A STUDY OF OPINIONS AND NEEDS OF COMPUTER AND ENGINEERING MANAGEMENT STUDENTS TOWARD THE CURRICULUM

by

Ms. Parichart Nakarawat

A Final Report of the Three - Credit Course
CE 6998 Project

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science
in Computer and Engineering Management
Assumption University

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Project Title	A Study of Opinions and Needs of Computer and Engineering Management Students toward the Curriculum
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Academic Year	November 2001

The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

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November 2001

ABSTRACT

This project was established for the purpose of studying the opinions and needs of Computer and Engineering Management students towards the curriculum. There are 4 sections in evaluating the curriculum. They are (1) purposes of the curriculum, (2) structure of the curriculum, (3) contents of the curriculum, and (4) evaluation of the curriculum.

The samples sizes, 165 samples were composed of the alumni of MS(CEM). The questionnaire is constructed as the instrument used for gathering data and is divided into 2 parts. Its first part deals with the opinions and needs towards the curriculum, and the second part deals with the general personal information. The results were analyzed by SPSS program to calculate percentage, means, standard deviation (S.D.) and cronbach's alpha (α), and then data is interpreted in the form of table with description.

The study results obtained show that most student's opinions are fairly agreeable on the purposes of the curriculum because the majority of the focus group think that this program can teach them to reach that purpose. While the second part and third part, the students need the faculty to consider some points such as increasing the subject in required and general elective courses for choosing, increasing the number of computer in computers laboratory, etc. Lastly, the results of most student's opinions are fairly agreeable on the evaluation of the curriculum. However, the report and presentation should be taken into consideration as a part of the evaluation of each subject.

The overall results from the study can let the faculty understand and consider to develop and improve in order to increase the level of the student's opinions to be positive and increase the efficiency of the curriculum.

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First of all, my research project will not be complete if I do not have a chance to express my great appreciation to my advisor: Dr. Chamnong Jungthirapanich (Dean of Graduate School of Computer and Engineering Management). His patient assistance, suggestion and valuable advice have led me from the report inception to report completion.

Secondly, I would like to thank all of the CEM students who have helped me in answering the questionnaires. I am indebted to them. Without their valuable information, this project would not have been possible.

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I. INTRODUCTION

1.1 Background of the Study

The development of a country is a complex process and it needs a lot of factors such as money, human, technology, etc. Human is the most important factor for developing country because human is a part of all sectors in developing country and other sectors cannot develop effectively without human. For example, developing economics, developing culture, developing politics, etc. Therefore, to develop our country, it is necessary to focus on human first. The best way to improve quality and efficiency of human being is to provide the better education.

As His Majesty (lectures to teachers and students at Jidralda Palace 2520: 3) said that "Education is the important tool for developing knowledge, ability, thought, attitude, value, merit of human in order to be of a good, quality and efficient citizen. When our country consists of the quality and efficient citizens, the country development will become smooth and successful."

In Thailand, there are many schools that provide the education for people and it has many levels starting from kindergarten to university. Assumption University or ABAC is one of the alternative for persons who are interested in continuing education in Bachelor Degree, Masters Degree and Doctoral Degree. ABAC was originally initiated in 1969. It was formally established in June 1972 and accredited by Ministry of Education and Ministry of University affairs in May 1975. The founding father of this institution is Brother Bernard Mary of the Brothers of St. Gabriel-Catholic religious, congregation devoted to education and other philanthropic activities in Thailand and other countries. English is the officially approved medium of instruction at this university.

At the beginning, ABAC was operated as a small-scale institution with only 51 students, two classrooms, three administrative personnel, and a part-time faculty member. Assumption Business Administration College has grown by leaps and bounds into Assumption University in 1990. Now, ABAC has already produced 28 batches and it still keeps continuing the procurement of graduates every year.

The objectives and policies of ABAC are to serve the nation by providing scientific and humanistic knowledge, particularly in the business education and management science through research and interdisciplinary approaches. To this end it aims at forming intellectually competent graduates who

(a) are morally sound, committed to acting justly, and open to further growth.

(b) appreciate freedom of expression, imbibe right attitudes and ideologies through a carefully integrated curriculum of Ethics, Science, Languages and Business Management.

(c) achieve academic excellence through hard work, critical thinking and effective decision-making.

Master's Degree Program of Science in Computer and Engineering Management (CEM) is one of the interesting programs at Assumption University. Although it was established for more than 10 years, it is still unique. Now, CEM has around 17 batches and it keeps continuing the registration of new students every trimester. The CEM curriculum is not similar to any curriculum because it provides the combination of three kinds of knowledge that are Computer, Engineering and Management but other programs provide only one area of knowledge. For example, MBA provides only the knowledge of management or CIS provides only knowledge of computer, etc.

The basic philosophy of the Master of Science in Computer and Engineering Management is to provide tools to the engineer and scientist that will allow him or her

to operate more effectively in a managerial position. In addition, the curriculum will also prepare a manager who lacks computer and engineering background to perform better in a computer and engineering related field to organization. It might be pointed out that we are using the term management in its broadest meaning. It does not necessarily mean that they will be in charge of a group of the computer special lists or engineers. There are many staff positions in corporations where the combined knowledge of computer, engineering and management is of significant value.

Therefore, the curriculum of Master of Science in Computer and Engineering Management is intended to produce graduates with the following qualification:

(1) To have adequate knowledge to be in managerial positions in technical-related enterprises.

(2) To have adequate knowledge to be a problem solver for manufacturing and service industries.

(3) To have adequate knowledge to be a teacher in computer and engineering management.

(4) To have adequate knowledge to be an entrepreneur in service and manufacturing industries.

(5) To have ethics and responsibilities toward the society and to their profession.

In addition, there are four groups of courses in the 48-credit program.

(1) Remedial Courses. Any student with insufficient knowledge on computer, engineering, or statistics concepts must take.

(2) Required Courses. There are 7 required courses at 3 credits each, totaling 21 credits.

(3) Elective Course. Each student must take 7 elective courses.

1.1 Thesis or Non-Thesis Course. Each student must either complete a 6-credit thesis or 6-credit additional elective courses.

1.2 Significance of the Study

Master's Degree Program of Science in Computer and Engineering Management (CEM) was founded over 10 years ago at Assumption University. It has had around 18 batches up until now and it still keeps continuing the procurement of the graduates every trimester in a year. It has also produced a lot of graduate students who work in varieties of field. However, there is no research or study about the CEM student's opinion towards the curriculum and there is no one takes seriously the consideration about the CEM student's opinions towards the curriculum. Therefore, this project was established for the purpose of a study of the opinions and needs of the computer and engineering management students toward the curriculum.

To evaluate the curriculum, it will let us know that the program is going well or not because the curriculum is one of important components to fulfill the program. As we know, one who can directly reflect the curriculum is the student. So studying the student's opinions and needs can turn or lead this program to be beneficial to develop and improve the program to be an efficient program. Additionally, the results of the project can be told that the graduate students are satisfied about the curriculum or not?, and did the curriculum meet the objective?

The significance of the study is as follows:

(1) To understand the opinions and needs of CEM students toward the CEM curriculum

(2) To use the findings in improving and developing to be an efficient curriculum.

1.3 Objectives of the Study

The objectives of this research are as follows:

(1) To learn what are the CEM student's opinions and needs towards the CEM curriculum.

(2) To study the opinions of CEM students towards the objectives, contents and application of knowledge for their career.

(3) To learn how to extend the CEM curriculum in order to fulfill the CEM student's needs.

1.4 Scope of the Study

The study covers students who are the alumni of Master's Degree Program of Science in Computer and Engineering Management.

1.5 Definition of Terms

CEM: The graduate school of Computer and Engineering Management, Assumption University.

Curriculum: The curriculum of Master's Degree Program of Science in Computer and Engineering Management

Alumni: The student who has already graduated from Master's Degree Program of Science in Computer and Engineering Management.

Need: The circumstance in which requires something.

Opinion: The belief or judgement about something and not necessarily based on the fact or knowledge.

II. LITERATURE REVIEW

2.1 The Meaning of the Curriculum

Due to the education being an important tool of the society for developing human beings and country, without a good curriculum and good education management, we cannot reach its objective. There are many professionals concerned about the importance of curriculum and they give the meaning of the curriculum as below:

Curriculum can refer to the total structure of ideas and activities developed by an educational institution to meet the learning needs of students and to achieve desired educational aims. Some people use the term to refer simply to the content of what is taught. Others include also the teaching and learning methods involved, how student's attainment is assessed, and the underlying theory or philosophy of education (Rowntree 1981).

Carter V. Good (1945) gives 3 meanings for curriculum as below:

(1) A systematic group of courses or sequences of subjects required for graduation or certification in a major field of study, for example, social studies curriculum, physical education, physical education curriculum.

(2) A general over-all plan of the content or specific materials of instruction that the school should offer the student by way of qualifying him for graduation or certification of for entrance into a professional or a vocational field.

(3) A group of courses or planned experience which a student has under the guidance of the school or college.

Curriculum is that series of things which children and youth must do and experience by way of developing ability to do the things well that make up the affairs of adult life (Bobbitt 1918).

Curriculum is that of the subjects and subject matter therein to be taught by teachers and learned by students, and still widely used to refer to the set of subjects or courses offered, and also to those required or recommended or grouped for other purposes (Saylor and Alexander 1981).

The school curriculum is to be composed of all the experiences children have under the guidance of teachers (Caswell and Campbell 1935).

All of the planned experiences provided by the school to assist pupils in attaining the designated learning out-comes to the best of their abilities (Neagley and Evans 1967).

A sequence of potential experiences is set up in the school for the purpose of disciplining children and youth in group, ways of thinking and acting (Smith, Stanley and Shores 1957).

A set of intentions about opportunities for engagement of person-to-be-educated with other persons and with things (all bearers of information, processes, techniques, and values) in certain arrangements of time and space (Lewis and Miel 1972).

The curriculum consists of the means of instruction used by the school to provide opportunities for student learning experiences leading to desired learning out comes (Krug 1957).

The learner's engagements with various aspects of the environment which have been planned under the direction of the school (Mackenzie 1964).

A way of preparing people participate as productive members of our culture (Taba 1962).

The set of learning and experiences for children planned by the school to attain the aims of education (Michaelis, Grossman and Scott 1967).

2.2 The Model and Theory of the Curriculum

The models of curriculum can be separated by the following curriculum developers:

Smith, Stanley and Shores (1957) separated the models of curriculum into 3 models :

(1) Subject Curriculum

(2) Activity Curriculum

(3) Core Curriculum

Hilda Taba (1962) separated the models of curriculum into 5 models:

(1) Subject Curriculum

(2) Broad-Field Curriculum

(3) Curriculum Based on Social Processes and Life Function

(4) Activity or Experience Curriculum

(5) Core Curriculum

Neagley and Evans (1967) separated into 3 main models:

(1) Curriculum Designs Emphasizing Subjects

  (a) Subject-Centered Curriculum

  (b) Correlated Curriculum

  (c) Broad-Field or Fused Curriculum

  (d) Core Curriculum

  (e) Culture-Epoch Curriculum

  (f) Integrated Curriculum

(2) Curriculum Designs Emphasizing the Child

  (a) Activity Curriculum

  (b) Child-Centered Curriculum

(c) Experience Curriculum

(3) Curriculum Designs Emphasizing Society

(a) Community-Centered Curriculum

Zais (1976) separated into 3 groups:

(1) Subject-Centered Designs

(a) Subject Design

(b) Disciplines Design

(c) Broad-Fields Design

(2) Leaner-Centered Design

(a) Activity/Experience Design

(3) Problem-Centered Designs

(a) Areas of Living Design

(b) Core Design

McNiel (1981) separated into 4 models:

(1) Humanistic Curriculum

(2) Social Reconstructionist Curriculum

(3) Technological Curriculum

(4) Academic Subject Curriculum

Saylor, Alexander and Lewis (1981) separated into 5 models:

(1) Designs Focused on Subject Matter/Disciplines

(2) Designs Focused on Specific Competencies/Technology

(3) Designs Focused on Human Traits/Processes

(4) Designs Focused on Social Functions/Activities

(5) Designs Focused on Individual Needs and Interests/Activities

From separating the models of curriculum by the curriculum developers, they can be understandably grouped by the following:

(1) Design Focused on Disciplines/Subjects

Aim of the curriculum: It was believed that knowledge from the disciplines/subjects would help the learner reasonable, creative desire and keep continuing the tradition and custom.

Content and Instruction: The content could be divided into main subjects or minor subjects. Instruction was extremely concentrated on the instructors. Instructors must be the experts in the content or subject and they must be able to disseminate it very well.

Evaluation of the curriculum: It depended on each subject or content because the instructors must have some different techniques of instruction in each subject.

(2) Designs Focused on Individual Interests and Needs

Aim of the curriculum: It was developed according to the interest and ability of the learners.

Content and Instruction: The content was very difficult to be developed because the flexibility was necessary to be responsive to the interest and ability of the learners. The instruction was extremely focused on the learners so the instructors were the connectors for the instruction more than the disseminators.

Evaluation of the curriculum: This would lead to the evaluation of the learners.

(3) Designs Focused on Social Activities and Problems

Aim of the curriculum: It was focused on analyzing the activities and problems of the society, the relationship and attitude in co-operation.

Content and Instruction: The content would be the development of knowledge in any field concerned in the situation of activities and problems occurring in that society. The curriculum would focus on making the co-operation in learning.

Evaluation of the curriculum: The learners could take part in selecting and using tools of evaluation. The focus of evaluation was on the ability in the creation of society.

(4) Designs Focused on Processed Skills

Aim of the curriculum: It was focused on how efficient the ability of solving the problems was.

Content and Instruction: Most of the contents were focused on the management process in everything that is necessary for living. Instruction would focus on learning by doing so the instructors acted as the connectors and the providers of any experience.

Evaluation of the curriculum: It was focused on the management process and the achieved result was viewed only as the information for consideration.

(5) Designs Focused on Specific Competencies

Aim of the curriculum: It was focused only on how efficient the operation was.

Content and Instruction: The content would be focused on organizing the data system, defining basic knowledge to deeper knowledge and

learning by doing for being expert. Instruction would firstly focus on the basic knowledge. Then learning by doing was required until being expert so the instructors would act as the connectors who also checked out the competencies of the learners and would find out whether the learners could meet the objective.

(6) Modern way for the model of curriculum, Zais (1976) said that there would be another option which was procured by humanists: Unencapsulation Design and Humanistic Design.

Aim of the curriculum: It was believed that helping the learners develop themselves and free for learning was the aspect of the curriculum. Importantly, the curriculum must not change the learner to be like anyone.

Content and Instruction: The content was concerned in developing and connecting any knowledge about human life. The instruction needed the relationship between the learners and instructors. The instructors would not force the learners to do what they did not want to do. The kindness was the most important in this way.

Evaluation of the curriculum: It was focused on the evaluation of the process more than the achieved result by viewing whether the activities provided could help the learners feel free to learn.

In constructing the curriculum, it needs to firstly understand the curriculum theory and the models of curriculum because there are many definitions of curriculum mentioned above. Geoge A. Beauchamp (1975) proposed that the curriculum theory should be separated into 2 categories: Design Theories and Engineering Theories.

Saylor & Alexander (1974) said that curriculum planning had 3 steps to capture: Curriculum Designing, Curriculum Implementation and Curriculum Evaluation.

In curriculum designing, there are 3 groups of the curriculum theories which are referred to for this study:

(1) Types of Aim of the curriculum were divided into 3 groups (Bloom 1972)

(a) Cognitive Domain

(1) Knowledge

(2) Comprehension

(3) Application

(4) Analysis

(5) Synthesis

(6) Evaluation

(b) Affective Domain

(1) Receiving

(2) Responding

(3) Valuing

(4) Organizing

(5) Characterizing

(c) Psychomotor Domain

(1) Observing

(2) Imitating

(3) Practicing

(4) Adapting

(2) Criteria in selecting the content of subject: Zais (1976)

(a) Criterion of Significance.

The question of "Is it necessary to the basic fundamental of learning that subject?". It is useful for selecting the content of any

field but if only Criterion of Significance is used, it will be specific for the expert effectively. But the problems and necessity of the learners and the society will be denied.

(b) Criterion of Utility

It is useful for the relation with the society because it does not include the content that is not necessary to proceed in everyday life. However, in everyday life of adults, the necessity of experience in youths may be ignored, the important activities of adults may not be useful for everyone and the consideration of what is necessary for adults is the current decision instead of what is going to be in the future.

(c) Criterion of Learners' Interests

Whatever is the interest of the learners, that is the content of curriculum. This causes the problems because the learners who are the youths are not able to know which is useful and important to their lives and this is not involved in the interest of the society.

(d) Criterion of Human Development

It is realized that school does not only reflect any situation of the society but also has a duty of changing the society and the learners. So, this type of curriculum is involved in the quality of human life.

(3) Evaluation of the quality of curriculum

After finishing designing the curriculum, the evaluation of the curriculum document for checking the appropriate and perfect components included in the curriculum document is the next step.

Checklist is popular tool for checking the correctness and perfection of the curriculum components is Checklist by defining topics of each list in an evaluation format. Then it will be evaluated by the expert. This following checklist is composed perfectly by David Pratt (1980):

(a) General Purposes

(1) How definite and clear are the characteristics of expected result defined?

(2) How important is the purpose of curriculum?

(3) Is the purpose of curriculum covering the whole important expectation?

(b) Reason and Necessity

(1) Is there any mention of necessity in using this curriculum or not?

(2) Is any important comment of curriculum mentioned or not?

(3) Is that comment true or usable?

(4) Is there any guess about the comment that will occur?

(5) If there is any research about necessity, how perfect ways of research and description about their results?

(c) Specific Purposes

(1) Is there any mention of specific purpose?

(2) Is there any reference of type and importance of each one of specific purposes?

(3) Is there any relationship between each one of the general purposes and specific purposes?

(4) How clear, flexible, usable and appropriate are the specific purposes?

(5) If every one of the specific purposes is achieved, will the general purposes of curriculum be true?

(d) Criterion in Behavioral Measurement

(1) How appropriate are the criteria of giving marks?

(2) Are the received results from curriculum evaluated by defined standards?

(3) How clear, perfect, reliable and efficient are the criteria of consideration to be?

(e) Evaluation for Grading

(1) How definite and clear are the grading levels?

(2) Does the grading level reflect any importance of specific purposes?

(3) Does the grading level support any importance of specific purposes effectively?

(f) Content

(1) Does the curriculum that is used have any explanation of the society and community?

(2) How clear is the content of institute?

(3) How definite is the line of command?

(4) Can any institute use this curriculum?

(5) Is there any comment of the effects of subject, project and teacher?

(g) Characteristic of Learner

(1) Is there any reference of characteristics of learners in this curriculum?

(2) Is there any reference of process in selecting a learner?

(3) Are the qualifications of the learner defined?

(4) How appropriate is the basic test?

(h) Instruction

(1) Is there enough instruction planning in details?

(2) Is it worth?

(3) Is the content attractive?

(4) Is there any relationship with purposes?

(5) Are the ways of instructing suitable, variable and creative

(i) Inequity of Learner

(1) How often is the evaluation between class?

(2) Is there any preparation of supportive instruction? And how appropriate and creative is that supportive instruction?

(3) Is there any support for a good learner?

(j) Details in Operation

(1) Is the minimum and maximum of learners defined?

(2) Is there any procedure in solving the problems of less or more learners than ones that are defined?

(3) Is there any reference of teaching accessories?

(4) Are those teaching accessories relative to the curriculum?

(5) Can those teaching accessories be supplied and available easily?

(6) How suitable are those teaching accessories?

(7) Is there any mention of facilities that is necessary?

(8) Is there any computation of the whole time that will be used?

(9) Is there any reference of qualification, ability, duty and responsibility of instructors?

(k) Testing of curriculum

(1) Is there any test of using curriculum?

(2) Is there any reference of results of testing curriculum?

(l) Evaluation of Project

(1) Is there any measurement of efficiency of project?

(2) Are there any other parts of curriculum that are necessary for being evaluated?

(3) Is there any extension and improvement?

(m) Curriculum Implementation

(1) Is there any procedure and schedule for the curriculum?

(2) How clear are the roles and duties of the curriculum user?

(3) How clear and possible is the plan for using curriculum?

(n) Productivity

(1) Does the curriculum itself have a freedom?

(2) Is the productivity from the curriculum interesting and creative?

In curriculum engineering, it means every process that is necessary to bring about the curriculum in school.

(1) Models of Curriculum Engineering

(a) The Administrative Model

This is a process of operation from top to bottom line. This kind of operation is rather suitable for the curriculum used for the

centralized management of the organization. Members of Board design and prepare for the curriculum. Users of the curriculum are not involved in designing the curriculum so they must understand the contents, techniques and any procedure defined in the curriculum after this curriculum was accepted.

(b) The Grass-Roots Model

This is contrary to (a) because it starts from bottom to top line. It is believed that developing the curriculum efficiently should let the instructors take part in designing the curriculum including the learners and people in the society.

(c) The Demonstration Model

The models of Smith, Stanley and Shores (1957) have 2 types: the first is to separate each teaching unit and let the instructors test each unit (so-called Research and Development). Another is to let some of the instructors who are confused or not satisfied with any part of the curriculum find other procedures in operating.

(d) The Systematic Action-Research Mode

Smith, Stanley and Shores (1957) believed that "To change the curriculum is to change the society".

This type of model is the co-operation of persons in the organization and the experts in content so it will be involved in the real situation of the society.

(e) Computer-Based Model

Computer is used to design the curriculum by letting the instructors and learners fill in the list card. When the information is

input in the computer, that information will be used to be the database for each learner (Kirst and Walker 1971).

(2) Models of Curriculum Evaluation

(a) Behavioral Objective Model

Tyler (1950) found that the procedure in evaluating the curriculum should answer all of these questions:

(1) What are the educational purposes that are required by school?

(2) Which are the educational experiences of learners, which can achieve those educational purposes?

(3) How are the educational experiences organized efficiently?

(4) How can we know whether those purposes can achieve goals?

Tyler's process focused on 3 parts: Educational Purposes, Educational Experiences and Goal Achievement as shown in Figure 2.1:

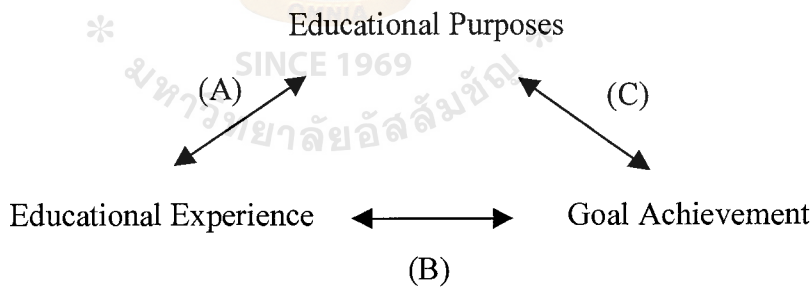

Figure 2.1. Tyler Loop (Tyler 1950).

From the Figure 2.1, the evaluation is to compare the goal achievement with the educational purposes, which is replaced by the symbol $\xleftrightarrow{(C)}$ However, the evaluation of relationship between the educational purposes and the educational experiences and between the

educational experiences and the goal achievement will be included. This model is suitable for curriculum evaluation that is planned in advance because it definitely concentrates on the product.

(b) Goal-Free Evaluation Model

Scriven found that the evaluators should not be interested only in expectation because the good and bad results are not what were expected. He will evaluate on the actual effects. The evaluators will be free for collecting every type of data without a goal. For example, evaluation of drug is acquired by collecting the data after using that drug (Saylor, Alexander and Lewis 1981).

(c) Responsive Model

Robert E. Stake (1968) determined 3 groups of data that were necessary to evaluation:

(1) Antecedents mean data before operating.

(2) Transactions mean data while operating.

(3) Outcomes mean data after operating.

The evaluators must collect 4 types of data to see the congruence:

(1) Intents

(2) Observation

(3) Standard

(4) Judgement

Analyzing the data due to Stake's model is to see the relationship of the data among antecedents, transactions and

outcomes. The data for being evaluated is achieved by finding the congruence between intents and observations as Table 2.1:

Table 2.1 Process of Analyzing the Data of Evaluation (Robert 1968).

Curriculum (Project)	Data that must be collected			
	Intents	Observation	Standards	Judgements
Antecedents	Congruence			
Transaction	Congruence			
Outcomes	Congruence			

In decision making, Stake compared the project which was currently operated with other projects and with the standards that the experts had already defined as Figure 2.2:

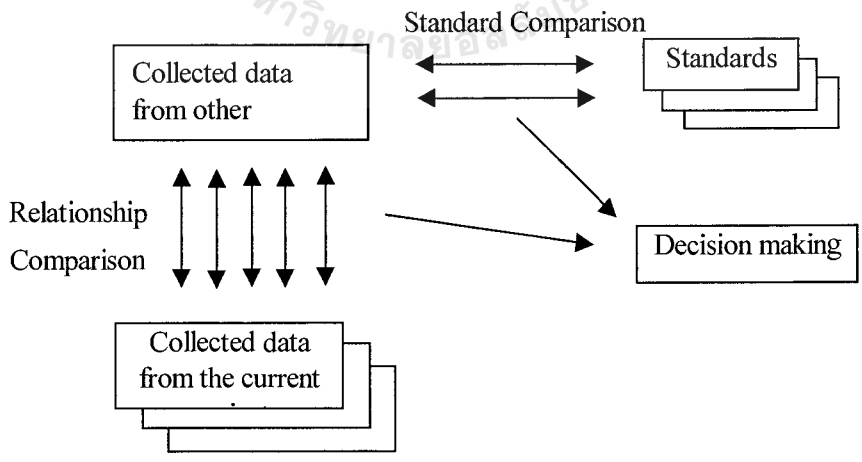

Figure 2.2. Process of Making Decision of Project (Robert 1968).

(d) The CIPP Model

Between 1968-1970, Daniel L. Stufflebeam was a chairman of The Phi Delta Kappa National Study Committee on Evaluation. He proposed one of the models in evaluating curriculum. This model is to evaluate 4 parts of data:

(1) Context Evaluation (evaluating the surrounding that affects the purposes).

(2) Input Evaluation (evaluating what is necessary before operating)

(3) Process Evaluation (evaluating the operating process)

(4) Product Evaluation (evaluating the productivity)

2.3 Research Methodology

2.3.1 Research Overview

Research is the formal, systematic application of the scientific method to study the problems. Business and Management research is formal and systematic application of the scientific method to study the business and management problems. The major difference between research in business and management and other scientific research is the nature of the phenomena studied (Gay and Diehl 1992).

All the research problems require their own special emphases and approaches and the choice of research approach depends on the nature of the research. The categories differ significantly in terms of research purpose, research questions, the precision of the hypotheses that are found, and the data collection methods that are used (Churchill 1992).

Gay and Diehl (1992) separated research approach into 5 categories:

(a) Historical Research

(b) Descriptive Research

(c) Correlational Research

(d) Causal-Comparative Research

(e) Experiment Research

Churchill (1992) separated research approach into 3 categories:

(a) Exploratory Research

(b) Descriptive Research

(c) Casual Research

Aaker, Kumar and Day (1998) also separate research approach into 3 categories:

(a) Exploratory Research

(b) Descriptive Research

(c) Casual Research

Research process is a sequence of steps, which can be followed when designing the research project. There are 6 steps involved in conducting research as follows: (Gay and Diehl 1992)(Churchill 1992)(Zikmund 2000)(Aaker, Kumar and Day 1998) (Blankenship, Breen and Dutka 1998)(Burns and Bush 2000).

(1) Selection and Definition of a Problem or Formulate Problem

A problem is a hypothesis or question of interest to people that can be tested or answered through the collection and analysis data. The part of the process of problem definition includes specifying the objectives of the specific research project or projects that might be undertaken. Each project should have one or more objectives, and the next step in the process should not be taken until these can be explicitly stated.

(2) Planning a Research Design

The choices of research design depend on how much is known about the problem. Procedures typically include selection of subjects and selection

or development of measurement methodologies. The design of the study will dictate to a great extent the specific procedures involved in the study.

(3) Planning a Sample

Method of Selecting a Sample

Selection of a sample is very important step in conducting a research study because the quality of the sample determines the generalizability of the results. Sampling is the process of selecting a number of units for a study in such a way that the units represent the larger group from which they were selected. The individuals who are selected comprise a sample; the larger group referred to as population. There are techniques or procedures as follows:

(a) Random Sampling or Simple Random Sampling

Random sampling is the process of selection of a sample in such a way that all individuals in defined population have an equal and independent chance of being selected for a sample. In other words, every individual has the same probability of being selected.

(b) Stratified Random Sampling

Stratified random sampling is the process of selecting a sample in such a way that identified subgroups in the population are represented in the sample in the same proportion that they exist in the population. Researcher often considers stratified random if they believe the population is subdivided into strata such that the variability within each stratum is less than the variability within the entire population.

(c) Cluster Sampling

Cluster sampling is a technique in which the population is subdivided into groups or "cluster". Therefore, cluster sampling is sampling in which groups, not individuals, are randomly selected. To be part of cluster, all the members of the selected groups must have similar characteristics. A cluster sampling is good alternative for selecting samples when personal interviews are involved.

In cluster sampling, sampling efficiency is improved by decreasing cost at the faster rate than accuracy. Like stratified sampling, cluster sampling is a two step process. Unlike stratified sampling, the process of cluster sampling involves dividing the population into subgroups, here it is termed cluster instead of strata.

(d) Systematic Sampling

Systematic sampling in which individuals are selected from a list by taking every Kth name. What's "Kth" name? It really goes back to the old system of counting off (one-two-one-two and so on). Thus, if the population contains 10,000 (=N) people and a sample size of 1,000 (=n) is desired, every tenth (=I, sampling interval) person is selected for the sample.

Determination of Sample Size

Zikmund (2000) said that a primary characteristic of a good sample is the degree to which it is representative of the population from which is selected because the purpose of sampling is to gain information about population.

Churchill (1992) stated that the sample size could be found by formula as below:

$$n = (Z^2)(6^2)/H^2$$

where

n = sample size

H = desired precision

6 = population standard deviation

Z = level of confidence

Under the infinite population, the statistic formula to be used to determine the sample size is:

$$n = (PQ)Z^2/I^2$$

where

n = sample size

p = portion with attribute

Z = number of standard deviation above and below selected "p" containing the required portion of case) to equal to confidence level require.

I = Interval range

The sample size can be found by formula of Taro Yamane (ประคอง 2538) as following;

$$n = N/(1+Ne^2)$$

where

n = the size of group to take samples

e = tolerance of sampling error

N = total population

The formula of finding the sample size is following (Aaker, Kumar and Day 1998)

$$n = Z^2 6^2/(\text{Sampling error})^2$$

where

n = sample size

6 = population standard deviation

(S is used if 6 is unknown)

Z = confidence level

s = sample standard deviation

Sampling error = allowed sampling error

(4) Collecting Data

The choice of data collection method is a critical point in the research process. Often the information that we need to solve the problem already exists in the form of (a) secondary data, or data that have already been collected for some purpose other than question on hand. If the information needed is not readily available, or if it is available only in the form

unsuitable for the problem at hand, then the research must depend on (b) primary data, which are collected specially for the study.

(a) Secondary Data

The significant advantages of secondary data are the cost and time economies they offer the researcher. If the information being sought is available as secondary data the researcher need simply go to library, locate the appropriate source or sources, and extract and record the information desired.

Despite the many potential benefits of secondary data, they also have a number of limitations. By definition, secondary data are data that were collected in the past for purposes other than the current research. Hence, problems of fit are likely to occur in the data required for current research and available data. The available data may have a different unit of measurement from what is required.

(b) Primary Data

One type of primary data of great interest to researcher is the subject's demographic and socioeconomic characteristic such as age, education, occupation, marital status, sex, income or social class. These variables are used to cross-classify the collected data and in some way make sense of them.

Aaker, Kumar and Day (1998) state that primary data are collected especially to address a specific research objective. A variety of methods, ranging from qualitative research to surveys to experiments may be employed.

