postgraduate degree
1.	Reaction Level	3.71	3.41
2.	Learning Level	3.54	2.89
3.	KM Effectiveness in the training programs	3.51	3.58
	All fields together	3.63	3.27

5.4.3- The University:

Table (5.37) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields “Learning Level, KM effectiveness in the training programs and all fields together”, then these are significant differences in respondents' answers toward these fields due to the university. We conclude that the characteristic of the university has an effect on these fields.

Table (5.37) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for the field “Reaction Level”, then this is insignificant difference in respondents' answers toward this field due to the university. We conclude that the characteristic of the university has no effect on this field.

Table (5.37): Independent Samples T-Test of the fields and their p-values for the university

No	Field	Test value	P-value(Sig.)
1.	Reaction Level	-0.607	0.545
2.	Learning Level	-2.311	0.022*
3.	KM Effectiveness in the training programs	-3.681	0.000*
	All fields together	-2.170	0.031*

* The mean difference is significant a 0,05 level

Table (5.38) shows the mean for each field of the university. For the fields "Reaction Level, Learning Level, KM effectiveness in the training programs and all fields together”, the mean for respondents with the university of " Other university" is higher than the Islamic university.

Engineers who graduated from the Islamic university tend to agree less than the engineers who graduated from other universities. As most of GSETC members, employees and trainer have either work or graduated from the Islamic university, therefore, trainees from

Islamic university tend to agree less and make a significant difference, as they do not find a big difference in knowledge or skills.

Table (5.38): Mean for each field of The University

No	Field	Means	
		Islamic University	Other
1.	Reaction Level	3.68	3.71
2.	Learning Level	3.45	3.66
3.	KM Effectiveness in the training programs	3.45	3.85
	All fields together	3.58	3.71

5.4.4-Graduation Year:

Table (5.39) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields “Learning Level and all fields together”, then these are significant differences in respondents' answers toward these fields due to Graduation year. We conclude that the characteristic of Graduation year has an effect on these fields.

Table (5.39) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for the other fields, then there is insignificant difference in respondents' answers toward these fields due to graduation year. We conclude that the characteristic of graduation year has no effect on these fields.

Table (5.39): ANOVA test of the fields and their p-values for Graduation year

No	Field	Test value	P-value(Sig.)
1.	Reaction Level	2.251	0.083
2.	Learning Level	4.703	0.003*
3.	KM Effectiveness in the training programs	2.509	0.060
	All fields together	4.135	0.007*

* The mean difference is significant a 0,05 level

Table (5.40) shows the mean for each field for graduation year.

For the fields " Learning Level and All fields together", the mean for respondents with Graduation year of "2011 and more "are higher than other graduation year groups.

Table (39 and 40) show that newly graduate engineers (Less experienced engineers) tend to take more courses since they need to gain more skills and knowledge more than high experienced engineers who gained enough experience. As for engineers who graduated before year 2000, they are concerned to develop their skills in computer programs since computer programs were not commonly used before 13 years and they are in need to develop themselves in computer programs based engineering.

Table (5.40): Mean for each field of Graduation Year

No	Field	Means			
		Less than 2000	2000 – 2005	2006 – 2010	2011 and more
1.	Reaction Level	3.59	3.67	3.60	3.72
2.	Learning Level	3.58	3.47	3.31	3.59
3.	KM Effectiveness in the training programs	3.78	3.61	3.37	3.54
	All fields together	3.61	3.60	3.49	3.66

5.4.5-Number of Courses Attended:

Table (5.41) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields "Reaction Level, Learning Level and All fields together", then these are significant differences in respondents' answers toward these fields due to number of courses attended. We conclude that the characteristic of number of courses attended has an effect on these fields.

Table (5.41) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for the field "KM effectiveness in the training programs", then this is insignificant difference in respondents' answers toward this field due to number of courses attended. We conclude that the characteristic of number of courses attended has no effect on this field.

