

CERTIFICATION OF APPROVAL

Assessing User Acceptance on Competencies Level Assessment System using Technology Acceptance Model

By

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

ZURAINI HANIM BINTI ZAINI

ABSTRACT

This project is aims to prove the idea of implementing the Competencies Level Assessing System (CLASS) for training center by using the Technology Acceptance Model (TAM). The CLASS system using Weighted scoring model approach to calculate the Competencies Level of the training session The system able to produce the details performance of the respondent and generate the recommendation for each respondent. Technology Acceptance Model (TAM) that focus on the usefulness of the system is using to evalutes the user's acceptance on the implementing the CLASS system The data gathered analyzed using t-test analysis.

ACKNOWLEDMENT

All along the one year of development of this project, there are some important parties who sacrifices their efforts for the success of this project with me .Therefore, I would like to dedicate this page for returning to the graceful of:

1. Ms Noreen Izza Arshad ,Final Year Project Supervisor
:Who help and suggest me all the along the development process.she and her efforts are to be respect as one of the best supervisor.
2. Knowledge Management Team (Lecturers).University technology PETRONAS
:Who suggest and give recommendation towards the project improvement by time to time.
3. Mr.Shan Appudurai,Manager of Halliburton Technichal Excellence Centre,UTP
:Who sacrifices the valuable time and provide a very good cooperation for the success of this project
4. PETRONAS , my main sponsor
:Who all the time support me up until now that I could be able to contribute this useful project as a reference for the Knowledge Management field and its students in the future.

And absolutely ,my family who gives me all of the will powers and being all the time supportive ,until today that this project is completed and be successful.

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CHAPTER 1

INTRODUCTION

1.1. BACKGROUND INFORMATION

As the economic cycle continues to spin toward its next step in the process, many organizations are weighing the importance of training in lieu of other seemingly pressing concerns. The training services industry become more profitable and highly fragmented nowadays. It is a great opportunity to study on business process of the training centre such as competencies assessment which the way the training center reviews their performance in order to sustain in the competitive market.

Here, the basic idea and definitions are defined by variety of sources about the main idea of this project which are: Weighted Scoring Model, Competencies Assessment and Halliburton Technical Excellence Centre (HTEC) as our collaborator .HTEC is an ordinary training center and their operation is purely on Training and Development of Halliburton employees in various subject matters.

What are Weighted Scoring Model? [1]

A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria .The first step in the weighted scoring model is to identify the criteria which is important for the project selection process. The second Step is to assign weightage (percentage) to each criterion so that the total weights add up to 100%.The next step is to assemble an evaluation team, and have each member evaluation and assign scores to each criterion for each project. In the last step the scores are

multiplied by the weights and the resulting products are summed to get the weighted scores. Projects with the higher weighted scores are the best options for selection since “the higher the weighted score, the better it is.”

[2] A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria .These criteria can include factors such as meeting broad organizational needs; addressing problems, opportunities, or directives; the amounts of time it will take to complete the project; the overall priority of the project; projected financial performance of the project and so on

What are Competencies? [3]

Competencies are measures of job performance that combines a person’s skills, knowledge and most importantly behaviors that enable him/her to perform assigned tasks and roles.

It is also usually defined as the combination of knowledge, skills and attitudes that enable individuals or groups of individuals to perform work to defined standards.

Unlike skills or knowledge, which exists only in its own right, competencies, are wider in scope. It reflects individual ability to perform on the job, taking into consideration their knowledge, skills and behaviors For e.g. a Mechanic will require the necessary technical skills to repair engines to the desired standards specified by the relevant recognized institution or bodies like the National Occupational Skills Standards (NOSS) or an organization. In addition, the mechanic must demonstrate desired behavioral traits like communication, initiative and a safety orientation that will enable him/her to perform the tasks successfully.

When is a person said to be Competent?

A person is said to be Competent when he or she is assessed by a trained assessor and is found to have demonstrated the Required Competencies (Behavioral, Role & Functional) at an acceptable level set by the industry or an organization.

A Competency Dictionary and Competency Anchors guide the Assessor, in his/her assessment of individual employee's competencies. Individual employees may also present evidence to support their level of competency.

Evidence may be in the form of past experiences or relevant tests undertaken by the employee that is recognized by the Assessors.

What are Competency Dictionaries and Competency Anchors?

A Competency Dictionary is a document that lists competencies for each trade or job and describes the level of performance expected for each competency. It is organised based on Competency Clusters, Units of Competency, Elements of Competency and the Performance Criteria, which describes the performance to which individuals must demonstrate to be assessed as Competent.

A Competency Anchor describes the Level of Competency a person has demonstrated or assessed. Typically there are 6 Competency levels namely;

Level 1: Awareness

A person is assessed as having basic awareness of the competency.

Level 2: Basic Skill

A person is assessed as having basic skill in the competency and always requires supervision in order to perform to desired standards.

Level 3: Skilled

A person is assessed as skilled in the competency, but requires occasional supervision.

Level 4: Advance Skilled

A person is assessed as exceeding the skilled level and does not require any supervision to carry out the task.

Level 5: Mastery

A person is assessed as competent with the ability to supervise and train others in the competency.

Level 6: Industry Expert

A person who is acknowledged as an expert in the competency by specific industry or professional association.

For e.g. An experienced individual who sits in the advisory board of the Institute of Engineers advising on matters related to mechanical engineering may be considered as an expert in the competency related to mechanical engineering.

How is the Competency Assessment different from the Performance Appraisal?

Performance appraisal focuses on your output or results in a performance period against a set target, goals or objectives. Competency Assessment, on the other hand, focuses on what you can do against a set performance criteria or defined standards. What you can do (Competency Assessment) does not necessarily translate into output or results. Therefore, the Performance Appraisal will still be used to assess your output.

In essence, there are distinct differences in the two assessments. One is to measure your ability to carry out assigned tasks (Competency Assessment) against desired standards or criteria while the other is to measure your output or results (Performance Appraisal or Assessment) against the target set within a specified period.

How is competency linked to Employee's development?

Reconciliation between the Required Competency Level and your Current competency Level will determine whether there are gaps to be addressed. The gaps will allow you to focus on the training and development programmes necessary. There is no longer a need for you to wonder what training is necessary. You could also decide whether you want to move your employees to higher level competencies.

How is competency linked to performance measurement?

Competencies are enablers, i.e. the knowledge, skills and attributes to enable you to carry out your job duties and responsibilities. By default, a competent person will normally be able to produce the desired results in job execution. However, there may some instances where a competent individual may not produce the desired results on the job. There may other factors that influencing his on-the job performance. This must be investigated so as remedial actions are taken to remove the impediment to performance.

Performance is defined as a series of activities that produce desired results. For example, a Welder's task is to join two metal plates together. He is said to have performed, when he carries out the task within the specified time, cost and quality. Therefore the measure of his performance is based on him/her welding the two joints in a timely and cost effective manner that meets the specified quality standards. The Welder will require the necessary competence (e.g. competent in using arch welding equipment) to carry out the welding of the two joints.

How was the competency for each job identified?

The competencies are derived primarily from a task analysis or job analysis. This involves identifying the critical task of the job together with the jobholder and the immediate superior. It is important that only the critical tasks are considered, as these are

the ones that enable the jobholder to perform. The critical tasks are then recorded as competency requirements. In addition, the Performance Criteria which the jobholder must satisfy are described. The Performance Criteria are the standards to which the jobholder must demonstrate when carrying out the tasks.

For e.g. a Welder when joining two metal sheets together must ensure that the workplace is safe for him to carry out the task. He/she must also ensure that the weld that he/she produces meets the quality standards and that he/she welds within the specified time frame.

The identified competencies, the Performance Criteria and the Required Competency Level are then validated by the Head of Department to ensure that it reflects the current competency requirement of the jobholder and standards set by the Company on the Performance Criteria.

What is about Halliburton Excellence Center ?

[4] Halliburton Excellence Center is the new 'technical excellence center' (TEC), providing training support in geology and geophysics to both new graduates and oil industry professionals, is the first of its kind to be set up by Halliburton outside of North America.

'One of the main challenges that the exploration and production industry faces is its aging expertise and the need to develop its human capital to extract the best out of the technology and its assets,' says Dr Rosti Saruwono, vice president of Petronas' education division. 'Petronas is therefore looking to industry service providers to assist us in training and developing local resources.'

Mark McCurley, a vice president in Halliburton's Production Optimization division, adds: 'This is a major commitment by Halliburton for a training facility in the eastern

hemisphere, which is the largest economic and energy consumption growth area in the world today.'

The collaboration is a winning strategy for both companies, according to McCurley. 'As this generation of employees begins retiring over the next five years, the need to invest in the training and development of the younger generation becomes crucial.'

Halliburton says it will also be investing more than US\$700,000 in the TEC this year, some of it allocated to classroom and office renovation but a significant portion going into IT and communication infrastructure. Like the company's other three TECs - in Texas, Colorado and Mexico - the Malaysian center will have the latest broadband and videoconferencing technology, allowing trainees to participate in the global lectures given by subject-matter experts anywhere in the world and also to interact with participants at other TECs.