(1) Qualitative Research

The purpose of qualitative research is to find out what is in a person's mind. Qualitative data are collected to know more about things that cannot directly be observed and measured. These methods are less structured and more intensive than standardized questionnaire based interview. Qualitative research can be separate into 3 methods:

(a) Individual In-depth Interviews

Individual in-depth interviews are interviews that are conducted face-to-face with the respondent, in which the subject matter of interview is explored in detail. There are 2 basic types of in-depth interviews as follows:

(1) Non Directive Interviews

In non-directive interviews, the respondent is given maximum freedom to respond, within the bounds of topics of interest to the interviewer.

(2) Semistructured or Focused Individual Interviews

Interview attempts to cover a specific list of topics or subareas.

(b) Focus Group Interview Discussions

A focus group interview discussion is the process of obtaining possible ideas or solution to a problem from a group of respondents by discussing it. The emphasis in this method is on the results of group interaction when

focused on a series of topics a discussion leader introduces.

(c) Projective Techniques

Projection techniques are used when it is believed that respondents will not or cannot respond meaningfully to direct question about the reasons for certain behavior or attitudes.

Burns and Bush (2000) stated that projective technique involve situations in which participants are placed in (project into) simulated activities in the hopes that they will divulge things about themselves that they might not reveal under direct questioning. Projective techniques are appropriate in situations in which the researcher is convinced that respondents will be hesitant to relate their true opinions.

The most common projective techniques in business research are:

(1) Word association

(2) Completion test / Sentence completion

(3) Picture interpretation / Thematic apperception test (TAT)

(4) Third-person techniques

(5) Role playing

(b) Observational / Experiment Method

Observation is a controlled regarding either of the events or when applied to individuals, of respondent's behavior. The mean of observation may be personal or mechanical (Blankenship, Breen and Dutka 1998).

Experiment, holds the greatest potential for establishing cause and effect relationship. The use of experimentation allows investigation of change in a variable, such as productivity, while manipulating one or two other variables under controlled condition (Zikmund 2000).

Aaker, Kumar and Day (1998) separated the observation method into:

(1) Direct observation

(2) Contrived observation

(3) Content analysis

(4) Physical trace measure

(5) Humanistic inquiry

(6) Behavior-recording devices

(3) Survey Method

The survey is the overwhelming choice for collecting primary data. The principal advantage of a survey is that it can collect a great deal of data about an individual respondent at one time. the second advantage of this method is versatility, survey can be employed in virtually any setting and are adaptable to research objectives.

There are four basic survey methods as follows:

(a) Personal Interview

(b) Telephone Interview

(c) Mail Survey

(d) Fax survey

Alvin C. and Ronald (2000) said that the most common method of generating primary data is through survey. A survey is a research technique in which information is gathered from a sample of people by use of a questionnaire.

(5) Analyzing the Data

Data analysis usually involves application of one or more statistical techniques. Data are analyzed in a way that permits the researcher to test the research hypothesis or answer the research question. The researcher may amass a mountain of data, but it is useless unless the findings are analyzed and the results interpreted in the right of the problem on hand.

(6) Formulating the Conclusion and Preparing the Report

The conclusions are based on the results of the data analysis. They should be stated in terms of the original hypothesis or question. Thus, it is imperative that the research report be accurate and clear, since no matter how well all previous steps have been completed, the project will not be successful than the research report. One empirical study that investigated the factors determining the extent to which research results are used by firms found that the research report is one of the five most important determinants.

2.3.2 Research Instruments

Researcher has two choices of two main research instruments in collecting primary data: the questionnaire and mechanical devices. The questionnaire is by far the most common instrument in collecting primary data. The questionnaire consists of a set of questions presented to respondents for their answer. The questionnaire is very flexible in that there are many numbers of ways to ask questions. Questionnaires need to be carefully developed, tested, and debugged before they are administered on a large scale (Kotler, Leong, Tan and Ang 1996).

Gay and Diehl (1992) state that questionnaire is a written methodology for collecting information and/or opinions regarding the current state of population.

The careful construction of a questionnaire is essential to the success of a survey. First of all, questions must be designed to elicit information that meets the data requirements of the study. Questions must be clear, easy to understand, and directed toward a definable objective. Until those objectives have been defined, researchers should not attempt to develop a questionnaire, for the composition of the questions depends on the nature of the objective and the details demanded. One common mistake in questionnaire construction is to ask questions that interest the researchers but do not provide information that helps in deciding whether to accept or reject a hypothesis. Finally, the most important rule is maintaining an unbiased, objective approach in composing questions (Pride and Ferrell 1985).

There are many potential errors that can be made when compelling a questionnaire, as follows: (Proctor 1996)

(a) Including irrelevant questions

(b) Including unanswerable questions

(c) Omitting important questions

(d) Including ambiguous questions

(e) Including leading or biased questions

In preparing a questionnaire, the researcher has to carefully choose the questions and their form, wording, and sequence (Kotler 1991)(Kotler, Leong, Tan and Ang 1996) (Kotler and Armstong 1994)(Proctor 1996).

(a) Sequence.

Care should be exercised in the sequencing of questions. The lead questions should be for creating interest when possible. Difficult or personal questions should be asked towards the end of the interviews so that the respondents do not become defensive. The questions should follow a logical order, and personal questions should be left to the last. Classificatory data on the respondent are put the last because they are more personal and less interesting to the respondent.

(b) Wording

Care should also be exercised in the wording of questions. The researcher should use simple, direct, unbiased wording. The questions should be pretested with a sample of the respondents before they are formally included.

(c) Forms

The form of the question can influence the response. There are two kinds of question forms as follows:

(1) Open-ended Question

Open-ended question is a question characterized by the condition that the respondents are free to reply in their own words

rather than being limited to choosing from among a set of alternatives (Churchill 1992).

Kotler and Armstrong (1994) state that open-ended questions are especially useful in the exploratory stage of research where the researcher is looking for insight into how people think rather than in measuring how many people think in a certain way.

There are 5 types of open-ended questions as follows:

(a) Completely Unstructured

A question that the respondents can answer in an almost unlimited number of ways.

(b) Word Association

The respondents are required to respond with the first word that comes to mind when presented with the selection of words. The test words are intermixed with neutral words to conceal the purpose of the study.

Response to each of the key terms are recorded word-for-word and later analyzed for their meaning. The responses are usually judged in three ways: by the frequency with which any word is given as a response, by the average amount of time that elapses before response is given, and by the number of respondents who do not respond at all to a test word after a reasonable period of time (Churchill 1992).

(c) Sentence Completion

With a sentence completion, respondents are given incomplete sentences and asked to complete them in their own

words. The researcher then inspects that exists. The notion they have is that respondents will reveal something about themselves in their responses (Burns and Bush 2000).

(d) Story Completion

An incomplete story is presented, and respondents are asked to complete it.

(e) Picture Completion

An ambiguous picture is presented to someone in which one character is making a statement, shown in a balloon. Respondents are asked to identify with the other and fill in the empty balloon.

(f) Thematic Apperception Tests (TAT)

A test consisting of a series of pictures shown to research subjects who are then asked to provide a description of the picture. The researcher analyzes the content of these descriptions in an effort to clarify a research problem. Pictorial material such as cartoons, photographs, or drawings is often used in this approach, although other stimuli are also used.

(2) Close-ended Question

Close-ended questions prespecify all the possible answers, and respondents make a choice among them. The questions provide answers that are easier to tabulate and interpret.

Kotler (1991) separated the type of close-ended questions into:

(a) Dichotomous

(b) Multiple choice

(c) Likert scale

(d) Semantic differential

(e) Importance scale

(f) Rating Scale

(g) Intention-to-buy scale

Proctor (1996) separated the type of close-ended questions into:

(a) Dichotomous

(b) Multiple choice

(c) Likert scale

(d) Semantic differential

(e) Rating scale

(f) Staple scale

The descriptions of each type of close-ended questions are as follows:

(a) Dichotomous

A fixed-alternative question in which respondents are asked to indicate which of the two possible alternative responses most closely corresponds to their position on a subject. There are usually yes and no. For example: Did you buy your hi-fi on credit items? ❒ Yes ❒ No

(b) Multiple Choice

Multiple choice is a question with three or more answers. The respondents are given a choice of answer and must check one. This model requires the researcher's idea of range of possible responses.

(c) Likert Scale

Likert scale requires a respondent to indicate a degree of agreement or disagreement with a variety of statements related to the attitude or object. They are also called summated scales, because the scores on the individual items are summed to produce a total score for the respondent. A Likert scale usually consists of two parts, the items part and the evaluative part. The items part is essentially a statement about a certain product, event, or attitude. The evaluative part is a list of response categories ranging from "strongly agree" to "strongly disagree". An important assumption of this scaling method is that each of the items (statements) measure some aspect of a single common factor; otherwise, the items cannot legitimately be summed. In other words, the resulting scale is unidimensional (Aaker, Kumar and Day 1998).

(d) Semantic Differential

This, too, assesses people's attitudes and comprises a scale running between two bipolar adjectives. People indicate a point between the two extremes that reflects their own feelings towards a given statement. For example:

<u>Thai Airways</u>

Large	❒	❒	❒	❒	❒	Small
Modern	❒	❒	❒	❒	❒	Old-fashioned

(e) Importance Scale

A scale that rates the importance of some attribute, from "not important at all" to "extremely important".

(f) Rating Scale

A scale that rates some attributes, from "poor" to "excellent".

(g) Intention-to-buy Scale

A scale that describes the respondent's intention to buy product or/and services. The example is as follows:

"If an in-flight telephone was available on a long flight, I would"

Definitely use	Probably use	Not sure	Probably not use	Definitely not use

(h) Staple Scale

The respondents are asked to select a plus number for words that they think describes the service (or product) accurately. The more accurate they think the description is the larger should be the plus number selected. Conversely, they must select minus number for words, which they feel, do not describe the service (or product). The less accurate they believe the description to be, the larger should be the minus number selected. The example is as below:

+5	+5
+4	+4
+3	+3
+2	+2
+1	+1
Helpful	Reliable
-1	-1
-2	-2
-3	-3
-4	-4
-5	-5

III. RESEARCH METHODOLOGY

3.1 Population and Sample Size

(a) Population of This Research

Population of this research is the alumni of Master's Degree Program of Science in Computer and Engineering Management MS(CEM). The total population is 872 persons.

(b) Sample Size

The sample size of this research can be found by using the formula below: (ประคอง 2538)

$$n = N/(1+Ne^2)$$

where

n = the size of group to take samples

N = total population

e = tolerance of sampling error

There are 872 persons who are alumni of CEM and the tolerance of sampling error for this research is no more than 7 percent. Therefore, the calculation of sample size is:

$$n = 872/[1+(872*0.07^2)]$$

$$= 872/(1+4.2728)$$

$$= 165.377$$

$$= 165 \text{ samples}$$

3.2 Research Tool

The aims of this research is to study of the opinions and needs of computer and engineering management students towards the curriculum. To achieve the research objective, a survey method is research technique choice for collecting data in which information is gathered by using a questionnaire.

The questionnaire is prepared for the project purpose and the researcher designed questionnaire from the studied books, theses, bulletins, documents and other researches that related to the evaluation of curriculum both in Thai and English. In addition, the questionnaire was checked for the correctness and validity by the advisor and was tested by 10 CEM students. After that the advisor improved and added some points in order to make it better before sending it to the samples.

Questionnaire is prepared in English and it is separated into 2 parts:

Part I: Likert Scale.

This part is related to the opinions and needs of CEM students toward the curriculum. They are also divided into 4 sections that consist of:

(1) Purposes of the curriculum

(2) Structure of the curriculum

(3) Content of the curriculum

(4) Evaluation of the curriculum

In addition, the respondents are asked to indicate whether the statement reflected to his or her view. The evaluative part is a list of response categories ranging from "strongly agree" to "strongly disagree" which are arranged in 5 levels as following:

5 Strongly agree

4 Agree

3 Neither agree nor disagree

2 Disagree

1 Strongly Disagree

Part II: Multiple Choice.

In this part, the question is related to the personal information of the respondents including ID number, gender, age, education background and occupation.

3.3 Data Collection

The needed and essential information from research study will be obtained and gathered by using questionnaire with random sampling of 165 respondents. The researcher submitted the questionnaire to the alumni of MS(CEM) by mail during 1st to 31st August 2001.

3.4 Data Analysis

(a) Data from Part I (Multiple choice)

The researcher analyzed the information of respondent's status by calculating the percentage of the respondents in the form of the table as following:

(1) The number of students by ID number.

(2) The number of students by gender.

(3) The number of students by age.

(4) The number of students by education background.

(5) The number of students by employment.

(b) Data from Part II (Likert Scale)

In this part, the data was analyzed by using SPSS program (Statistical Package for the Social Sciences) version 10.0.7. The researcher analyzed the information by calculating percentage, mean and standard deviation of each result. The formulas are shown as below:

(1) The Mean of Each Result

The marks of each level are defined as follows:

Strongly agree	5
Agree	4
Neither agree nor disagree	3
Disagree	2
Strongly Disagree	1

From the above mark, the mean can be calculated by using the following formula:

$$\overline{X} = \frac{\Sigma x}{N}$$

where

Σx = total amount of each rate

N = total number of the respondents

After getting the mean, the researcher brought the mean of each rate to calculate the weight average and then defined the level of weighted average as following:

4.51 - 5.00	Strongly agree
3.51 - 4.50	Agree
2.51 - 3.50	Neither agree nor disagree
1.51 - 2.50	Disagree
1.00 - 1.50	Strongly Disagree

(2) Standard Deviation (S.D.)

The standard deviation of this research can be found by using the formula below: (Glass and Stanley 1970)

$$S.D. = \sqrt{\frac{\Sigma x^2 - [(\Sigma x)^2 / n]}{n - 1}}$$

where

S.D. = standard deviation

Σx^2 = sum of weighted average squared

Σx = sum of score

n = total number of the respondents

IV. RESULTS AND DISCUSSION

In this chapter, the researcher analyzed the data of the survey based on the conceptual framework in Chapter 3. The data analyses are separated into 2 parts as following:

(1) Part I: The personal information of focused group by calculating the results of each question in the form of percentage.

(2) Part II: The opinions and needs of CEM students toward the curriculum by calculating percentage, means and standard deviation of each question in the form of table.

4.1 Results and Discussion of the Personal Information

The personal information of alumni of MS(CEM) are ID number, gender, education background and occupation. The data is presented in the form of table and figure by calculating the percentage of each question.

Table 4.1. Frequency and Percentage of the Focus Group, Categorized by ID Numbers.

ID number	Frequency	Percentage	Cumulative Percentage
(1) 339-xxxx	0	0	0
(2) 333-xxxx	1	0.6	0.6
(3) 342-xxxx	3	1.8	2.4
(4) 351-xxxx	8	4.8	7.2
(5) 353-xxxx	2	1.2	8.4
(6) 361-xxxx	9	5.5	13.9
(7) 371-xxxx	8	4.8	18.7
(8) 373-xxxx	5	3.0	21.7
(9) 382-xxxx	5	3.0	24.7
(10) 391-xxxx	16	9.7	34.4
(11) 393-xxxx	18	11.0	45.4
(12) 402-xxxx	14	8.5	53.9
(13) 411-xxxx	34	20.6	74.5
(14) 413-xxxx	42	25.5	**100.0**
Total	**165**	**100.0**	

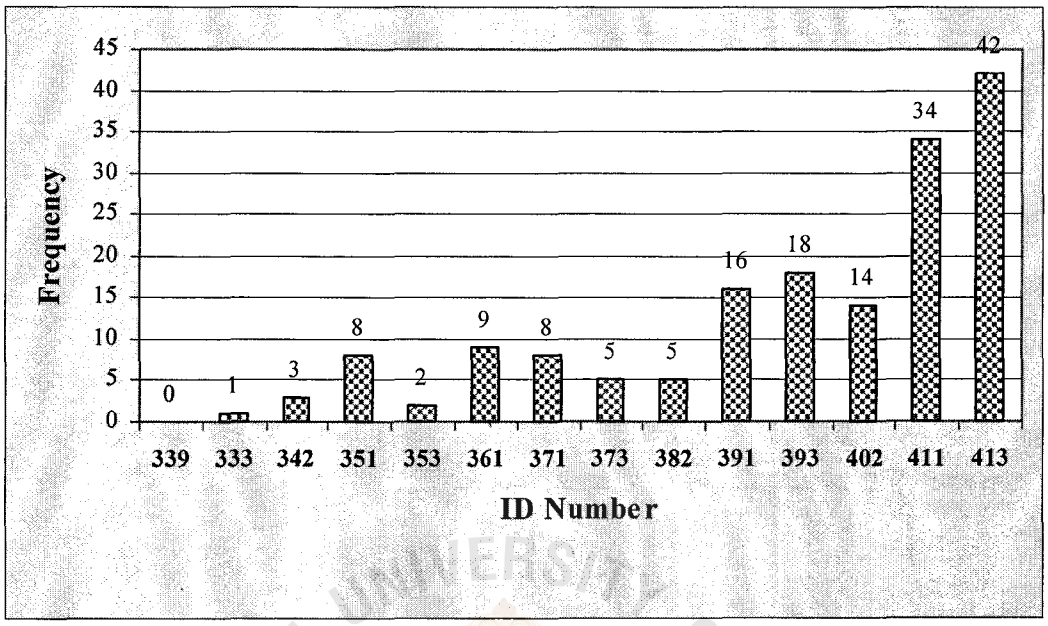

Figure 4.1. Frequency of the Focus Group, Categorized by ID Numbers.

Table 4.1 shows the personal information of the focus group based on student ID number. The focused group is divided into 13 groups of 165 alumni students. The majority of the focus group is the students with ID 413 (42 persons or 25.5%), student with ID 411 (34 persons or 20.6%), students with ID 393 (18 persons or 11%), students with ID 391 (16 persons or 9.7%), students with ID 402 (14 persons or 8.5%), students with ID 361 (9 persons or 5.5%), students with ID 371 (8 persons or 4.8%), students with ID 351 (8 persons or 4.8%), students with ID 373 (persons 3%), students with ID 382 (persons 3%), students with ID 342 (persons 1.8%), students with ID 353 (persons 1.2%) and ID students with 333 (persons or 0.6) respectively.

Table 4.2. Frequency and Percentage of the Focus Group, Categorized by Gender.

Gender	Frequency	Percentage	Cumulative Percentage
(1) Male	80	48.5	48.5
(2) Female	85	51.5	**100.0**
Total	**165**	**100.0**	

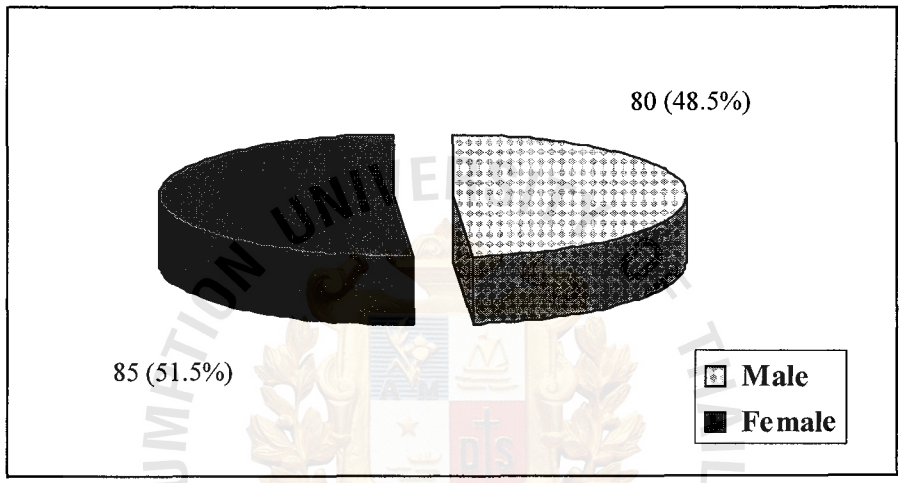

Figure 4.2. Frequency and Percentage of the Focus Group, Categorized by Gender.

Table 4.2 shows the focus group categorized by gender. There are totally 165 respondents in this research. The majority of the focus group consists of female 85 persons (51.5%) and male 80 person (48.5%).

Table 4.3. Frequency and Percentage of the Focus Group, Categorized by Age.

Age	Frequency	Percentage	Cumulative Percentage
(1) 22 years or lower	0	0	0
(2) 23 – 26 years	50	30.3	30.3
(3) 27 – 30 years	77	46.7	77.0
(4) 31 –34 years	28	16.9	93.9
(5) 35 years and over	10	6.1	**100.0**
Total	**165**	**100.0**	

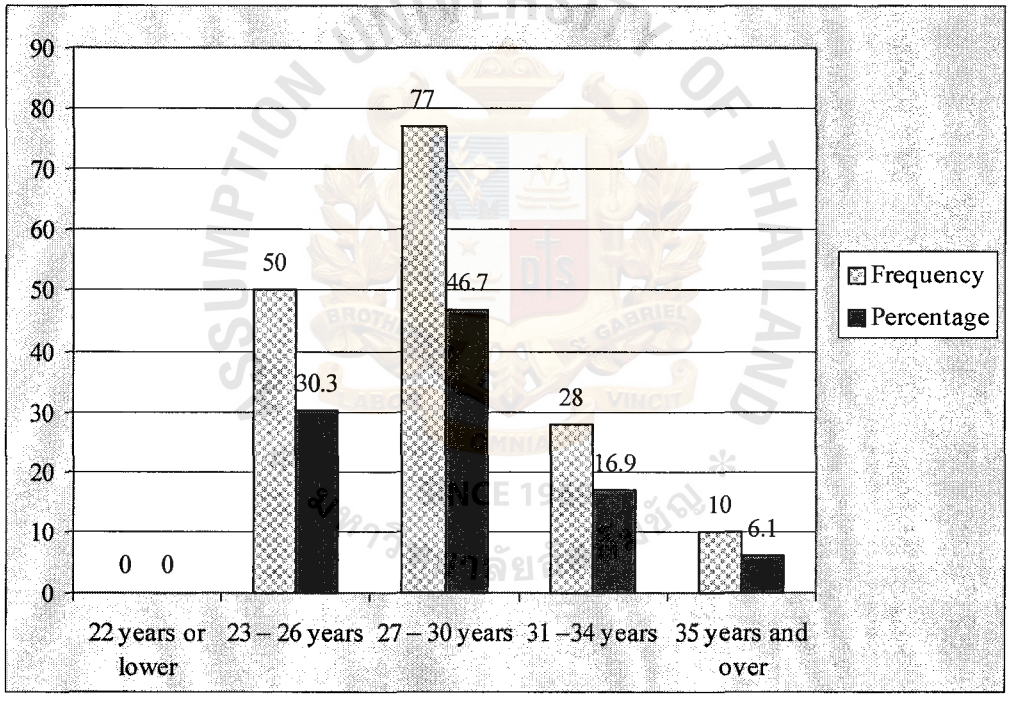

Figure 4.3. Frequency and Percentage of the Focus Group, Categorized by Age.

Table 4.3 shows that the majority of the focused group is aged between 27-30 years (46.7%), 23-26 years (30.3%), 31-34 years (16.9%), and 35 years and over (6.1%) respectively.

Table 4.4. Frequency and Percentage of the Focus Group, Categorized by Education Background.

Education Background	Frequency	Percentage	Cumulative Percentage
(1) Business Background	74	44.8	44.8
(2) Computer, Science or Engineering Background	73	44.2	89.0
(3) Neither of them	18	11.0	**100.0**
Total	**165**	**100.0**	

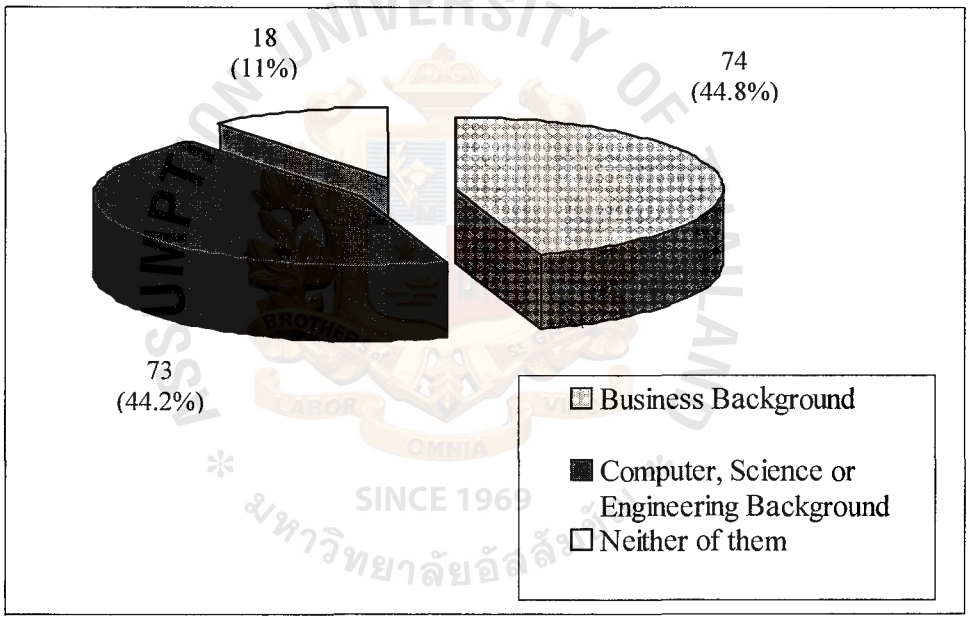

Figure 4.4. Frequency and Percentage of the Focus Group, Categorized by Education Background.

From Table 4.4, according to the education background, most of the students out of 165 students have business background, equivalent to 44.8% (74 persons) and computer or science or engineering background 44.2% (73 persons). Moreover some of the focus group have chosen neither of them, it is equivalent to 11% (18%).

Table 4.5. Frequency and Percentage of the Focus Group, Categorized by Occupation.

Occupation	Frequency	Percentage	Cumulative Percentage
(a) Private employee	119	72.1	72.1
(b) Business owner / independent career	24	14.6	86.7
(c) Civil servant	2	1.2	87.9
(d) State enterprise employee	12	7.3	95.2
(e) Students	3	1.8	97
(f) Unemployed	2	1.2	98.2
(g) Others	3	1.8	**100.0**
Total	**165**	**100.0**	

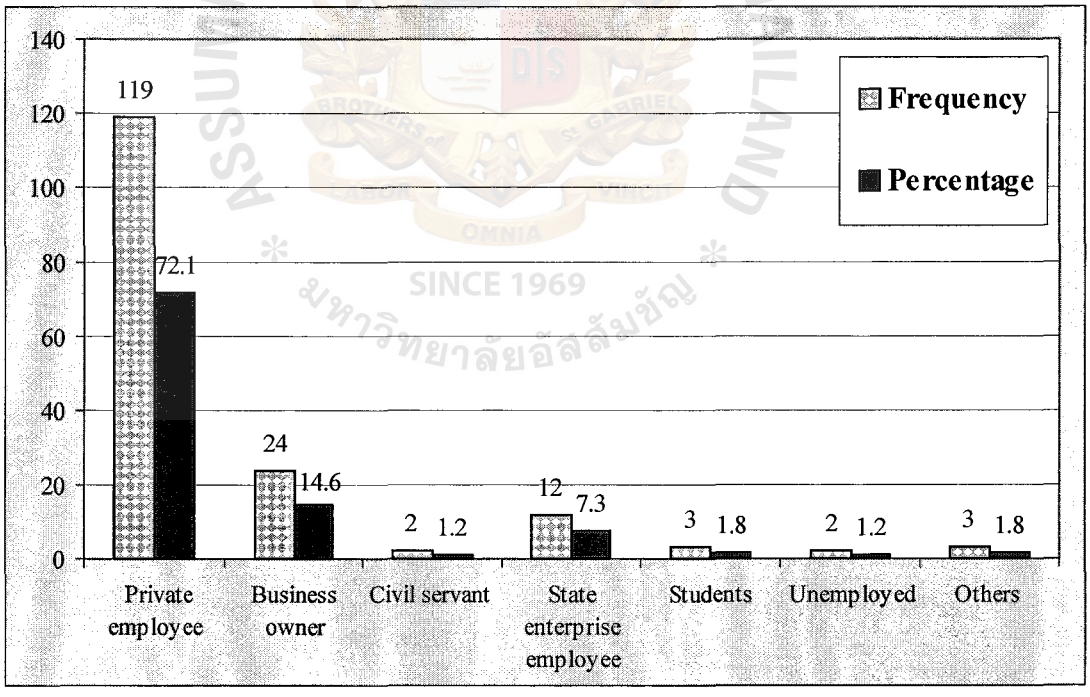

Figure 4.5. Frequency and Percentage of the Focus Group, Categorized by Occupation.

Table 4.5 shows that the personal information of focused group based on the variable "occupation", the majority of the focused group is private employee (72.1%), business owner or independent career (14.6%), state enterprise employee (7.3%), students (1.8%), others (1.8%), unemployed (1.2%) and civil servant (1.2%) respectively.

Additionally, some of the focused have chosen other answers, equivalent to 3 persons or 1.8%. Due to the fact that their occupation is housewife.

4.2 Result and Discussion of the Opinions and Needs towards the Curriculum

This part is related to the opinions and needs of CEM students toward the curriculum. The focus group is asked to indicate whether the statement reflected to his or her view and list of response categories ranging from "strongly agree" to "strongly disagree". The result is divided into 4 parts and is summarized as follows:

Purposes of the Curriculum

Table 4.6. The Distribution of Student's Opinions on the Purposes of to Have Adequate Knowledge to Be in Managerial Positions in Technical-Related Enterprises.

Opinion	Frequency	Percentage	Cumulative Percentage
Strongly agree	23	14.0	14.0
Agree	83	50.3	64.3
Neither agree nor disagree	53	32.1	96.4
Disagree	5	3.0	99.4
Strong disagree	1	0.6	**100.0**
Total	**165**	**100.0**	

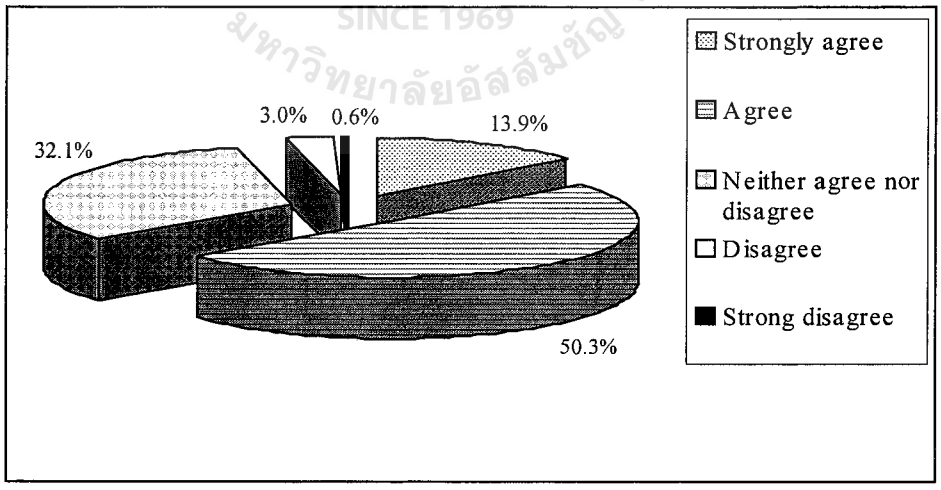

Figure 4.6. Percentage of Student's Opinions on the Purposes of to Have Adequate Knowledge to Be in Managerial Positions in Technical-Related Enterprises.

Table 4.6 and Figure 4.6 show that the majority of students agree that this curriculum gives them an adequate knowledge to be in managerial positions in technical-related enterprises (50.3%), students neither agree nor disagree that this curriculum gives them an adequate knowledge to be in managerial positions in technical-related enterprises (32.1%), students strongly agree that this curriculum gives them an adequate knowledge to be in managerial positions in technical-related (14.0%), and there are only 3.0% of them who disagree and 0.6% of them who strongly disagree with this purpose.

Table 4.7. The Distribution of Student's Opinions on the Purposes of to Have Adequate Knowledge to Be a Problem Solver for Manufacturing and Service Industries.