Table (5.41): ANOVA test of the fields and their p-values for No of courses attended

No	Field	Test value	P-value(Sig.)
1.	Reaction Level	6.489	0.002*
2.	Learning Level	5.111	0.007*
3.	KM Effectiveness in the training programs	2.245	0.108
	All fields together	6.933	0.001*

* The mean difference is significant a 0,05 level

Table (5.42) shows the mean for each field for No of courses attended.

For the fields "Reaction Level, Learning Level and All fields together ", the mean for respondents who attended 5 and Less courses ""is higher than others who attended more than 5 courses.

Table (5.42) shows that number of courses attended affects the engineers opinion in their reaction and learning. Moreover, table (5.42) shows that engineers who attended more courses tend to accept the effects of reaction and learning level less than those who attended less than five courses.

Table (5.42): Mean for each field of No of courses attended

No	Field	Means		
		5 and Less	6 – 10	11 and more
1.	Reaction Level	3.75	3.64	3.50
2.	Learning Level	3.57	3.43	3.25
3.	KM Effectiveness in the training programs	3.58	3.40	3.60
	All fields together	3.68	3.55	3.43

5.4.6-Practical Experience:

Table (5.43) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields “Reaction Level, Learning Level and All fields together ”, then these are significant differences in respondents' answers toward these fields due to Practical Experience. We conclude that the characteristic of Practical Experience has an effect on these fields.

Table (5.43) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for the field “KM effectiveness in the training programs”, then this is insignificant difference in respondents' answers toward this field due to practical experience. We conclude that the characteristic of Practical Experience has no effect on this field.

Table (5.43): ANOVA test of the fields and their p-values for Practical Experience

No	Field	Test value	P-value(Sig.)
1.	Reaction Level	8.691	0.000*
2.	Learning Level	9.473	0.000*
3.	KM Effectiveness in the training programs	0.145	0.865
	All fields together	9.791	0.000*

* The mean difference is significant a 0,05 level

Table (5.44) shows the mean for each field for Practical Experience.

For the fields "Reaction Level, Learning Level and All fields together ”, the mean for respondents with practical experience of " Less than 1 year "is higher than other practical experience groups.

Table (5.44) shows the engineers with higher practical experience tend to agree less than fresh graduate engineers who tend to agree more and this table enhances and reinforces the results of the previous tables (5.40).

Table (5.44): Mean for each field of Practical Experience:

No	Field	Means		
		Less than 1 Year	1Year – 2 Years	More than 2 years
1.	Reaction Level	3.80	3.61	3.61
2.	Learning Level	3.66	3.46	3.36
3.	KM Effectiveness in the training programs	3.54	3.54	3.49
	All fields together	3.73	3.56	3.52

Chapter 6

Conclusions &

Recommendations

6.1 -Introduction:

In this chapter, the conclusions of findings, and the recommendations of the present study will be discussed.

6.2- Conclusions:

This study investigates the effectiveness of reaction level, learning level and personal data (experience, university degree, age and number of courses attended) on training programs, an empirical study of the KM effectiveness at GSETC. Five elements of first two levels of KM (Trainer, training material, Learning environment, Knowledge and skills) are considered to represent the impact of KM on training program. In light of the findings that were presented in the previous chapter, the most notable conclusions were:

1. 75.02% of the respondents agreed that there is a statistical significant effect of the trainer on KM effectiveness in the training programs at 0.05 level, the findings shows that GSE trainers have a deep knowledge that they can enlarge engineer's experience. However, they usually lack methods for an effective communication skills and how to make trainees interested.
2. 72.27% of the respondents agreed that there is a statistical significant effect of the training material on KM effectiveness in the training programs at 0.05 level, the findings show that the training materials are relevant to the topics discussed. However, trainers and training centers should improve the training materials to make it consistent with the latest references and engineering books versions and methods used.
3. 68.01% of the respondents agreed that there is a statistical significant effect of the classroom layout on KM effectiveness in the training programs at 0.05 level, the findings show that classroom layout is provided with suitable audiovisual tools, as well as it is painted with (white and blue colors) that are suitable to trainee's attention. However, the classroom should take other forms of layout that is suitable for discussion group and pair work.