The first training semester began recently with studies covering cementing services, production enhancement and completion tools. There are a total of 26 students from both Halliburton and Petronas from Asia, Africa and the Middle East.

As part of the collaboration agreement, Halliburton Digital & Consulting Solutions will play a major role through the provision of petroleum information technology. In May the division announced the award to UTP of \$8.6 million in Landmark software licensing for students pursuing engineering degrees. The grant, spanning a three-year period, will provide the students at UTP with access to Landmark's top drilling, production optimization, field development and prospect generation applications.

'Landmark is very pleased with the opportunity to provide UTP access to our suite of exploration and production software as it will help them prepare technically competent and skilled graduates trained to utilize cutting-edge technology in this very specialized field,' says Landmark president Peter Bernard. 'This grant is instrumental in preparing

UTP graduates for joining the industry workforce as experienced and highly qualified geoscientists or engineers.'

Associate Professor Dr Ibrahim Kamaruddin, UTP's director of undergraduate studies, notes: 'The grant represents a part of our overall effort to increase the recognition of UTP as an advanced exploration and production education and training center. Our undergraduate students will now have access to leading-edge software to facilitate cutting-edge research in our newly completed academic complex, which provides the students with state-of-the-art facilities in a dynamic learning environment. When they earn their degrees, the students will be familiar with the functionality of Landmark's software and will have a shorter learning curve for using such tools, thus helping them prepare for a career in the earth sciences.'

The university's mechanical engineering program is designed to produce skilled graduates who are creative and innovative in the design, analysis and operation management of mechanical engineering systems, with research and development and leadership capabilities to serve the nation's interest and to fulfill the technological needs and advancement of Petronas.

Using the software included in the grant, the university plans to research drilling fluid formulation and optimization using palm-oil derivatives, formation damage control in and around the wellbore, and the feasibility of air injection in Malaysian reservoirs.

1.2. INITIATIVE IDEA / PROBLEM STATEMENT

Organizations understand the importance of providing employees with opportunities to grow personally and professionally. The organization will send their employee to training in order to improve their effectiveness in performing their job. The training would be in house training or organize training by training center or consulting firm. Most of the training assessment of the training will be manually conducted to determine the effectiveness after the session.

But less of the training center implement the assessment system for assessing the participation performance level. Therefore for this research study, researcher will focus on Competencies Level Assessment System (CLASS) which is a system that able to calculate the competency level of the training session as well generate the individual recommendation according to the performance after attending the training session

The CLASS provides a series of question for pre test and post test. The employee who attends the training will be able to know their competencies and the training center will know their competencies level in conducting the training after the training session.

So in this study, there will be improvement on the functionality of the CLASS which expanded it to provide details of the assessment and recommendation to each individual employee as a guide to improve their competencies level.

1.3. OBJECTIVES

The Objectives of this project are:

1. To capture /identify the assessment level of employee based on the pretest and post test result.
2. To calculate the knowledge weight of the employee using the Weighted scoring Model
3. To calculate the competencies level of the training session
4. To improve the Competencies Level Assessment System(CLASS) by building the recommendation section and comparison test section.
5. To test the functionality features of CLASS.
6. To evaluate user acceptance toward CLASS based on Technology Acceptance Model
7. To analyze the data gathered from the questionnaire distributed.

1.4. SCOPE OF STUDY

To assist the real implementation, The scope that I need to study are :

1. Halliburton as the TEST BASE
2. Knowledge worker(k-Worker)
3. Weighted Scoring Model
 - a. The model.
 - b. Parameter of the model.
 - c. The Formula of the model.
4. Structure of the Questions.
5. Borland –the software that are use to develop the system.
6. Technology Acceptance Model
7. T-test data analysis

CHAPTER 2

LITERATURE REVIEW / THEORIES

2.1. LITERATURE REVIEW

There many theories, past experiences and articles need to be introduced in order to complete this project.

[5] Training is no longer *optional*. It's not an enhancer, a supporter, or a *nice to have* thing. In the 21st century, an organization's capacity to effectively train its people is part of its ability to survive. And if that capacity isn't there – or if it's defective – then the organization itself will reveal that flaw in a number of destructive ways, including loss of bottom line profits.

Why the Skilled Workforce Makes Training Essential

It's a misnomer to think that so-called *skilled workers* are those human beings who emerge from university or college and bring with them some kind of technical or practical acumen. That may have been true a few decades ago; but no longer, and never again.

In today's world, *everyone* is a skilled worker. From the receptionist with the high school education to the CFO with an MBA, the entire workforce has become a skilled landscape; and that means that there is arguably *no* position that isn't in need of continuous training.

Each member of a team, a unit, and a company can no longer be viewed as individual silos focusing on their singular task within a limited sphere of activities. Rather, today, *each person is a part of a skilled workforce*; and if there are gaps or lacks in any area, the entire workforce will suffer. And make no mistake: this suffering isn't merely emotional or cultural (though that is a part of it). This suffering is financial.

[5] Training = Profit

When there are gaps in the skilled workforce – gaps caused by lack of training – then, automatically, work become inefficient and money is lost.

How *much* money is lost depends on the type of gap and how it manifests; but without doubt, regardless of whether a company sells flowers or microchips, a gap in the skilled workforce costs money.

In the past, this gap was typically seen only in terms of sales, such as whether a lack of training caused a sale to be lost. Now, however, we know without *any* economic doubt that the costs of ineffective or non-existent training gaps go *far* beyond lost sales. These additional financial costs include: rework, missed profits (smaller profits due to inefficiency), and misallocated resources (money spent trying to fix a gap could be better spent elsewhere). There's also lost market share, lost potential word-of-mouth advertising from satisfied (or merely served) customers, and the list goes on.

[6] Beyond Perception: A Pretest and Posttest Evaluation of a Regional Internet Extension Inservice Training

The pretest and posttest results clearly show the effectiveness of the Internet for actual knowledge acquisition of theoretical and applied agricultural topics. As also found in with previous Internet trainings, there is a general acceptance of this style of learning

This literature describes about the method of the pretest and posttest is effective for the learning base assessment.

[7]Competency: The development of an assessment system for dental vocational training and general professional training: a Scottish approach

The role of competencies in postgraduate dental education and training has been a major topic of interest in recent years. Concerns have been voiced from all sides of the profession about how the competence of trainees and the quality of training can be assured so that high standards of patient care can be maintained. A three year project which seeks to develop a competency-based assessment system for general professional training is underway which hopes to answer some of the concerns and provide an evidence-based system of assessment for the early postgraduate years. This paper looks at the reasoning behind the project, its aims, and the progress made to date.

This literature is describing about the demand for the assessment system for the training center.

[8]Using a weighted score model as an aid to selecting procurement methods for small building works

This paper proposes the use of a weighted score model as an aid to selecting procurement methods for small building works. From this paper, client organizations should become more aware of the potential to select, with reliability and consistency over time, the optimum procurement method for a particular type of small works, given those criteria which they identify as being important at the time and in consideration of not only the characteristics of the small works themselves, but the works in the context of the organization's ongoing business.

This literature is describing the effectiveness of the weighted score model in helping the organization to make the business decision.

2.2. RESEARCH MODEL

An evaluation exercise based on the Technology Acceptance Model (TAM) is conducted to assess the level of motivation of respondent to use Competencies Level Assessment System (CLASS).[9] The Technology Acceptance Model (TAM) is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. It was developed by Fred Davis and Richard Bagozzi (Bagozzi et al., 1992; Davis et al., 1989). Several researchers have replicated Davis's original study (Davis, 1989) to provide empirical evidence on the relationships that exist between usefulness, ease of use and system use (Adams, Nelson & Todd, 1992; Davis et al., 1989; Hendrickson, Massey & Cronan, 1993; Segars & Grover, 1993; Subramanian, 1994; Szajna, 1994). Davis's original Technology Acceptance Model is shown in Figure 1.

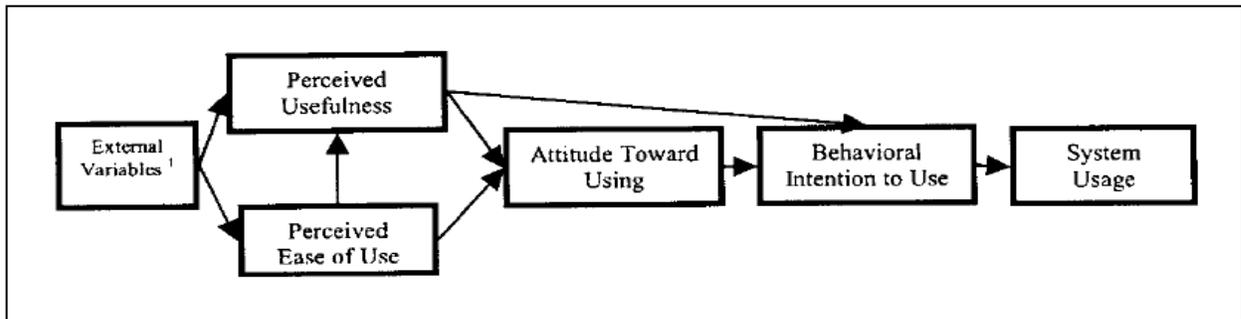


Figure 1: Davis's original Technology Acceptance Model

The proposed research model for this study is shown in Figure 2. The research studies focus on the shaded area as it supports the specific requirement of the client which is Halliburton Excellent Training Center (HTEC) who wanted to evaluate on the usability of the Competencies Level Assessment System (CLASS).