Opinion	Frequency	Percentage	Cumulative Percentage
Strongly agree	12	7.3	7.3
Agree	73	44.2	51.5
Neither agree nor disagree	70	42.4	93.9
Disagree	10	6.1	**100.0**
Strong disagree	0	0	
Total	**165**	**100.0**	

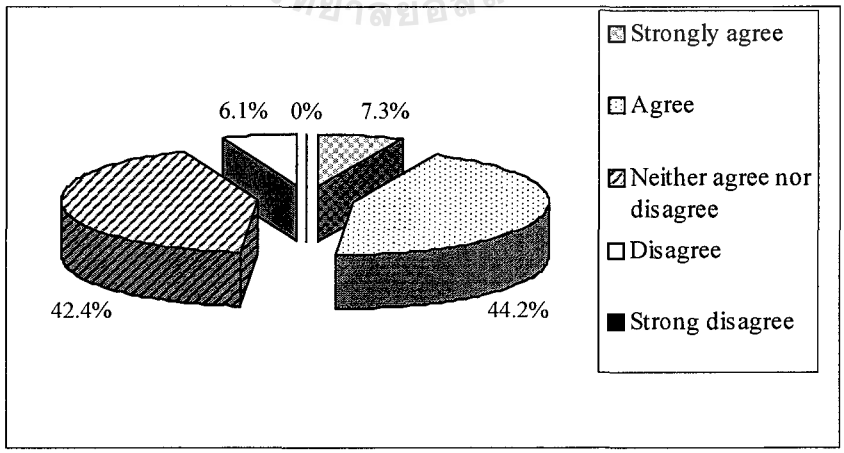

Figure 4.7. Percentage of Student's Opinions on the Purposes of to Have Adequate knowledge to Be a Problem Solver for Manufacturing and Service Industries.

Table 4.7 and Figure 4.7 show that the majority of the focused group agree that this curriculum gives them adequate knowledge to be a problem solver for manufacturing and service industries (44.2%), neither agree nor disagree for this purpose (42.4%), strongly agree (7.3%), disagree (6.1%) and none of them strongly disagree with this purpose.

Table 4.8. The Distribution of Student's Opinions on the Purposes of to Have Adequate Knowledge to Be a Teacher in Computer and Engineering Management.

Opinion	Frequency	Percentage	Cumulative Percentage
Strongly agree	4	2.4	2.4
Agree	27	16.4	18.8
Neither agree nor disagree	74	44.8	63.6
Disagree	48	29.1	92.7
Strong disagree	12	7.3	**100.0**
Total	**165**	**100.0**	

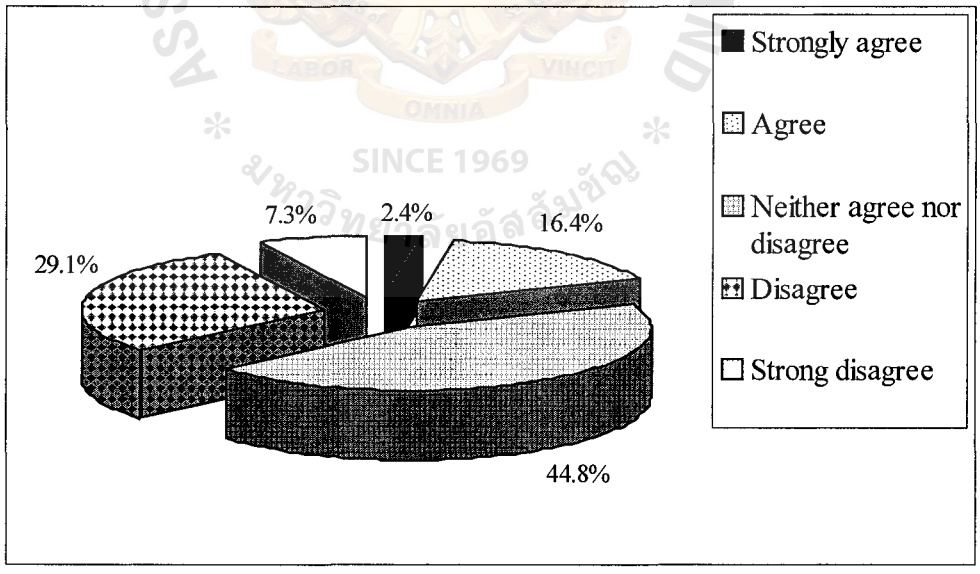

Figure 4.8. Percentage of Student's Opinions on the Purposes of to Have Adequate Knowledge to Be a Teacher in Computer and Engineering Management.

Table 4.8 and Figure 4.8 show that that the majority of the alumni students neither agree nor disagree that this curriculum gives them adequate knowledge to be a teacher in computer and engineering management (44.8%), disagree for this purpose (29.1%), agree (16.4%), disagree (6.1%), strongly disagree (7.3%) and strongly agree (2.4%) respectively.

Table 4.9. The Distribution of Student's Opinions on the Purposes of to have Adequate Knowledge to Be an Entrepreneur in Service and Manufacturing Industries.

Opinion	Frequency	Percentage	Cumulative Percentage
Strongly agree	10	6.1	6.1
Agree	79	47.9	54.0
Neither agree nor disagree	58	35.5	89.1
Disagree	16	9.7	98.8
Strong disagree	2	1.2	**100.0**
Total	**165**	**100.0**	

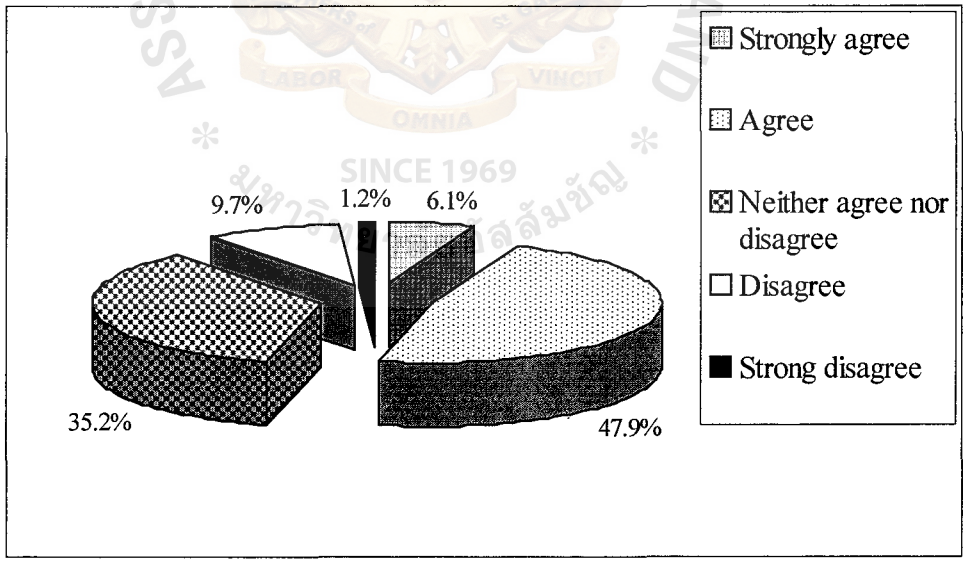

Figure 4.9. Percentage of Student's Opinions on the Purposes of to Have Adequate Knowledge to Be an Entrepreneur in Service and Manufacturing Industries.

Table 4.9 and Figure 4.9, based on the purpose of this curriculum, which the curriculum gives adequate knowledge to be an entrepreneur in service and manufacturing industries. The student's opinions score based on this purpose can rank from the highest score to the lowest score as neither agree nor disagree (43.0%), agree (36.8%), disagree (10.9%), strongly agree (6.1%) and strongly disagree (1.2%) respectively.

Table 4.10. The Distribution of Student's Opinions on the Purposes of to Have Ethics and Responsibilities to Society and to Their Profession.

Opinion	Frequency	Percentage	Cumulative Percentage
Strongly agree	19	11.5	11.5
Agree	71	43.0	54.5
Neither agree nor disagree	54	32.7	87.2
Disagree	14	8.5	95.7
Strong disagree	7	4.2	**100.0**
Total	**165**	**100.0**	

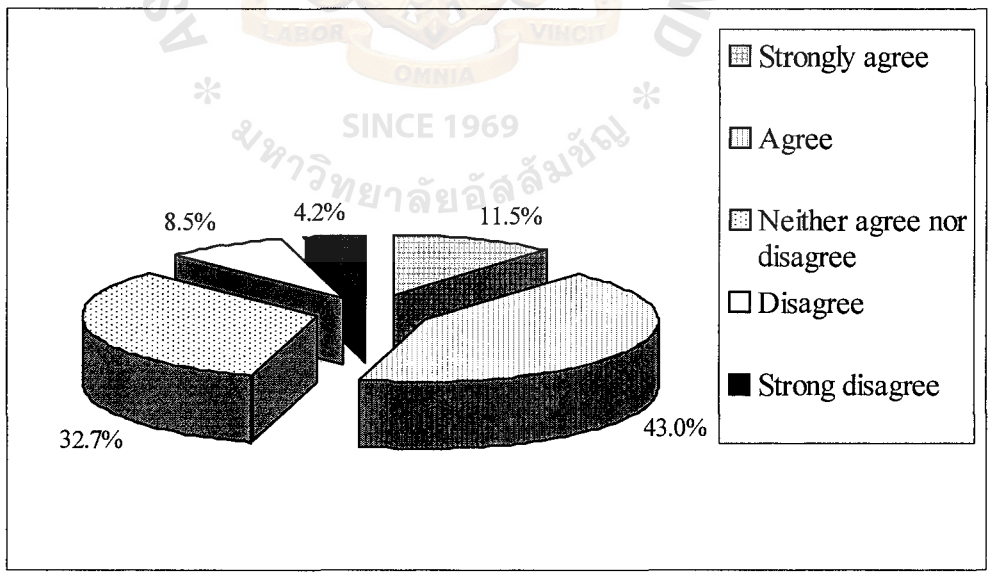

Figure 4.10. Percentage of Student's Opinions on the Purposes of to Have Ethic and Responsibilities to Society and to Their Profession.

Table 4.10 and Figure 4.10 show that the majority of students agree that this curriculum makes them have ethics and responsibilities to society and to their profession (43.0%), neither agree nor disagree for this purpose (32.7%), strongly agree for this purpose (10.5%), disagree (8.5%) and strongly disagree (4.2%) respectively.

Table 4.11. The Summarized Student's Opinions towards the Purposes of the Curriculum.

Statement	Mean	Standard Deviation
1. To have adequate knowledge to be in managerial positions in technical-related enterprises.	3.74	0.76
2. To have adequate knowledge to be a problem solver for manufacturing and service industries.	3.53	0.72
3. To have adequate knowledge to be a teacher in computer and engineering management.	2.78	0.89
4. To have adequate knowledge to be an entrepreneur in service and manufacturing industries.	3.48	0.80
5. To have ethics and responsibilities to society and to their profession.	3.49	0.95

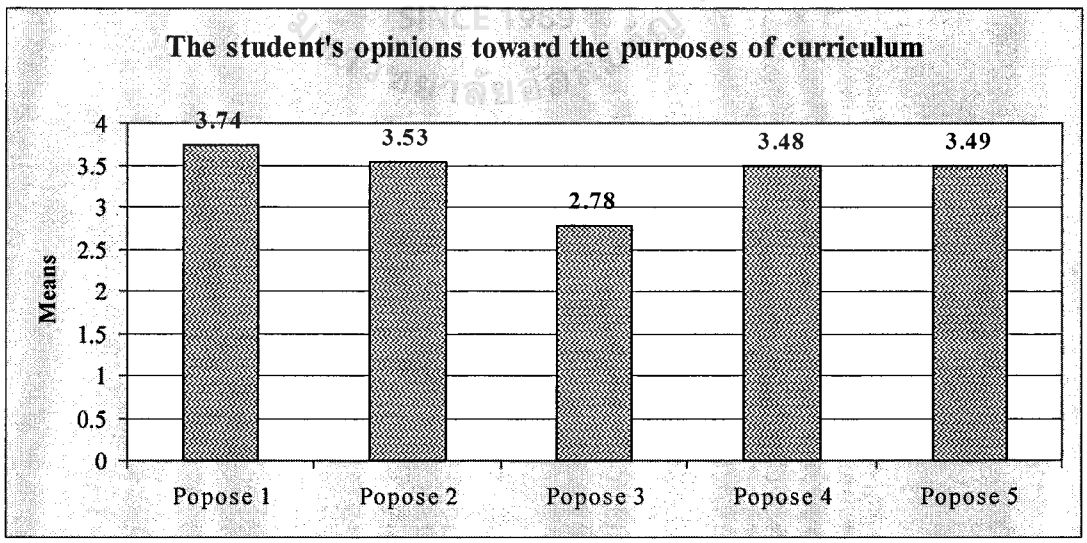

Figure 4.11. The Summarized Student's Opinions towards the Purposes of the Curriculum.

From Table 4.11 and Figure 4.11 there are 5 purposes of the curriculum of Master of Science in Computer and Engineering. According to the purposes of this curriculum, the student's opinions score can be ranked from the highest score to the lowest score as purpose number 1 (score 3.74), purpose number 2 (score 3.53), purpose number 5 (score 3.49), purpose number 4 (score 3.38) and purpose number 3 (2.78) respectively. The score that over 3.40 show that the student's opinions are agreeable with the purpose of the curriculum except the purpose number 3 has scored only 2.78. However, the overall student's opinions towards the purposes of the curriculum are fairly agreeable with score of 3.29.

Structure of the Curriculum

Table 4.12. The Distribution of Student's Opinions on the Number of Courses.

Statements	Opinions	Frequency	Percentage
The number of courses is appropriate. (48 credits)	Strongly agree	23	14.0
	Agree	83	50.3
	Neither agree nor disagree	53	32.1
	Disagree	5	3.0
	Strong disagree	1	0.6
	Total	**165**	**100.0**

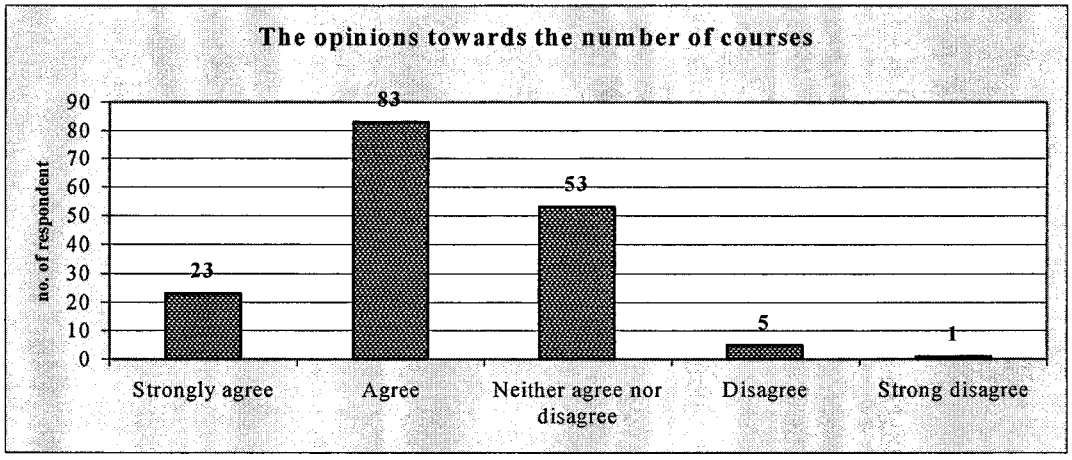

Figure 4.12. Frequency of Student's Opinions on the Number of Courses.

Table 4.12 and Figure 4.12 show that the majority of focused group agrees that the number of courses is appropriate (50.3%), neither agree nor disagree (32.1%), strongly agree (13.9%), disagree (3.0%) and strongly disagree (0.6%) respectively.

Table 4.13. The Distribution of Student's Opinions on the Number of Required Courses.

Statements	Opinions	Frequency	Percentage
The number of required courses is appropriate (21 credits).	Strongly agree	27	16.4
	Agree	85	51.5
	Neither agree nor disagree	34	20.6
	Disagree	16	9.7
	Strong disagree	3	1.8
	Total	**165**	**100.0**

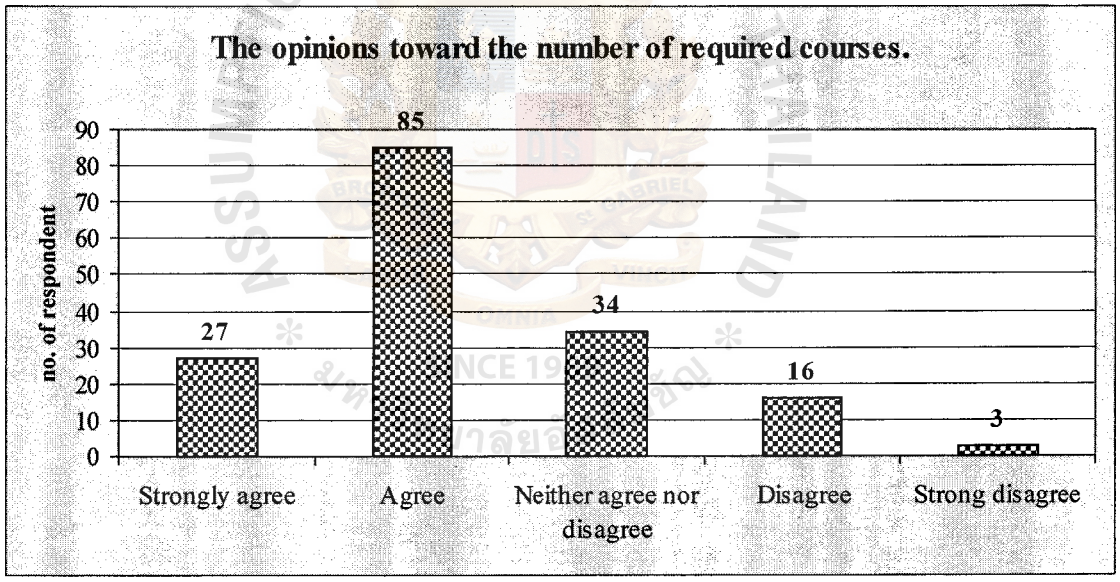

Figure 4.13. Frequency of Student's Opinions on the Number of Required Courses.

Table 4.13 shows that the majority of focused group agrees that the number of required courses is appropriate (51.5%), neither agree nor disagree (20.6%), strongly agree (16.4%), disagree (9.7%) and strongly disagree (1.8%) respectively.

Table 4.14. The Distribution of Student's Opinions on the Number of Required Elective Courses.

Statements	Opinions	Frequency	Percentage
The number of required elective courses is appropriate (12 credits).	Strongly agree	23	14.0
	Agree	64	38.8
	Neither agree nor disagree	54	32.7
	Disagree	21	12.7
	Strong disagree	3	1.8
	Total	**165**	**100.0**

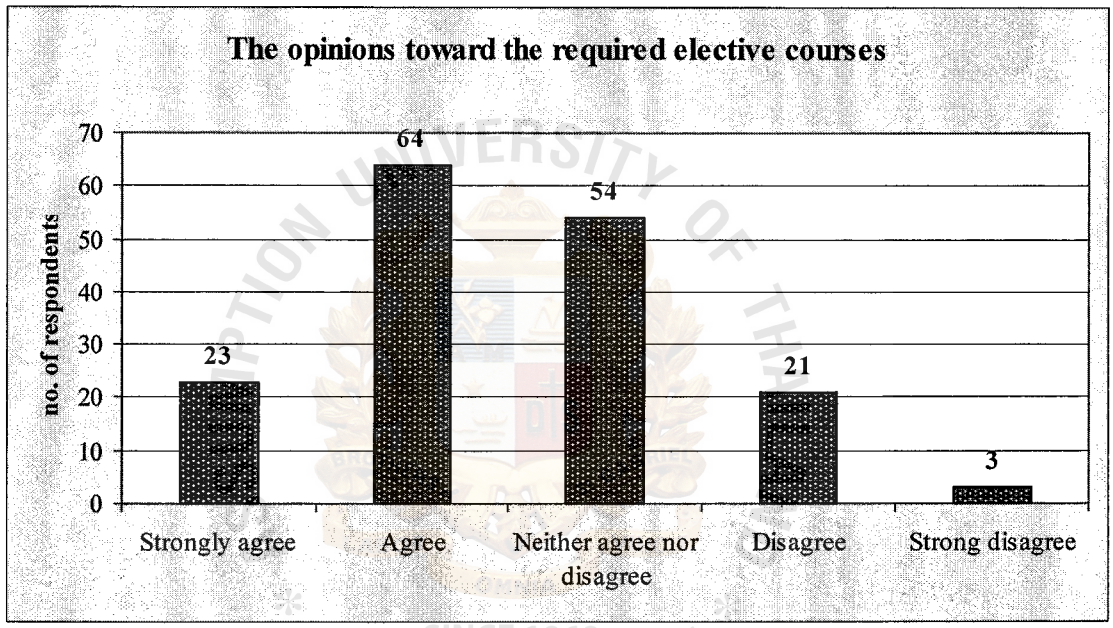

Figure 4.14. Frequency of Student's Opinions on the Number of Required Elective Courses.

Table 4.14 shows that the majority of focused group agrees that the number of required courses is appropriate (51.5%), neither agree nor disagree (20.6%), strongly agree (16.4%), disagree (9.7%) and strongly disagree (1.8%) respectively.

Table 4.15. The Distribution of Student's Opinions on the Number of General Elective Courses.

Statements	Opinions	Frequency	Percentage
The number of general elective courses is appropriate (9 credits).	Strongly agree	21	12.7
	Agree	68	41.2
	Neither agree nor disagree	56	34.0
	Disagree	19	11.5
	Strong disagree	1	0.6
	Total	**165**	**100.0**

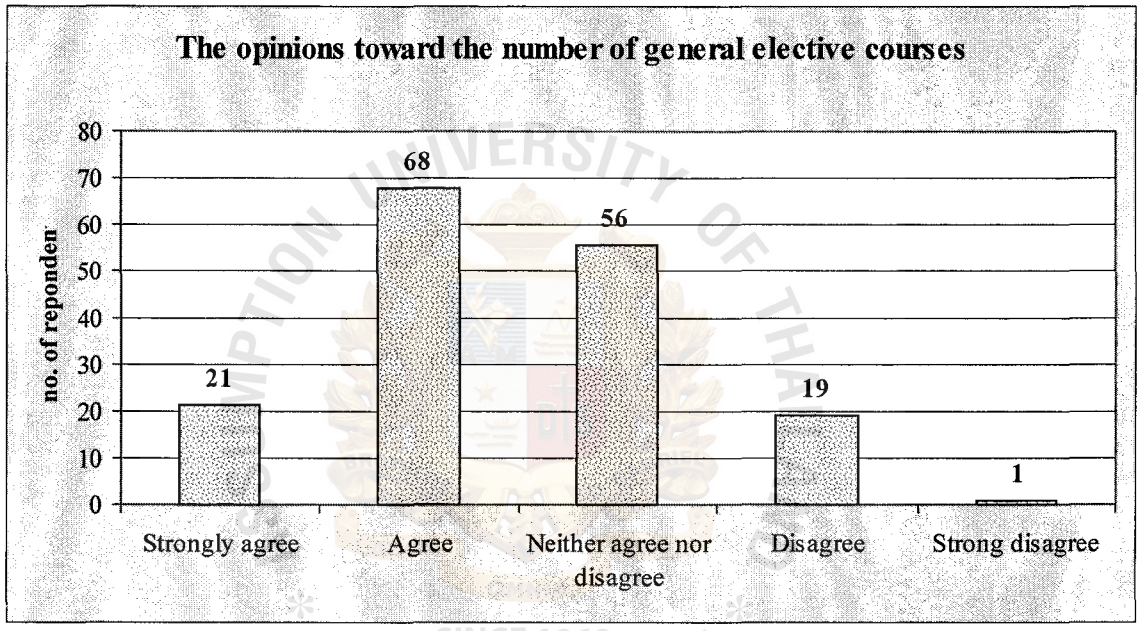

Figure 4.15. Frequency of Student's Opinions on the Number of General Elective Courses.

Table 4.15 shows that the majority of focused group agrees that the number of required courses is appropriate (41.2%), neither agree nor disagree (34.0%), strongly agree (12.7%), disagree (11.5%) and strongly disagree (0.6%) respectively.

Table 4.16. The Distribution of Student's Opinions towards the Proportion among the Number of Required Courses, Required Elective Courses and General Elective Courses.

Statements	Opinions	Frequency	Percentage
The proportion among the number of required courses, required elective courses and general elective courses is appropriate.	Strongly agree	16	9.7
	Agree	79	47.9
	Neither agree nor disagree	50	30.3
	Disagree	17	10.3
	Strong disagree	3	1.8
	Total	**165**	**100.0**

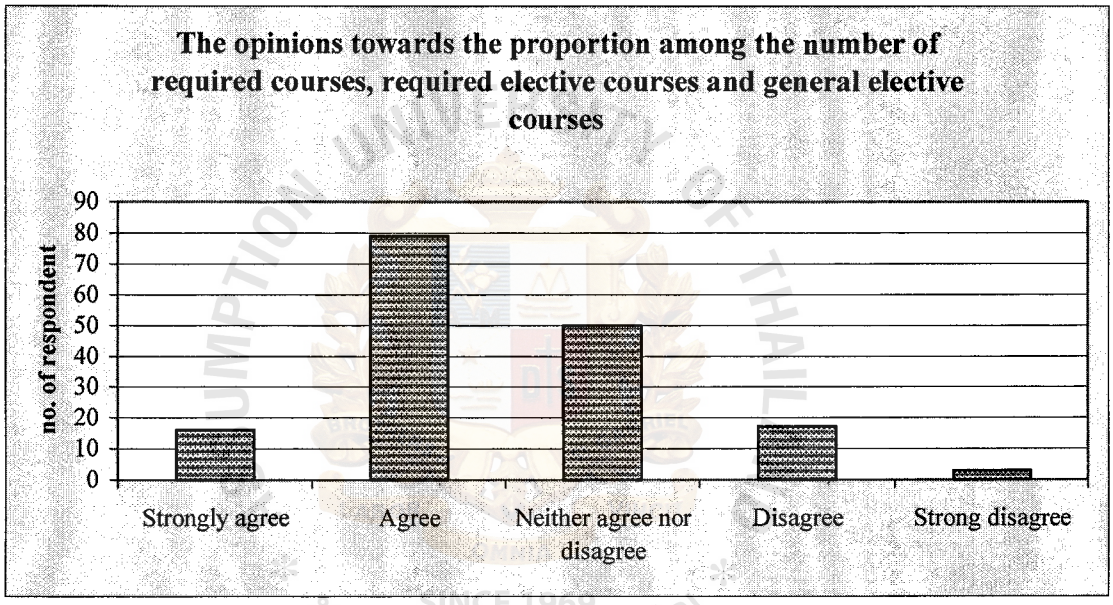

Figure 4.16. Frequency of Student's Opinions towards the Proportion among the Number of Required Courses, Required Elective Courses and General Elective Courses.

Table 4.16 shows that the majority of focused group agrees that the proportion among the number of required courses, required elective courses and general elective courses is appropriate. (47.9%), neither agree nor disagree (30.3%), disagree (10.3%), strongly agree (9.7%) and strongly disagree (1.8%) respectively.

Table 4.17. The Distribution of Student's Opinions on Increasing the Number of Courses.

Statements	Opinions	Frequency	Percentage
The number of courses should be increased (more than 48 credits).	Strongly agree	12	7.3
	Agree	18	10.9
	Neither agree nor disagree	48	29.0
	Disagree	60	36.4
	Strong disagree	27	16.4
	Total	**165**	**100.0**

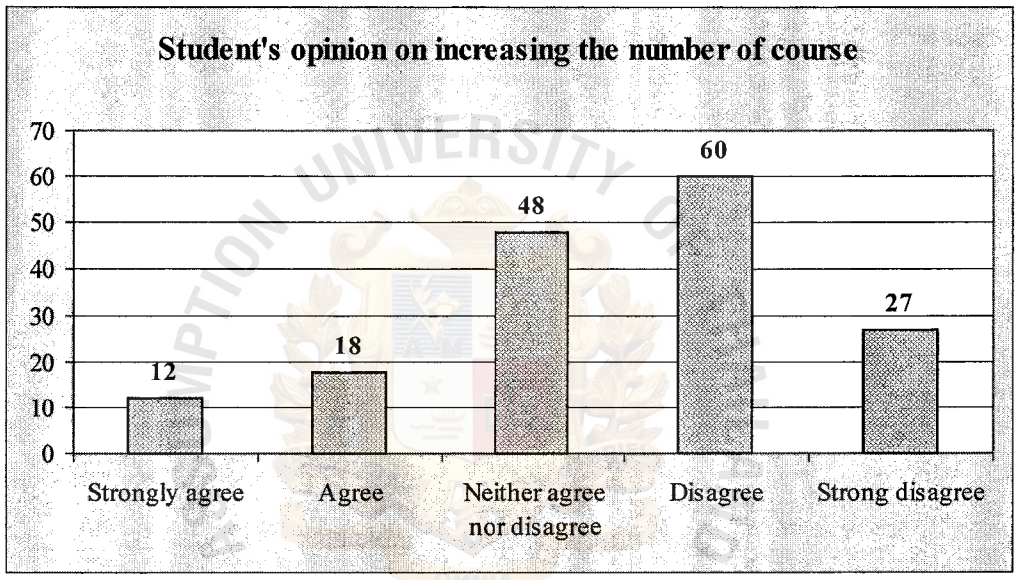

Figure 4.17. Frequency of Student's Opinions on Increasing the Number of Courses.

Table 4.17 is the data about the opinions and needs towards increasing the number of courses. From total of 165 respondents, 87 students (52.7%) gave a negative answer, 30 students (18.2%) gave affirmative answer and 29.0% were neutral. The breakdown is 36.4% disagree, 29.0% neither agree nor disagree, 16.4% strongly disagree, 10.9% agree and 7.3% strongly agree on this topic.

Table 4.18. The Distribution of Student's Opinions on Increasing the Number of Required Courses.

Statements	Opinions	Frequency	Percentage
The number of required courses should be increased (more than 21 credits).	Strongly agree	8	4.8
	Agree	30	18.2
	Neither agree nor disagree	54	32.7
	Disagree	64	38.8
	Strong disagree	9	5.5
	Total	**165**	**100.0**

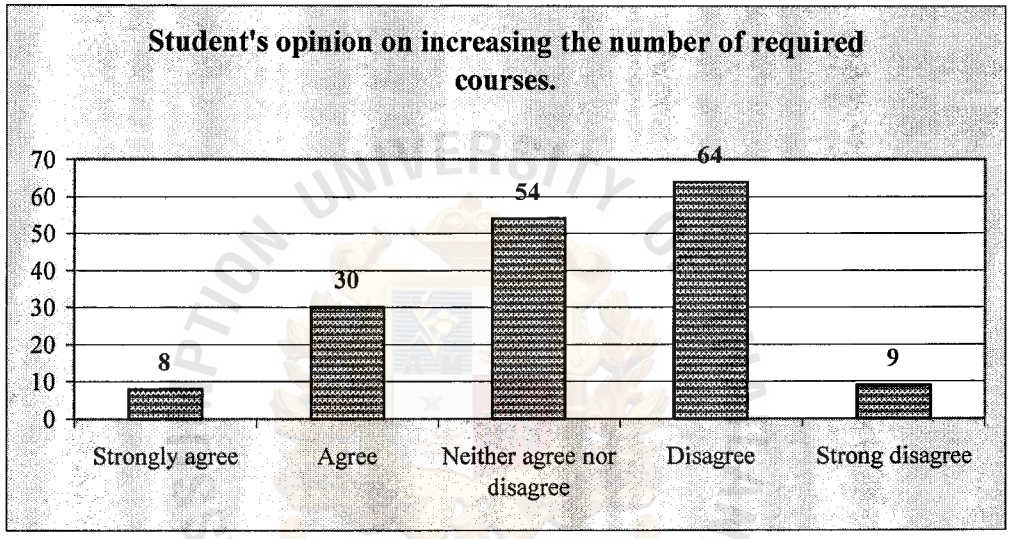

Table 4.18. Frequency of Student's Opinions on Increasing the Number of Required Courses.

