Teaching and learning in higher education: a case study of engineering students learning economics

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Abstract

Teaching and learning in higher education has not been receiving the attention it deserves and the assumption that good teaching is common in universities, needs re-thinking. The focus of this thesis is on a case study of engineering students studying economics in a university in Singapore. Two traditions of research on teaching and learning economics have existed: the economists' tradition in conducting quantitative research, and the educationists' who use qualitative methods for data gathering and analysis. These approaches are analysed and as a consequence of the weaknesses established, this thesis took a different research approach. Instead of focusing on teaching, course design and the prediction of students' outcome performances, its aim is to understand the learning experiences of the students. Data were collected from 12 students through semi-structured interviews and these data were analysed using a grounded theory approach to conceptualise and represent a phenomenon or an experience of the students. Five different categories were eventually discovered which represented the students' common experiences and conceptualisation of their experiences: 'difficult', 'interesting', 'unsatisfactory', 'pragmatism' and 'enriching'. Strauss and Corbin's Paradigm model of grounded theory was adopted to relate the data systematically and purposefully in order to capture the complexity in understanding the learning experiences of the students. It is hence the intention of this study to allow the students to tell the stories of their learning journey, an experience which may change over time and at times becoming contradictory. To complement this analysis of students' experience, the views of the academic staff were also collected by interview. The lecturers have a different idea of factors that affect students' learning, and these are categorised as students' motivation, students' heavy workload, assessment and the syllabus coverage – issues that are unrelated to their own teaching methods, which however are important from the students' point of view. In the final analysis, regardless of the variation in students' experiences, the two important direct influences on them are teaching methods and the attitudes of the academic staff towards teaching.

Declaration

I certify that the content of this dissertation is my own work, except where otherwise stated, and that the material has not been submitted for another degree.

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Chapter 1 Introduction

1.1 Background

Higher education in Singapore has undergone a period of rapid change since the late 1980s, with the two public universities becoming organizations adopting a more explicit market ethos which increasingly dominates every facet of academic activities.

The Singapore government has, since the late 1980s, been carrying out a comprehensive review of the higher education system with the aim of making higher education competitive in the regional and global contexts. In fact, the ultimate goal of reforming the university education is to transform Singapore into an education hub in the Asia-Pacific region (Mok & Tan, 2004). Hence, specific policies have been implemented to give the public universities more autonomy in their affairs - among other factors that have resulted in rising student numbers at a time of budget constraints.

The Singapore government believes that universities should play a strategic role in the dissemination, creation and application of knowledge (Mok & Tan, 2004). On the recommendation of the International Academic Advisory Panel (IAAP), the higher education curriculum was re-designed to include cross-disciplinary studies.

A similar change is witnessed in the U.K., which has undergone changes in responding to the globalization in the economic system that has placed greater emphasis on relevant

skills acquisition and development of the graduates. The higher education reform was designed to increase accountability and quality, and at the same time to accommodate a mass system of higher education that inevitably increased the workload of the academic staff (Evans & Abbott, 1998).

A positive outcome from the U.K. experience as a result of the reform is a greater attention directed at the teaching and learning methods employed in higher education. The Dearing Report has recommended the establishment of an Institute for Learning and Teaching in Higher Education to commission research and development in learning and teaching practices - among other initiatives (Evans & Abbot, 1998).

One distinctive feature of Singapore's experience that is different from the U.K.'s is the lack of emphasis on teaching and learning in higher education in the Singapore reform. Nevertheless, common features can still be identified from the two countries, and they are: more students, greater diversity amongst students and increased demands on faculty members. The increased demands have not been compensated for by a reduction in workload of faculty members. Instead, what I have observed is the imposition of higher expectations in relation to individual research and administrative work. As a result, teaching is often compromised in such an environment where faculty members are constantly striving to cope with their rapidly changing responsibilities.

In addition, at least in the case of Singapore, it is a fact that academic staff are often appointed to lecturing posts with little or no training in teaching methods. Hence it is

presumptuous to assume that the relationship between academic staff's ability to teach and their academic qualifications is linear and positively related. From the interviews conducted in this study, I realised that the students have noticed that most professors in the university do not communicate well in lectures, and they accept the fact that the majority of the professors, although with PhDs, could not teach.