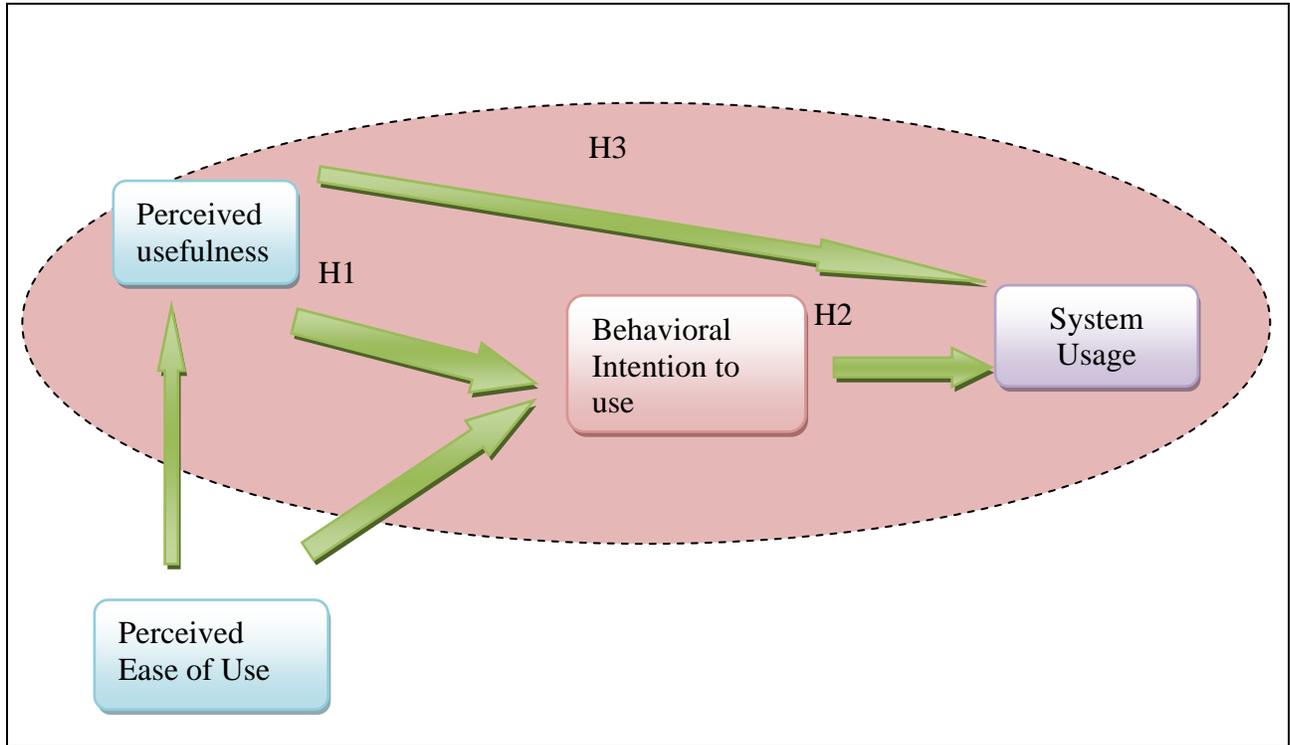


Figure 2: Proposed Research Model

Adapted by: W. Money & A. Turner, *Application of The Technology Acceptance Model to a Knowledge Management System*.(2006)

Base on the proposed research studies in Figure 2, the variable which included is Perceived usefulness, Behavioral Intention to use and the System usage. According to Fred Davis Perceived usefulness (PU) is defined as "the degree to which a person believes that using a particular system would enhance his or her job performance".[9]While Behavioral intention to use is defined as the individual's interest in using the system for future work.[10]

Davis has found that there is a relationship between user beliefs about the technology's usefulness and attitude and the intention to use the technology [11]. This lead to two main criteria based on following hypothesis:

H1: Perceived usefulness has a direct positive effect on user 'behavioral intention to use the CLASS system

H2: Behavioral intention to use has direct positive effect on the system usage of the CLASS System

In addition, an individual may adopt a technology if he or she perceived it as convenient, useful and socially important even though they do not enjoy using the technology [12] Thus it leads to the following hypothesis.

H3: Perceived usefulness has direct positive effect on the system usage of the CLASS System