4. 69.82% of the respondents agreed that there is a statistical significant effect of time on KM effectiveness in the training programs at 0.05 levels, the findings show that trainers highly commit to starting and ending time. However, there is no enough time given to allow each trainee to practice the training items.
5. 69.34% of the respondents agreed that there is a statistical significant effect of knowledge on KM effectiveness in the training programs at 0.05 level, the findings show that Knowledge is suitable for the trainees jobs. However, decision makers do not mostly conduct pre and post interviews and tests.
6. 68.95% of the respondents agreed that there is a statistical significant effect of skills on the KM effectiveness in the training programs at 0.05 level, the findings show that skills are sufficient to cover the key issues for the trainees jobs. However, decision makers do not mostly conduct performance test, interviews or projects to measure the skills.
7. 69.24% of the respondents agreed that there is a statistical significant effect of The personal characteristics on the training program at 0.05 levels, the findings show that females, less experienced engineers and engineering degrees ,engineers who attended less than 5 courses and those who graduated from other universities except the Islamic university are highly affecting the training programs, but it has less impact on males, higher experienced engineers, engineers who attended more than 10 courses and those who graduated from Islamic university.
8. According to the interviews that have been made with GSETC key staff such as DR. Farid Alqeeq and eng. Rawya Aljla, as well as theoretical framework and previous studies reviewed in chapter 2 and 3, it is also included that
 - A. KM can be time-consuming and expensive to use levels 3 or 4 of the model, so it is not practical for all organizations and situations. This is especially the case for organizations that do not have a dedicated training or human resource department like GSETC and others in Gaza strip. In a similar way, it can be expensive and resource intensive to "wire up an organization" to collect data

with the sole purpose of evaluating training at levels 3 and 4. (Whether or not this is practical depends on the systems already in place within the organization).

- B. The model also assumes that each level's importance is greater than the last level, and that all levels are linked. For instance, it implies that reaction is less important, ultimately, than results, and that reactions must be positive for learning to take place. In practice, this may not be the case.

6.3- Recommendations:

Although Kirkpatrick's four-levels training evaluation model is popular and widely used, there are a number of considerations that need to be taken into account when using KM:

1. Training needs analysis should be conducted to determine the needs and the importance of the training courses and hence, recognize the levels used from KM.

2. The study results show that the training program under investigation was positively evaluated by the trainees at the reaction and learning levels .In addition to this, training material and learning environment have significant relationship when they are considered among all other variables. This study recommends that future training courses can benefit from the way this course was conducted .In particular:
 - A. Trainers should attend training of trainers course (TOT) since it enhances their abilities to make the training courses more fun, enjoyable and effective.
 - B. Training materials should be designed in a way that contain the latest references, programs and books that are contemporary to the current codes and programs used.
 - C. The trainees need a clear understanding of why the material provided in the classroom is relevant to their job. The material and presentations need to add a comprehensive link between the classroom and practical training. The trainees need to understand the link between the material provided and how it will be used in their job.
 - D. Follow up with the trainees during and after training has taken place. Asking question such as "What could be added to the training that would have helped you in applying the new skills?"
 - E. Provide follow up, or continued training to help the trainees refresh their skills and to assure that the trainees understand the material.
 - F. GSETC should conduct further studies and data collection with various trainees. They can measure the responses from the different training sessions to see what

patterns occur on areas of improvement, and if the material is consistent from session to session.

- G. Classrooms layout should be well suited for discussion groups and pair works in order to enhance the quality of the training courses.
 - H. Training centre administration and trainers should agree to enlarge the number of hours to cover the key issues in the course as well to give trainees time to practice the practical issues to ensure that benefits are gained.
 - I. Pre and post test should be conducted to recognize the current knowledge and the trainees' level, so it will be more oblivious to add or eliminate some unnecessary elements based knowledge.
 - J. Projects and performance tests should be conducted to measure the current level of trainees' skills, so it will be more oblivious to add or eliminate unnecessary element based skills
3. Future training centers should conduct and create a review questionnaire or short quiz for some of the areas. These can be used at the end of each day to measure how much information the trainee has retained in regards to the days topics. GSETC or company can use these quizzes or questionnaires to see how many of the trainees are or are not retaining the information trained on. If the company finds that many trainees are not absorbing the information from a certain department they can look at restructuring that training and allowing more time.
 4. Despite the previous positive results at both reaction and learning levels, it recommends that these results should be supported by measuring the effectiveness of the training programs at the remaining levels (transfer and impact or results). As reaction level measures how the participants felt about the training by emphasizing participant enjoyment, satisfaction and enthusiastic during training and learning level measure what the participants learn from the training programs.
 5. According to the existing literature, it is also recommended to examine some key points when measuring training reaction and learning such as organizational satisfaction, job