A survey conducted by Becker & Watts (1998) in America found that economists are generally reluctant to use alternative teaching methods - which may suggest that an equilibrium state of teaching efficiency has been reached, although the equilibrium may be one that is established by convenience and custom rather than representing effective teaching practices. In this study, I have found that the academic staff struggle with the traditional talk and chalk method of teaching. In this university, a system of professional development is in place to provide assistance to the academic staff in teaching matters – but, as I will show later, the standard of teaching, at least in the introductory economics course which is the focus of this thesis, is less than desirable.

The trend in higher education development in increasingly transferring the onus of learning to the students and allowing them to take control of their own studies has perhaps de-emphasised the need for good teaching in higher education, which in turn has created an indifferent attitude towards adopting better teaching methods as well as a lack of will power at the departmental level to make the change. It would be then unjust to expect the students to take responsibility for their own learning when the faculty members are not measuring up to the required standard of teaching.

Hence, instead of lamenting the students' lack of motivation to learn independently and often wanting to be 'spoon fed', it might be timely to determine and understand the contributing factors to this seemingly irresponsible behaviour. In this study, I have found that the students' strategy towards learning was the result of the teaching staff's uninspiring and poor teaching methods, in addition to external environmental factors.

It is the intention of this thesis to understand the learning experiences of the students in an introductory economics course with the aim of improving the standard of teaching in higher education.

1.2 Context

This study is conducted within a college of engineering. The respondents are engineering students from the various engineering schools who are required to complete a 3-academic-unit introductory economics course – Principles of Economics. There are several key features, including a 'soft-option' subject, in an engineering school and they are listed below:

- The economics course is a non-core subject within the engineering schools
- The students have a very full curriculum, due to the broad-based education system
- The teaching and the overall aspects of the course do not always receive the attention they deserve in the schools

- The university's assessment system remains traditional, and requires a final examination with a relatively high weight allocation of 60 percent to 70 percent on examination performance.

The teaching of the economics course is often marginalised given this environment, and in the following chapters I will reveal how students' learning either is or is not affected, within these parameters.

1.3 Problem

The initial research interest was to determine the causes of a high failure rate in the economics course among the engineering students. However, due to several institutional policy changes that took place during the research period, the syllabus of the course has not only been drastically scaled down but the failure rate has been reduced to an acceptable range. The problem became seemingly insignificant from the management point of view - but from the engineering students' learning perspective, they still consider economics concepts unreal relative to the logic of natural science.

On the other hand, from the teaching perspective, despite the improved pass rate the faculty member involved in this course still found that the conceptual problems encountered by the students remained unchanged. Their explanation of the students' learning difficulties tends to revolve around two issues: firstly, that the difficulties were

the result of the students' lack of motivation to learn; and secondly, it was because the students had not obtained sufficient general knowledge because of their lack of reading.

Given these two factors, and with the aim of improving the standard of teaching, the research topic was ultimately focused on the perspective of the students. Hence, the research question of this study was grounded on a central, simple theme – to understand the experience of students learning the principles of economics. The lecturers' views, on the other hand, are peripheral to this study. They were collected to support the data analysis in showing how teaching takes place in the classrooms.

1.4 Chapter outline and overview

The literature in this area, teaching economics in an engineering school, is not only limited but is also often not directly related to the context of this study. Nevertheless, in Chapter 2 I will discuss the research findings of the economists who have conducted research in this area of economics education. It is interesting to note that, perhaps naturally, this group of researchers often adopted the quantitative approach in their study, and their areas of interest are often confined to determining the relationship between the factor inputs (students' background, quality of teaching staff, the course syllabus) and the expected performance of the students. On the other hand, educationalists have in recent years given due attention to teaching and learning in higher education. However, their research interests, as I will discuss later, are not directly related to a content-driven subject like economics. In this chapter, the differences of research interests of the two

'camps' are presented, and research findings that are significant to this study are highlighted accordingly.

The research methodology in this study will be discussed in Chapter 3. It started with a survey with the intention of finding specific areas for further research using quantitative methods but this was soon abandoned with the realization that an alternative approach was best suited for a research question that is intangible and abstract. Grounded theory is the research method used in this study, and I will present in this chapter the procedure of how data were collected and analysed, and finally how common themes were formed which developed into the learners' theory about their learning experience.

In chapter 4, I will discuss the five themes representing the students' learning experiences. I will first present the themes individually, and highlight the causes that led the students to develop the theory. I have as a result realised that the experiences of the students are interconnected, complex and sometimes contradictory; therefore I have also attempted to present the interrelationships of the different learning experiences in this chapter with the aim of highlighting key concerns in order to improve the teaching standard.