Table 4.18 is the data about the opinions and needs toward increasing the number of required courses. From total of 165 respondents, 73 students (44.2%) gave a negative answer, 38 students (23.0%) gave affirmative answer and 32.7% are neutral. The breakdown is 38.8% disagree, 32.7 % neither agree nor disagree, 18.2% agree, 5.5% strongly disagree, and 4.8% strongly agree on this topic.

Table 4.19. The Distribution of Student's Opinions on Increasing the Number of Required Elective Courses.

Statements	Opinions	Frequency	Percentage
The number of required elective courses should be increased (more than 12 credits).	Strongly agree	10	6.1
	Agree	28	17.0
	Neither agree nor disagree	71	43.0
	Disagree	49	29.7
	Strong disagree	7	4.2
	Total	**165**	**100.0**

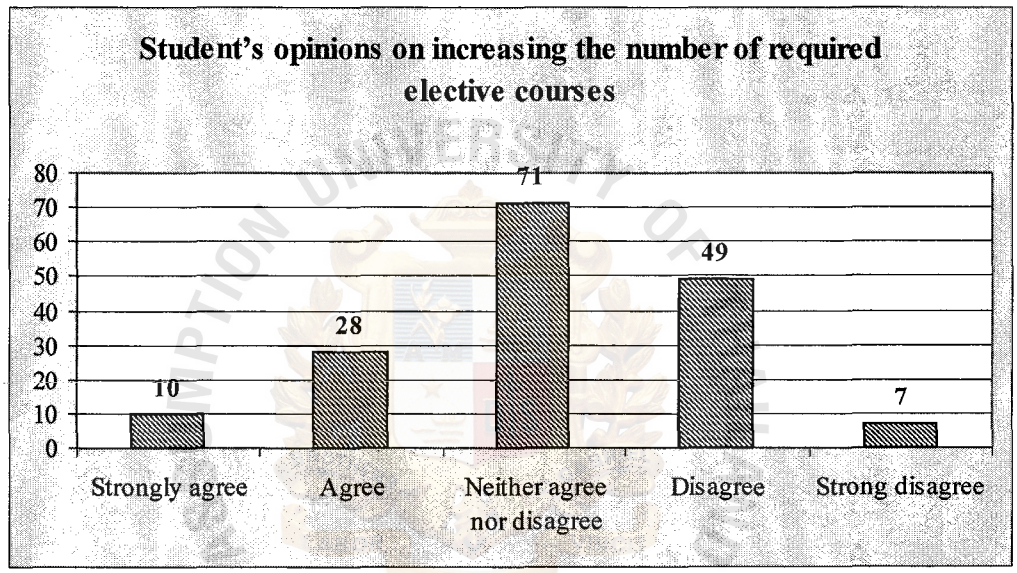

Table 4.19. Frequency of Student's Opinions on Increasing the Number of Required Elective Courses.

Table 4.19 is the data about the opinions and needs toward increasing the number of required elective courses. From total of 165 respondents, 56 students (33.9%) gave a negative answer, 38 students (23.0%) gave affirmative answer and 43.0% were neutral. The breakdown is 43.0% neither agree nor disagree, 29.7% disagree, 17% agree, 6.1% strongly agree and 4.2% strongly disagree on this topic.

Table 4.20. The Distribution of Student's Opinions on Increasing the Number of General Elective Courses.

Statements	Opinions	Frequency	Percentage
The number of general elective courses should be increased (more than 9 credits).	Strongly agree	10	6.1
	Agree	34	20.6
	Neither agree nor disagree	63	38.2
	Disagree	50	30.3
	Strong disagree	8	4.8
	Total	**165**	**100.0**

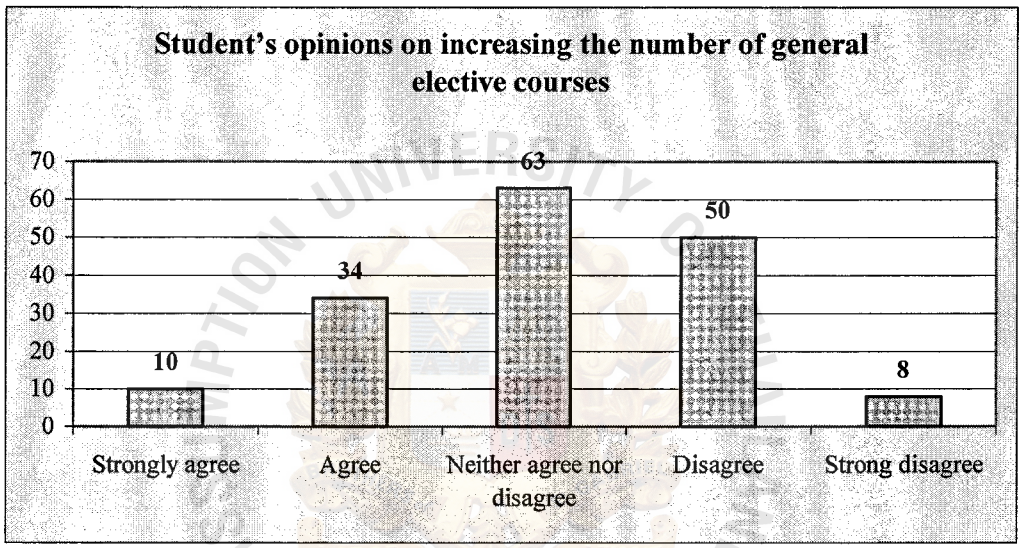

Figure 4.20. Frequency of Student's Opinions on Increasing the Number of General Elective Courses.

Table 4.20 is the data about the opinions and needs toward increasing the number of required courses. From total of 165 respondents, 58 students (35.2%) gave a negative answer, 44 students (26.7%) gave affirmative answer and 38.2% were neutral. The breakdown is 38.2% neither agree nor disagree, 30.3% disagree, 20.6% agree, 6.1% strongly agree and 4.8% strongly disagree on this topic.

Table 4.21. The Distribution of Student's Opinions toward the Proportion among the Number of Computer Courses, Engineering Courses and Management Courses.

Statements	Opinions	Frequency	Percentage
The proportion among the number of computer courses, engineering courses and management courses is appropriate.	Strongly agree	5	3.0
	Agree	45	27.3
	Neither agree nor disagree	81	49.1
	Disagree	31	18.8
	Strong disagree	3	1.8
	Total	**165**	**100.0**

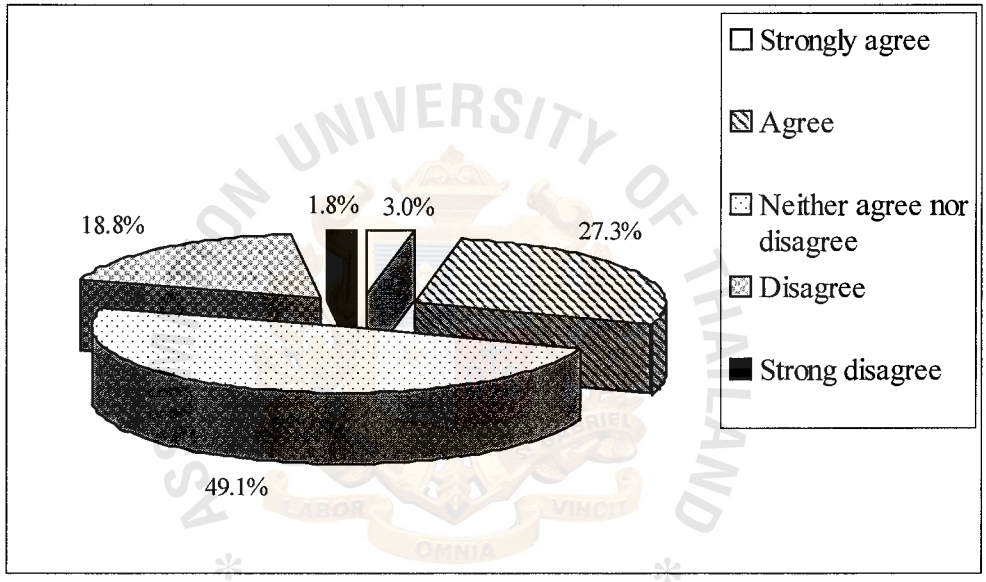

Figure 4.21. Percentage of Student's Opinions towards the Proportion among the Number of Computer Courses, Engineering Courses and Management Courses.

Table 4.21 and Figure 4.21 show that the majority of focused group neither agree nor disagree that the proportion among the number of computer courses, engineering courses and management is appropriate (49.1%), agree (27.3%), disagree (18.8%), strongly agree (3.0%) and strongly disagree (1.8%) respectively.

Table 4.22. The Distribution of Student's Opinions on Increasing the Number of Computer Courses.

Statements	Opinions	Frequency	Percentage
The subject of computer courses for studying should be increased.	Strongly agree	33	20.0
	Agree	73	44.2
	Neither agree nor disagree	41	24.8
	Disagree	16	9.7
	Strong disagree	2	1.2
	Total	**165**	**100.0**

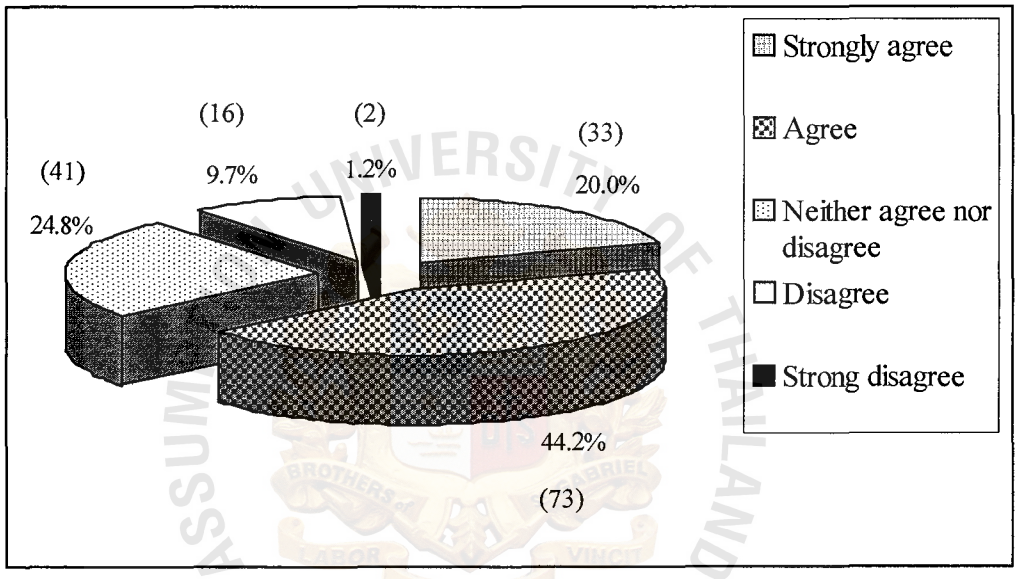

Figure 4.22. Frequency and Percentage of Student's Opinions on Increasing the Number of Computer Courses.

Table 4.22 and Figure 4.22 is the data about the opinions and needs towards increasing the number of computer courses. From total of 165 respondents, 106 students (64.2%) gave affirmative answer, 18 students (10.9%) gave negative answer and 24.8% of them were neutral. The breakdown is 44.2% agree, 24.8% neither agree nor disagree, 20% strongly agree, 9.7% disagree and 1.2% strongly disagree on this topic.

Table 4.23. The Distribution of Student's Opinions on Increasing the Number of Engineering Courses.

Statements	Opinions	Frequency	Percentage
The subject of engineering courses for studying should be increased..	Strongly agree	13	7.9
	Agree	58	35.1
	Neither agree nor disagree	77	46.7
	Disagree	16	9.7
	Strong disagree	1	0.6
	Total	**165**	**100.0**

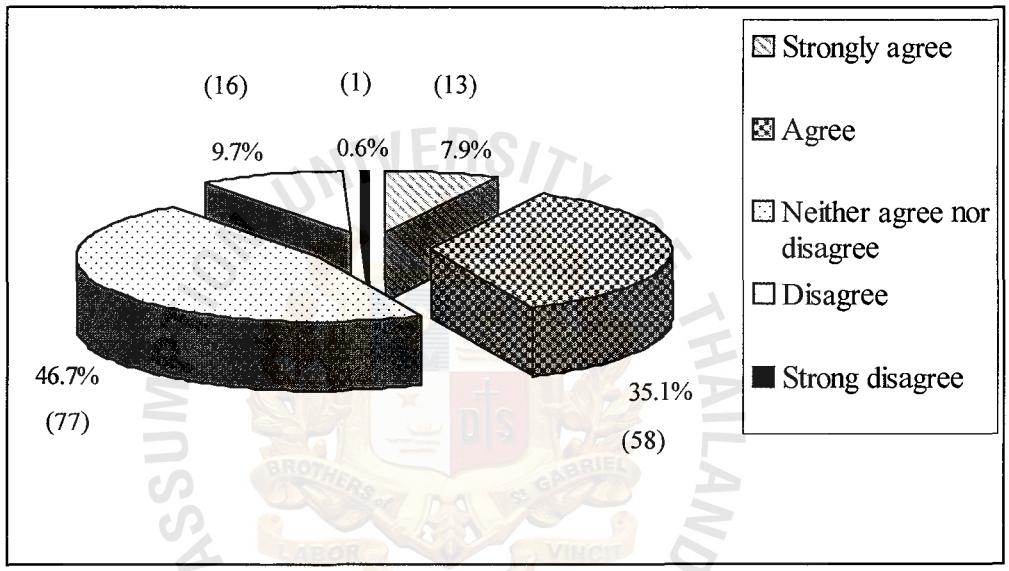

Figure 4.23. Frequency and Percentage of Student's Opinions on Increasing the Number of Engineering Courses.

Table 4.23 and Figure 4.23 is the data about the opinions and needs towards increasing the number of engineering courses. From total of 165 respondents, 71 students (43.0%) gave affirmative answer, 17 students (10.3%) gave negative answer and 46.7% of them were neutral. The breakdown is 46.7% neither agree nor disagree, 35.1% agree, 9.7% disagree, 7.9 strongly agree and 0.6% strongly disagree on this topic.

Table 4.24. The Distribution of Student's Opinions on Increasing the Number of Management Courses.

Statements	Opinions	Frequency	Percentage
The subject of management courses for studying should be increased.	Strongly agree	21	12.7
	Agree	71	43.0
	Neither agree nor disagree	55	33.3
	Disagree	15	9.1
	Strong disagree	3	1.8
	Total	**165**	**100.0**

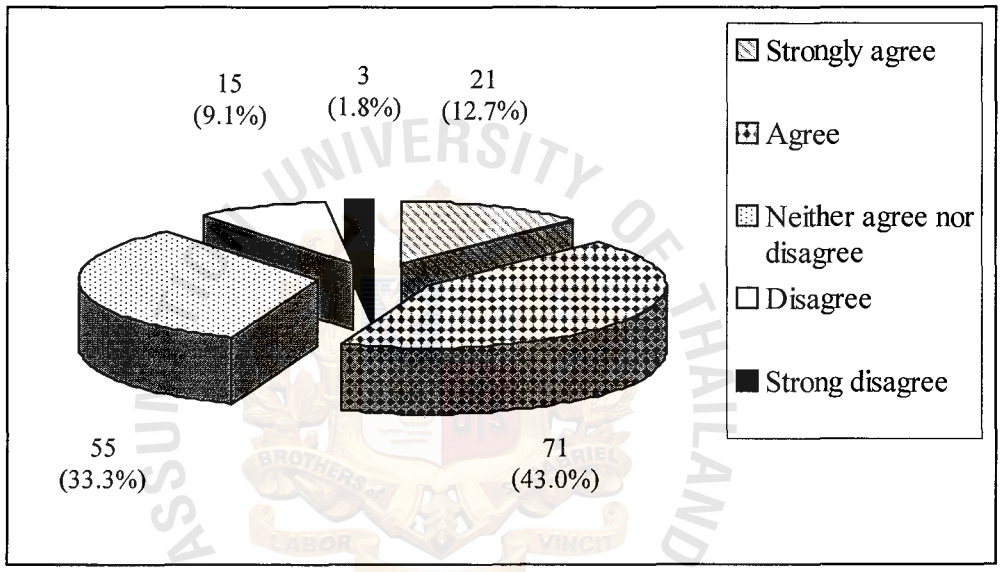

Figure 4.24. Frequency and Percentage of Student's Opinions on Increasing the Number of Management Courses.

Table 4.24 and Figure 4.24 is the data about the opinions and needs towards increasing the number of management courses. From total of 165 respondents, 92 students (55.8%) gave affirmative answer, 18 students (10.9%) gave negative answer and 33.3% of them were neutral. The breakdown is 43.0% agree, 33.3% neither agree nor disagree, 12.7% strongly agree, 9.1% disagree and 1.8% strongly disagree on this topic.

Table 4.25. The Distribution of Student's Opinions on the Varieties of Required Elective Course for Choosing.

Statements	Opinions	Frequency	Percentage
This program offers enough varieties of required elective courses for students to choose.	Strongly agree	6	3.6
	Agree	37	22.4
	Neither agree nor disagree	60	36.4
	Disagree	49	29.7
	Strong disagree	13	7.9
	Total	**165**	**100.0**

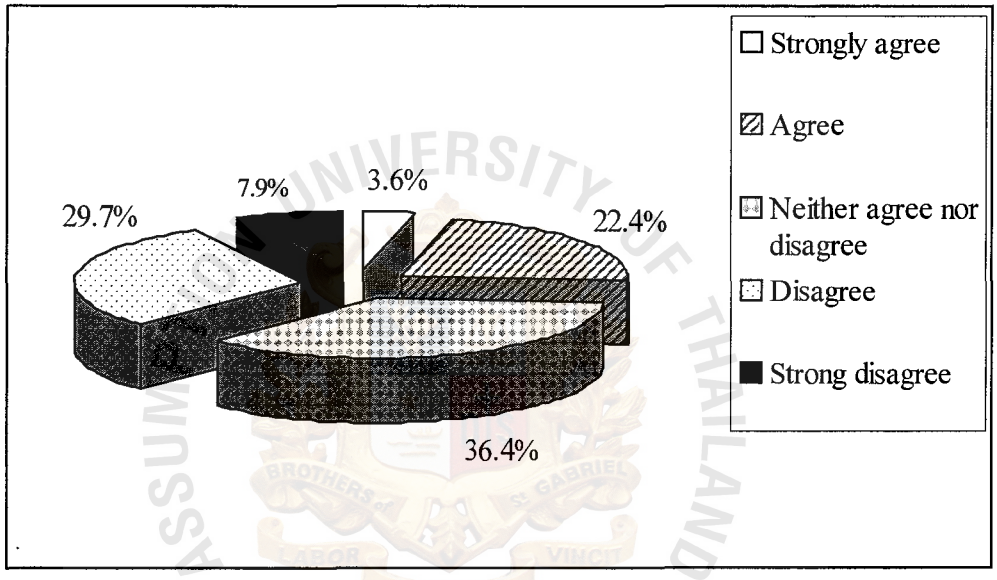

Figure 4.25. Percentage of Student's Opinions on the Varieties of Required Elective Course for Choosing.

From Table 4.25 and Figure show that the most of alumni students neither agree nor disagree that this program offers enough varieties of required elective courses for students to choose (36.4%), disagree (29.7%), agree (22.4%), strongly disagree (7.9%) and strongly agree (3.6%) respectively.

Table 4.26. The Distribution of Student's Opinions on Increasing the Subject of Required Elective Course for Choosing.

Statements	Opinions	Frequency	Percentage
The subject of required elective courses for choosing should be increased.	Strongly agree	23	13.9
	Agree	71	43.0
	Neither agree nor disagree	57	34.5
	Disagree	11	6.7
	Strong disagree	3	1.8
	Total	**165**	**100.0**

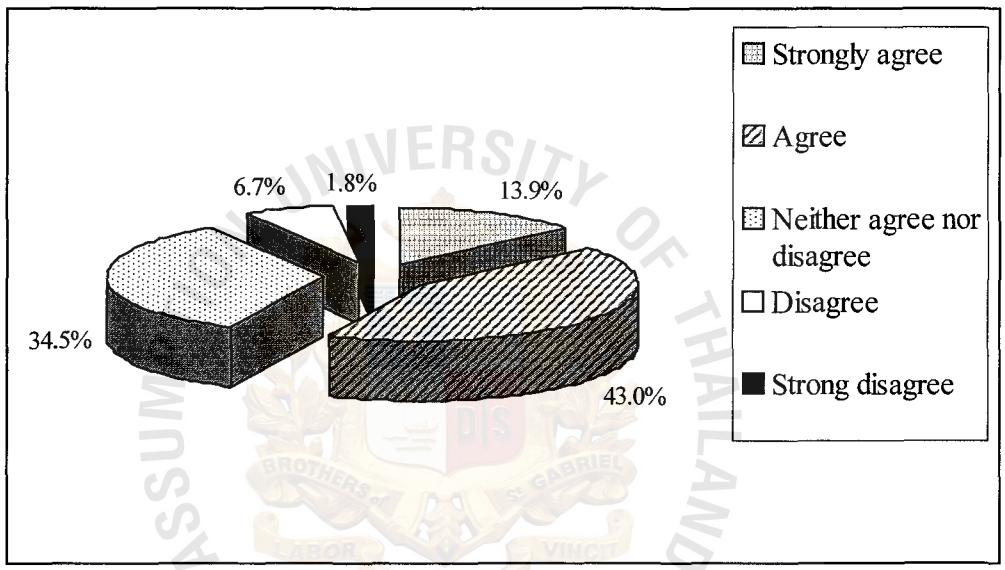

Figure 4.26. Percentage of Student's Opinions on Increasing the Subject of Required Elective Course for Choosing.

Table 4.26 and Figure 4.26 show the student's opinions on increasing the subject of required elective course for choosing. The majority of the focus group agrees to increase the subject of required elective course for choosing (43.0%), neither agree nor disagree (34.5%), strongly agree (13.9%), disagree (6.7%) and strongly disagree (1.8%) respectively.

Table 4.27. The Distribution of Student's Opinions on the Varieties of General Elective Courses for Choosing.

Statements	Opinions	Frequency	Percentage
This program offers enough varieties of general elective courses for students to choose.	Strongly agree	4	2.4
	Agree	41	24.8
	Neither agree nor disagree	61	37.0
	Disagree	50	30.3
	Strong disagree	9	5.5
	Total	**165**	**100.0**

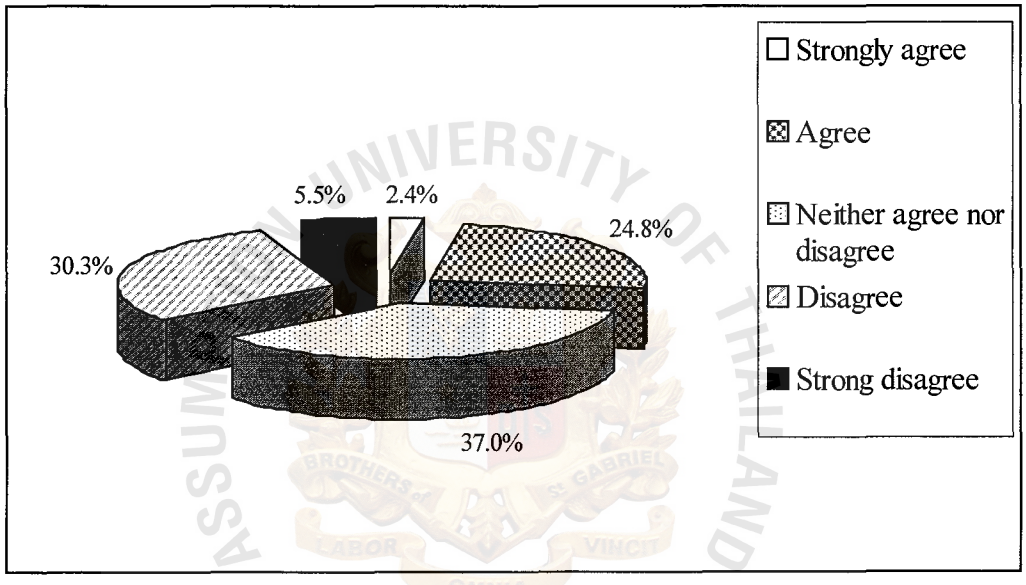

Figure 4.27. Percentage of Student's Opinions on the Varieties of General Elective Courses for Choosing.

Table 4.27 shows that most of the alumni students neither agree nor disagree that this program offers enough varieties of general elective courses for students to choose (37.0%), disagree (30.3%), agree (24.8%), strongly disagree (5.5%) and strongly agree (2.4%) respectively.

Table 4.28. The Distribution of Student's Opinions on Increasing the Subjects of General Elective Course for Choosing.

Statements	Opinions	Frequency	Percentage
The subjects of general elective courses for choosing should be increased.	Strongly agree	21	12.7
	Agree	79	47.9
	Neither agree nor disagree	58	35.2
	Disagree	6	3.6
	Strong disagree	1	0.6
	Total	**165**	**100.0**

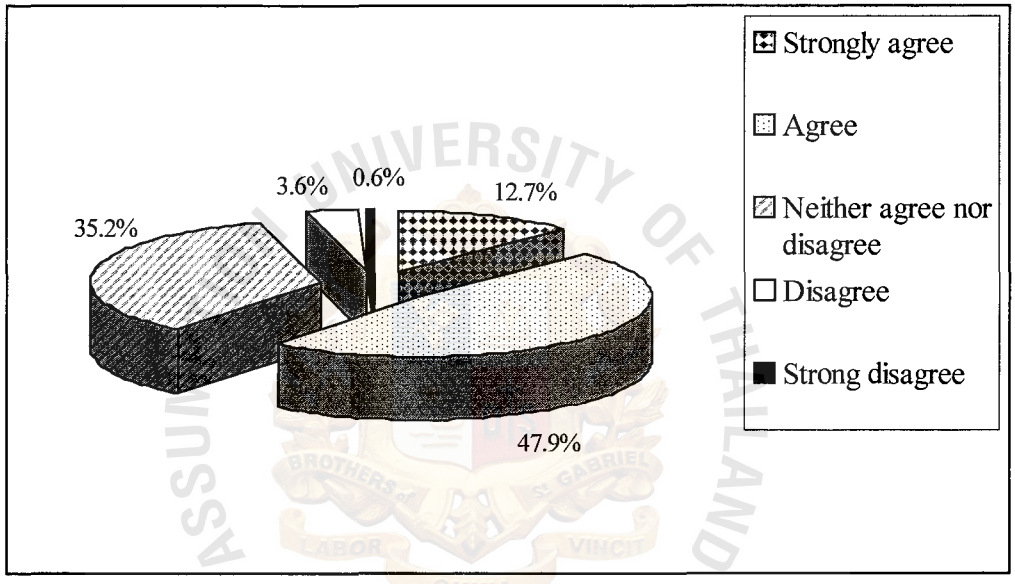

Figure 4.28. Percentage of Student's Opinions on Increasing the Subjects of General Elective Course for Choosing.

Table 4.28 shows the student's opinions on increasing the subjects of general elective course for choosing. The majority of the focus group agrees to increase the subjects of required elective course for choosing (47.9%), neither agree nor disagree (35.2%), strongly agree (12.7%), disagree (3.6%) and strongly disagree (0.6%) respectively.

Table 4.29. The Summarized Student's Opinions and Needs towards the Structure of the Curriculum.

Statement	Mean	Standard Deviation
1. The number of courses is appropriate (48 credits).	3.96	0.77
2. The number of required courses is appropriate (21 credits).	3.71	0.92
3. The number of required elective courses is appropriate (12 credits).	3.50	0.95
4. The number of general elective courses is appropriate (9 credits).	3.54	0.88
5. The proportion among the number of required courses, required elective courses and general elective courses is appropriate.	3.53	0.87
6. The number of courses should be increased (more than 48 credits).	2.56	1.11
7. The number of required courses should be increased (more than 21 credits).	2.78	0.97
8. The number of required elective courses should be increased (more than 12 credits).	2.91	0.94
9. The number of general elective courses should be increased (more than 9 credits).	2.93	0.97
10. The proportion among the number of computer courses, engineering courses and management courses is appropriate.	3.11	0.80
11. The subject of computer courses for studying should be increased.	3.72	0.93
12. The subject of engineering courses for studying should be increased.	3.40	0.79
13. The subject of management courses for studying should be increased.	3.56	0.89
14. This program offers enough varieties of required elective courses for students to choose.	2.84	0.98
15. The subject of required elective courses for choosing should be increased.	3.61	0.87
16. This program offers enough varieties of general elective courses for students to choose.	2.88	0.93
17. The subject of general elective courses for choosing should be increased.	3.68	0.76

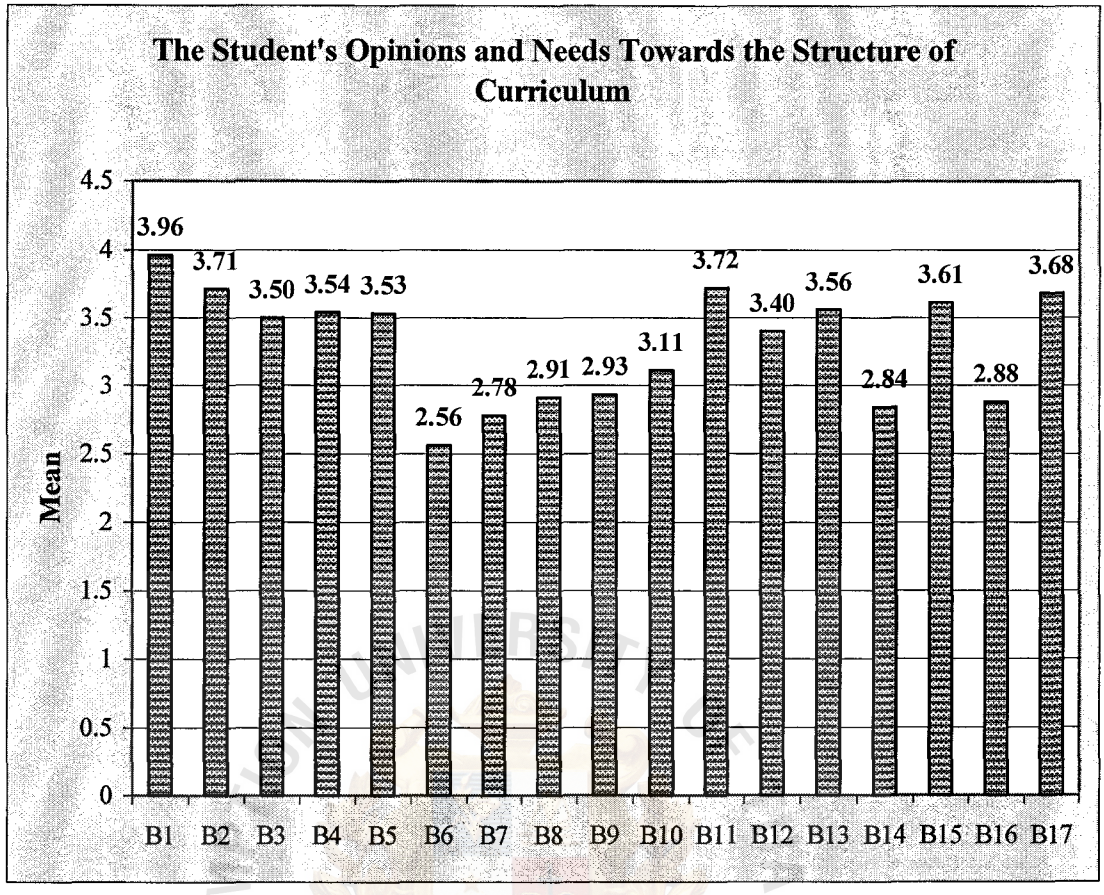

Figure 4.29. The Summarized Student's Opinions and Needs towards the Structure of the Curriculum.