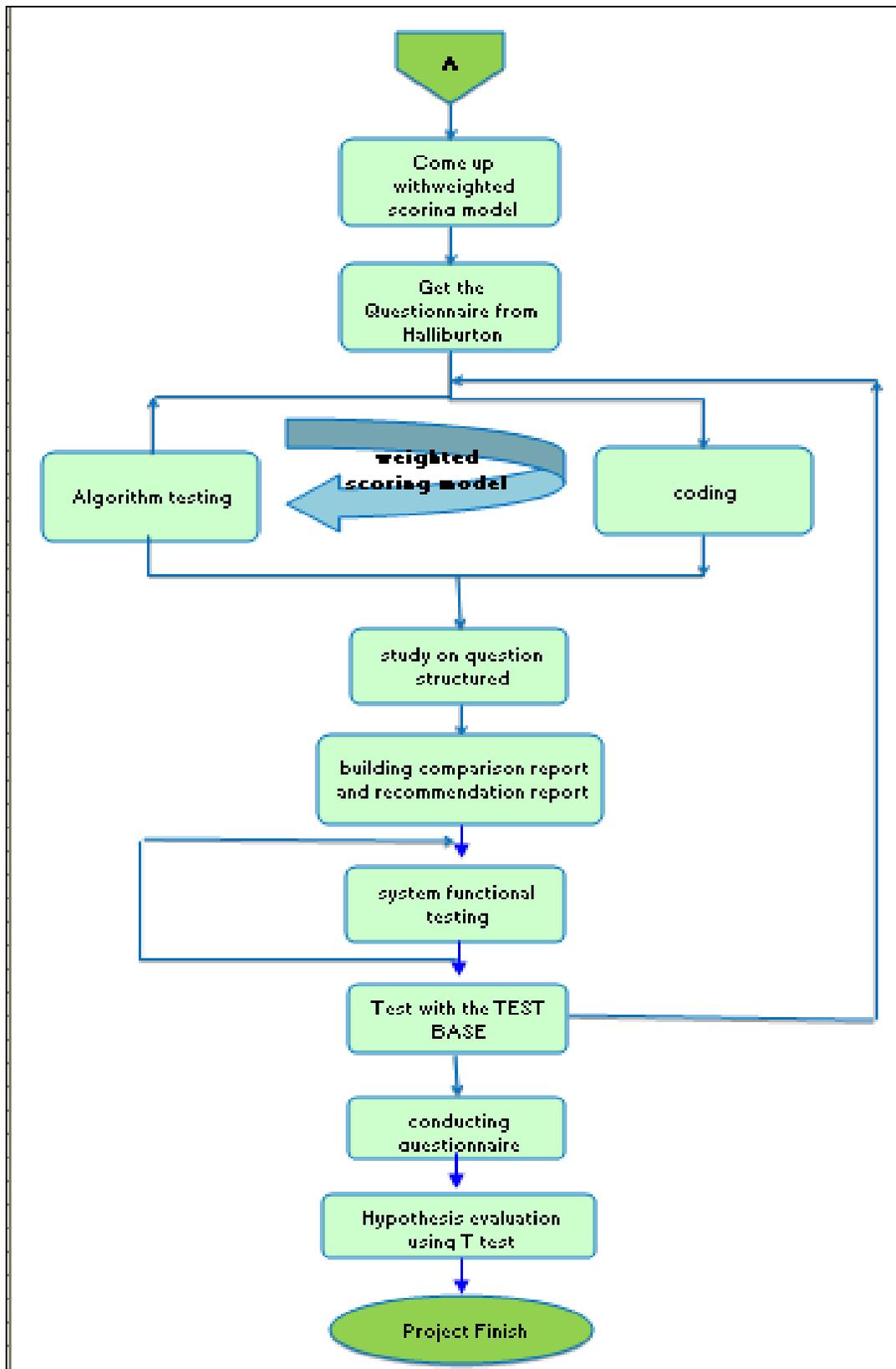


Figure 4: Main Project Development

3.2. SYSTEM METHODOLOGY

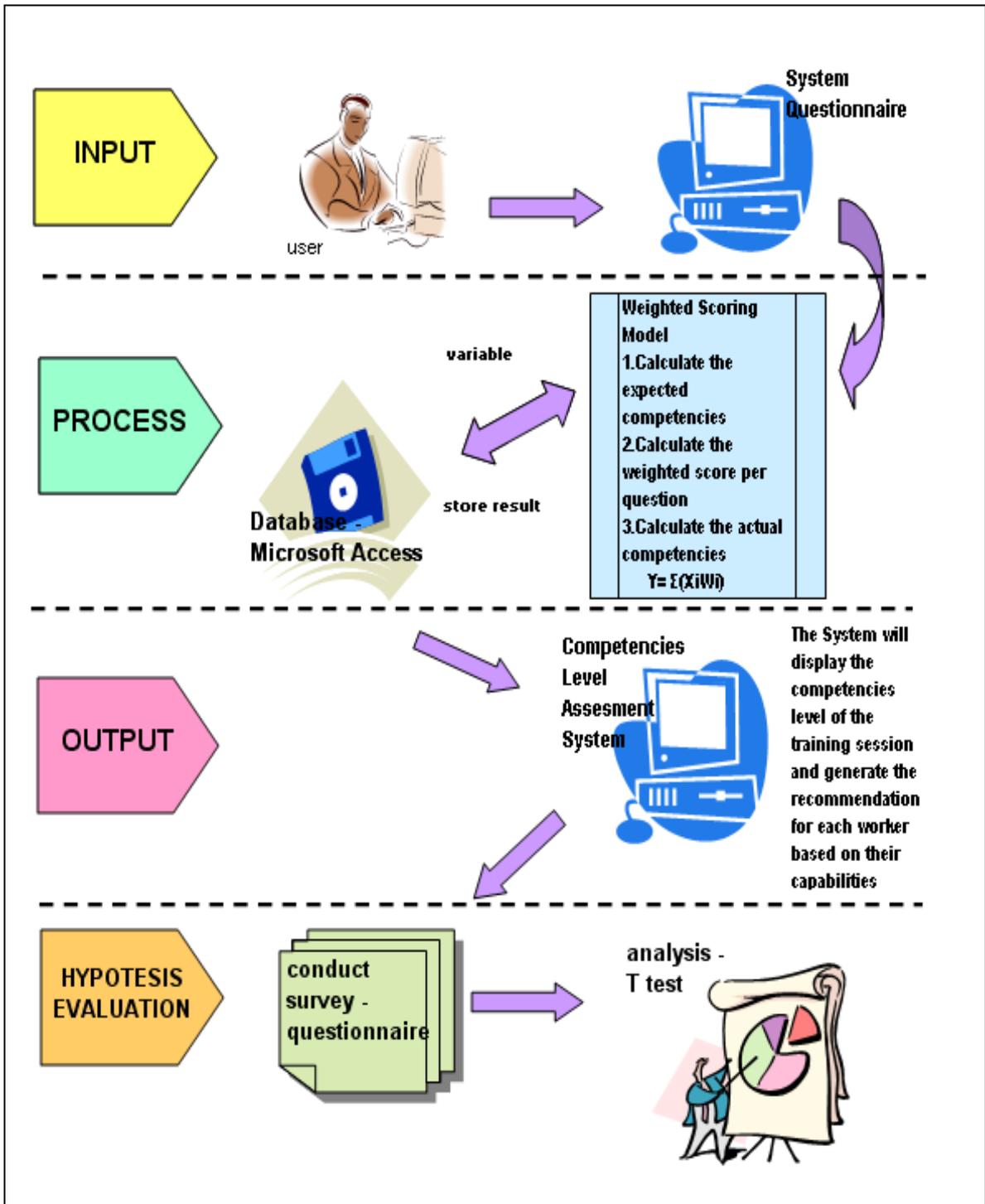


Figure 5 : System Methodology

3.2. PRIMARY DATA COLLECTION METHODOLOGY

This section is explaining about the user acceptance towards Competencies Level Assessment system (CLASS) using Technology Acceptance Model(TAM)and this project is applying the Hypothetico –Deductive Method.

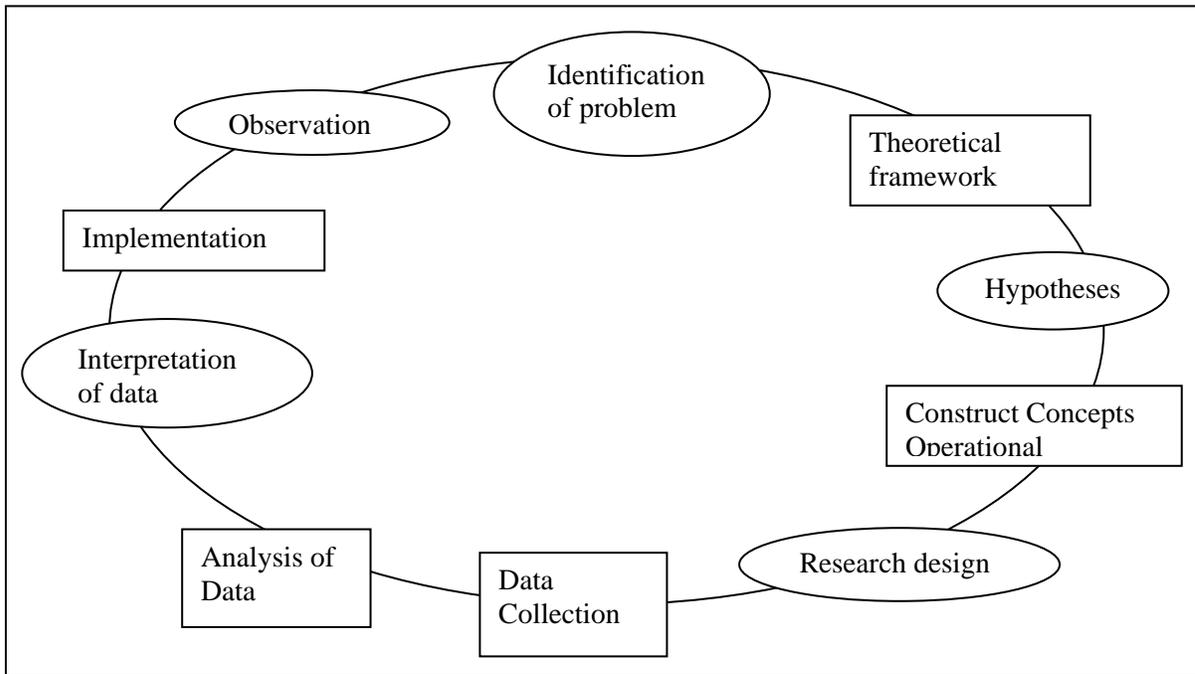


Figure 6 : Hypothetico –Deductive Method.

Observation

Nowadays, the training industry is becoming more important to the organization in order to improve their workers performance. It is a great opportunity to do conduct a research on training center activities.

Identification of problem

From the meeting conducted with the client, Halliburton Technical Excellence Center (HTEC), the researcher found that HTEC conducts their competencies assessment

manually. The Competencies Level Assessment System (CLASS) is chosen to be implemented in HTEC competencies assessment system.

Theoretical framework

The TAM has been chosen to be the framework model in order to evaluate the user acceptance on the Competencies Level Assessment System (CLASS) in the Training Center.

Hypothesizing

Three(3) hypothesis has been constructed to represent the relationship among the variable of the TAM Model .There are

H1: Perceived usefulness has a direct positive effect on user behavioral intention to use the CLASS

H2: Behavioral intention to use has direct positive effect on the system usage of the CLASS

H3: Perceived usefulness has direct positive effect on the system usage of the CLASS System

Data Collection

- The set of questionnaire has been developed to represent the TAM variable and distributed to the 30 respondents. The respondent had test the CLASS before answering the questionnaire.

Analysis of data

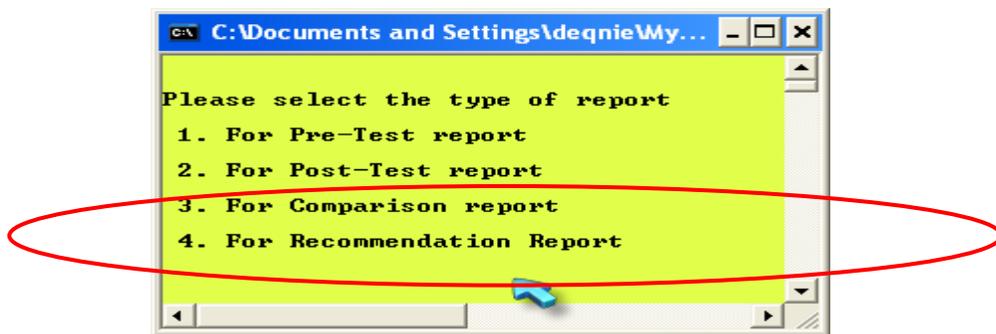
- T-test
 - The data is analyzed using T-Test analysis to see the significant correlation between two variables as well as to test the hypothesis. The result of analysis determine whether the idea on implementing the CLASS is accepted by the user or not.