Lastly, in the concluding chapter of this thesis I will present the views of the lecturers in relation to the key concerns highlighted in Chapter 4, and the implications and recommendations of each. Despite the fact that most of these issues are beyond the

control of the faculty members, there are several recommendations that could be implemented by the individual members.

Finally, I have also found that the teaching staff have been making changes to improve the course, but these improvements have been carried out in a fragmented manner without much success – at least from the learning perspective of the students. It is timely, due to the increasing demand on the faculty members, to practise what economists have preached by applying the economics concept in game theory, pursuing the best outcome by encouraging staff not to work in isolation and settle for the second best, but to co-operate in effort to achieve the best outcome for both students and staff.

Chapter 2 Literature Review

2.1 Background

Interest in the teaching of economics can be dated back to the early 20th century; an early publication was a report of a round table discussion meeting of the American Economics Association[1] in 1919. According to Wolfe, the meeting showed a lack of direction from the academics in dealing with problems in teaching economics; it was, however, a forum to bemoan the high number of students enrolled in the introductory course and the perceived inability of younger economists to handle the teaching (Wolfe, 1920).

The report was, on one hand, a macro-discussion of the effects of the influx of introductory economics students; on the other hand mechanical, in that it dealt with the micro-administrative problems within the department (Wolfe, 1920). Contrary to the lack of strategy concerning the improvement of economics teaching in the conference meeting, the Harvard investigation[2] was more promising in its attempt to examine the problem with a systematic approach in terms of its organization, functions and methods of economics teaching (Wolfe, 1920). Wolfe's commentary was interesting, although it was written eighty-five years ago. There have been improvements since the days of Wolfe, but the central theme of maintaining the functionality of economics teaching remains relevant today.

[1] The American Economic Journal was the key journal for the publication of economics education before the establishment of the Journal of Economic Education in 1969 and the Journal of Economic Literature.[if 'the' is part of title, then it needs capital letters]

[2] A report presented by the Department of Education at the request of the Department of Economics to investigate the level of teaching in Harvard University in 1917.

The next important milestone in the teaching of economics was the development of the Test of Understanding of College Economics (TUCE), first published in 1968 and prepared by a team of distinguished economists including George Stigler, Paul Samuelson and G.L. Bach (Siegfried and Walstad, 1998). The TUCE exam became a standard measurement of cognitive achievement and a basis of analysis for much research work conducted to improve teaching effectiveness. In addition, the establishment of the Journal of Economic Education and Journal of Economic Literature provided added avenues for researchers in economic education to present their findings, apart from secondary sources like the Journal of Economic Perspectives and the journal of Economic Inquiry

Finally, a comprehensive overview of economic education research was conducted by Siegfried and Fels in 1979, which was a landmark survey that not only provided an overview of the research conducted so far but also of direction for future work to be conducted in this field. For instance, in the area of research methodology Siegfried and Fels highlighted two areas for improvement; firstly, a refinement in research methods by using a simultaneous equations model to draw research conclusions rather than a single equation and secondly, to encourage more testing of innovative teaching technologies by individuals other than those who devised the new methods in order to improve generalizability in research.

The survey conducted by Siegfried & Fels was a collection of works by researchers who used an econometrics model as a tool for their analyses. The main thrust of the survey was to present new findings that aim to achieve efficiency in economics teaching. Naturally, economics instructors were drawn to familiar concepts for solution. The concept of production function, in determining how to increase output without having to increase the demand on factor inputs, was adopted to overcome the increasing budget constraints placed on higher education.

In order to derive the production function, factor inputs and output levels which needed to be determined, Siegfried and Fels categorized these inputs into three groups: firstly, the students' performance achievement before entering university, mainly determined by SAT, GPA or pre-test scores; secondly, the time spent by students during the course; and lastly, the availability of technology to transform effort into cognitive achievements.

The measurement of outputs is, however, more complex with a multiplicity of objectives. The outcome can be defined from a narrow spectrum of cognitive performance to a broader understanding of a change in students' behaviour and values. In each case, the analyses were derived using test scores and surveys as a means of measurement. The survey conducted by Siegfried and Fels was comprehensive - to include a specific section on the impact of human capital and college environment on economics education, as well as the impact of alternative teaching methods on economics education.