satisfaction, perception of having available resources to implement training and conducting pre/post tests, quizzes, interviews and projects to measure knowledge and skills.

6.4-Limitation and Future Study

This study focused only on evaluating the effectiveness of the training program at the reaction and learning levels. Future studies should focus on using Kirkpatrick's first two levels in profit organization and make comparative studies to have better results.

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Appendices

Appendix 1 – Questionnaire judgment committee

Dr. Majed ElFarra	Islamic University of Gaza
Dr. Sami Abu AlRoss	Islamic University of Gaza
Dr. Samir Safi	Islamic University of Gaza
Dr. Akram Samour	Islamic University of Gaza
Dr. yousef Ashour	Islamic University of Gaza
Dr. Nehia Al-Telbani	Al- Azhar University
Dr. Ramiz Budair	Al- Azhar University
Dr. Jalal Shabat	Al-Quds open university

Appendix 2 – Questionnaire (Arabic Version)

الإستبانة

"فعالية تطبيق أول مستويين من نموذج كيركباترك لضمان إنجاز النتائج المطلوبة في البرامج التدريبية"

الهدف الأساسي من هذه الإستبانة هو قياس "فعالية تطبيق أول مستويين من نموذج كيركباترك الممثلة بمستوي رد الفعل ومستوي التعلم لضمان إنجاز النتائج المطلوبة في البرامج التدريبية". نرجو منك أن تملأ الإستبانة بالحقائق بأن تضع علامة (√) حول الإجابة التي تعكس وجه نظرك. المعلومات في هذا الإستبانة ستستخدم فقط لغرض إنجاز البحث العلمي وسنضمن لك السرية والخصوصية.....

شكرا لك

الباحث :

م.محمد سدر

أولا المعلومات الشخصية:

الجنس:		<input type="checkbox"/> ذكر	<input type="checkbox"/> أنثى
المؤهل الأكاديمي الهندسي:		<input type="checkbox"/> بكالوريوس	<input type="checkbox"/> درجة عليا
سنة التخرج:		-----	
الجامعة:		<input type="checkbox"/> الإسلامية	<input type="checkbox"/> الأزهر
		<input type="checkbox"/> فلسطين	<input type="checkbox"/> أخري (-----)
كم عدد الدورات التي أخذتها		-----	
سنوات الخبرة		<input type="checkbox"/> أقل من سنة	<input type="checkbox"/> من سنة الي سنتين
		<input type="checkbox"/> أكثر من سنتين	

ثانيا: أجب عن الأسئلة التالية بوضع علامة (√) حول العبارات الآتية طبقا لدرجة موافقتك لها "