Table 4.29 and Figure 4.29 show student's opinion score towards the structure of curriculum. The highest score of student's opinion is (1) The number of courses is appropriate (48 credits) and the lowest score of student's opinions is (6) The number of courses should be increased (more than 48 credits).

Moreover, the student's opinions score can rank from highest score to lowest score as follows: (1) The number of courses is appropriate, (11) The subject of computer courses for studying should be increased, (2) The number of required courses is appropriate, (17) The subject of general elective courses for choosing should be increased, (15) The subject of required elective courses for choosing should be increased, (13) The subject of management courses for studying should be increased, (4) The number of general elective courses is appropriate, (5) The proportion among the number of required courses, required elective courses and general elective courses is appropriate, (3) The number of required elective courses is appropriate, (12) The subject of engineering courses for studying should be increased, (10) The proportion among the number of computer courses, engineering courses and management courses is appropriate, (9) The number of general elective courses should be increased, (8) The number of required elective courses should be increased, (16) This program offers enough varieties of general elective courses for students to choose, (14) This program offers enough varieties of required elective courses for students to choose, (7) The number of required courses should be increased and (6) The number of courses should be increased.

Content of the Curriculum

Table 4.30. The Distribution of Student's Opinions on the Curriculum Is Updated and Follows the Latest Developments in the Industries.

Statements	Opinions	Frequency	Percentage
The curriculum is updated and follows the latest developments in the industries.	Strongly agree	10	6.1
	Agree	57	34.5
	Neither agree nor disagree	79	47.9
	Disagree	15	9.1
	Strong disagree	4	2.4
	Total	**165**	**100.0**

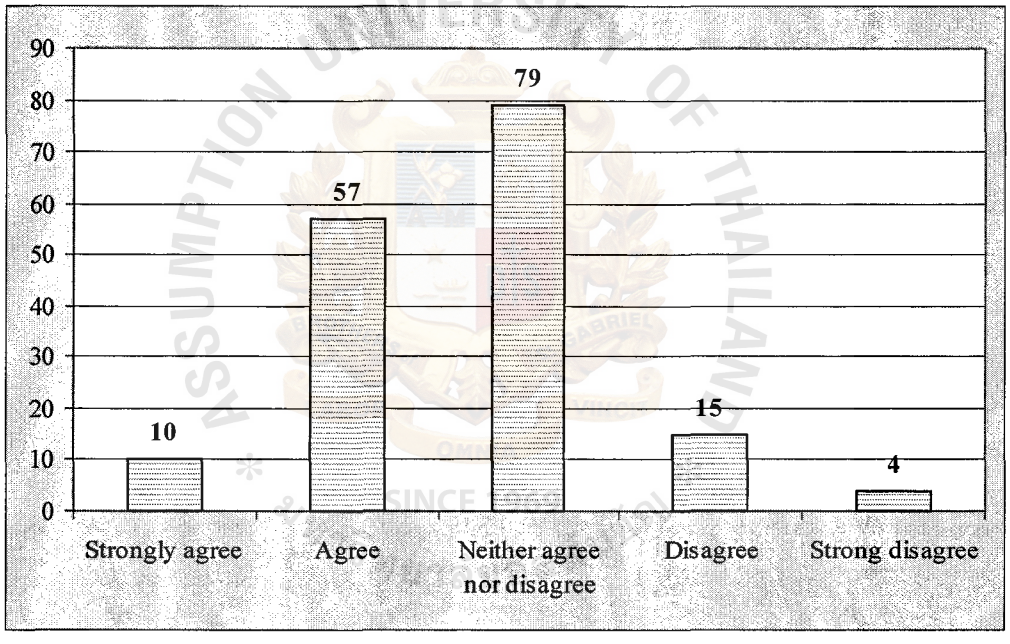

Figure 4.30. Frequency of Student's Opinions on the Curriculum Is Updated and Follows the Latest Developments in the Industries.

Table 4.30 shows that the majority of the students neither agree nor disagree that this curriculum is updated and follows the latest developments in the industries (47.9%), agree (34.5%), disagree (9.1%), strongly agree (6.1%) and strongly disagree (2.4%) respectively.

Table 4.31. The Distribution of Student's Opinions on the Curriculum Is Relevant to the Demand of the Job Market.

Statements	Opinions	Frequency	Percentage
The curriculum is relevant to the demand of the job market.	Strongly agree	6	3.6
	Agree	46	27.9
	Neither agree nor disagree	74	44.8
	Disagree	34	20.6
	Strong disagree	5	3.0
	Total	**165**	**100.0**

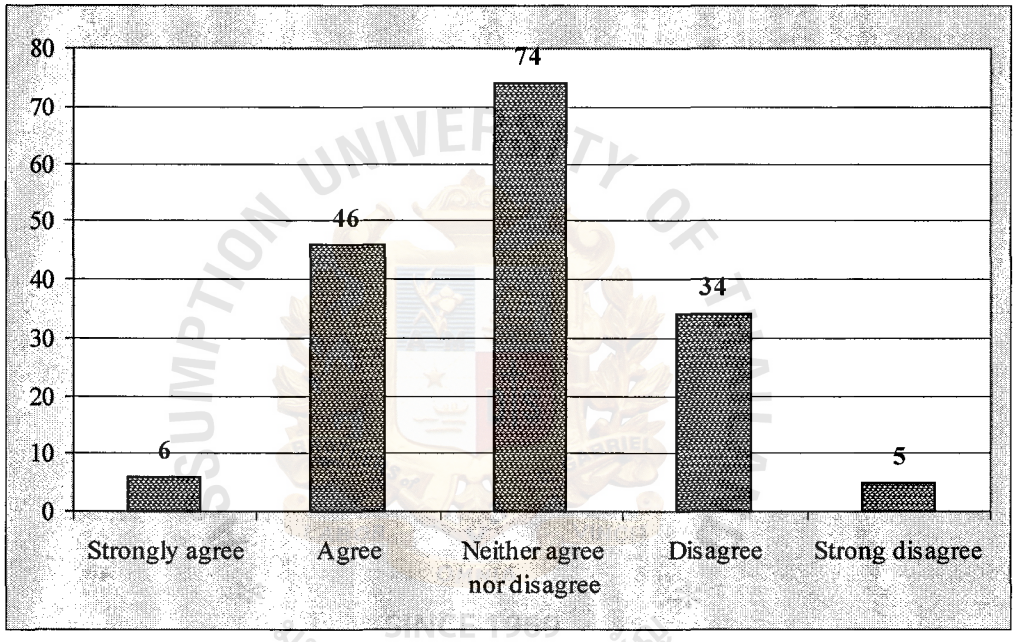

Figure 4.31. Frequency of Student's Opinions on the Curriculum Is Relevant to the Demand of the Job Market.

Table 4.31 shows that the majority of the students neither agree nor disagree that this curriculum is relevant to the demand of the job market (44.8%), agree (27.9%), disagree (20.6%), strongly agree (3.6%) and strongly disagree (3.0%) respectively.

Table 4.32. The Distribution of Student's Opinions on the Curriculum Is Appropriate for Continuing Education towards the Doctoral Degree.

Statements	Opinions	Frequency	Percentage
The curriculum is appropriate for continuing education towards the doctoral degree.	Strongly agree	6	3.6
	Agree	23	13.9
	Neither agree nor disagree	89	53.9
	Disagree	39	23.6
	Strong disagree	8	4.8
	Total	**165**	**100.0**

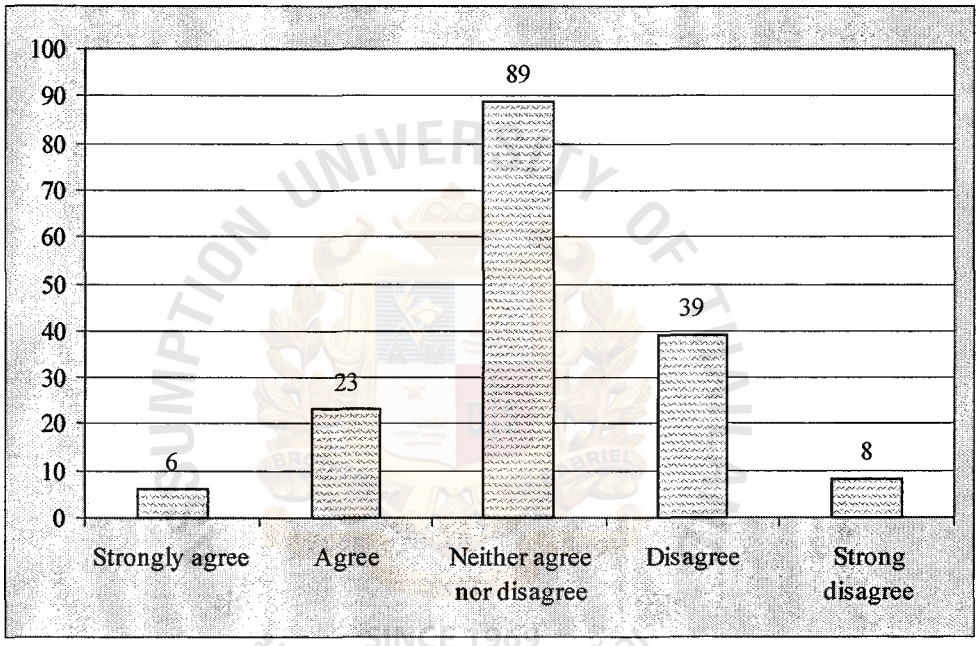

Figure 4.32. Frequency of Student's Opinions on the Curriculum Is Appropriate for Continuing Education towards the Doctoral Degree.

Table 4.32 shows that the majority of the students neither agree nor disagree that this curriculum is appropriate for continuing education towards the doctoral degree (53.9%), disagree (23.6%), agree (13.9%), strongly agree (4.8%) and strongly disagree (3.6%) respectively.

Table 4.33. The Distribution of Student's Opinions on This Curriculum Can Fulfill My Personal Goal.

Statements	Opinions	Frequency	Percentage
This curriculum can fulfill my personal goal.	Strongly agree	10	6.1
	Agree	54	32.7
	Neither agree nor disagree	60	36.4
	Disagree	29	17.6
	Strong disagree	12	7.3
	Total	**165**	**100.0**

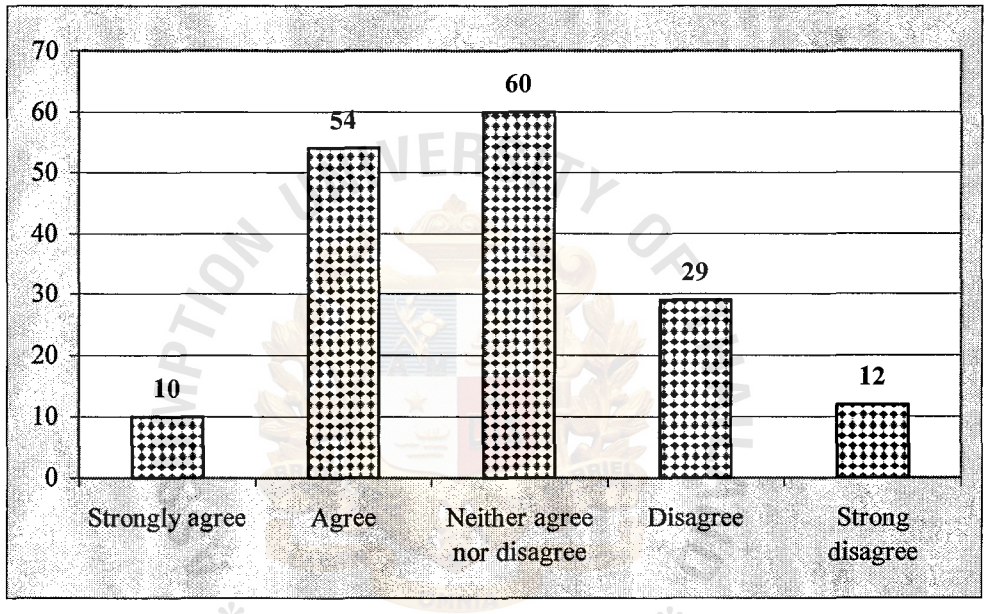

Figure 4.33. Frequency of Student's Opinions on This Curriculum Can Fulfill My Personal Goal.

Table 4.33 shows that the majority of the students neither agree nor disagree that this curriculum can fulfill my personal goal (36.4%), agree (32.7%), disagree (17.6%), strongly agree (7.3%) and strongly disagree (6.1%) respectively.

Table 4.34. The Distribution of Student's Opinions on the Contents of Subjects in Required Courses Are Updated.

Statements	Opinions	Frequency	Percentage
The contents of subjects in required courses are updated.	Strongly agree	5	3.0
	Agree	65	39.4
	Neither agree nor disagree	74	44.8
	Disagree	19	11.5
	Strong disagree	2	1.2
	Total	**165**	**100.0**

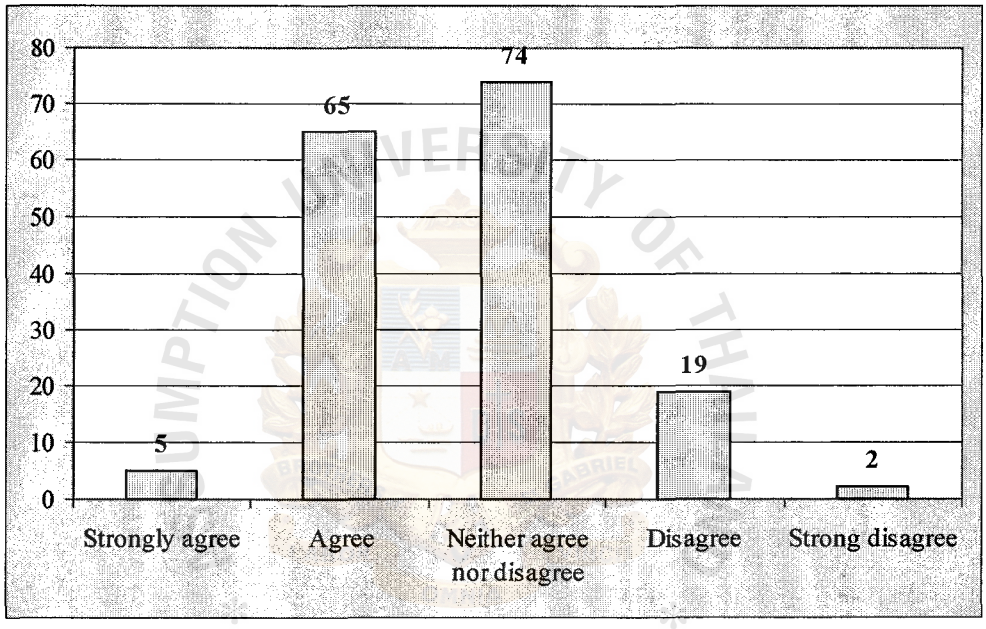

Figure 4.34. Frequency of Student's Opinions on the Contents of Subjects in Required Courses Are Updated.

Table 4.34 shows that the majority of the students neither agree nor disagree that the contents of subjects in required courses are updated (44.8%), agree (39.4%), disagree (11.5%), strongly agree (3.0%) and strongly disagree (1.2%) respectively.

Table 4.35. The Distribution of Student's Opinions on the Contents of Subjects in Required Elective Courses Are Updated.

Statements	Opinions	Frequency	Percentage
The contents of subjects in required elective courses are updated.	Strongly agree	4	2.4
	Agree	56	33.9
	Neither agree nor disagree	94	57.0
	Disagree	10	6.1
	Strong disagree	1	0.6
	Total	**165**	**100.0**

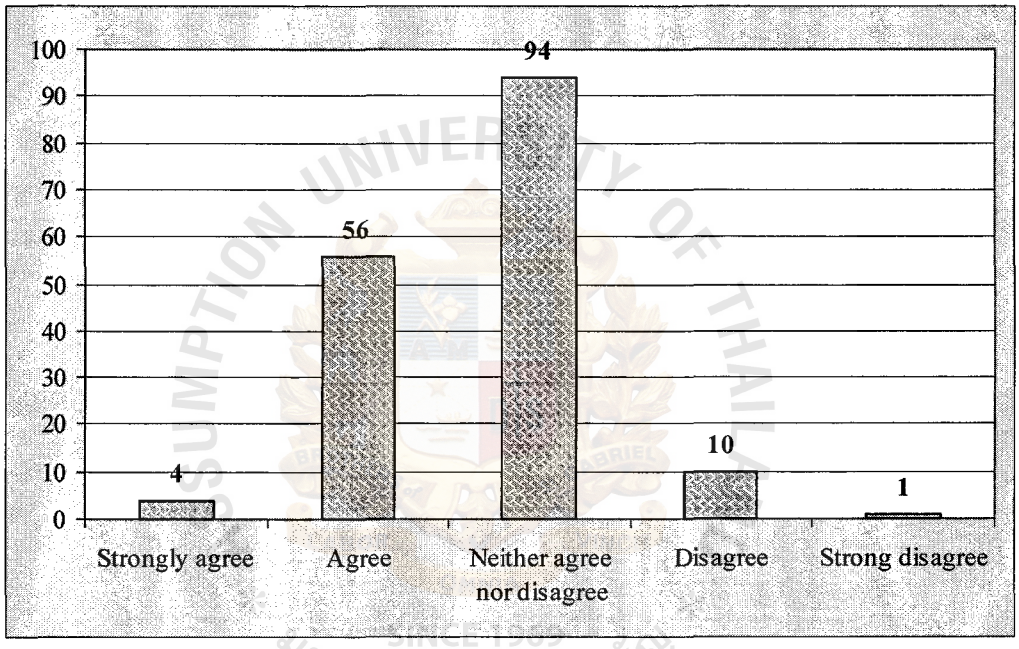

Figure 4.35. Frequency of Student's Opinions on the Contents of Subjects in Required Elective Courses Are Updated.

Table 4.35 shows that the majority of the students neither agree nor disagree that the contents of subjects in required elective courses are updated (57.0%), agree (33.9%), disagree (6.1%), strongly agree (2.4%) and strongly disagree (0.6%) respectively.

Table 4.36. The Distribution of Student's Opinions on the Contents of Subjects in General Elective Courses Are Updated.

Statements	Opinions	Frequency	Percentage
The contents of subjects in general elective courses are updated.	Strongly agree	4	2.4
	Agree	53	32.1
	Neither agree nor disagree	94	57.0
	Disagree	13	7.9
	Strong disagree	1	0.6
	Total	**165**	**100.0**

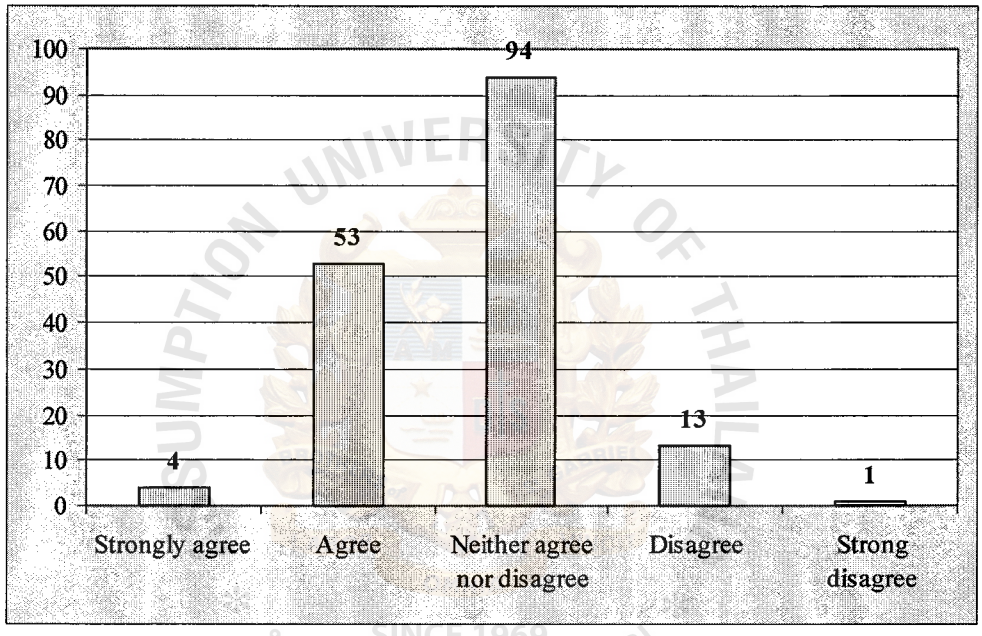

Figure 4.36. Frequency of Student's Opinions on the Contents of Subjects in General Elective Courses Are Updated.

Table 4.36 shows that the majority of the students neither agree nor disagree that the contents of subjects in general elective courses are updated (57.0%), agree (32.1%), disagree (7.9%), strongly agree (2.4%) and strongly disagree (0.6%) respectively.

Table 4.37. The Distribution of Student's Opinions on the Contents of Subjects in Required Courses Are Interesting.

Statements	Opinions	Frequency	Percentage
The contents of subjects in required courses are interesting.	Strongly agree	4	2.4
	Agree	63	38.2
	Neither agree nor disagree	76	46.1
	Disagree	20	12.1
	Strong disagree	2	1.2
	Total	**165**	**100.0**

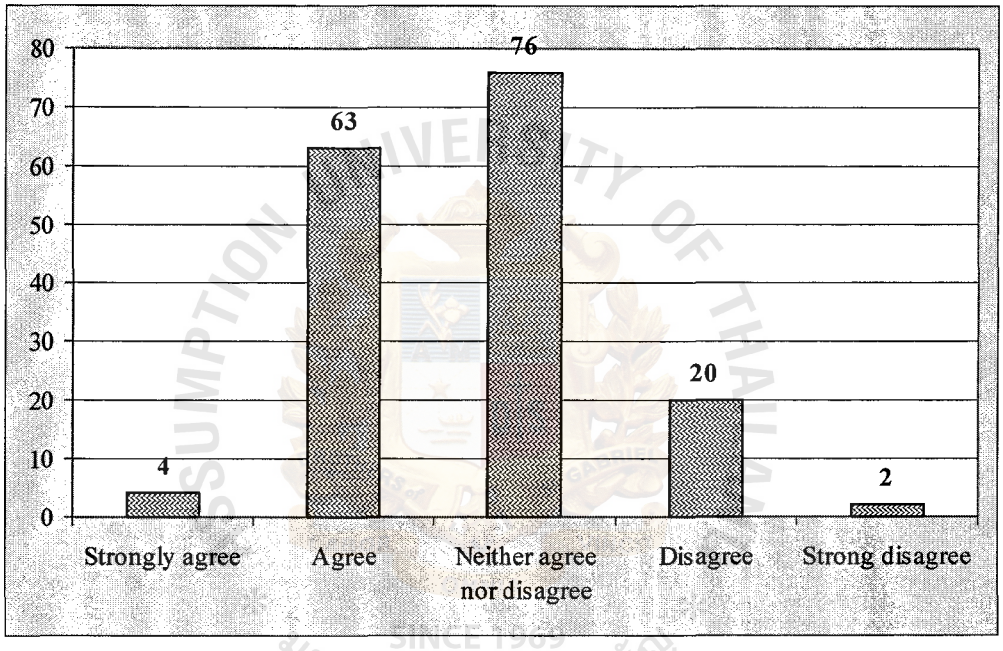

Figure 4.37. Frequency of Student's Opinions on the Contents of Subjects in Required Courses Are Interesting.

Table 4.37 shows that the majority of the students neither agree nor disagree that the contents of subjects in required courses are interesting (46.1%), agree (38.2%), disagree (12.1%), strongly agree (2.4%) and strongly disagree (1.2%) respectively.

Table 4.38. The Distribution of Student's Opinions on the Contents of Subjects in Required Elective Courses Are Interesting.

Statements	Opinions	Frequency	Percentage
The contents of subjects in required elective courses are interesting.	Strongly agree	6	3.6
	Agree	68	41.2
	Neither agree nor disagree	79	47.9
	Disagree	11	6.7
	Strong disagree	1	0.6
	Total	**165**	**100.0**

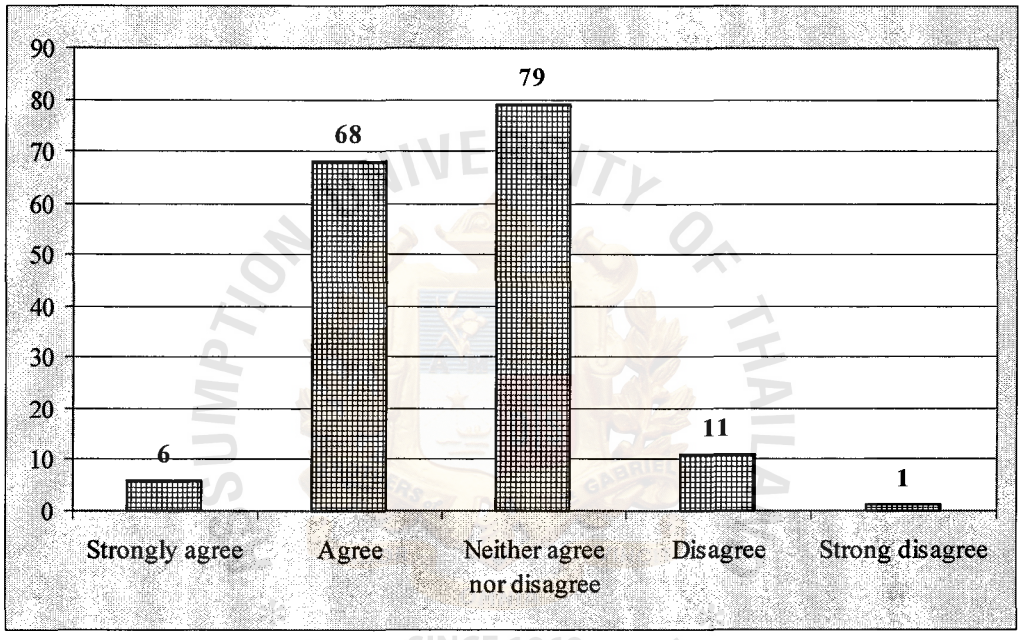

Figure 4.38. Frequency of Student's Opinions on the Contents of Subjects in Required Elective Courses Are Interesting.

Table 4.38 shows that the majority of the students neither agree nor disagree that the contents of subjects in required elective courses are interest (47.9%), agree (41.2%), disagree (6.7%), strongly agree (3.6%) and strongly disagree (0.6%) respectively.

Table 4.39. The Distribution of Student's Opinions on the Contents of Subjects in General Elective Courses Are Interesting.

Statements	Opinions	Frequency	Percentage
The contents of subjects in general elective courses are interesting.	Strongly agree	4	2.4
	Agree	68	41.2
	Neither agree nor disagree	74	44.8
	Disagree	18	10.9
	Strong disagree	1	0.6
	Total	**165**	**100.0**

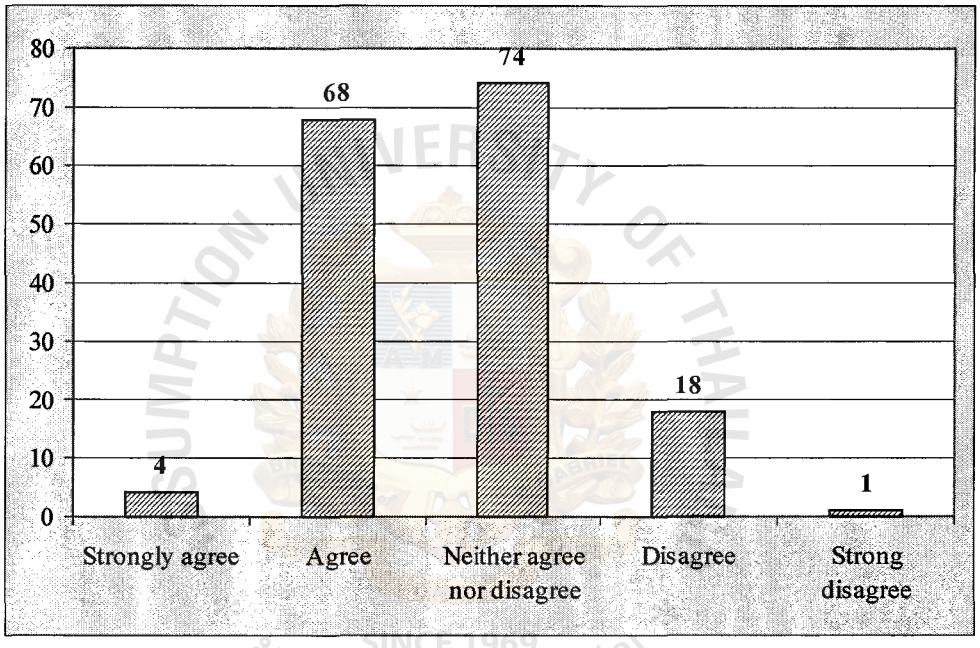

Figure 4.39. Frequency of Student's Opinions on Contents of Subjects in General Elective Courses Are Interesting.

Table 4.39 shows that the majority of the students neither agree nor disagree that the contents of subjects in general elective courses are interesting (44.8%), agree (41.2%), disagree (10.9%), strongly agree (2.4%) and strongly disagree (0.6%) respectively.

Table 4.40. The Distribution of Student's Opinions on Textbooks in This Program Are Updated and Follow the Latest Developments.

Statements	Opinions	Frequency	Percentage
Textbooks in this program are updated and follow the latest developments.	Strongly agree	9	5.5
	Agree	70	42.4
	Neither agree nor disagree	63	38.2
	Disagree	21	12.7
	Strong disagree	2	1.2
	Total	**165**	**100.0**

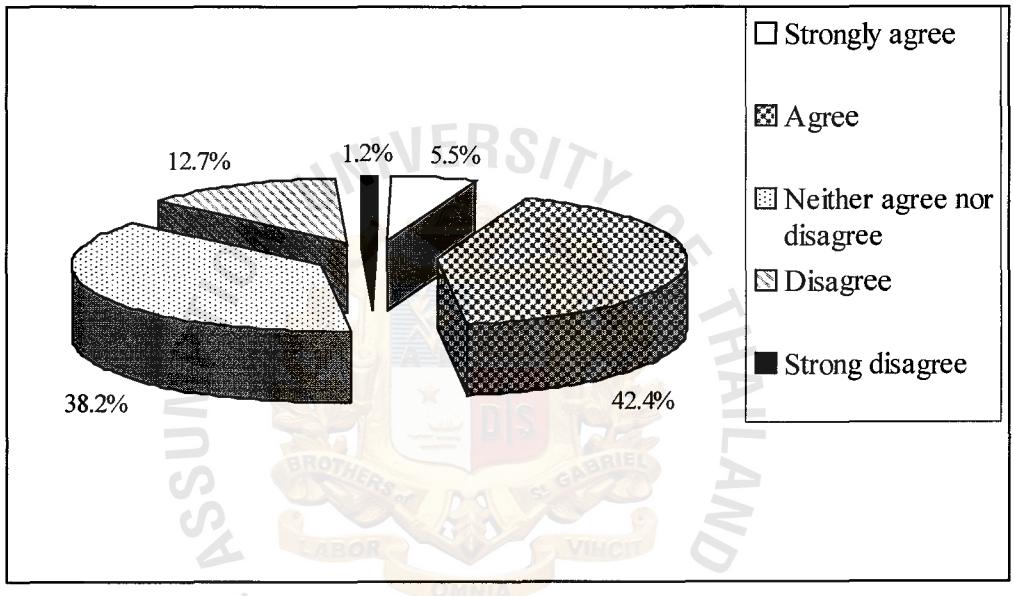

Figure 4.40. Percentage of Student's Opinions on Textbooks in This Program Are Updated and Follow the Latest Developments.

Table 4.40 shows that the majority of the students agree that textbooks in this program are updated and follow the latest developments (42.4%), neither agree nor disagree (38.2%), disagree (12.7%), strongly agree (5.5%) and strongly disagree (1.2%) respectively.

Table 4.41. The Distribution of Student's Opinions on the Number of Textbooks and Documents That Are Related to This Curriculum in the Library Is Enough for Learning.