The survey showed a wide range of findings - from the effect of students' academic background on outcome to the effect of the use of information technology on post-test scores. However, the major problem with this survey was in the tool of analysis – the econometrics model. To explain the process of learning and teaching using an efficiency model of production function tends to simplify the essence of education. The quantitative orientation in educational research pre-supposes too many variables as constant or controllable, and the efficiency model of production function could perhaps explain, with scientific authority, the causes of the phenomenon, but lacks depth of understanding.

Furthermore, the adoption of production function as a model to explain efficiency may be misleading. This is because there are two types of efficiency in economics: one of technical efficiency which merely shows the different combinations of input factors that could achieve the same level of output. In other words, it showed a range of alternative production techniques, involving different combinations of inputs, each of which may produce an identical amount of output. However, to meet the increasing demand of budget constraints requires economic efficiency, which shows how the resources are used in such a way that there is no waste of expenditure.

According to the theory of production function, only one point along the production function displayed economic efficiency, which depends on the relative prices of the inputs. The researchers of the quantitative approach could not show the economically efficient point because one must recognize that students learned economics differently; hence, no one approach or technique can claim superiority. It is perhaps more

meaningful to understand how students learn economics rather than predicting their rate of success using their past test achievements, and utilize the different teaching methods to help them overcome their learning deficiency. Becker (1997) added that, from statistical theory, failure to reject the null hypothesis does not imply its acceptance and, most importantly, education is a multi-product output that cannot be reflected in a single multiple-choice test score, which is a standardized tool for the TUCE exam.

Generally, research on Economics education does not have such a high status as that of other mainstream research in many economics departments. It was noted that the quantity of research on economic education at the university level has declined since the 1980s, despite expanded opportunities for publication (Becker et al, 1991). This reduction could be partially due to the increase in the emphasis on economics education at pre-university level (Becker et al, 1991). It could also be due to a higher number of incidences of the closure of economics departments or a merger with business departments in many universities in the U.S.A. A study by Becker (1997) found that the number of economics degrees awarded for the period between 1950 and 1994 had declined and had reached a steady state of about 2% of all undergraduate degrees awarded in America, having been overtaken by business degrees. Hence, it is possible that the quantity of research on economics education suffered as a result, although Becker et al (1991) believed that it was due to the comprehensive survey conducted by Siegfried and Fels in 1979 which led many researchers to feel that there was no more research worthy of making a contribution to the field.

It has been rather difficult during the course of this research to find published research work in the area of teaching/learning economics by engineering students. The research so far can be categorized into three main areas: firstly, on improving pre-university teaching and how it affects students' university performance; secondly, conducting surveys on whether undergraduate economics prepares students for graduate studies, especially in the liberal arts colleges in the USA; and thirdly, methods of improving undergraduate economics teaching, both as a major and minor. In this study, the university structure and hence the course is different from the research work conducted so far (mainly American), in such a way that the university in this study does not offer minor studies – or at least did not during the data collection period. Hence the subject of study, Principles of Economics, is just a prescribed general elective for the fulfilment of an engineering degree.[3] The review of the literature will be organized in terms of the determination of content, issues of teaching, textbooks, students' background and learning approaches.

2.2 Content determination

The determination of content involves first a review of the objectives and aims of teaching. Few researchers had reviewed the objective of teaching in terms of the knowledge students must have in the view of the lecturer. Many of the key issues - for instance, the most fundamental of the purposes of teaching economics - are still relevant today; as economic theory evolves, it is easy to lose sight of the fundamentals when the number of theories increases over the years. The following section highlights two issues:

[3] The structure has changed since the academic year 2004/5, when students were allowed to choose a minor in the following disciplines: business, economics, education, sociology or psychology.

firstly, the need to continuously review the objectives and content of the course; and secondly, the need to determine the amount of knowledge to impart in each semester (the syllabus).

Objective

Wolfe (1920) highlighted the importance of stating the objectives of teaching - and this was supported by the fact that most staff members were hazy in their description of the aims, which, to a certain degree, affected students' perception of the course. The general perception then was that they felt it was not to be "real" but disconnected. Criticisms were targeted at the academics of the Department of Economics of Harvard University of the time; frequent usage of phrases like 'critical analysis' and 'analytical judgment' by academic staff in the writing of courses showed little indication that effort was being made in the formulation of aims with any particular objectives in mind. Wolfe called for a change in the economics curriculum to make it more relevant to life and society, not only to be productive in generating students' interest and results, but in enabling students to find employment in the future.