أ. مستوي رد الفعل أولا : المدرب						
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يمتلك مدرب نقابة المهندسين في غزة خبرة عميقة حول مجال التدريب.	1.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يستخدم مدرب نقابة المهندسين في غزة الأدوات السمعية و البصرية والمطبوعات بفاعلية.	2.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعرض مدرب نقابة المهندسين في غزة المادة التدريبية بشكل مختصر وواضح .	3.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعرض مدرب نقابة المهندسين في غزة الأسئلة ولديه الإجابة .	4.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعرض مدرب نقابة المهندسين في غزة تفسيرات مختلفه للمواد التدريبية المعقدة.	5.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعرض مدرب نقابة المهندسين في غزة أمثلة عملية جيدة .	6.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعرض مدرب نقابة المهندسين في غزة المادة التدريبية بحماس وإهتمام.	7.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يلفظ مدرب نقابة المهندسين في غزة الكلمات بوضوح، بشكل صحيح وبشكل خالي من الغموض .	8.
أ. مستوي رد الفعل ثانيا : المادة التدريبية						
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تعتبر المادة التدريبية ملائمة للمواضيع التي تم نقاشها .	1.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تعتبر المادة التدريبية مفيدة للمتدربين في فهم الأجزاء التي تم نقاشها.	2.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتم عرض المادة التدريبية بطريقة واضحة متسلسلة . ومنتظمة	3.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تعتبر المادة التدريبية سهلة الفهم.	4.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تعتبر كمية المادة التدريبية المطروحة كافيها بما فيه الكفاية لتغطية أهداف الدورة.	5.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتم تزويد المادة التدريبية بالمطبوعات والكتيبات اللازمة لتسهيل عملية التدريب.	6.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تعتبر المادة التدريبية محفزة وممتعة .	7.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تلمي المادة التدريبية أهداف الدورة بكفاءة وفاعلية.	8.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتم تزويد المادة التدريبية بأخر المراجع والكتب الحديثة.	9.
أ. مستوى رد الفعل ثالثا : البيئة التعليمية						
1 - تصميم القاعات الدراسية						
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر تصميم القاعات الدراسية مناسب لعرض المادة التدريبية بواسطة الأدوات السمعية والبصرية .	1.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر تصميم القاعات الدراسية ملائما من حيث وضع الطاولات والكراسي بحيث تقدم أفضل طريقة ممكنة للعرض .	2.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر تصميم القاعات الدراسية مناسبة لعمل المتدربين علي شكل أزواج .	3.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر تصميم القاعات الدراسية مناسبة لعمل المتدربين علي شكل مجموعات مناقشة.	4.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر تصميم القاعات الدراسية مناسبة للأعمال التطبيقية العملية	5.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يتيح تصميم القاعات الدراسية للمتدربين الحركة بسهولة .	6.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يخلق تصميم القاعات الدراسية بيئة محفزة وممتعة .	7.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر تصميم القاعات الدراسية غير مناسب حيث تم تصميمه بألوان شديدة وديكورات صاروخية بحيث تشتت إنتباه المتدربين.	8.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يوفر تصميم القاعات الدراسية مسافة مناسبة بين المدرب والمتدربين.	9.
2 - الوقت						
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر وقت التدريب مناسب لجدول المتدربين .	1.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر وقت التدريب المخصص كافيا لتغطية المادة التدريبية .	2.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تعتبر الفترة الزمنية مناسبة لكل جلسة.	3.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يعتبر الوقت المعطي كافيا للمتدربين لكي يمارسوا النشاطات العملية.	4.

<input type="checkbox"/>	تعتبر الفترة الزمنية للإستراحة مناسبة وكافية للمتدربين.	.5				
<input type="checkbox"/>	يعتبر الوقت المعطى للمناقشة مناسب وكافي للمتدربين لإبداء آرائهم.	.6				
<input type="checkbox"/>	يعتبر تقسيم الوقت لكل محاضرة مناسب من حيث جلب المتعه وكسر حاجز الملل .	.7				
<input type="checkbox"/>	يتم الإلتزام بأوقات التدريب بشكل دقيق من قبل المدرب ومركز التدريب.	.8				

ب. مستوى التعلم رابعا : المعرفة

لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة	
<input type="checkbox"/>	يتم قياس المعرفة بإجراء إختبار قبل وبعد الدورة التدريبية .	.1				
<input type="checkbox"/>	يتم قياس المعرفة بإجراء مقابلة أو إختبار شفهي قبل وبعد الدورة التدريبية.	.2				
<input type="checkbox"/>	يكتسب المتدربون معرفة جديدة بحيث يمكنهم تقديم إستشارة حول المواضيع التي تم تغطيتها أثناء الدورة التدريبية.	.3				
<input type="checkbox"/>	تعتبر المعرفة ملائمة لوظائف المتدربين .	.4				
<input type="checkbox"/>	تقابل المعرفة توقعات المتدربين .	.5				
<input type="checkbox"/>	يتم وضع المعرفة في المستوى المناسب للمتدربين وهي محددة بما فيه الكفاية لبناء المعلومات التي يحتاجها المتدربين	.6				
<input type="checkbox"/>	تعتبر المعرفة دقيقة، شاملة بما فيه الكفاية ومحددة لأدوار المتدربين .	.7				
<input type="checkbox"/>	يتم نقل المعرفة بطرق ممتعة و متنوعة مثل (مجموعات مناقشة والعصف الذهني الخ).	.8				