CHAPTER 4

RESULT AND DISCUSSION

4.1. SYSTEM IMPROVEMENT

The improvement of The Competency Level Assessment system is on the comparison report and recommendation report



Comparison report

- The Comparison report is a features that provide the detail about the employee who attend the training with Halliburton Excellent Training Center (HTEC).
- The Comparison report enable the management of the training center as well as the human resource of the organization to keep track on the employee performance during the competencies assessment process

Recommendation report

- The Recommendation Report provides the recommendation to the employee to be able to improve their competencies level base on their capability .The recommendation is generated automatically according to the performance during the assessment.

4.2. FUNCTIONALITY SYSTEM TESTING

The weighted scoring Model formula is

$$Y = \sum wixi$$

Y = output from the calculation

Wi = The assigned value according to the position of each respondent

Xi = The mark from the set of questionnaire

The value of the Weightage(W) for Pre-test

Weightage(W)	Position
4	Manager
3	Engineer
2	Technician
1	Ordinary worker

The value of the Weightage(W) for Post test

Mark	Weightage(W)
Mark(PRE) \geq 80	W(PRE)+2
60 < Mark(PRE) < 80	W(PRE)+1

Explanation on the table column heading

- W1 = The assigned weighted for each respondent for pretest
- EC1 = Expected contribution for each respondent for the group competency level for pretest
- EC2 = Expected contribution for each respondent for the group competency level for post test
- EXPECTED = The expected result the system should produce
- ACTUAL = The actual result produce by the system
- MARK = The correct answered in the form of percentage
- RESULT = The result of the testing

We have implemented the FUNCTIONAL TESTING in order to proof against the ACCURACY result of the system. The testing have been done to 30 respondent .The respondent are divided into group that consists of 5 respondent per group.The Result of the Functional System can be illustrated as the table below

GROUP 1

RESPONDEN NO	W1	EC1		RESULT	MARK	PRETEST			W2	EC2		RESULT	MARK	POSTTEST		RESULT
		EXPECTED	ACTUAL			EXPECTED	ACTUAL	RESULT		EXPECTED	ACTUAL			EXPECTED	ACTUAL	
R1	2	20.00%	20.00%	PASS	50%	10.00%	10.00%	PASS	2	13.33%	13.33%	PASS	60%	8.00%	8.00%	PASS
R2	2	20.00%	20.00%	PASS	60%	12.00%	12.00%	PASS	2	13.33%	13.33%	PASS	60%	8.00%	8.00%	PASS
R3	2	20.00%	20.00%	PASS	70%	14.00%	14.00%	PASS	3	20.00%	20.00%	PASS	90%	18.00%	18.00%	PASS
R4	2	20.00%	20.00%	PASS	80%	16.00%	16.00%	PASS	4	26.67%	26.67%	PASS	80%	21.33%	21.33%	PASS
R5	2	20.00%	20.00%	PASS	80%	16.00%	16.00%	PASS	4	26.67%	26.67%	PASS	100%	26.67%	26.67%	PASS
COMPETENCY LEVEL(PRETEST)						68.00%	68.00%	PASS	COMPETENCY LEVEL(POST TEST)				82.00%	82.00%	PASS	
COMPETENCY LEVEL OF THE TEAM									EXPECTED		14.00%				PASS	
									ACTUAL		14.00%					

Description

The group consists of technicians. The competencies level before undergoing the the training session is about 68%.After attending the training ,The competencies level have been increased to 82%.The training session have shown an increased in the competencies level of group 1 by 14%.Since the system is able to deliver the same result as the expected result. Hence this system is able to appreciate the Accuracy system attribute

GROUP 2

RESPONDEN NO	W1	EC1		RESULT	MARK	PRETEST		RESULT	W2	EC2		RESULT	MARK	POSTTEST		RESULT
		EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL	
R1	1	11.11%	11.11%	PASS	40%	4.44%	4.44%	PASS	1	10.00%	10.00%	PASS	50%	5.00%	5.00%	PASS
R2	1	11.11%	11.11%	PASS	30%	3.33%	3.33%	PASS	1	10.00%	10.00%	PASS	40%	4.00%	4.00%	PASS
R3	2	22.22%	22.22%	PASS	70%	15.56%	15.56%	PASS	3	30.00%	30.00%	PASS	90%	27.00%	27.00%	PASS
R4	2	22.22%	22.22%	PASS	50%	11.11%	11.11%	PASS	2	20.00%	20.00%	PASS	60%	12.00%	12.00%	PASS
R5	3	33.33%	33.33%	PASS	60%	20.00%	20.00%	PASS	3	30.00%	30.00%	PASS	100%	30.00%	30.00%	PASS
COMPETENCY LEVEL(PRETEST)						54.44%	54.44%	PASS	COMPETENCY LEVEL(POST TEST)				78.00%	78.00%	PASS	
COMPETENCY LEVEL OF THE TEAM									EXPECTED		23.56%				PASS	
									ACTUAL		23.56%					

Description

The group consists of ordinary workers, technicians and an engineer. The competencies level before undergoing the training session is about 54%.After attending the training ,The competencies level have been increased to 78%.The training session have successfully increase the competencies level of group 2 by 23.56 %. Since the system is able to deliver the same result as the expected result, hence this system is able to appreciate the Accuracy system attribute

GROUP 3

RESPONDEN NO	W1	EC1		RESULT	MARK	PRETEST		RESULT	W2	EC2		RESULT	MARK	POSTTEST		RESULT
		EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL	
R1	3	16.67%	16.67%	PASS	50%	8.33%	8.33%	PASS	3	13.64%	13.64%	PASS	60%	8.18%	8.18%	PASS
R2	3	16.67%	16.67%	PASS	60%	10.00%	10.00%	PASS	3	13.64%	13.64%	PASS	60%	8.18%	8.18%	PASS
R3	4	22.22%	22.22%	PASS	60%	13.33%	13.33%	PASS	4	18.18%	18.18%	PASS	90%	16.36%	16.36%	PASS
R4	4	22.22%	22.22%	PASS	80%	17.78%	17.78%	PASS	6	27.27%	27.27%	PASS	80%	21.82%	21.82%	PASS
R5	4	22.22%	22.22%	PASS	80%	17.78%	17.78%	PASS	6	27.27%	27.27%	PASS	100%	27.27%	27.27%	PASS
COMPETENCY LEVEL(PRETEST)						67.22%	67.22%	PASS	COMPETENCY LEVEL(POST TEST)				81.82%	81.82%	PASS	
COMPETENCY LEVEL OF THE TEAM									EXPECTED	14.60%						PASS
									ACTUAL	14.60%						

Description

The group consists of engineers and managers. The competencies level before undergoing the training session is about 67.22%. After attending the training, the competencies level is increased to 81%. The training session has successfully increased the competencies level of group 3 by 14.6%. Since the system is able to deliver the same result as the expected result. Hence this system is able to appreciate the Accuracy system attribute.

GROUP 4

RESPONDEN NO	W1	EC1		RESULT	MARK	PRETEST		RESULT	W2	EC2		RESULT	MARK	POSTTEST		RESULT
		EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL	
R1	1	8.33%	8.33%	PASS	40%	3.33%	3.33%	PASS	2	11.76%	11.76%	PASS	60%	7.06%	7.06%	PASS
R2	1	8.33%	8.33%	PASS	60%	5.00%	5.00%	PASS	2	11.76%	11.76%	PASS	60%	7.06%	7.06%	PASS
R3	3	25.00%	25.00%	PASS	70%	17.50%	17.50%	PASS	4	23.53%	23.53%	PASS	90%	21.18%	21.18%	PASS
R4	3	25.00%	25.00%	PASS	70%	17.50%	17.50%	PASS	4	23.53%	23.53%	PASS	80%	18.82%	18.82%	PASS
R5	4	33.33%	33.33%	PASS	80%	26.67%	26.67%	PASS	5	29.41%	29.41%	PASS	100%	29.41%	29.41%	PASS
COMPETENCY LEVEL(PRETEST)						70.00%	70.00%	PASS	COMPETENCY LEVEL(POST TEST)				83.53%	83.53%	PASS	
COMPETENCY LEVEL OF THE TEAM									EXPECTED	13.53%						PASS
									ACTUAL	13.53%						

Description

The group consists of ordinary workers, engineers and a manager. The competencies level before undergoing the training session is about 70%.After attending the training ,The competencies level is increased to 83.53%.The training session have successfully increase the competencies level of group 4 by 13.53 %. Since the system could able to deliver the same result as the expected result, hence this system is able to appreciate the Accuracy system attribute