Statements	Opinions	Frequency	Percentage
The number of textbooks and documents that are related to this curriculum in the library is enough for learning.	Strongly agree	6	3.6
	Agree	30	18.2
	Neither agree nor disagree	63	38.2
	Disagree	51	30.9
	Strong disagree	15	9.1
	Total	**165**	**100.0**

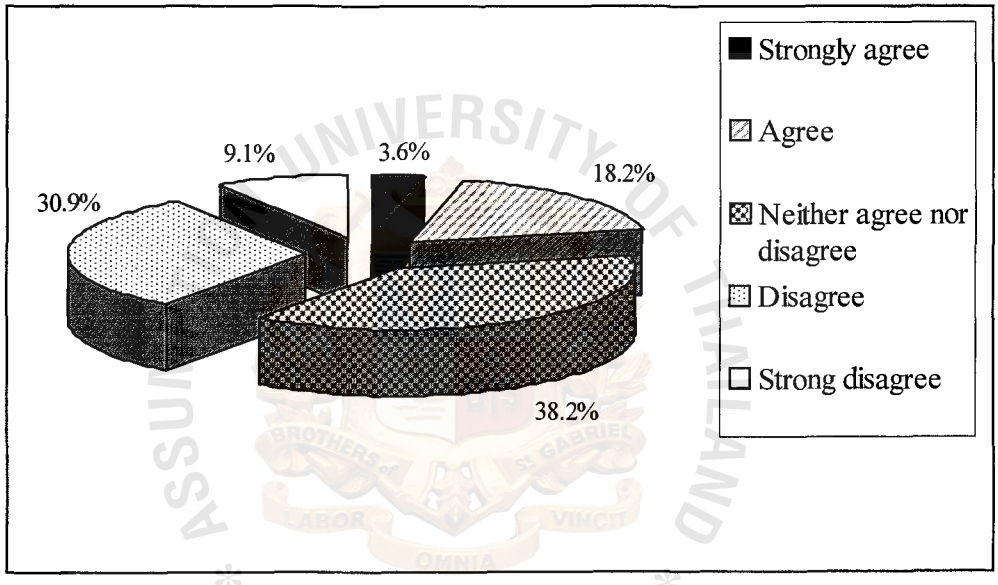

Figure 4.41. Percentage of Student's Opinions on the Number of Textbooks and Documents That Are Related to This Curriculum in the Library Is Enough for Learning.

Table 4.41 shows that the majority of the students neither agree nor disagree that the number of textbooks and documents that are related to this curriculum in the library is enough for learning (38.2%), disagree (30.9%), agree (18.2%), strongly disagree (9.1%) and strongly agree (3.6%) respectively.

Table 4.42. The Distribution of Student's Opinions on the Number of Computers in Labs for Practice Is Appropriate.

Statements	Opinions	Frequency	Percentage
The number of computers in labs for practice is appropriate.	Strongly agree	6	3.6
	Agree	23	13.9
	Neither agree nor disagree	58	35.2
	Disagree	58	35.2
	Strong disagree	20	12.1
	Total	**165**	**100.0**

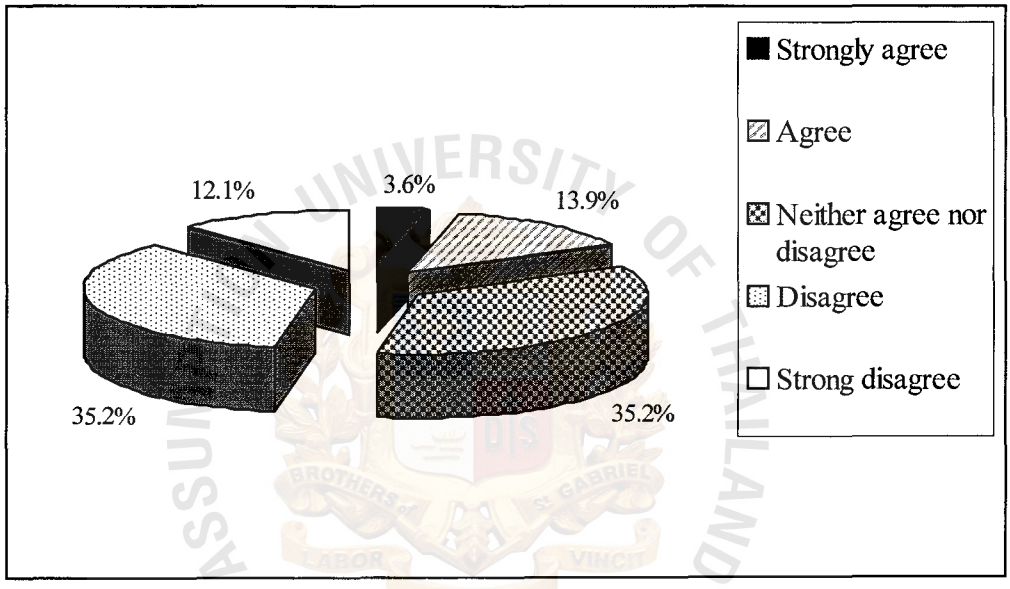

Figure 4.42. Percentage of Student's Opinions on the Number of Computers in Labs for Practice Is Appropriate.

Table 4.41 shows that the majority of the students disagree that the number of computers in labs for practice is appropriate (35.2%), neither agree nor disagree (35.2%), agree (13.9%), strongly disagree (12.1%) and strongly agree (3.6%) respectively.

Table 4.43. The Summarized Student's Opinions and Needs towards the Content of the Curriculum.

Statement	Mean	Standard Deviation
1. The curriculum is updated and follows the latest developments in the industries.	3.33	0.82
2. The curriculum is relevant to the demand of the job market.	3.08	0.87
3. The curriculum is appropriate for continuing education towards the doctoral degree.	2.88	0.84
4. This curriculum can fulfill my personal goal.	3.13	1.01
5. The contents of subjects in required courses are updated.	3.32	0.76
6. The contents of subjects in required elective courses are updated.	3.32	0.65
7. The contents of subjects in general elective courses are updated.	3.28	0.67
8. The contents of subjects in required courses are interesting.	3.28	0.76
9. The contents of subjects in required elective courses are interesting.	3.41	0.70
10. The contents of subjects in general elective courses are interesting.	3.34	0.73
11. Textbooks in this program are updated and follow the latest developments.	3.38	0.82
12. The number of textbooks and documents that are related to this curriculum in the library is enough for learning.	2.76	0.98
13. The number of computers in labs for practice is appropriate.	2.62	0.99

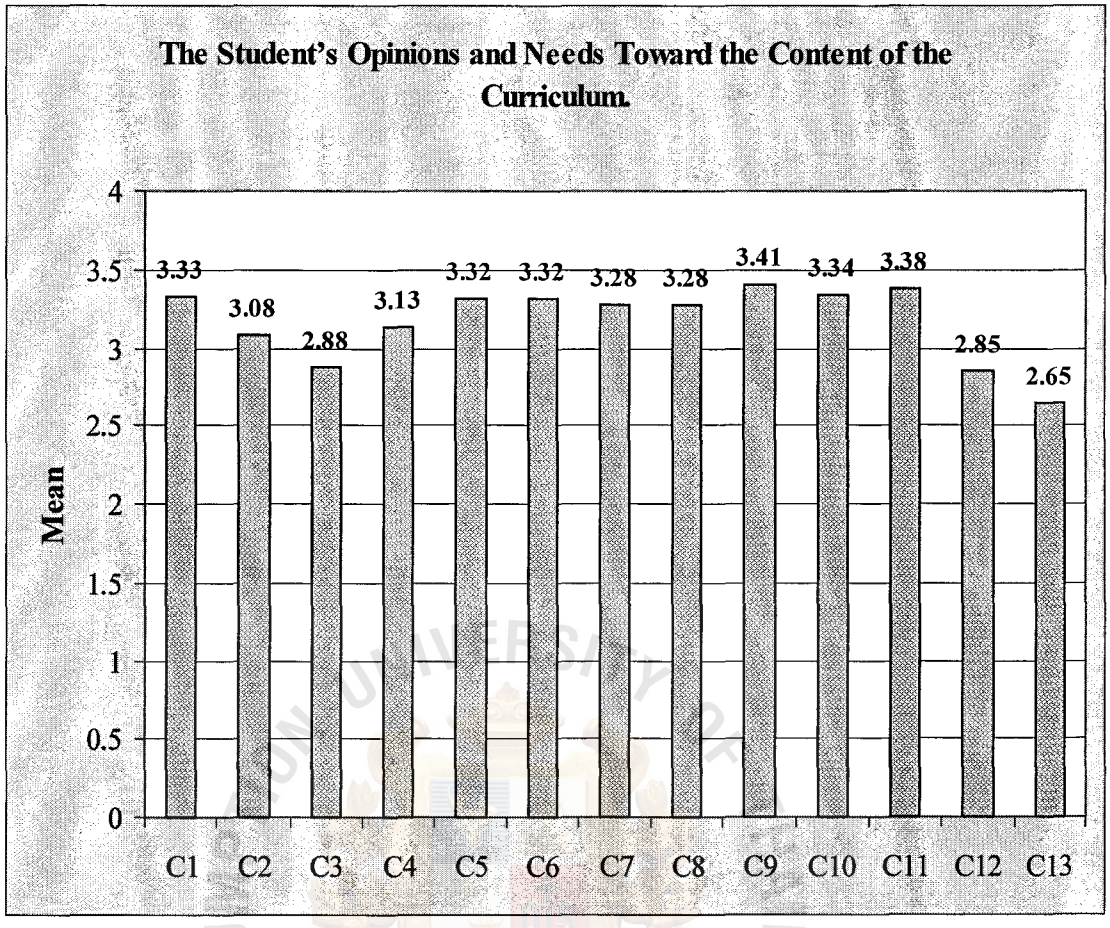

Figure 4.43. The Summarized Student's Opinions and Needs towards the Content of the Curriculum.

Table 4.30 and Figure 4.30 show student's opinion score toward the content of curriculum. The highest score of student's opinion is (9) The contents of subjects in required elective courses are interesting and the lowest score of student's opinions is (13) The number of computers in labs for practice is appropriate.

Additionally, the student's opinions score can rank from highest score to lowest score as follows: (9) The contents of subjects in required elective courses are interesting, (11) Textbooks in this program are updated and follow the latest developments, (10) The contents of subjects in general elective courses are interesting, (1) The curriculum is updated and follows the latest developments in the industries, (5) The contents of subjects in required courses are updated, (6) The contents of subjects in required elective courses are updated, (7) The contents of subjects in general elective courses are updated, (8) The contents of subjects in required courses are interesting, (4) This curriculum can fulfill my personal goal, (2) The curriculum is relevant to the demand of the job market, (3) The curriculum is appropriate for continuing education towards the doctoral degree, (12) The number of textbooks and documents that are related to this curriculum in the library is enough for learning and (13) The number of computers in labs for practice is appropriate.

Evaluation of the Curriculum

Table 4.44. The Distribution of Student's Opinions on the Evaluation of Grade Ranks.

Statements	Opinions	Frequency	Percentage
The evaluation of grade ranks, e.g. A, B,...., F is reliable.	Strongly agree	20	12.1
	Agree	73	44.2
	Neither agree nor disagree	61	37.0
	Disagree	10	6.1
	Strong disagree	1	0.6
	Total	**165**	**100.0**

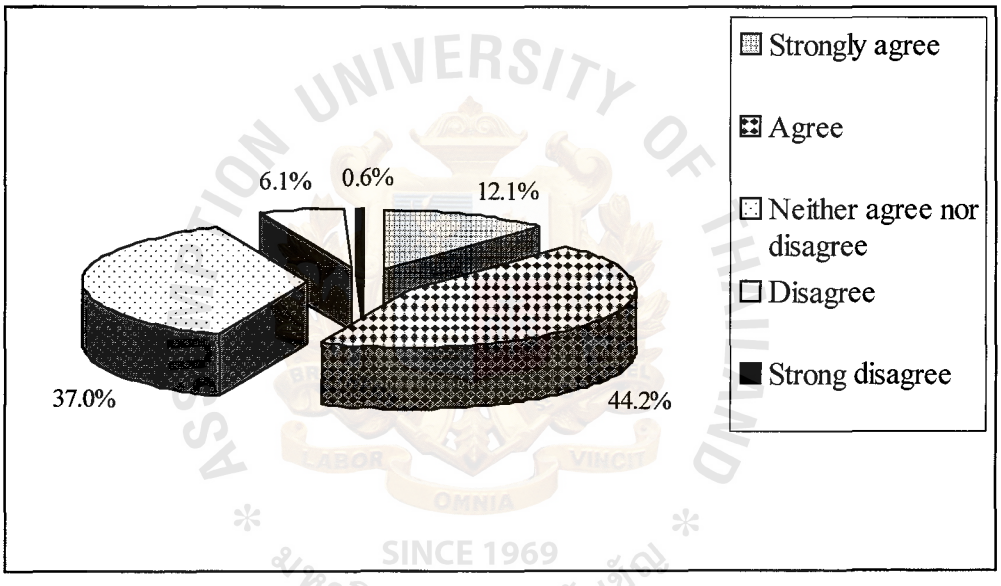

Figure 4.44. Percentage of Student's Opinions on the Evaluation of Grade Ranks.

Table 4.44 and Figure 4.44 show the student's opinions on the evaluation of grade rank. The majority of focus group agrees that the evaluation of grade rank is reliable (44.2%), neither agree nor disagree (37.0%), strong agree (12.1%), disagree (6.1%) and strongly disagree (0.6%) respectively.

Table 4.45. The Distribution of Student's Opinions on the Grade Received Truly Reflects the Skill and Knowledge.

Statements	Opinions	Frequency	Percentage
The grade received truly reflects my skill and knowledge.	Strongly agree	10	6.1
	Agree	76	46.1
	Neither agree nor disagree	60	36.4
	Disagree	16	9.7
	Strong disagree	3	1.8
	Total	165	100.0

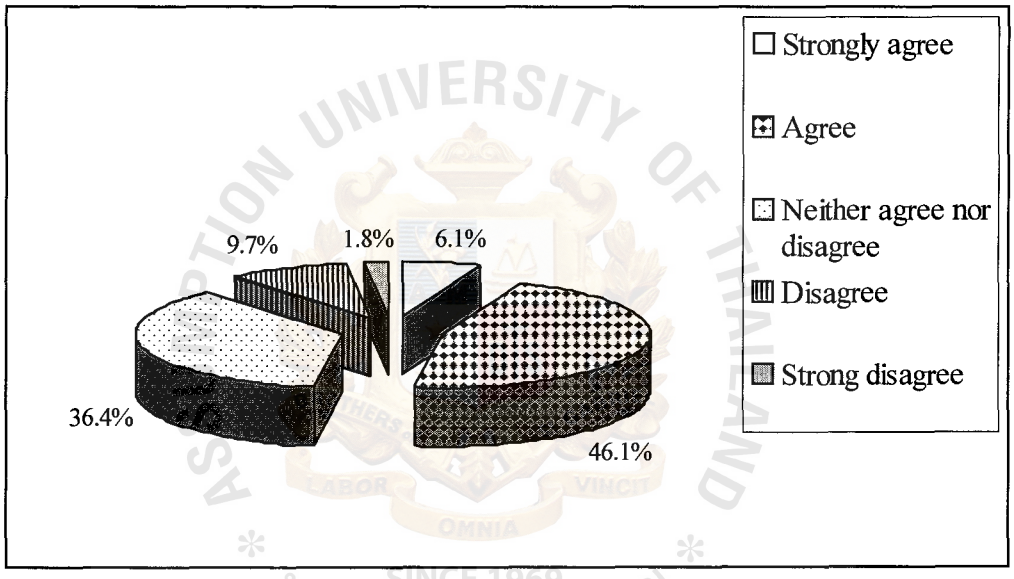

Figure 4.45. Percentage of Student's Opinions on the Grade Received Truly Reflects the Skill and Knowledge.

Table 4.45 and Figure 4.45 show the student's opinions on the grade received truly reflects their skill and knowledge. The majority of focus group agrees that the grade received truly reflects their skill and knowledge (46.1%), neither agree nor disagree (36.4%), disagree (9.7%), strong agree (6.1%), and strongly disagree (1.8%) respectively.

Table 4.46. The Distribution of Student's Opinions on the Weight of Grade.

Statements	Opinions	Frequency	Percentage
The weight of grade, e.g. A = 4, A^- = 3.75, B^+ = 3.25, …., F = 0 is appropriate	Strongly agree	38	23.0
	Agree	74	44.8
	Neither agree nor disagree	44	26.7
	Disagree	8	4.8
	Strong disagree	1	0.6
	Total	**165**	**100.0**

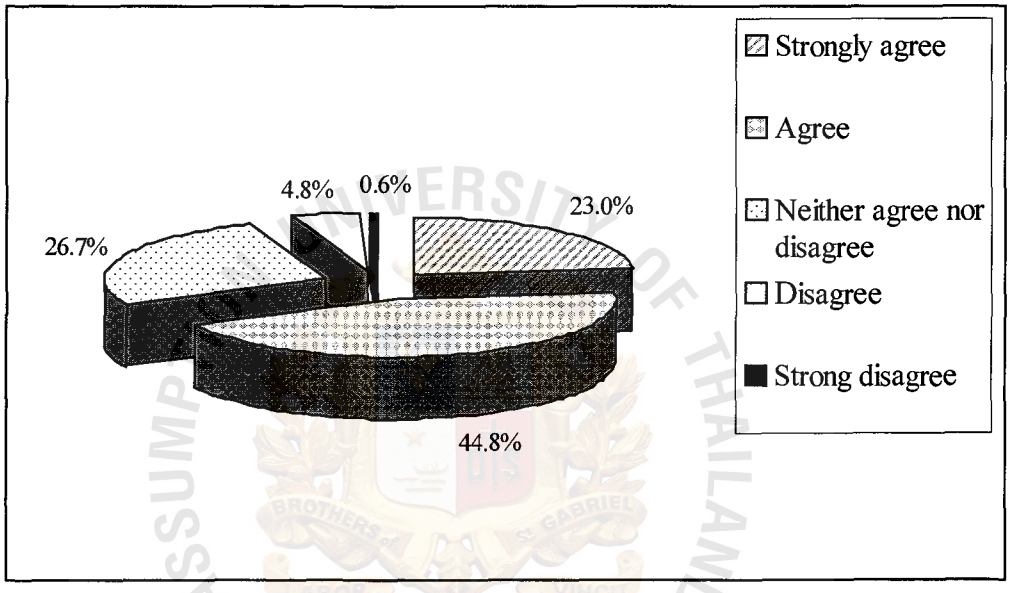

Figure 4.46. Percentage of Student's Opinions on the Weight of Grade.

Table 4.46 and Figure 4.46 show the student's opinions on the weight. The majority of focus group agrees that the weight of grade is appropriate (44.8%), neither agree nor disagree (26.7%), strong agree (23.0%), disagree (4.8%), and strongly disagree (0.6%) respectively.

Table 4.47. The Distribution of Student's Opinions on Changing the Weight of Grade.

Statements	Opinions	Frequency	Percentage
The weight of grade should be changed.	Strongly agree	4	2.4
	Agree	20	12.1
	Neither agree nor disagree	63	38.2
	Disagree	49	29.7
	Strong disagree	29	17.6
	Total	**165**	**100.0**

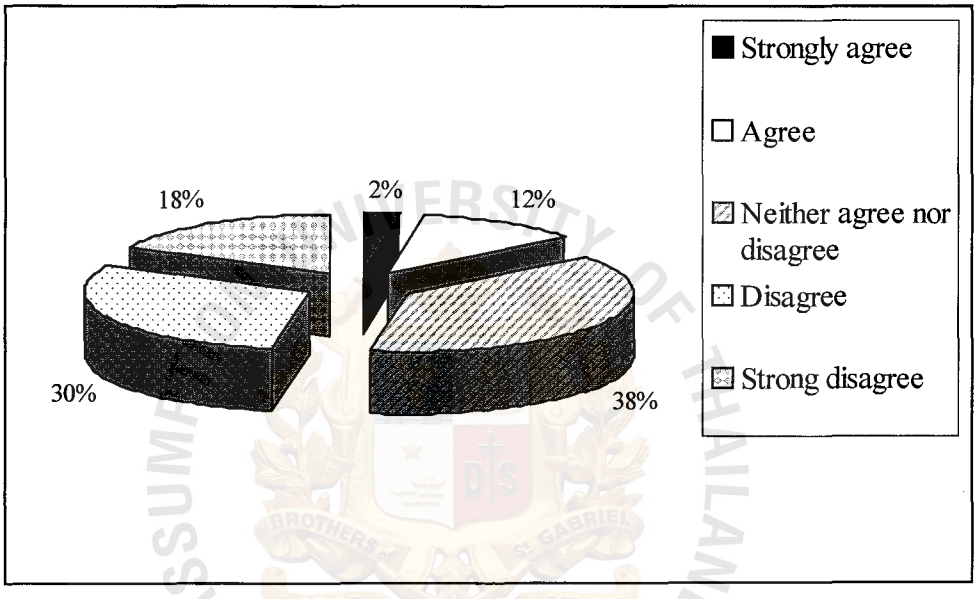

Figure 4.47. Percentage of Student's Opinions on Changing the Weight of Grade.

Table 4.47 and Figure 4.47 show the student's opinions on changing the weight of grade. The majority of focus group neither agree nor disagree agrees about changing the weight of grade (38.2%), disagree (29.7%), strong disagree (17.6%), agree (12.1%), and strongly agree (2.4%) respectively.

Table 4.48. The Distribution of Student's Opinions about the Final and Midterm Examination Is Adequate for the Evaluation of This Program.

Statements	Opinions	Frequency	Percentage
Final and midterm examination is adequate for the evaluation of this program.	Strongly agree	9	5.5
	Agree	63	38.2
	Neither agree nor disagree	58	35.2
	Disagree	28	16.9
	Strong disagree	7	4.2
	Total	**165**	**100.0**

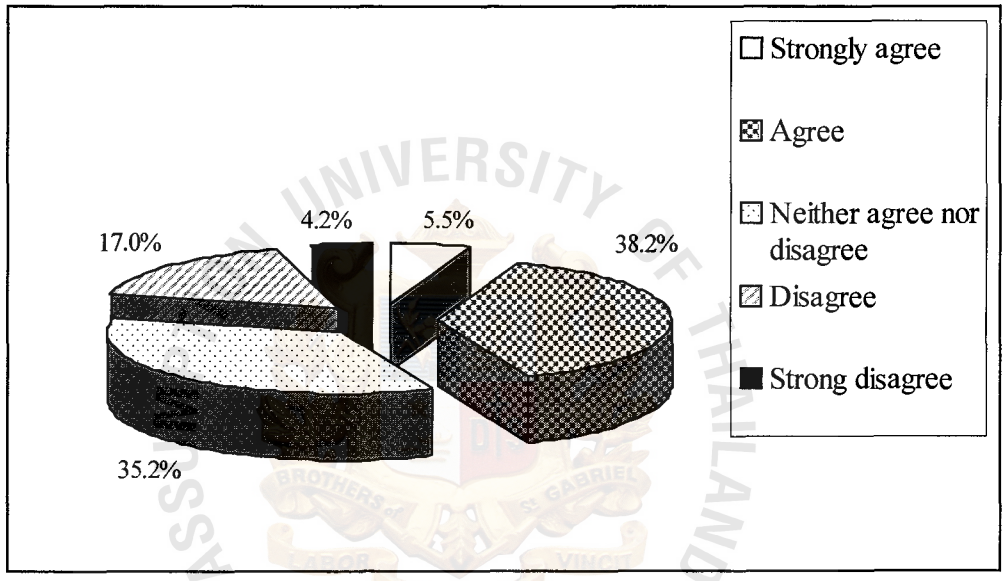

Figure 4.48. Percentage of Student's Opinions about the Final and Midterm Examination Is Adequate for the Evaluation of This Program.

Table 4.48 and Figure 4.48 show that the majority of students agree that final and midterm examination is adequate for the evaluation of this curriculum (38.2%), neither agree nor disagree (35.2%), disagree (16.9%), strongly agree (5.5%), and strongly disagree (4.2%) respectively.

Table 4.49. The Distribution of Student's Opinions on Assigning Pop Quizzes.

Statements	Opinions	Frequency	Percentage
Pop quizzes should be assigned in order for students to better prepare for the midterm or final examination.	Strongly agree	20	12.1
	Agree	67	40.6
	Neither agree nor disagree	65	39.4
	Disagree	11	6.7
	Strong disagree	2	1.2
	Total	**165**	**100.0**

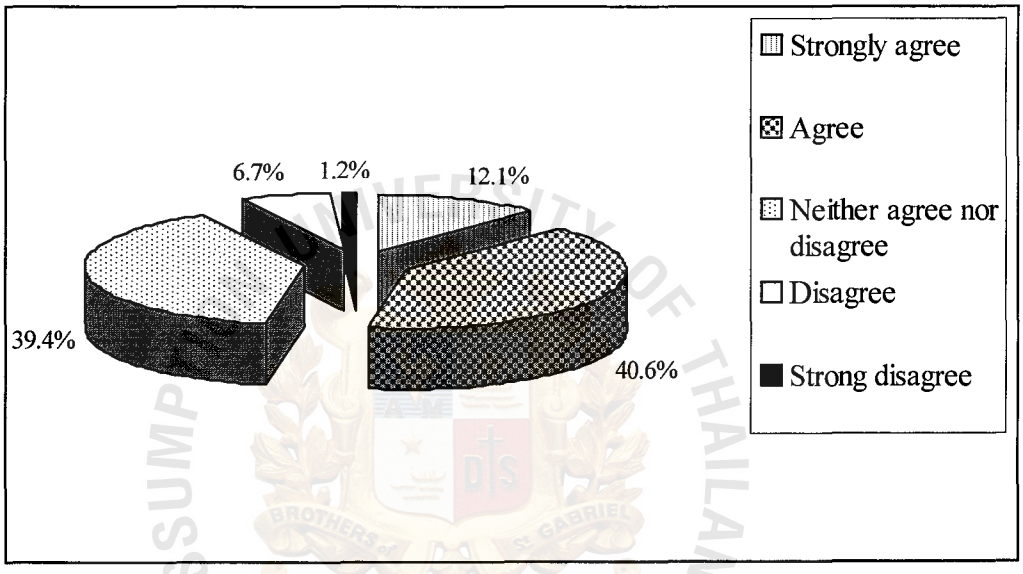

Figure 4.49. Percentage of Student's Opinions on Assigning Pop Quizzes.

Table 4.49 and Figure 4.49 show the student's opinions on assigning pop quizzes. The majority of students agree that pop quizzes should be assigned in order for students to prepare better for the midterm or final examination (40.6%), neither agree nor disagree (39.4%), strong agree (12.1%), disagree (6.7%), and strongly disagree (1.2%) respectively.

Table 4.50. The Distribution of Student's Opinions on the Grading System Should Be Based on the Report.

Statements	Opinions	Frequency	Percentage
The grading system should be based not only on the examination, but also on the report.	Strongly agree	31	18.8
	Agree	89	54.0
	Neither agree nor disagree	40	24.2
	Disagree	4	2.4
	Strong disagree	1	0.6
	Total	**165**	**100.0**

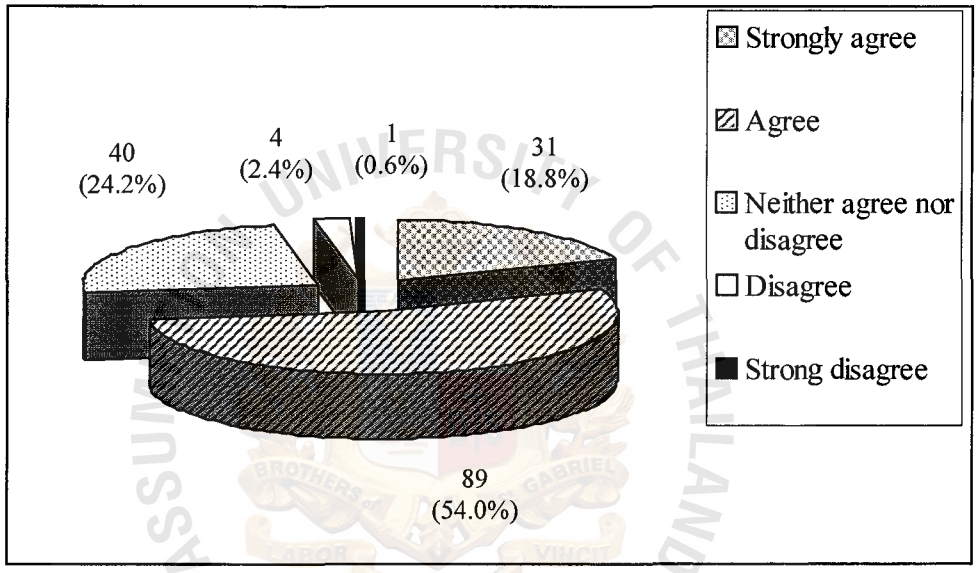

Figure 4.50. Frequency and Percentage of Student's Opinions on the Grading System Should Be Based on the Report.

Table 4.50 and Figure 4.50 show the data about the student's opinions towards The grading system should be based not only on the examination, but also on the report. From total of 165 respondents, 120 students (72.7%) gave affirmative answer, 5 students (3.0%) gave negative answer and 24.2% of them were neutral. The breakdown is 54.0% agree, 24.2% neither agree nor disagree, 18.8% strongly agree, 2.4% disagree and 0.6% strongly disagree on this topic.

Table 4.49. The Distribution of Student's Opinions on Assigning Pop Quizzes.

Statements	Opinions	Frequency	Percentage
Pop quizzes should be assigned in order for students to better prepare for the midterm or final examination.	Strongly agree	20	12.1
	Agree	67	40.6
	Neither agree nor disagree	65	39.4
	Disagree	11	6.7
	Strong disagree	2	1.2
	Total	**165**	**100.0**

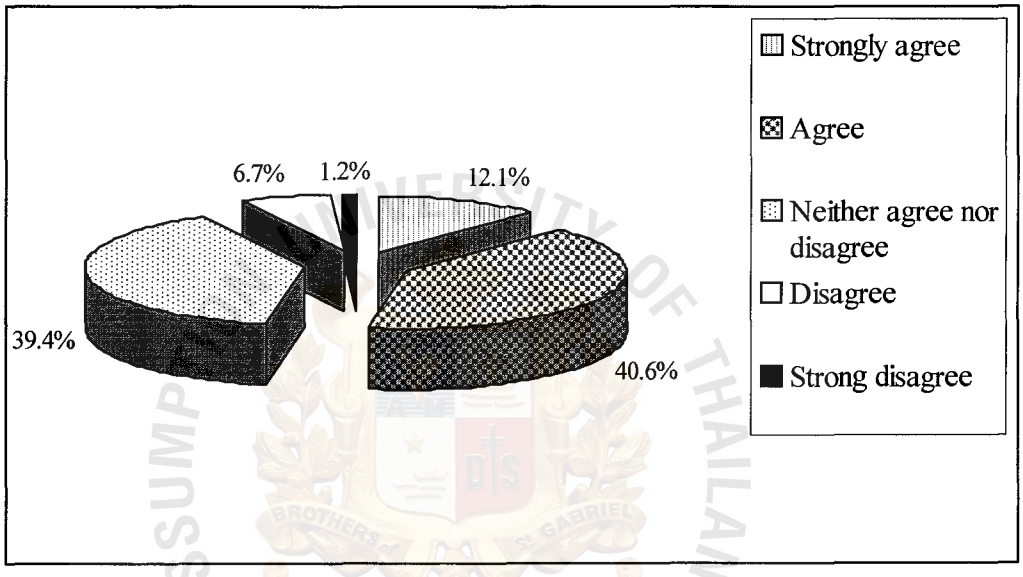

Figure 4.49. Percentage of Student's Opinions on Assigning Pop Quizzes.

Table 4.49 and Figure 4.49 show the student's opinions on assigning pop quizzes. The majority of students agree that pop quizzes should be assigned in order for students to prepare better for the midterm or final examination (40.6%), neither agree nor disagree (39.4%), strong agree (12.1%), disagree (6.7%), and strongly disagree (1.2%) respectively.