ب - مستوى التعلم خامسا : المهارة

لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبارة	
<input type="checkbox"/>	يتم قياس المهارة بإجراء مشروع لكل متدرب في نهاية الدورة التدريبية.	.1				
<input type="checkbox"/>	يتم إنجاز المهارة المكتسبة بثقة أكثر.	.2				
<input type="checkbox"/>	يتم إنجاز المهارة المكتسبة بشكل أسرع .	.3				
<input type="checkbox"/>	يتم قياس المهارة بإجراء إختبار الأداء لكل متدرب في نهاية الدورة التدريبية.	.4				

<input type="checkbox"/>	يتم قياس المهارة باختضاع المتدربين للتمارين العملية لمعرفة الصعوبات التي يواجهها المتدربين .	5.				
<input type="checkbox"/>	تعتبر المهارات المكتسبة ملائمة مع المتدربين من حيث تنمية القدرات الشخصية.	6.				
<input type="checkbox"/>	يتم وضع مهارات جديدة عبر المحاضرات لتزويد المتدربين بالمهارات اللازمة.	7.				
<input type="checkbox"/>	يتم وضع المهارات في المستوى المناسب للمتدربين وهي محددة بما فيه الكفاية لبناء المعلومات التي يحتاجها المتدربين.	8.				
<input type="checkbox"/>	يتم نقل المهارات بطرق ممتعة و متنوعة مثل (مجموعات مناقشة والعصف الذهني الخ).	9.				

ت - تأثير مستوي رد الفعل والتعلم علي فاعلية نموذج كيركاترك في الدورات التدريبية						
لا أوافق بشدة	لا أوافق	محايد	أوافق	أوافق بشدة	العبرة	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يؤثر مدرب نقابة المهندسين بشكل فعال علي فاعلية نظام كيركاترك في الدورات التدريبية.	1
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تؤثر المادة التدريبية بشكل فعال علي فاعلية نظام كيركاترك في الدورات التدريبية في نقابة المهندسين.	2
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يؤثر تصميم القاعات الدراسية بشكل فعال علي فاعلية نظام كيركاترك في الدورات التدريبية في نقابة المهندسين.	3
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	يؤثر الوقت بشكل فعال علي فاعلية نظام كيركاترك في الدورات التدريبية في نقابة المهندسين.	4
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تؤثر المعرفة بشكل فعال علي فاعلية نظام كيركاترك في الدورات التدريبية في نقابة المهندسين.	5
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تؤثر المهارات بشكل فعال علي فاعلية نظام كيركاترك في الدورات التدريبية في نقابة المهندسين.	6
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	تؤثر الصفات الشخصية لمتدربين نقابة المهندسين بشكل فعال من حيث (الخبرة, الدرجة الجامعية , العمر, عدد الدورات المؤخوة) علي فاعلية نظام كيركاترك في الدورات التدريبية في نقابة المهندسين.	7

انتهت الاستبانة

Appendix 3 – Questionnaire (English Version)

**Islamic University of Gaza
Commerce Faculty
Business Administration Dep.**

Questionnaire

**“Effectiveness of Implementing Kirkpatrick’s first two levels to
Ensure Fulfilling the Required Results of Training Program.”**

The aim of this questionnaire is to measure the effectiveness of implementing Kirkpatrick’s first two levels represented by reaction level and Learning Level to ensure fulfilling the required results of training Program. We are kindly asking you to fill the questionnaire with relevant facts and accurate answers. Please put (√) for the answers which reflect your point of view. The information in this questionnaire will be used solely for the purpose of scientific research and we will maintain it in secret and privacy.....