GROUP 5

RESPONDEN NO	W1	EC1		RESULT	MARK	PRETEST		RESULT	W2	EC2		RESULT	MARK	POSTTEST		RESULT
		EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL	
R1	2	13.33%	13.33%	PASS	20%	2.67%	2.67%	PASS	2	11.11%	11.11%	PASS	60%	6.67%	6.67%	PASS
R2	2	13.33%	13.33%	PASS	40%	5.33%	5.33%	PASS	2	11.11%	11.11%	PASS	60%	6.67%	6.67%	PASS
R3	4	26.67%	26.67%	PASS	70%	18.67%	18.67%	PASS	5	27.78%	27.78%	PASS	90%	25.00%	25.00%	PASS
R4	4	26.67%	26.67%	PASS	80%	21.33%	21.33%	PASS	6	33.33%	33.33%	PASS	80%	26.67%	26.67%	PASS
R5	3	20.00%	20.00%	PASS	50%	10.00%	10.00%	PASS	3	16.67%	16.67%	PASS	100%	16.67%	16.67%	PASS
COMPETENCY LEVEL(PRETEST)						58.00%	58.00%	PASS	COMPETENCY LEVEL(POST TEST)				81.67%	81.67%	PASS	
COMPETENCY LEVEL OF THE TEAM									EXPECTED		23.67%				PASS	
									ACTUAL		23.67%					

Description

The group consists of ordinary workers, engineers and a manager. The competencies level before undergoing the training session is about 70%.After attending the training ,the competencies level have been increased to 83.53%.The training session have successfully increase the competencies level of group 5 by 13.53 %. Since the system is able to deliver the same result as the expected result, hence this system is able to appreciate the Accuracy system attribute

GROUP 6

RESPONDEN NO	W1	EC1		RESULT	MARK	PRETEST		RESULT	W2	EC2		RESULT	MARK	POSTTEST		RESULT
		EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL			EXPECTED	ACTUAL	
R1	2	20.00%	20.00%	PASS	50%	10.00%	10.00%	PASS	2	15.38%	15.38%	PASS	60%	9.23%	9.23%	PASS
R2	1	10.00%	10.00%	PASS	60%	6.00%	6.00%	PASS	1	7.69%	7.69%	PASS	60%	4.62%	4.62%	PASS
R3	1	10.00%	10.00%	PASS	70%	7.00%	7.00%	PASS	2	15.38%	15.38%	PASS	90%	13.85%	13.85%	PASS
R4	3	30.00%	30.00%	PASS	20%	6.00%	6.00%	PASS	3	23.08%	23.08%	PASS	80%	18.46%	18.46%	PASS
R5	3	30.00%	30.00%	PASS	80%	24.00%	24.00%	PASS	5	38.46%	38.46%	PASS	100%	38.46%	38.46%	PASS
COMPETENCY LEVEL(PRETEST)						53.00%	53.00%	PASS	COMPETENCY LEVEL(POST TEST)				84.62%	84.62%	PASS	
COMPETENCY LEVEL OF THE TEAM									EXPECTED	31.62%					PASS	
									ACTUAL	31.62%						

Description

The group consists of ordinary workers, technicians and engineers. The competencies level before undergoing the training session is about 53%. After attending the training, the competencies level have been increased to 84.62%. The training session have successfully increase the competencies level of group 6 by 31.62 %. Since the system is able to deliver the same result as the expected result. Hence this system is able to appreciate the Accuracy system attribute

4.3. DATA ANALYSIS

From the questionnaire distributed among the knowledge worker (K-Worker), the results are the analyzed. In question 1, the respondent were asked whether the format of the question in the Competencies Level Assessment System (CLASS) is easy to answer, 54 % agree, 33 % strongly agree while 13 % neither agree nor disagree. The result are shown in Figure 6

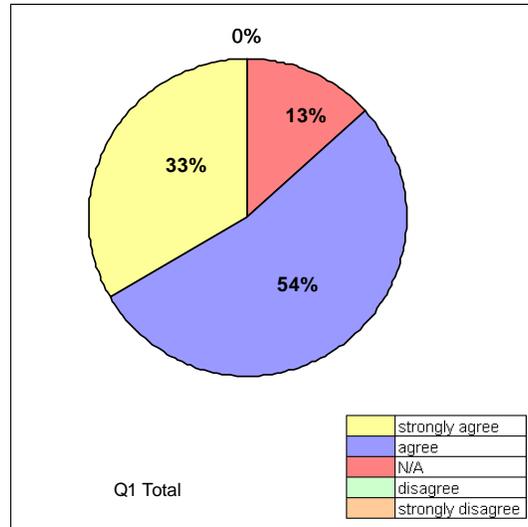


Figure 6: Summary of question 1

Next, in question 2, respondent were asked the question of the pretest and post test in the CLASS system is focusing on the technical skill environment. 47 % of the respondent answered agrees and the remaining answered neither agrees nor disagree . The result are shown in Figure 7

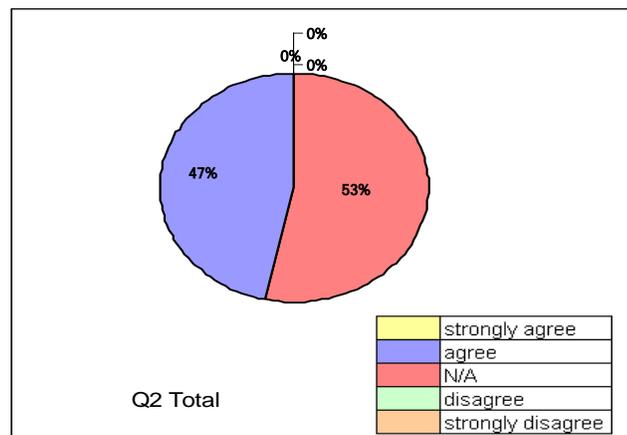


Figure 7: Summary of question 2

Next, in question 3, respondent were asked whether the pre-test question gives an indication on the area of knowledge that they should focus during the training. 37 % of

the respondent answered agrees and 63% answered strongly agree. The result are shown in Figure 8.

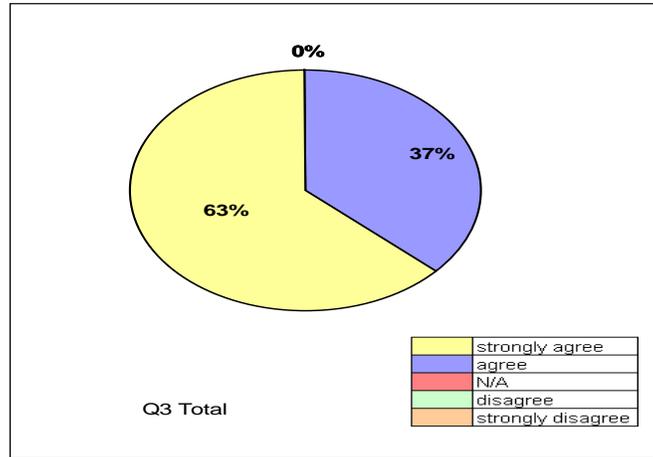


Figure 8: Summary of question 3

For question 4, respondent were asked whether they satisfied with the recommendation that CLASS system provides.47 % satisfied ,3 % strongly satisfied , 7 % dissatisfied and remaining neutral, neither satisfied nor dissatisfied . The result are shown in Figure 9.

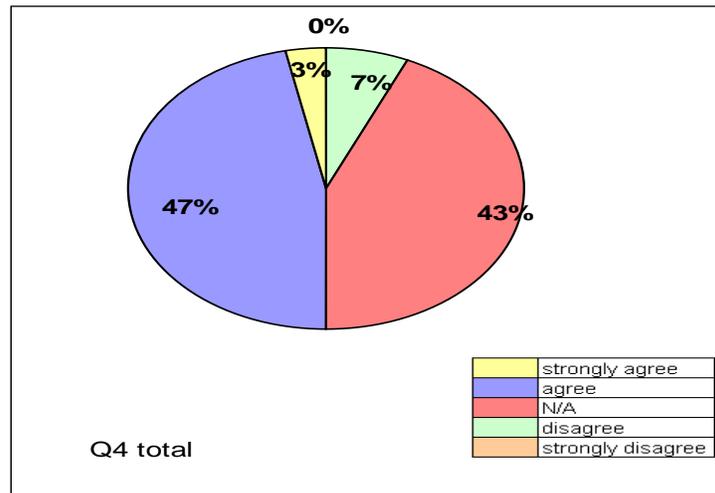


Figure 9: Summary of question 4

Next, in question 5, respondent were asked whether the CLASS system guides them on improving their competency level based on their current position.47 % of the respondent

answered agrees ,3% strongly agree,7 % disagree and 43 % neither agree or not The result are shown in Figure 10

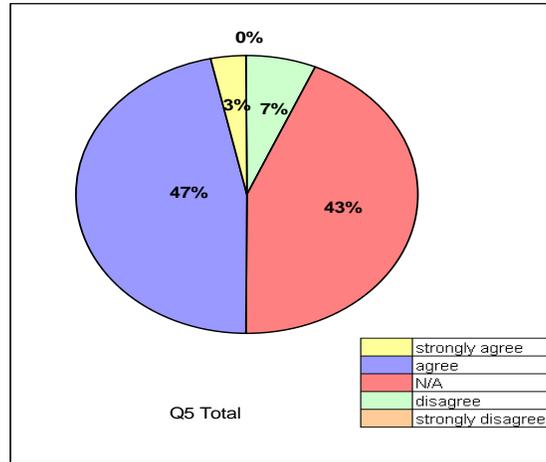


Figure 10: Summary of question 5

For the question 6, respondent were asked whether the CLASS system enable them to know their capability.40 % of the respondent answered disagrees, and 30% strongly disagree ,13 % and remaining are neither agree or not. The result are shown in Figure 11.