Table 4.50. The Distribution of Student's Opinions on the Grading System Should Be Based on the Report.

Statements	Opinions	Frequency	Percentage
The grading system should be based not only on the examination, but also on the report.	Strongly agree	31	18.8
	Agree	89	54.0
	Neither agree nor disagree	40	24.2
	Disagree	4	2.4
	Strong disagree	1	0.6
	Total	**165**	**100.0**

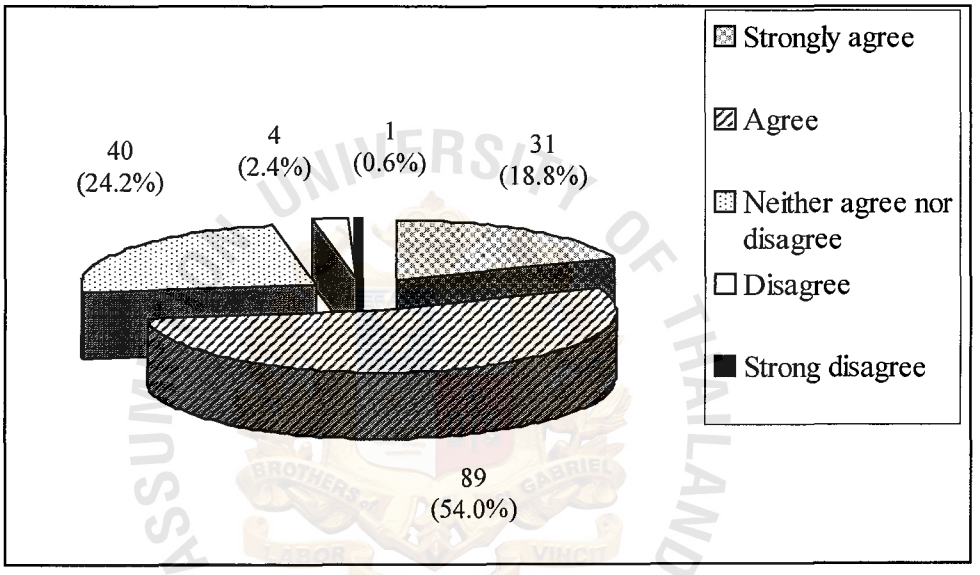

Figure 4.50. Frequency and Percentage of Student's Opinions on the Grading System Should Be Based on the Report.

Table 4.50 and Figure 4.50 show the data about the student's opinions towards The grading system should be based not only on the examination, but also on the report. From total of 165 respondents, 120 students (72.7%) gave affirmative answer, 5 students (3.0%) gave negative answer and 24.2% of them were neutral. The breakdown is 54.0% agree, 24.2% neither agree nor disagree, 18.8% strongly agree, 2.4% disagree and 0.6% strongly disagree on this topic.

Table 4.51. The Distribution of Student's Opinions on the Grading System Should Be Based on the Presentation.

Statements	Opinions	Frequency	Percentage
The grading system should be based not only on the examination, but also on the presentation.	Strongly agree	39	23.6
	Agree	86	52.1
	Neither agree nor disagree	34	20.6
	Disagree	5	3.0
	Strong disagree	1	0.6
	Total	**165**	**100.0**

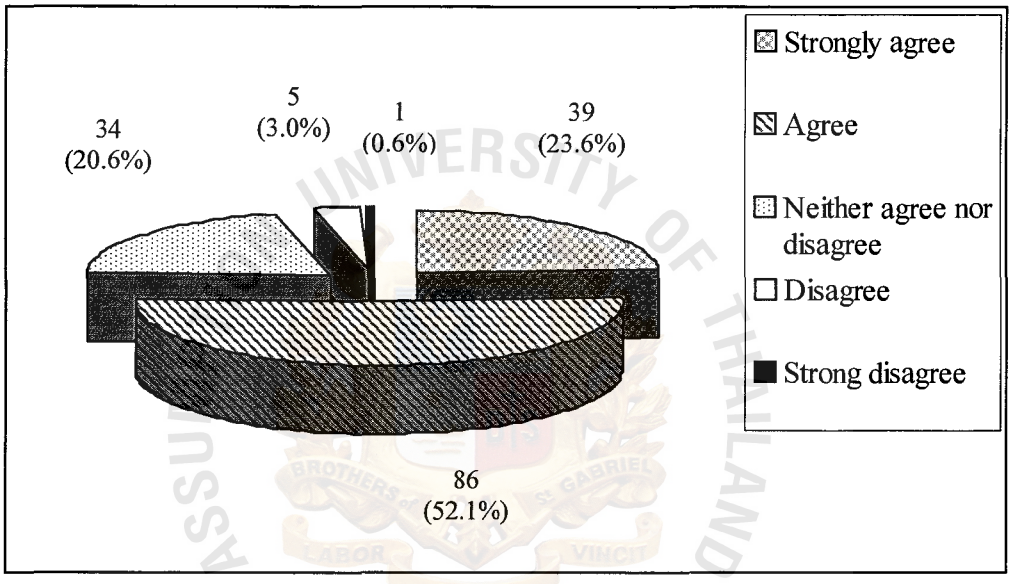

Figure 4.51. Frequency and Percentage of Student's Opinions on the Grading System Should Be Based on the Presentation.

Table 4.51 and Figure 4.51 show the data about the student's opinions towards the grading system should be based not only on the examination, but also on the presentation. From total of 165 respondents, 125 students (75.8%) gave affirmative answer, 6 students (3.6%) gave negative answer and 20.6% of them were neutral. The breakdown is 52.1% agree, 20.6% neither agree nor disagree, 23.6% strongly agree, 3.0% disagree and 0.6% strongly disagree on this topic.

Table 4.52. The Distribution of Student's Opinions on the Option of Thesis and Project.

Statements	Opinions	Frequency	Percentage
The options of thesis (plan A) and project (plan B) are appropriate.	Strongly agree	23	14.0
	Agree	54	32.7
	Neither agree nor disagree	63	38.2
	Disagree	21	12.7
	Strong disagree	4	2.4
	Total	**165**	**100.0**

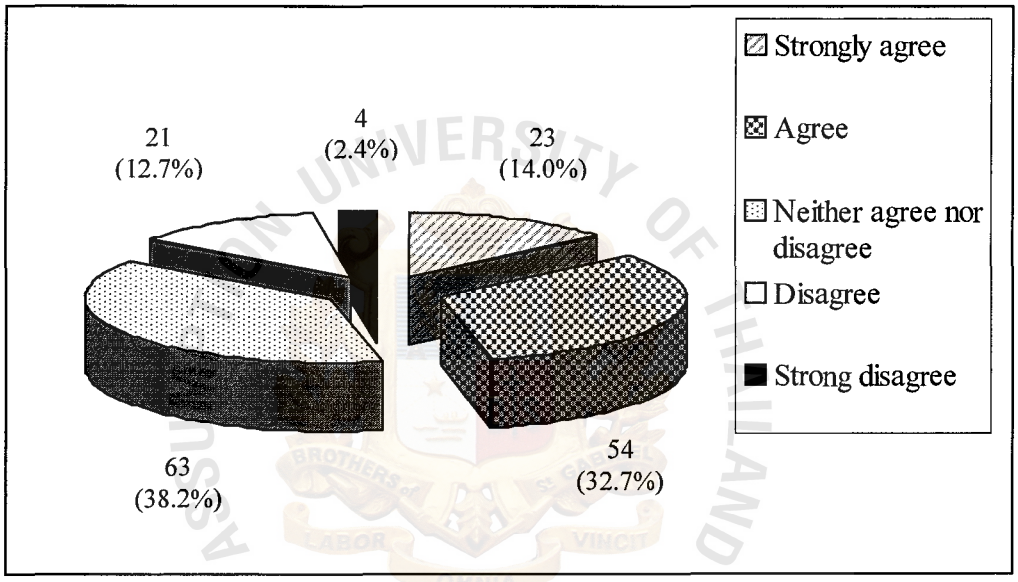

Figure 4.52. Frequency and Percentage of Student's Opinions on the Option of Thesis and Project.

Table 4.52 and Figure 4.52 show the students opinions towards the option of thesis and project. There are 63 students (38.2%) out of 165 respondents neither agree nor agree that the option of thesis and project is appropriate, 32.7% agree, 14.0% strongly agree, 12.7% disagree and 2.4% strongly disagree. However, 77 students (46.7%) gave a positive answer about this topic.

Table 4.53. The Distribution of Student's Opinions on This Curriculum Should Have Only Plan A.

Statements	Opinions	Frequency	Percentage
This curriculum should have only plan A or thesis option for the students.	Strongly agree	7	4.2
	Agree	19	11.5
	Neither agree nor disagree	61	37.0
	Disagree	48	29.1
	Strong disagree	30	18.2
	Total	**165**	**100.0**

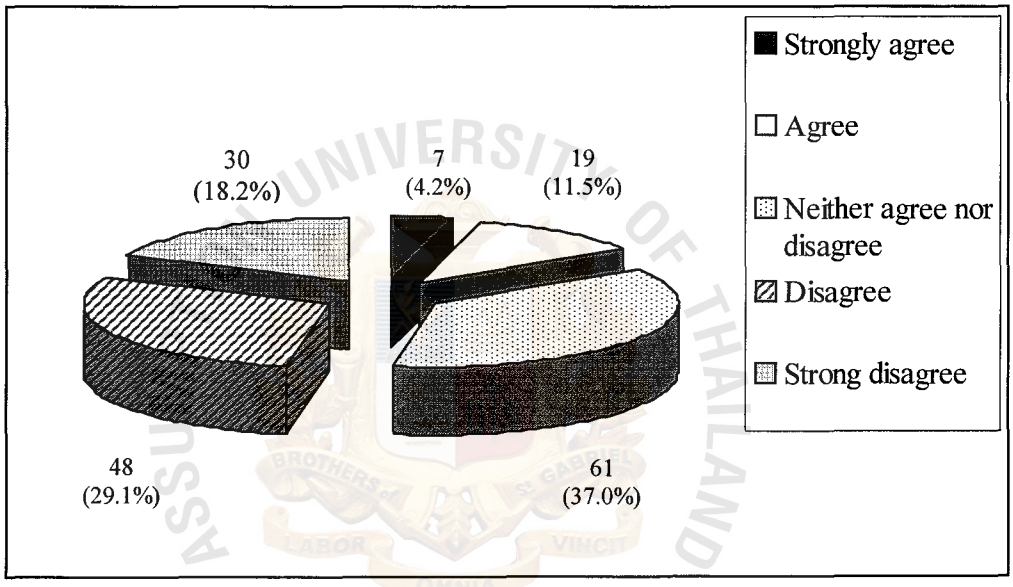

Figure 4.53. Frequency and Percentage of Student's Opinions on This Curriculum Should Have Only Plan A.

Table 4.53 and Figure 4.53 show the data about the student's opinions towards this curriculum should have only plan A or thesis option for the students. From total of 165 respondents, 61 students (37.0%) neither agree nor disagree that this curriculum should have only plan A for the students (37.0%), disagree (29.1%), strongly disagree (18.2)%, agree (11.5%) and strongly agree (4.2%) respectively.

Table 4.54. The Distribution of Student's Opinions on the Format of the Examination Should Be Open-Book.

Statements	Opinions	Frequency	Percentage
The format of the examination should be open-book.	Strongly agree	21	12.7
	Agree	40	24.2
	Neither agree nor disagree	83	50.3
	Disagree	15	9.1
	Strong disagree	6	3.6
	Total	**165**	**100.0**

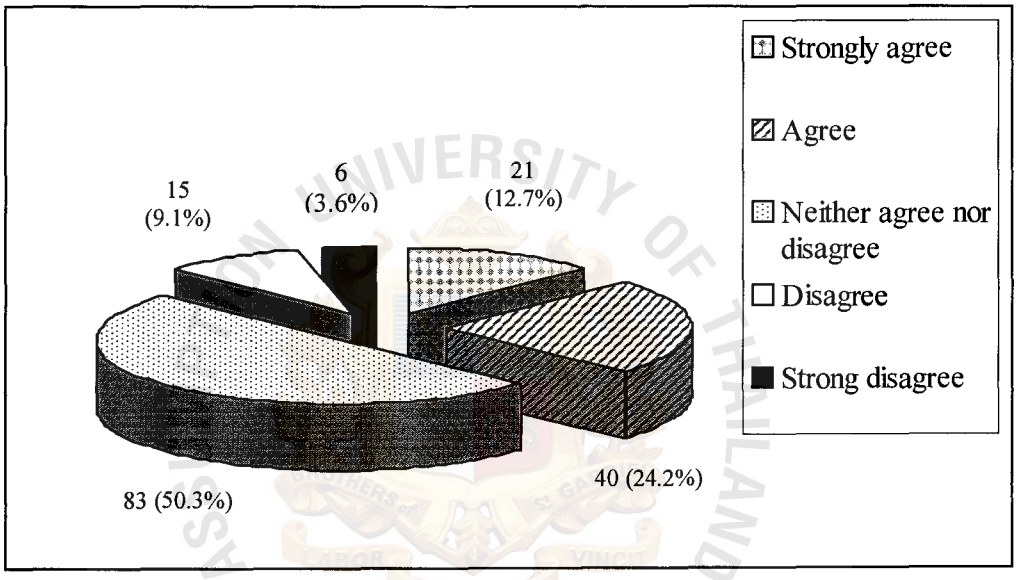

Figure 4.54. Frequency and Percentage of Student's Opinions on the Format of the Examination Should Be Open-Book.

Table 4.54 and Figure 4.54 show the data about the student's opinions towards the format of the examination should be open-book. From total of 165 respondents, 61 students (36.9%) gave affirmative answer, 21 students (12.7%) gave negative answer and 50.3% of them were neutral. The breakdown is neither agree nor disagree (50.3%), agree (24.2%), strongly agree (12.7%), disagree (9.1%) and strongly disagree (3.6%) respectively.

Table 4.55. The Distribution of Student's Opinions on the Format of the Examination Should Be Closed-Book.

Statements	Opinions	Frequency	Percentage
The format of the examination should be closed-book.	Strongly agree	1	0.6
	Agree	17	10.3
	Neither agree nor disagree	89	54.0
	Disagree	38	23.0
	Strong disagree	20	12.1
	Total	**165**	**100.0**

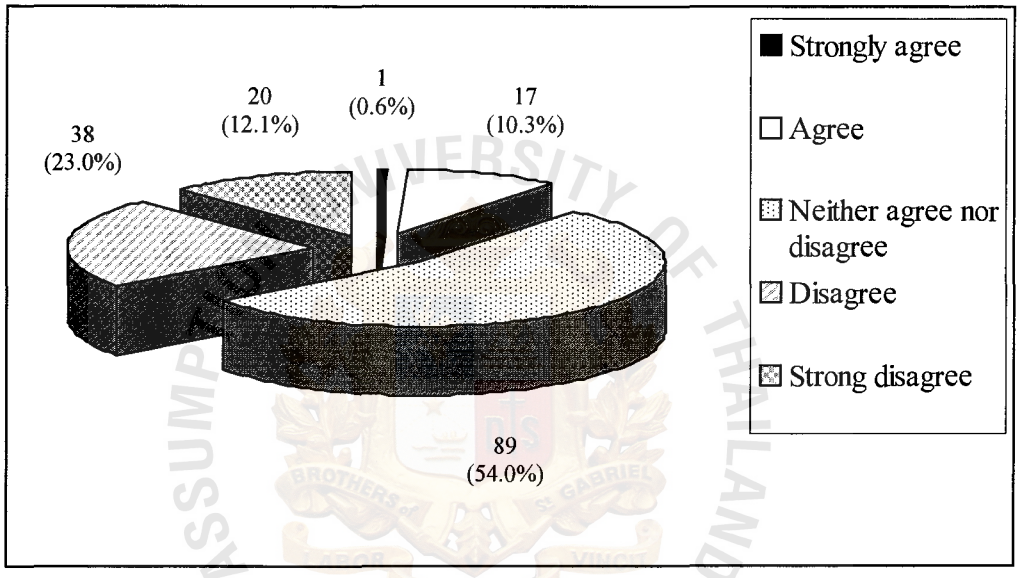

Figure 4.55. Frequency and Percentage of Student's Opinions on the Format of the Examination Should Be Closed-Book.

Table 4.55 and Figure 4.55 show the data about the student's opinions towards the format of the examination should be closed-book. From total of 165 respondents, 58 students (35.2%) gave negative answer, 19 students (11.5%) gave affirmative answer and 54.0% of them were neutral. The breakdown is the majority of focus group neither agree nor disagree about the format of the examination should be closed-book (54.0%), disagree (23.0%) and strongly disagree (12.1%) agree (10.3%) and strongly agree (0.6%) respectively.

Table 4.56. The Distribution of Student's Opinions on the Number of Papers in the Comprehensive Examination.

Statements	Opinions	Frequency	Percentage
The number of papers in the comprehensive examination is appropriate (4 papers).	Strongly agree	19	11.5
	Agree	72	43.6
	Neither agree nor disagree	56	34.0
	Disagree	15	9.1
	Strong disagree	3	1.8
	Total	**165**	**100.0**

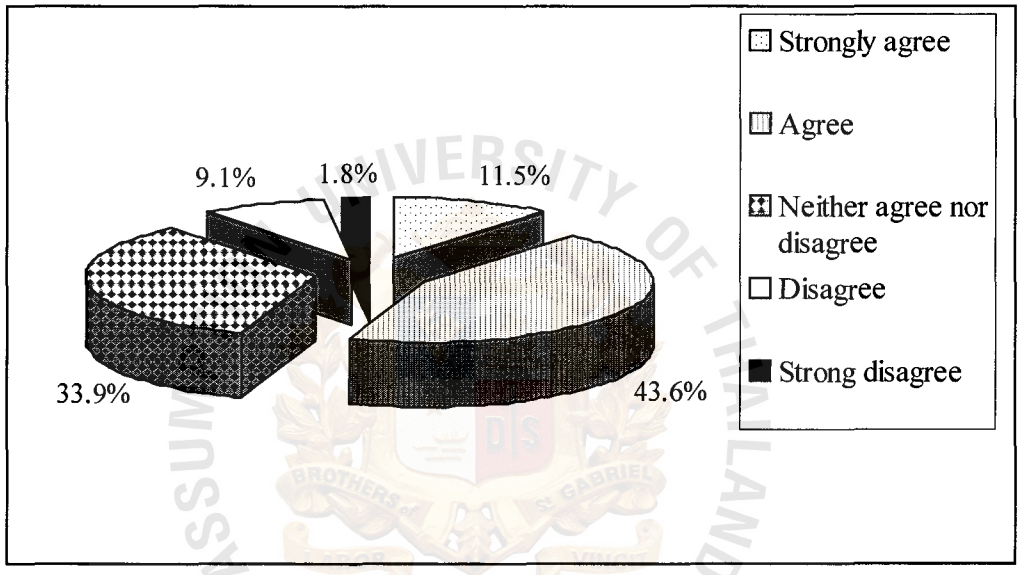

Figure 4.56. Percentage of Student's Opinions on the Number of Papers in the Comprehensive Examination.

Table 4.56 and Figure 4.56 show the student's opinion towards the number of papers in the comprehensive examination. The majority of respondents agree that the number of papers in the comprehensive examination is appropriate (43.6%), neither agree nor disagree (34.0%), strongly agree (11.5%), disagree (9.1%) and strongly disagree (1.8%) respectively.

Table 4.57. The Distribution of Student's Opinions on Increasing the Number of Papers in the Comprehensive Examination.

Statements	Opinions	Frequency	Percentage
The number of papers in the comprehensive examination should be increased (more than 4 papers).	Strongly agree	4	2.4
	Agree	19	11.5
	Neither agree nor disagree	55	33.3
	Disagree	46	28.0
	Strong disagree	41	24.8
	Total	**165**	**100.0**

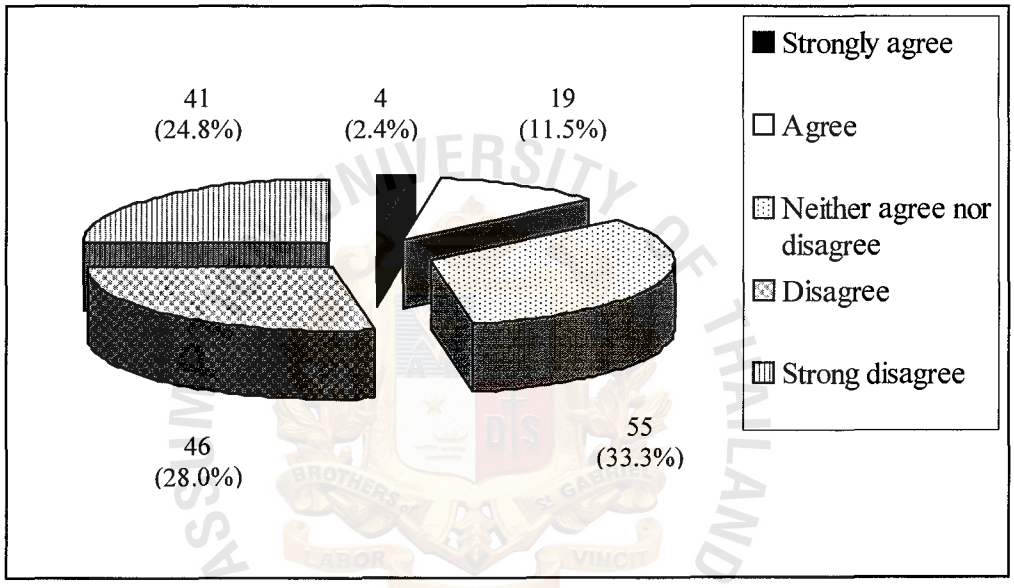

Figure 4.57. Frequency and Percentage of Student's Opinions on Increasing the Number of Papers in the Comprehensive Examination.

Table 4.57 and Figure 4.57 show the data about the student's opinions on increasing the number of papers in the comprehensive examination. From total of 165 respondents, 87 students (52.7%) gave negative answer, 23 students (13.9%) gave affirmative answer and 33.3% of them were neutral.

Table 4.58. The Distribution of Student's Opinions on All Subjects which Students Studied Should Be Included in the Comprehensive Examination.

Statements	Opinions	Frequency	Percentage
All subjects which students studied should be included in the comprehensive examination.	Strongly agree	6	3.6
	Agree	38	23.0
	Neither agree nor disagree	46	27.9
	Disagree	56	34.0
	Strong disagree	19	11.5
	Total	**165**	**100.0**

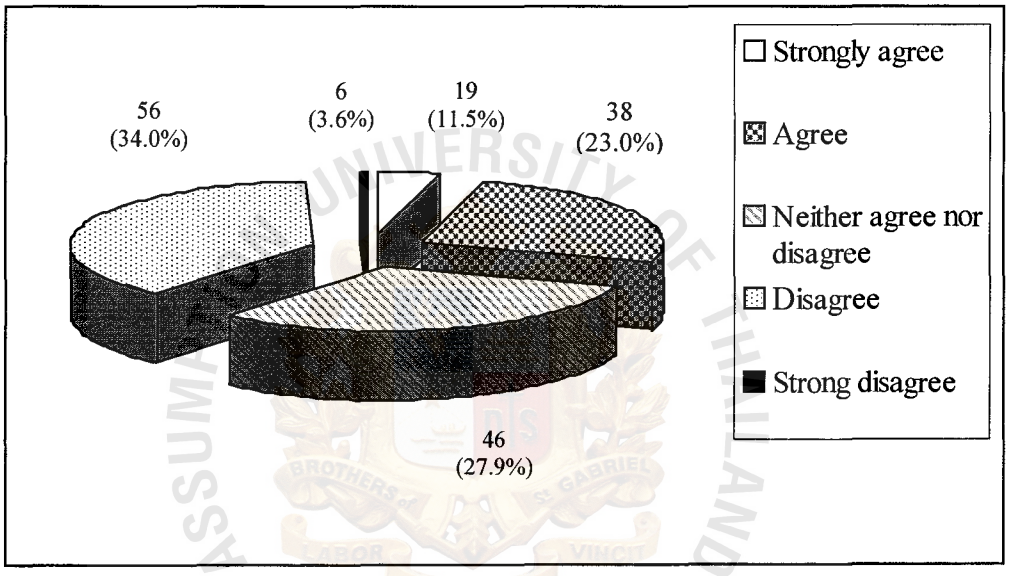

Figure 4.58. Frequency and Percentage of Student's Opinions on All Subjects which Students Studied Should Be Included in the Comprehensive Examination.

Table 4.58 and Figure 4.58 show the majority of students disagree that all subjects which students studied should be included in the comprehensive examination (34.0%), neither agree nor disagree (27.9%), agree (23.0%), strongly disagree (11.5%) and strongly agree (3.6%) respectively.

Table 4.59. The Distribution of Student's Opinions on the Subject Coverage in Comprehensive Examination.

Statements	Opinions	Frequency	Percentage
The subject coverage in each paper of the comprehensive examination is appropriate.	Strongly agree	11	6.7
	Agree	68	41.2
	Neither agree nor disagree	67	40.6
	Disagree	16	9.7
	Strong disagree	3	1.8
	Total	**165**	**100.0**

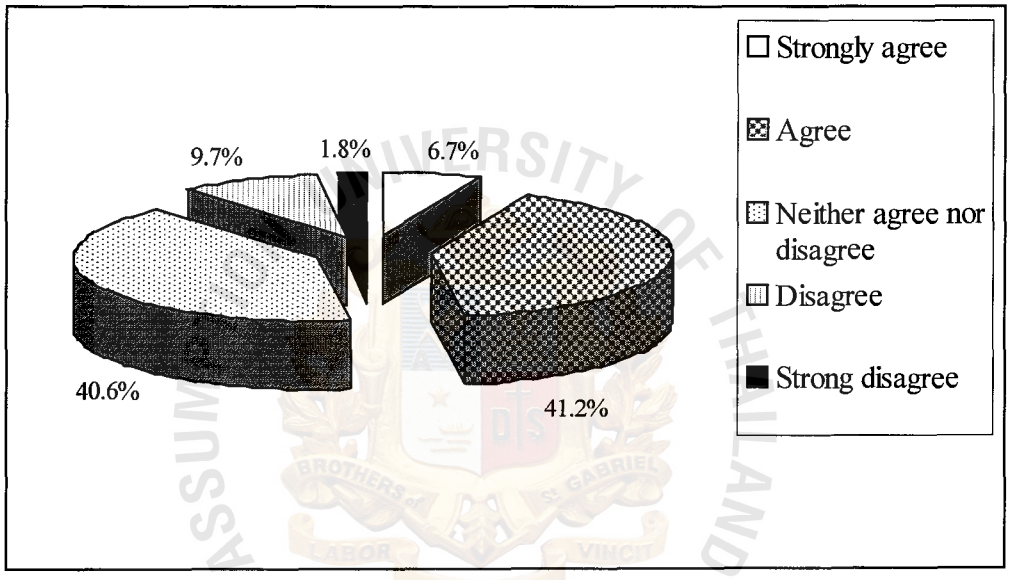

Figure 4.59. Percentage of Student's Opinions on the Subject Coverage in Comprehensive Examination.

From Table 4.59 and Figure 4.59, the majority of students agree that the subject coverage in each paper of the comprehensive examination is appropriate (41.2%), neither agree nor disagree (40.6%), disagree (9.7%), strongly agree (6.7%) and strongly disagree (1.8%) respectively.

Table 4.60. The Distribution of Student's Opinions on the Subject Coverage in Paper 1.

Statements	Opinions	Frequency	Percentage
The subject coverage in paper 1 is appropriate. (1)CE 6401 (2)CE 6403	Strongly agree	15	9.1
	Agree	73	44.2
	Neither agree nor disagree	60	36.4
	Disagree	13	7.9
	Strong disagree	4	2.4
	Total	**165**	**100.0**

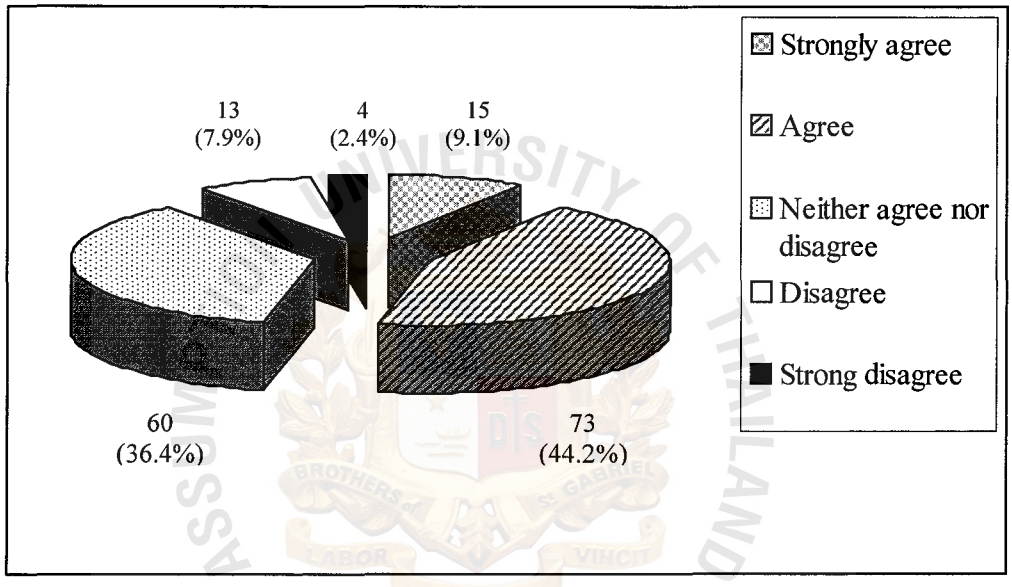

Figure 4.60. Percentage and Frequency of Student's Opinions on the Subject Coverage in Paper 1.

Table 4.60 and Figure 4.60 show the data about the student's opinions on the subject coverage in paper 1. From 165 respondents, there are 73 students (44.2%) agree that the subject coverage in paper 1 is appropriate, 36.4 % neither agree nor disagree, 9.1% strongly agree, 7.9% disagree and 2.4% strongly disagree on this topic.

Table 4.61. The Distribution of Student's Opinions on the Subject Coverage in Paper 2.

Statements	Opinions	Frequency	Percentage
The subject coverage in paper 2 is appropriate. (1)CE 6506 (2)CE 6501	Strongly agree	16	9.7
	Agree	80	48.5
	Neither agree nor disagree	58	35.2
	Disagree	9	5.4
	Strong disagree	2	1.2
	Total	**165**	**100.0**

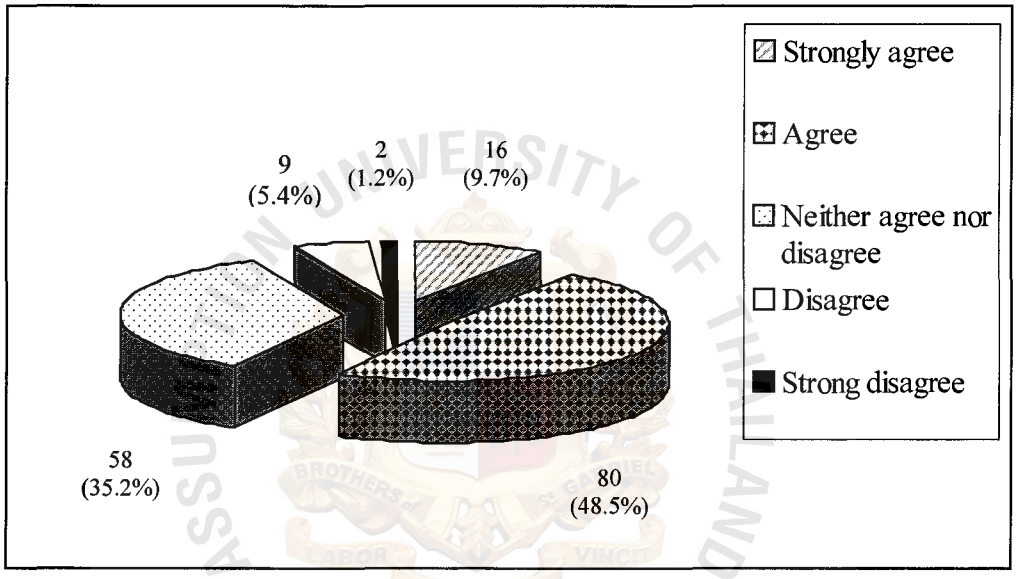

Figure 4.61. Frequency and Percentage of Student's Opinions on the Subject Coverage in Paper 2.