Thank you.

The Researcher:

Mohammed Sedder

The Supervisor:

Dr: Waseem Al-Habil

A: Personal Data

First: answer the following questions through your own details.

Gender	1. <input type="checkbox"/> Male	2. <input type="checkbox"/> Female	
Educational engineering qualification	1. <input type="checkbox"/> Bachelor	2. <input type="checkbox"/> postgraduate degree	
Graduation Year	-----		
The University	1. <input type="checkbox"/> Islamic University	2. <input type="checkbox"/> Al Azhar University	
	3. <input type="checkbox"/> Palestine University	4. <input type="checkbox"/> Other (.....)	
No of courses attended	-----		
Practical Experience	1. <input type="checkbox"/> Less than 1 Year	2. <input type="checkbox"/> 1Year – Less than 2 Years	3. <input type="checkbox"/> More than 2 years.

B : Organizational Data

Second: Answer the followings through putting a (✓) mark in front of each statement according to the degree of your agreement.

A: Reaction Level First: The Trainer						
Statement		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	GSE trainer has a deep knowledge about the training course.	<input type="checkbox"/>				
2.	GSE trainer uses visual materials & handouts effectively.	<input type="checkbox"/>				
3.	GSE trainer's explanations are clear and concise.	<input type="checkbox"/>				
4.	GSE trainer Solicits questions and has the answers	<input type="checkbox"/>				
5.	GSE trainer offers alternative explanations to complex material	<input type="checkbox"/>				
6.	GSE trainer sets good/practical examples.	<input type="checkbox"/>				
7.	GSE trainer has interests in sharing information and knowledge.	<input type="checkbox"/>				
8.	GSE trainer articulates words properly, clearly and unambiguously.	<input type="checkbox"/>				
A: Reaction Level Second: Training material						
Statement		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The training materials are relevant to the topics discussed.	<input type="checkbox"/>				
2.	The training materials are useful for the participants in understanding the issues discussed.	<input type="checkbox"/>				
3.	The training materials are presented in a clear, systematic and organized manner.	<input type="checkbox"/>				
4.	The training materials are easy to understand.	<input type="checkbox"/>				
5.	The amount of training materials covered is highly justified.	<input type="checkbox"/>				
6.	The training materials are provided with handouts and booklet.	<input type="checkbox"/>				
7.	The training materials are motivating and interesting.	<input type="checkbox"/>				
8.	The training materials satisfy the objectives of the course very effectively.	<input type="checkbox"/>				

9.	The training materials are provided with the latest references and books.	<input type="checkbox"/>				
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A: Reaction Level Third: Learning Environment

A:Classrooms layout:

Statement		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The classroom layout is well suited to share materials based on audiovisual tools.	<input type="checkbox"/>				
2.	The classroom layout is well suited to the formation of tables and desks that offer the best possible vision.	<input type="checkbox"/>				
3.	The classroom layout is well suited to pair work.	<input type="checkbox"/>				
4.	The classroom layout is well suited for discussion group work.	<input type="checkbox"/>				
5.	The classroom layout is well- suited for practical work.	<input type="checkbox"/>				
6.	The classroom layout encourages movement of the trainees.	<input type="checkbox"/>				
7.	The classroom layout creates an interesting and stimulating atmosphere.	<input type="checkbox"/>				
8.	The classroom layout is highly decorated and painted with colors that distort trainee's attention.	<input type="checkbox"/>				
9.	Classroom layout is designed to offer a suitable distance between the trainer and the audience.	<input type="checkbox"/>				

B: Time

Statement		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Training time is relevant for the schedule of the trainees.	<input type="checkbox"/>				
2.	Time dedicated for training courses is sufficient to cover the needed material.	<input type="checkbox"/>				
3.	Time period of each training session is suitable.	<input type="checkbox"/>				
4.	Time given to allow for each trainee to practice the training items is suitable.	<input type="checkbox"/>				