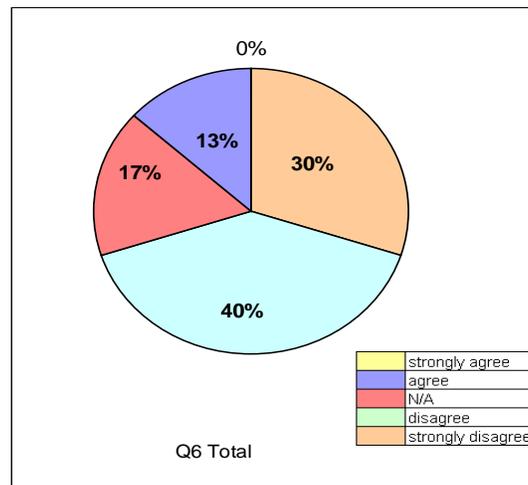


Figure 11: Summary of question 6

For question 7, respondent were asked whether the assessing their competency level is important for them to improve their performance in their career. All of the respondent

agree where about 63% answered disagrees and 37 % answer strongly agree . The result are shown in Figure 7 The result are shown in Figure 12.

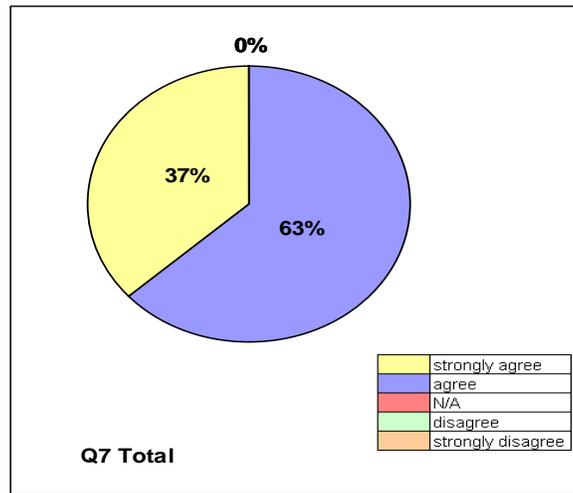


Figure 12: Summary of question 7

For question 8, respondent were asked on their believe whether they become more clear on their competency level of their current position after using the CLASS System. 39 % of the respondent answered agree,17 % strongly agree ,7% disagree and the remaining neutral, neither agree or not. The result are shown in Figure 13.

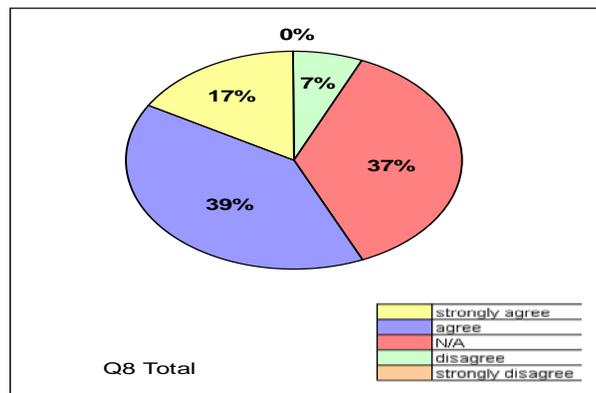


Figure 13: Summary of question 8

For the last question, respondent were asked whether they might use CLASS system even they are do not enjoy using technology. All the respondent are disagree where 47% of the

respondent answered strongly disagree and 53% answered disagree. The result is shown in Figure 14.

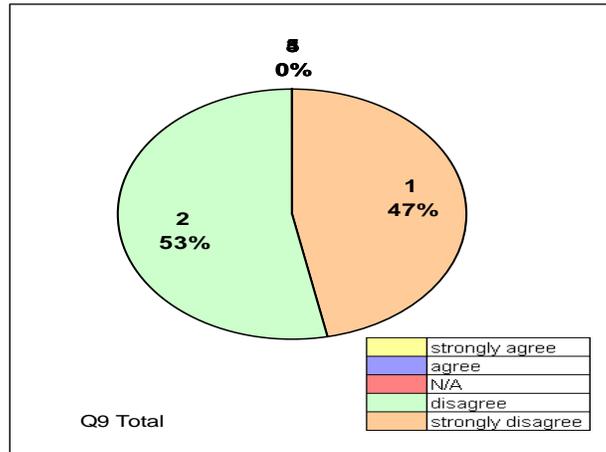


Figure 14: Summary of question 9

In order to make the calculation ,the strongly disagree was assign the weight of 1,disagree was 2,neither agree or disagree was 3,agree was 4 and strongly agree was 5. Descriptive statistics such as maximum, minimum, means, standard deviations and variance were obtained for the interval scaled independent and dependent variables. The results are shown in table 1.

Construct	Minimum	Maximum	Mean	Std Deviation	Variance
Usefulness	3.33	4.67	4.1	0.32	0.103
intention to use	2.67	4.33	3.34	0.48	0.233
System usage	2.67	4	3.19	0.38	0.147

Table 1: Descriptive Statistics

All item for each variable were measured on the 5 point scale and its average computed to evaluated each criterion as a whole .From the result ,it may seen that all mean computed are inclined to the AGREE perception when measure against 5 points scale. This means that user agreed to the implementation of the Competencies Level

system(CLASS).The lowest means computed is on system usage because the CLASS is develop using the C language environment, so the friendliness attribute is ignored

Next, a t-test is done to test the relationship between the usefulness with intention to use factor, intention to use with system usage factor and usefulness with system usage factor. The inter-correlations among the variables was computed and summarized in Table 2

Construct	Usefulness	intention to use	system usage
usefulness	1		
intention to use	0.352	1	
system usage	-0.0989	-0.148	1

Table 2: Pearson Correlation

The critical value obtained from the Pearson Correlation table at 29 degree of freedom ($df = \text{number of pair} - 2$) at the 0.05 level of two-tailed test is between 2.045 and -2.045. All values computed are between the range of critical value and it can therefore be concluded that the correlation between each variable is statically significant. Therefore hypothesis H1, H2 and H3 are substantiated and its null hypotheses are rejected. The result is illustrated as in Figure 15.

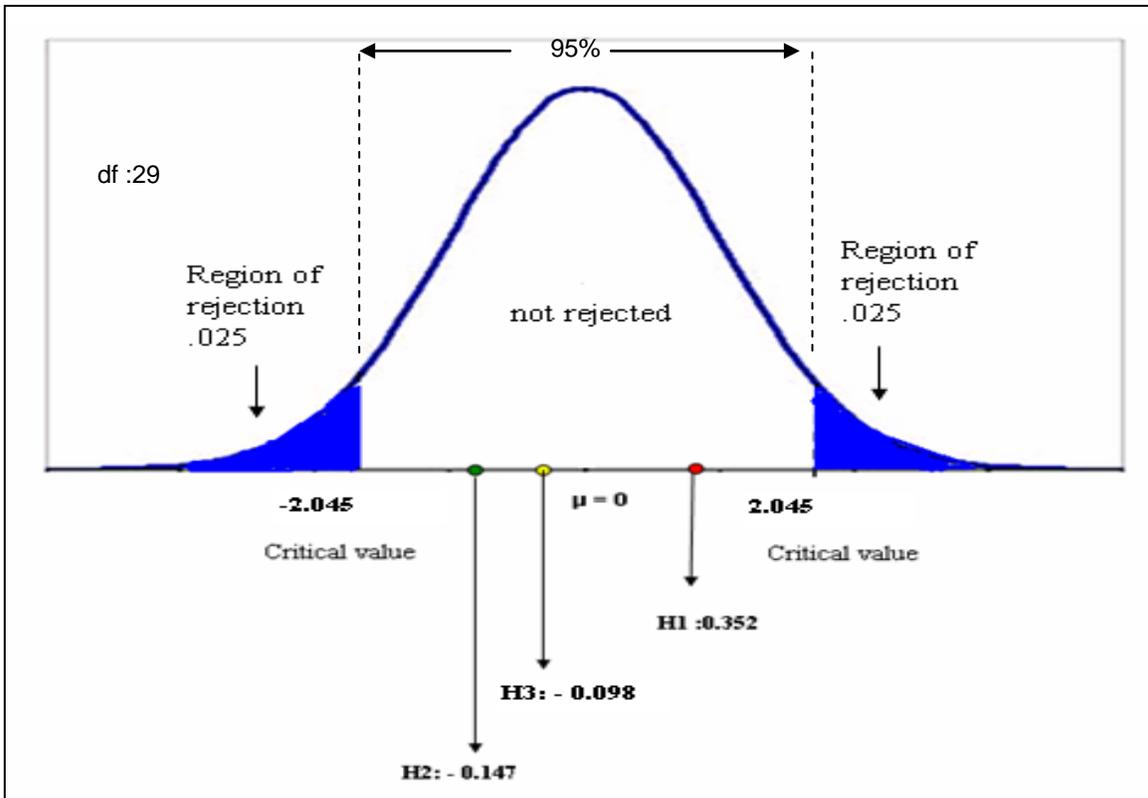


Figure 15: Hypothesis Test

As depicted in Figure 16, the hypothesis1 (H1), hypothesis 2(H2) and hypothesis 3 (H3) is not rejected .These three points fall at the region which is near to the mean point. Hence, it can be concluded that; H1, H2 and H3 are strongly accepted by users and indirectly showing that user are accepting the implementation of Competencies Level Assessment System (CLASS).