Table 4.61 and Figure 4.61 show the data about the student's opinions on the subject coverage in paper 2. From 165 respondents, there are 80 students (48.5%) agree that the subject coverage in paper 2 is appropriate, 35.2 % neither agree nor disagree, 9.7% strongly agree, 5.4% disagree and 1.2% strongly disagree on this topic.

Table 4.62. The Distribution of Student's Opinions on the Subject Coverage in Paper 3.

Statements	Opinions	Frequency	Percentage
The subject coverage in paper 3 is appropriate (choose 2 out of 3 subjects). (1)CE 6620 (2)CE 6705 (3)CE 6611	Strongly agree	10	6.1
	Agree	82	49.7
	Neither agree nor disagree	61	36.9
	Disagree	10	6.1
	Strong disagree	2	1.2
	Total	**165**	**100.0**

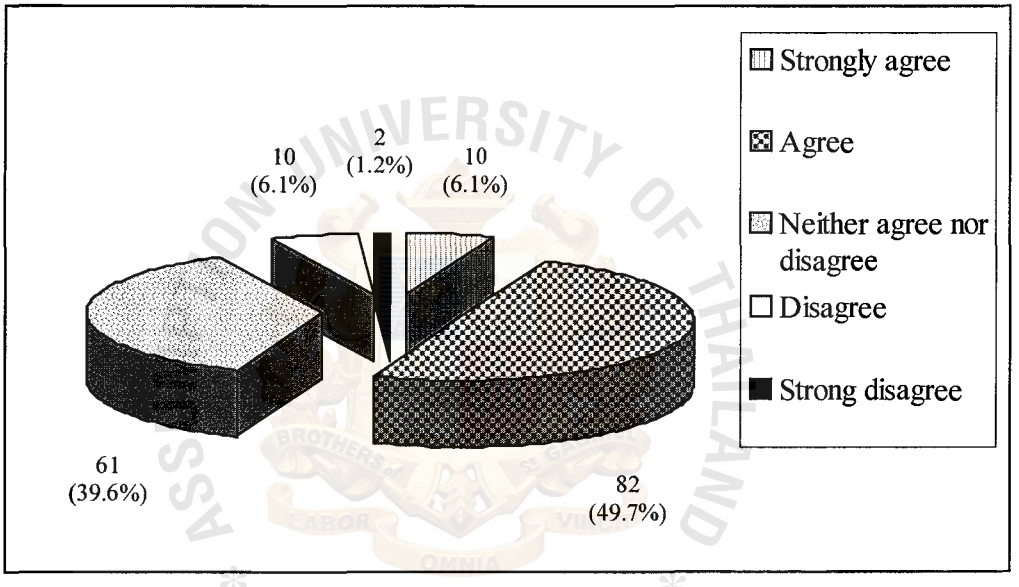

Figure 4.62. Frequency and Percentage of Student's Opinions on the Subject Coverage in Paper 3.

Table 4.62 and Figure 4.62 show the data about the student's opinions on the subject coverage in paper 3. From 165 respondents, there are 82 students (49.7%) agree that the subject coverage in paper 3 is appropriate, 36.9 % neither agree nor disagree, 6.1% strongly agree, 6.1% disagree and 1.2% strongly disagree on this topic.

Table 4.63. The Distribution of Student's Opinions on the Subject Coverage in Paper 4.

Statements	Opinions	Frequency	Percentage
The subject coverage in paper 4 is appropriate (choose 2 out of 4 subjects).	Strongly agree	13	7.9
(1)CE 6505	Agree	77	46.7
(2)CE 6509	Neither agree nor disagree	65	39.4
(3)CE 6511	Disagree	9	5.4
(4)CE 6512	Strong disagree	1	0.6
	Total	**165**	**100.0**

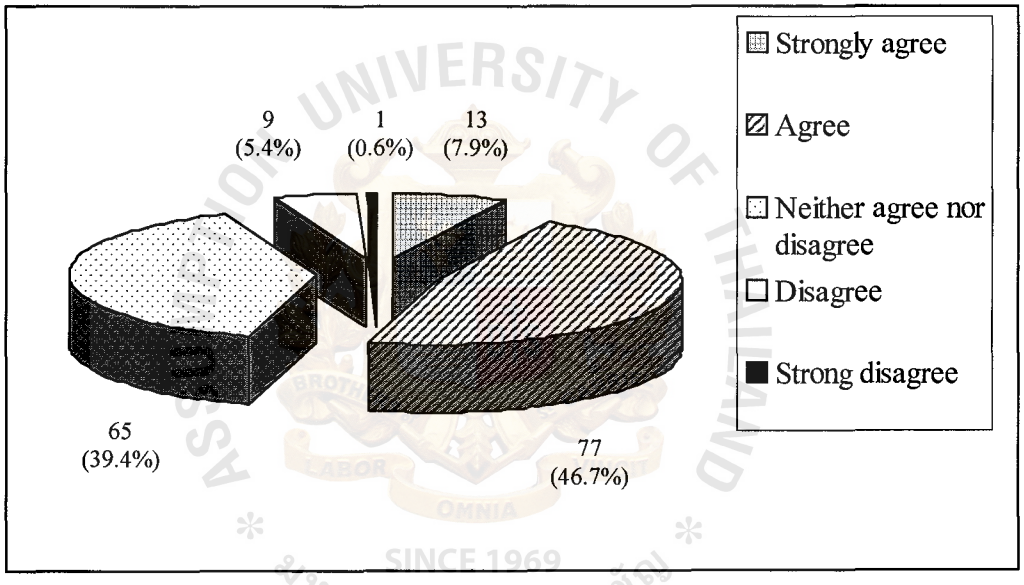

Figure 4.63. Frequency and Percentage of Student's Opinions on the Subject Coverage in Paper 4.

Table 4.63 and Figure 4.63 show the data about the student's opinions on the subject coverage in paper 4. From 165 respondents, there are 77 students (44.2%) agree that the subject coverage in paper 4 is appropriate, 39.4 % neither agree nor disagree, 7.9% strongly agree, 5.4% disagree and 0.6% strongly disagree on this topic.

Table 4.64. The Distribution of Student's Opinions on the Minimum Requirement Score in the Comprehensive Examination.

Statements	Opinions	Frequency	Percentage
For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate.	Strongly agree	18	11.0
	Agree	66	40.0
	Neither agree nor disagree	57	34.5
	Disagree	20	12.1
	Strong disagree	4	2.4
	Total	**165**	**100.0**
For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is not appropriate. The students should get at least 60 percent of each subject in each paper.	Strongly agree	8	4.8
	Agree	30	18.2
	Neither agree nor disagree	74	44.8
	Disagree	46	28.0
	Strong disagree	7	4.2
	Total	**165**	**100.0**

Table 4.64 shows the data about the student's opinions on the minimum requirement score in the comprehensive examination.

According to the student's opinion on the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate. From 165 respondents, 84 students (50.9%) gave affirmative answer, 24 students (14.5%) gave negative answer, and 34.5% of them are neutral. The breakdown is the majority of focus group agree that the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate (40.0%), neither agree nor disagree (34.5%), disagree (12.1%) and strongly agree (11.0%) and strongly disagree (2.4%).

While the student's opinion on the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is not appropriate, there are 53 students (32.1%) from 165 respondents gave negative answer, 38 students (23.0%) gave affirmative answer and 44.8% were neutral. The breakdown is the majority of focus

group neither agree nor disagree that the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is not appropriate and the students should get at least 60 percent of each subject in each paper (44.8%), disagree (28.0%), agree (18.2%) and strongly agree (4.8%) and strongly disagree (4.2%) for this topic.

Table 4.65. The Summarized Student's Opinions and Needs towards the Evaluation of the Curriculum.

Statement	Mean	Standard Deviation
1. The evaluation of grade ranks, e.g. A, B,…., F is reliable.	3.61	0.80
2. The grade received truly reflects my skill and knowledge.	3.45	0.82
3. The weight of grade, e.g. A = 4, A^- = 3.75, B^+ = 3.25, …., F = 0 is appropriate.	3.85	0.85
4. The weight of grade should be changed.	2.52	0.99
5. Final and midterm examination is adequate for the evaluation of this program.	3.24	0.94
6. Pop quizzes should be assigned in order for students to better prepare for the midterm or final examination.	3.56	0.84
7. The grading system should be based not only on the examination, but also on the report.	3.88	0.76
8. The grading system should be based not only on the examination, but also on the presentation.	3.95	0.79
9. The options of thesis (plan A) and project (plan B) are appropriate.	3.43	0.96
10. This curriculum should have only plan A or thesis option for the students.	2.55	1.05
11. The format of the examination should be open-book.	3.33	0.94
12. The format of the examination should be closed-book.	2.64	0.85
13. The number of papers in the comprehensive examination is appropriate (4 papers).	3.54	0.88
14. The number of papers in the comprehensive examination should be increased (more than 4 papers).	2.39	1.06
15. All subjects which students studied should be included in the comprehensive examination.	2.81	1.08
16. The subject coverage in each paper of the comprehensive examination is appropriate.	3.33	0.81

Table 4.65. The Summarized Student's Opinions and Needs towards the Evaluation of the Curriculum. (Continued)

Statement	Mean	Standard Deviation
17. The subject coverage in paper 1 is appropriate. (3) CE 6401 Management Information System (4) CE 6403 Computer and Internet Security	3.50	0.86
18. The subject coverage in paper 2 is appropriate. (5) CE 6506 Computer and Engineering Economy (6) CE 6501 Principles of Engineering Management I	3.60	0.79
19. The subject coverage in paper 3 is appropriate (choose 2 out of 3 subjects). (a) CE 6620 Production Management (b) CE 6705 Operations Research (c) CE 6611 Computer Integrated Manufacturing Systems and Management	3.53	0.75
20. The subject coverage in paper 4 is appropriate (choose 2 out of 4 subjects). (a) CE 6505 Financial Management (b) CE 6509 Personnel Management (c) CE 6511 Marketing Management (d) CE 6512 Case Studies in General Management	3.56	0.74
21. For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate.	3.45	0.93
22. For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is not appropriate. The students should get at least 60 percent of each subject in each paper.	2.92	0.91

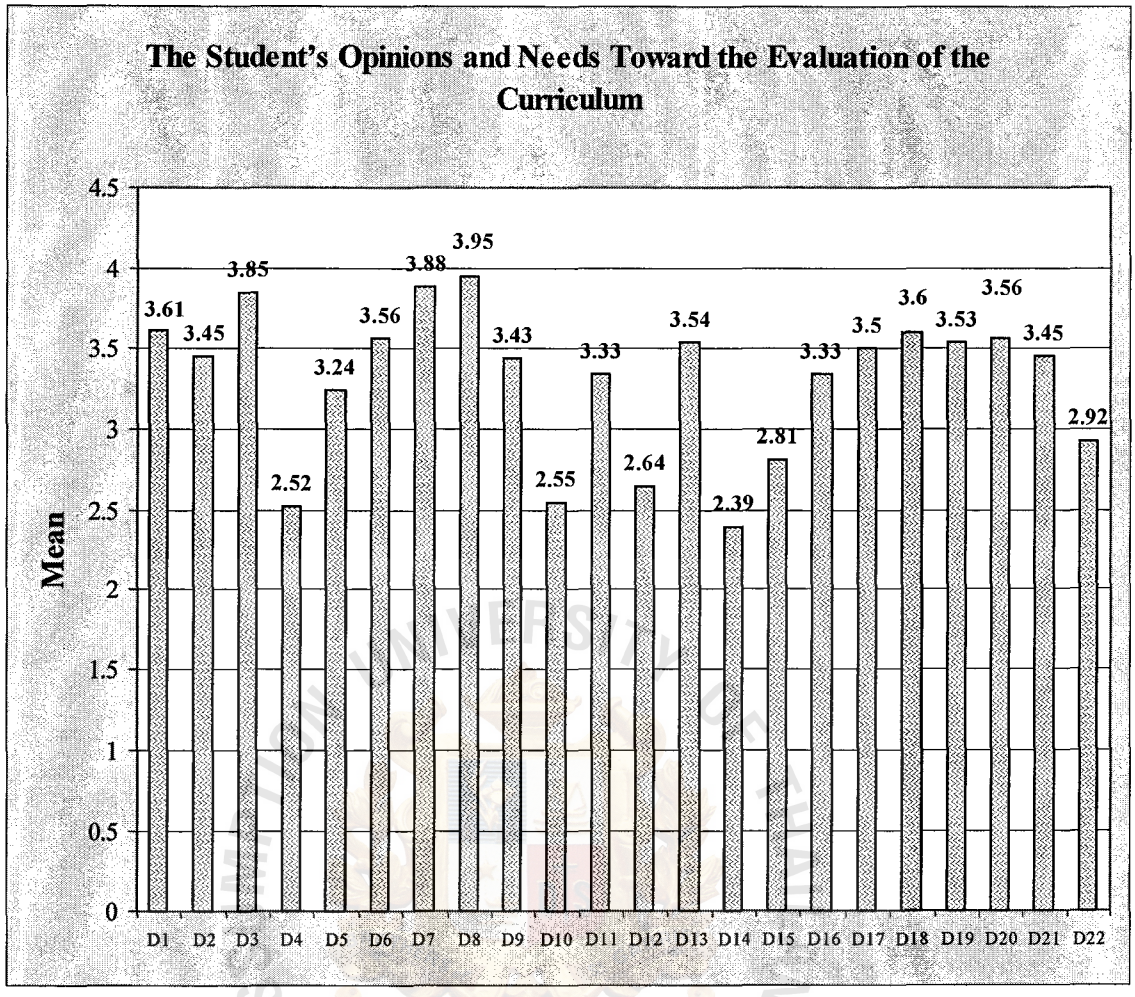

Figure 4.64. The Summarized Student's Opinions and Needs towards the Evaluation of the Curriculum.

Table 4.65 and Figure 4.65 shows student's opinion score toward the evaluation of curriculum. The highest score of student's opinion is (8) The grading system should be based not only on the examination, but also on the presentation and the lowest score of student's opinions is (14) The number of papers in the comprehensive examination should be increased.

Additionally, the student's opinions score can rank from highest score to lowest score as follows: (8) The grading system should be based not only on the examination, but also on the presentation, (7) The grading system should be based not only on the

examination, but also on the report, (3) The weight of grade is appropriate, (1) The evaluation of grade ranks is reliable, (18) The subject coverage in paper 2 is appropriate, (20) The subject coverage in paper 4 is appropriate, (6) Pop quizzes should be assigned in order for students to prepare better for the midterm or final examination, (13) The number of papers in the comprehensive examination is appropriate, (19) The subject coverage in paper 3 is appropriate, (17) The subject coverage in paper 1 is appropriate , (21) For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate, (2) The grade received truly reflects my skill and knowledge, (9) The options of thesis and project are appropriate, (16) The subject coverage in each paper of the comprehensive examination is appropriate, (11) The format of the examination should be open-book., (5) Final and midterm examination is adequate for the evaluation of this program, (22) For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is not appropriate. The students should get at least 60 percent of each subject in each paper, (15) All subjects which students studied should be included in the comprehensive examination, (12) The format of the examination should be closed-book, (10) This curriculum should have only plan A or thesis option for the students, (4) The weight of grade should be changed and (14) The number of papers in the comprehensive examination should be increased.

4.3 The Reliability of the Result

Reliability refers to the property of a measurement instrument that causes it to give similar results for similar inputs. It is difficult or impossible to establish absolute standards or the meaning of human responses to a survey. We can only hope to establish scales that are reasonably consistent. The methods discussed in this chapter are useful for situations in which the true state of the measured objects is not known.

While there is a lot of information to be gleaned from looking at correlation, what we really want is a single summary statistic that tells us how reliable our survey is. There are several ways to do this, the most common of which is Cronbach's alpha.

Cronbach's alpha (Cronbach 1951) is a measure of reliability. More specifically, alpha is a lower bound for the true reliability of the survey. Mathematically, reliability is defined as the proportion of the variability in the responses to the survey that is the result of differences in the respondents. That is, answers to a reliable survey will differ because respondents have different opinions, not because the survey is confusing or has multiple interpretations. The computation of Cronbach's alpha is based on the number of items on the survey (k) and the ratio of the average inter-item covariance to the average item variance.

The formula is:

$$\alpha = \frac{k\,\overline{\text{cov}} / \overline{\text{var}}}{1+(k-1)\,\overline{\text{cov}} / \overline{\text{var}}}$$

Under the assumption that the item variances are all equal, this ratio simplifies to the average inter-item correlation, and the result is known as the Standardized item alpha.

$$\alpha = \frac{k\overline{r}}{1+(k-1)\overline{r}}$$

Reliability analysis allows you to study the properties of measurement scales and the items that make them up. The Reliability Analysis procedure calculates a number of commonly used measures of scale reliability and also provides information about the relationships between individual items in the scale. Intraclass correlation coefficients can be used to compute interrater reliability estimates.

From all questions in the questionnaire, there are composed 57 items and analyzing by SPSS program version 10.0.7, the alpha value is 0.8507. This alpha value means the measurement scales of questionnaire reliability is 85.07% (0.8507). This shows that the reliability of questionnaire stands in high level and is suitable to be reference for the result.

V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

The project is aimed at studying the student's opinions and needs towards the curriculum and using the findings in improving and developing to the efficient curriculum. The population of this research is the alumni of Master's Degree Program of Science in Computer and Engineering Management, Assumption University.

Secondary data have been used and the primary data is gathered by using a questionnaire. After collecting of 165 sets of questionnaires, all answers are recorded into SPSS program (Statistical Package for the Social Sciences) version 10.0.7 in order to analyze and conclude the results.

The results are divided into 2 parts. First part is about the personal information of respondents and other is about the opinions and needs towards the curriculum. Additionally, the overall result is present in the form of the table and figure. The information that the researcher gathered from the study, it can conclude as follows:

(1) The Personal Information of the Respondent

From the personal information of the respondent, the researcher found that the majority of the respondents are the students with ID 413 (25.5%), female 85 persons (51.5%), age between 27-30 years (46.7%), business background (44.8%), and private employee (72.1%).

(2) The Student's Opinions towards the Curriculum

(a) The Student's Opinions towards the Purposes of the Curriculum

There are 5 purposes of the curriculum of Master of Science in Computer and Engineering. From the research, the student opinion score can be ranked from the highest score to the lowest score as

purpose 1 (score 3.74), purpose 2 (score 3.53), purpose 5 (score 3.49), purpose 4 (score 3.38) and purpose 3 (score 2.78) respectively. The score over 3.40 shows that the student's opinions are agreeable with the purpose of the curriculum except purpose 3.

However, the overall student's opinions toward the purposes of the curriculum are fairly agreeable with score of 3.29.

(b) The Student's Opinions towards the Structure of Curriculum

From the study, most of the student's opinions are fairly agreeable on the structure of curriculum. The lowest level of student's opinions score is (6) The number of courses should be increased and (1) The number of courses is appropriate, which is the highest of student's opinion score.

The student opinion score can be also ranked from the highest score to the lowest score as (1) The number of courses is appropriate, (11) The subject of computer courses for studying should be increased, (2) The number of required courses is appropriate, (17) The subject of general elective courses for choosing should be increased, (15) The subject of required elective courses for choosing should be increased, (13) The subject of management courses for studying should be increased, (4) The number of general elective courses is appropriate, (5) The proportion among the number of required courses, required elective courses and general elective courses is appropriate, (3) The number of required elective courses is appropriate, (12) The subject of engineering courses for studying should be increased, (10) The proportion among the number of

computer courses, engineering courses and management courses is appropriate, (9) The number of general elective courses should be increased, (8) The number of required elective courses should be increased, (16) This program offers enough varieties of general elective courses for students to choose, (14) This program offers enough varieties of required elective courses for students to choose, (7) The number of required courses should be increased, and (6) The number of courses should be increased.

(c) The Student's Opinions towards the Content of the Curriculum

From the study, most of the student's opinions are fairly agreeable on the content of the curriculum.

The student opinion score can be also ranked from the highest score to the lowest score as (9) The contents of subjects in required elective courses are interesting, (11) Textbooks in this program are updated and follow the latest developments, (10) The contents of subjects in general elective courses are interesting, (1) The curriculum is updated and follows the latest developments in the industries, (5) The contents of subjects in required courses are updated, (6) The contents of subjects in required elective courses are updated, (7) The contents of subjects in general elective courses are updated, (8) The contents of subjects in required courses are interesting, (4) This curriculum can fulfill my personal goal, (2) The curriculum is relevant to the demand of the job market, (3) The curriculum is appropriate for continuing education towards the doctoral degree, (12) The number of textbooks and documents that are related to this curriculum in the

library is enough for learning, and (13) The number of computers in labs for practice is appropriate.

(d) The Student's Opinions towards the Evaluation of Curriculum

The majority of the students are fairly agreeable on the evaluation of curriculum. Moreover, the student opinion score can be also ranked from the highest score to the lowest score as (8) The grading system should be based not only on the examination, but also on the presentation, (7) The grading system should be based not only on the examination, but also on the report, (3) The weight of grade is appropriate, (1) The evaluation of grade ranks is reliable. (18) The subject coverage in paper 2 is appropriate, (20) The subject coverage in paper 4 is appropriate, (6) Pop quizzes should be assigned in order for students to prepare better for the midterm or final examination, (13) The number of papers in the comprehensive examination is appropriate, (19) The subject coverage in paper 3 is appropriate, (17) The subject coverage in paper 1 is appropriate, (21) For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate, (2) The grade received truly reflects my skill and knowledge, (9) The options of thesis and project are appropriate, (16) The subject coverage in each paper of the comprehensive examination is appropriate, (11) The format of the examination should be open-book, (5) Final and midterm examination is adequate for the evaluation of this program, (22) For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass

each paper is not appropriate. The students should get at least 60 percent of each subject in each paper, (15) All subjects which students studied should be included in the comprehensive examination, (12) The format of the examination should be closed-book, (10) This curriculum should have only plan A or thesis option for the students, (4) The weight of grade should be changed and (14) The number of papers in the comprehensive examination should be increased.

Additionally, the reliability of the result can be analyzed by using SPSS program. The reliability value of this research is 0.8507 or 85.07%. It means that the reliability of the questionnaire is quite high.

5.2 Recommendations

To evaluate the curriculum, it will let us know that the program is going well or not because the curriculum is one of the important components to fulfill the program. Moreover, one who can directly reflect the curriculum is the student. Then studying the student's opinions and needs can turn or lead this program to be beneficial.

From the result, the researcher found that there are some points that need to be considered based on the student's opinions and needs. Therefore, the researcher would like to recommend as follows:

(a) Recommendation on Purposes of the Curriculum

From the finding, the purpose 3 has the lowest score (2.78) then faculty should give more emphasis on this purpose that is "To have adequate knowledge to be a teacher in computer and engineering management". Additionally, the researcher found that the reason of the student's opinions being neither agree nor disagree with this purpose

because the students think that they study only in the theoretical terms but they are not familiar with the practical side and have no idea how to do.

Therefore, the faculty should increase in practice courses for skillful addition because the fieldwork can help the students know how to apply their studying to the real work. Otherwise, the students think that textbook cannot help them when they face problems in the real situation.

(b) Recommendation on Structure of the Curriculum

Although the majority of the students think that the number of credits of courses, required courses and required elective courses are appropriate. There are some points that need to be considered as follows:

(1) The faculty should increase the subjects in computer and management because the most of CEM student had both business background and computer, engineering or science background. So the students who have business background need to increase their knowledge on computer technical skill and the students who have computer, engineering or science appreciate to increase their management skill.

(2) The faculty should increase the subjects of required elective courses and general elective courses for choosing. As the bulletin of CEM, there are many interesting subjects in this program but some subject did not open for studying.

(c) Recommendation on Content of the Curriculum

Although the students agree that the content of this program is updated and interesting, there are some points that are related to the content of the curriculum, and it needs the faculty to take into considered as follows:

(1) The number of computers provided in laboratory is not enough for student practice. The inadequate computers effect the content of this curriculum because some subjects in this program requires the student practice such as project management, system analysis design, etc. If the student did not well practice, the student will not know that the content of this program is enough or not for applying to the real life.

Additionally, the researcher found that the reason that makes the computer laboratory not adequate for students is because sometimes the computer laboratory is reserved for class study.

(2) The number of textbooks and documents that are related to this curriculum in the library is not enough for learning. Sometimes the students are interested in some topic in the textbook or did not understand some point. Therefore, they need information that make them more clear than before and the library is first place that most of the students will think of. So the faculty should take into consideration to increase the textbooks and documents that are related to this curriculum in the library.

(d) Recommendation on Evaluation of the Curriculum

The majority of the students are fairly agreeable on the overall evaluation of the curriculum. Otherwise, there are some points that need the faculty to take into consideration as follows:

(1) The presentation and report should be more of concern as part of evaluation of each subject.

(2) The format of examination should be the open-book rather than closed book. Because the students prefer to know how to apply their studying to the real work rather than remember the theory.

5.3 Further Study

Due to the limitation of time, this study is just results only on the alumni student's opinions and needs towards the curriculum. For the further study, the population should be also included committees, instructors, current students, and superior of the students. Additionally, it is necessary to evaluate the curriculum every 3 or 5 years to be an efficient curriculum.

APPENDIX A

THE QUESTIONNAIRE

Questionnaire

This questionnaire is established for the purpose of studying the opinions and needs of CEM students towards the curriculum. The results will be helpful towards the development and improvement of the program. Your answers in this questionnaire will be kept confidential.

This questionnaire is divided into 2 parts as follows:

Part I The opinions and needs towards the curriculum.

Part II The personal information of respondents.

Part I The Opinions and Needs towards the Curriculum.

This part is divided into 4 sections as follows:

A. Purposes of the curriculum.
B. Structure of the curriculum.
C. Content of the curriculum.
D. Evaluation of the curriculum.

Instruction: Please read each statement and then mark (X) in a box that accurately reflects your ideas.

(1) Mark X in the 5th box, meaning that you strongly agree.
(2) Mark X in the 4th box, meaning that you agree.
(3) Mark X in the 3rd box, meaning that you neither agree nor disagree.
(4) Mark X in the 2nd box, meaning that you disagree.
(5) Mark X in the 1st box, meaning that you strongly disagree.

Example:

Statements	5	4	3	2	1
A. To have adequate knowledge to be in managerial positions in technical-related enterprises.					

Explanation:

A. You marked X in the 5th box. It means that you strongly agree that this curriculum gives you an adequate knowledge to be in managerial positions in technical-related enterprises.

A. Purposes of the Curriculum

Statements	5	4	3	2	1
1. To have adequate knowledge to be in managerial positions in technical-related enterprises.					
2. To have adequate knowledge to be a problem solver for manufacturing and service industries.					
3. To have adequate knowledge to be a teacher in computer and engineering management.					
4. To have adequate knowledge to be an entrepreneur in service and manufacturing industries.					
5. To have ethics and responsibilities to society and to their profession.					

Other recommendations about the purposes of curriculum (If any)

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B. Structure of the Curriculum

Statements	5	4	3	2	1
1. The number of courses is appropriate (48 credits).					
2. The number of required courses is appropriate (21 credits).					
3. The number of required elective courses is appropriate (12 credits).					
4. The number of general elective courses is appropriate (9 credits).					
5. The proportion among the number of required courses, required elective courses and general elective courses is appropriate.					
6. The number of courses should be increased (more than 48 credits).					

Statements	5	4	3	2	1
7. The number of required courses should be increased (more than 21 credits).					
8. The number of required elective courses should be increased (more than 12 credits).					
9. The number of general elective courses should be increased (more than 9 credits).					
10. The proportion among the number of computer courses, engineering courses and management courses is appropriate.					
11. The subject of computer courses for studying should be increased.					
12. The subject of engineering courses for studying should be increased.					
13. The subject of management courses for studying should be increased.					
14. This program offers enough varieties of required elective courses for students to choose.					
15. The subject of required elective courses for choosing should be increased.					
16. This program offers enough varieties of general elective courses for students to choose.					
17. The subject of general elective courses for choosing should be increased.					

Other recommendations about the structure of curriculum (If any)

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C. Content of the Curriculum

Statements	5	4	3	2	1
1. The curriculum is updated and follows the latest developments in the industries.					
2. The curriculum is relevant to the demand of the job market.					
3. The curriculum is appropriate for continuing education towards the doctoral degree.					
4. This curriculum can fulfill my personal goal.					
5. The contents of subjects in required courses are updated.					
6. The contents of subjects in required elective courses are updated.					
7. The contents of subjects in general elective courses are updated.					
8. The contents of subjects in required courses are interesting.					
9. The contents of subjects in required elective courses are interesting.					
10. The contents of subjects in general elective courses are interesting.					
11. Textbooks in this program are updated and follow the latest developments.					
12. The number of textbooks and documents that are related to this curriculum in the library is enough for learning.					
13. The number of computers in labs for practice is appropriate.					

Other recommendations about the content of curriculum (If any)

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D. Evaluation of the Curriculum

Statements	5	4	3	2	1
1. The evaluation of grade ranks, e.g. A, B,…., F is reliable.					
2. The grade received truly reflects my skill and knowledge.					
3. The weight of grade, e.g. A = 4, A^- = 3.75, B^+ = 3.25, …., F = 0 is appropriate.					
4. The weight of grade should be changed.					
5. Final and midterm examination is adequate for the evaluation of this program.					
6. Pop quizzes should be assigned in order for students to better prepare for the midterm or final examination.					
7. The grading system should be based not only on the examination, but also on the report.					
8. The grading system should be based not only on the examination, but also on the presentation.					
9. The options of thesis (plan A) and project (plan B) are appropriate.					
10. This curriculum should have only plan A or thesis option for the students.					
11. The format of the examination should be open-book.					
12. The format of the examination should be closed-book.					
13. The number of papers in the comprehensive examination is appropriate (4 papers).					
14. The number of papers in the comprehensive examination should be increased (more than 4 papers).					
15. All subjects which students studied should be included in the comprehensive examination.					
16. The subject coverage in each paper of the comprehensive examination is appropriate.					
17. The subject coverage in paper 1 is appropriate. (1) CE 6401 Management Information System (2) CE 6403 Computer and Internet Security					
18. The subject coverage in paper 2 is appropriate. (1) CE 6506 Computer and Engineering Economy (2) CE 6501 Principles of Engineering Management I					

Statements	5	4	3	2	1
19. The subject coverage in paper 3 is appropriate (choose 2 out of 3 subjects). (a) CE 6620 Production Management (b) CE 6705 Operations Research (c) CE 6611 Computer Integrated Manufacturing Systems and Management					
20. The subject coverage in paper 4 is appropriate (choose 2 out of 4 subjects). (a) CE 6505 Financial Management (b) CE 6509 Personnel Management (c) CE 6511 Marketing Management (d) CE 6512 Case Studies in General Management					
21. For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is appropriate.					
22. For comprehensive examination, the minimum requirement of 60 percent combined scores from 2 subjects to pass each paper is not appropriate. The students should get at least 60 percent of each subject in each paper.					

Other recommendations about the evaluation of curriculum (If any)

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<u>Part II</u> The personal information of respondents.

1. Your ID number (first 3 digit only) ___ ___ ___ - XXXX
2. Gender

   ❒ Male ❒ Female
3. Age

   ❒ 22 years or lower ❒ 23 – 26 years

   ❒ 27 – 30 years ❒ 31 – 34 years

   ❒ 35 years and over
4. Your bachelor's degree, you have

   ❒ Computer, engineering or science background

   ❒ Business background

   ❒ Others (please specify) . . . . . .
5. Occupation

   ❒ Private employee ❒ Business owner / independent career

   ❒ Civil servant ❒ State enterprise employee

   ❒ Student ❒ Unemployed

   ❒ Others (please specify) . . . . . .

……..Thank you for your co-operation……..

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