5.	Time period for the break is sufficient for the trainees.	<input type="checkbox"/>				
6.	Time given for the discussions is suitable.	<input type="checkbox"/>				
7.	Time for each session is divided in a way that brings the interest and breaks the boredom.	<input type="checkbox"/>				
8.	Starting and ending times are accurately committed by the trainer and training centre administration.	<input type="checkbox"/>				

B: Learning Level Fourth: Knowledge

Statement		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Pencil and paper, pre and post tests are conducted to measure the knowledge.	<input type="checkbox"/>				
2.	Pre and post Interviews are conducted to measure the knowledge.	<input type="checkbox"/>				
3.	There is newly acquired knowledge to counsel someone about the topic covered in the course.	<input type="checkbox"/>				
4.	Knowledge is relevant to the trainee's jobs.	<input type="checkbox"/>				
5.	Acquired knowledge meets trainee's expectations.	<input type="checkbox"/>				
6.	Knowledge is specific enough to match the information that trainees need.	<input type="checkbox"/>				
7.	Knowledge is accurate, as well as sufficiently comprehensive and specific to the roles of the trainees.	<input type="checkbox"/>				
8.	Knowledge is imparted during training in ways that support interest and learning by a range of learning styles (including time for discussion, clarification and brainstorming).	<input type="checkbox"/>				

B: Learning Level Fifth: Skills

Statement		Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	Skills are measured by conducting projects at the end of the course.	<input type="checkbox"/>				
2.	Skills gained are fulfilled more confidently.	<input type="checkbox"/>				
3.	Skills gained are fulfilled faster.	<input type="checkbox"/>				

4.	Skills are measured by conducting a performance test.	<input type="checkbox"/>				
5.	Skills are measured by having trainees involved with practical exercises to understand the difficulties they face.	<input type="checkbox"/>				
6.	The skills taught in this class are relevant to trainee's personal development.	<input type="checkbox"/>				
7.	Sufficient skills are provided through instructions to cover the key issues.	<input type="checkbox"/>				
8.	Skills are comprehensive and specific enough to be imparted.	<input type="checkbox"/>				
9.	Skills are imparted during training in ways that support interest and learning by a range of learning styles (including time for discussion and clarification).	<input type="checkbox"/>				

C: The Effects of Reaction and Learning Levels on KM Effectiveness in the training programs

Statement		Too little	little	normal	much	Too much
1.	GSE trainer has a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				
2.	The Training material has a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				
3.	The classroom layout has a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				
4.	Time has a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				
5.	Knowledge has a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				
6.	Skills have a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				
7.	The personal characteristics of GSE trainees (experience, university degree, age and number of courses attended) has a significant effect on KM effectiveness in the training programs.	<input type="checkbox"/>				

Appendix 4– GSET courses during 2011

#	Course	Repetition	Participants
1	Project coordinator	1	18
2	English conversation	1	12
3	Proposal writing	1	15
4	Get Ready for Excellence	1	24
5	Alumni Skills Development	1	25
6	Therapy techniques using the mind and body	1	11
7	AutoCAD	4	54
8	CCNA	1	8
9	Land Desktop	2	22
10	ICDL	1	14
11	MS project	2	22
12	Photoshop	2	22
13	Excel Advance	2	30
14	Advance Computer Skills	1	21
15	Design for Earthquakes	1	14
16	Design for the disabled people	1	22
17	Manually Architectural Visualization	1	9
18	Power system analysis	1	15
19	Architecture design	1	36
20	Design and Supervision of Electrical Wiring	1	90
21	GSM	1	12
22	Electrical Machines	1	21
23	PHP	1	15
24	Sketch up	4	43
25	Safe	1	9
26	Advance GIS 9.3	2	20
27	ETABS	2	22
28	Water CAD	1	10
29	primavera	1	11
30	Electrical Wiring using AutoCAD	2	28
31	GIS Professional	1	11
32	SAP 2000	1	14
33	Planning using GIS	1	18
34	GIS 9.3	3	42
35	ETABS	1	13
36	Get ready for job for computer engineers	1	60
37	Get ready for job for civil engineers	1	70
38	JICA Project “	1	240
	Total		1143