CHAPTER 6

CONCLUSION AND FUTURE RECOMMENDATION

This project has shown that the idea of implementing the Competencies Level Assessment system is acceptance by the user in term of the functionality that the CLASS can offer.

Since CLASS is a prototype, the system friendliness attribute is ignored. There have been several criticism on the CLASS that the future developer should consider:

- CLASS is not friendly to use
- The question should provide visual aid such as diagram, graph and picture to assists the understanding of the employee/user.
- CLASS do not provide the help manual. The user might not be familiar on how to use the CLASS.

It is recommended that; CLASS is further improved in terms of its Graphical User Interface (GUI) since the demand of this kind of system is very high.

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APPENDICES

- [APP 1]** Summary of the respondent answer from the questionnaire distributed
- [APP 2]** The Questionnaire
- [APP 3]** The coding of the prototyping – comparison report session and recommendation report session

[APP 1] – Summary of the respondent answer from the questionnaire distributed.

RESPONDEN	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
R1	4	4	4	3	4	2	4	4	1
R2	4	4	5	4	4	2	4	4	1
R3	4	4	4	5	4	2	4	4	1
R4	4	3	4	3	4	2	4	3	1
R5	3	3	5	4	4	2	4	4	2
R6	3	3	5	3	4	2	5	3	2
R7	3	3	4	2	4	2	5	4	2
R8	3	3	4	2	4	2	4	5	1
R9	5	4	4	4	4	1	4	3	1
R10	5	4	4	4	4	2	5	5	2
R11	5	4	4	4	4	1	5	4	2
R12	4	4	5	4	5	2	5	3	2
R13	4	3	5	3	5	1	4	4	1
R14	4	3	5	3	5	2	5	5	2
R15	4	3	5	4	5	1	5	3	1
R16	4	3	5	4	5	3	4	4	1
R17	4	3	5	4	5	3	4	5	1
R18	4	4	5	4	4	3	4	2	2
R19	4	4	4	4	4	4	4	2	2
R20	4	4	4	4	4	1	4	3	2
R21	4	4	5	4	5	3	5	3	1
R22	4	4	5	4	5	4	5	4	1
R23	4	4	5	3	5	4	5	4	2
R24	5	4	5	3	4	4	4	3	1
R25	5	3	5	3	5	3	4	3	2
R26	5	3	5	3	4	1	5	5	1
R27	5	3	5	3	5	1	4	4	2
R28	5	3	5	3	4	1	4	3	2
R29	5	3	4	3	4	2	4	3	2
R30	5	3	5	3	5	1	4	4	2

Table 3 : Summary of respondent answer form the questionnaire distributed.

[APP 2] The set of questionnaire

1	The format of the question in the CLASS system is easy to answer
2	The question of the pretest and post test in the CLASS system is focusing on the technical skill environment
3	The pre-test question give me an indication on the area of knowledge that I should focus during the training
4	I am satisfied with the recommendation that CLASS system provides
5	The CLASS system guides me on improving my competency level based on my current position
6	The CLASS system enable me to know my capability
7	Assesing my competency level is important for me to improve my performance in my career
8	I believe I become more clear on my competency level of my current position after using the CLASS System
9	I will use Class system even i do not enjoy using the technology

[APP 3] The coding of the system improvement – comparison report session and recommendation report session

```
printf("\n\n*****\n\n");
printf("*****\n\n");
printf("*****\n\n");
printf("\n\nREPORT ON Performance Comparison of Halliburton Excellence Centre
August 2008\n\n");
printf("*****\n\n");
printf("*****\n\n");
printf("*****\n\n");
printf("\n\nThe Learning Success Rate of this group is %.2f %\n\n",
learning_rate);

if (learning_rate > 0.00)
{printf("\n\nThis group is considered as success learning group\n\nSince the
success rate of Post-test is higher than Pre-test\n\n\n");
}
else
{printf("\n\nThe learning has failed!\n\nSince there is no improvement in learning
process\n\n\n");
}
```

Comparison reports;

It will identify the Success Rate or the calculated competencies of the Learning project.

If there is some improvement or positive result after calculation, the system will notify the success of learning.

In turns, if there is no improvement, the system will notify the failure.

```
printf("\n\nComparison No. 1: The number of correct answer from Pre-test and
Post-test\n\nNumber 1 represents the CORRECT answer\n\nNumber 0 represents the
WRONG answer\n\n");
```

```
for (i=0 ; i < 5; i++)
{ printf("\n\nStudent No. %d\n\n", i+1);
for(k=0 ; k < total_q_pre ; k++)
{
printf("Question No. %d      Result of Pre-test is %d      Result of Post-test is
%d \n\n", k+1, pre_array_mark[i][k], post_array_mark[i][k]);
}
}
```

```

printf("\n\n          #####          \n\n");
printf("\n\nEnter 1 to continue\n");
scanf("%d",&key);
clrscr();

}

printf("\n\nPlease ENTER 1 to view the Comparison No.2\n\n");
scanf("%d", &key);

clrscr();
printf("\n\nComparison No. 2: The weights assigned for Pre-test and Post-test\n\n");

for (i=0 ; i < 5; i++)
{printf("\n\nStudent No. %d\n\n", i+1);
printf("Weight of Pre-test is %d      Weight of Post-test is %d \n\n", weight[i],
weight2[i]);
}

printf("\n\n          #####          \n\n");

printf("\n\nPlease ENTER 1 to view the Comparison No.3\n\n");
scanf("%d", &key);

clrscr();
printf("\n\nComparison No. 3: The expected contributions for Pre-test and Post-
test\n\n");

for (i=0 ; i < 5; i++)
{ printf("\n\nStudent No. %d\n\n", i+1);
printf("Expected contribution of Pre-test is %.2f\n\nExpected contribution of
Post-test is %.2f \n\n", calculated_weight[i], calculated_weight2[i]);
}

printf("\n\n          #####          \n\n");

printf("\n\nPlease ENTER 1 to view the Comparison No.4\n\n");
scanf("%d", &key);

clrscr();
printf("\n\nComparison No. 4: The actual contributions for Pre-test and Post-
test\n\n");

for (i=0 ; i < 5; i++)
{ printf("\n\nStudent No. %d\n\n", i+1);
printf("Actual contribution of Pre-test is %.2f\n\nActual contribution of Post-test
is %.2f \n\n", student_pre_calculated[i], student_post_calculated[i]);
}
printf("\n\n          #####          \n\n");

}break;

```



```

        else
        { count3 = count3 + 1;
          num = 2;
        }
      }

      switch(num)
      {
        case 0: {if(k == 2 && count1 > 1)
                  printf("\n\n\nRECOMMENDED TO: Send for
FOUNDATIONS OF PROBLEM SOLVING course\n\n ");
                  //printf("\n\n      #####      \n\n"); }
                  else {break;}
                  break;}
        case 1: {if(k == 5 && count_2 > 1)
                  printf("\n\n\nRECOMMENDED TO: Send for
PROBLEM SOLVING USING SCHEMATICS AND DIAGRAMS course\n\n ");
                  //printf("\n\n      #####      \n\n"); }
                  else {break;}
                  break;}
        case 2: {if(k == 9 && count3 > 1)
                  printf("\n\n\nRECOMMENDED TO: Send for
ADVANCE PROBLEM SOLVING course\n\n ");
                  //printf("\n\n      #####      \n\n"); }
                  else {break;}
                  break;}

      }
    }
  }
  printf("\n\n\n*****\n\n\n");
  printf("\n\nPlease ENTER 1 to view the Recommendation for the next
student\n\n");
  scanf("%d", &key);

  clrscr();
}

} break;
default: break;
}

//-----> Repeation asking for
reports

printf("\n\n\nDo you wish to have another type of reports \n\nType 1 for continue or
0 to terminate?\n\n");
scanf("%d", &choice2);

/*if( choice2 == 'Y' || choice2 == 'y')
{ count =0;
  count2 =0;
  count2 = count +1;
}

```

```
    }  
  
    else  
    { count =0;  
      count2 =0;  
      count2 = count -5;  
    }  
    */  
    clrscr();  
  
} while ( choice2 != 0 );  
  
getch();  
return 0;  
  
}
```