Stigler drew similar attention by stating the general objectives of the principal course in a round table discussion in 1941 and these are summarized as below:

- To interest the student
- To acquaint the student with the more important facts concerning our economic system and perhaps with its historical background

- To provide the student with the minimum analytical equipment necessary to understand our economic system and to appraise general economic policies
- To engage in discreet propaganda for "good" policies

The stated objectives were more specific compared to Wolfe's – but, most importantly, an important breakthrough was in the restructuring of the curriculum supported by Stigler which showed the seriousness of the inadequacy of methods of teaching economics to non-economists. He proposed a reduction in technical analysis in the elementary course which included the deletion of complicated mathematical treatment of concepts and fancy cost curves (geometrical distinctions between long-run and short-run cost curves).

The need to simplify the course was again proposed in later years by Frank (1998), urging academic staff to be more selective in the syllabus in order to give value to the subject rather than a superficial exposition of the concepts. Frank went on to argue that the teaching aims and objectives should be different between economics major and minor, but most academics still operate under the illusion that most first-year students arrive with a burning desire to become an economics major. The reality is that most students are not likely to take another unit of economics, and the academics have just a term to make a good impression on students. Hence, Frank (1998) believed that the aim of teaching is to choose a few core microeconomic concepts and explain them well so as to help students to think like economists. Frank believed that the best way to stimulate the interest of the students was to illustrate with examples drawn from their daily experience. The core concepts were those which Frank believed would be essential in

decision making, like the concept of opportunity cost and cost-benefit analysis. A cursory glance at the textbook written by Frank today shows these key concepts illustrated with numerous examples.

Content

Another major issue related to the object of teaching is in determining the content of the subject. In the earlier discussion, Wolfe (1920) argued that economics teaching should be more realistic to ensure students' employability in the future, and therefore it was necessary to connect the teaching with real life, by presenting a picture of the actual organization and operation of the existing economic society with imperfections like monopoly agreements, trade-union policy, blackmail strikes, etc., to avoid the 'unreal' feeling of the students. Most importantly, Wolfe (1920) argued that since ethics, politics and economics are interwoven in the real world, any attempt to separate these issues would be an injustice to the students. In this respect, it is traditional for economists to be objective in their investigation, undisturbed by differences of opinion or standards in ethical valuation, but Wolfe argued that one cannot see the full facts of economic life unless issues are projected upon the ethical background of aim and purpose. Hence, with respect to the objectives of teaching, Wolfe believed that "*Economics has not only to secure and impart scientific knowledge with regard to society, but to equip the student to choose intelligently the attitude he will take in the presence of its issues and problems.*" (Wolfe, 1920, p 745)

Stigler (found in Blodgett et al, 1941, p 420), however, argued against the inclusion of politics and social analyses in the principles course *"for such things may better be left unsaid than said badly."* His concern was with the inability of staff to deliver a fair analysis - which will be discussed in the following section.

Edwards and MacEwan (1970) of Harvard University called for a new curriculum that was different from the orthodox approach. They proposed a radical (left-wing) curriculum that explicitly discussed issues of power and conflict in society, and the vices of capitalism in terms of inequality and alienation. An important issue was the emphasis on externalities in order to balance the power of capitalism, and welfare and social concerns. The survey conducted by Siegfried and Fels in 1979 omitted this radical approach because they felt that findings to support such radical ideology were lacking. Indeed, the proposed change in curriculum was radical - but gradually, as the world began to witness the destruction of the environment by the way high value was placed on the increase in material output, environmental economics has found itself a foothold in the teaching today.

The fact remains that economics is evolving with time and with every finding of new applications and refinements of theory. The content selection could not be specified once and for all; it must change over time to be reflective of the world situation (Peart, 1994). Peart was concerned with the curriculum of the graduate course, where topics covered were too specific, and which often neglected the interrelationships between theory, applications and mathematical techniques.

Peart also provided an alternative solution to the Committee of College Faculty's (CCF) recommendation in improving the curricula of undergraduate economics at selected liberal arts colleges. The CCF's response to the declining trend of graduate students from liberal arts colleges was to teach more advanced theory at undergraduate level at the expense of subjects like economic history and the history of economic thought. Peart argued instead for a two-semester course so that the students were given the foundation to fit theory and mathematics together at the graduate level. This brings us to the content discussion at the undergraduate level.

In the undergraduate course, the problem was more in the scope of the course – the short-list or long-list controversy (McConnell, 1998). Supporters of the short-list believed that the principles course was too ambitious, too comprehensive and too encyclopaedic, and they advocated a short-list of core topics which were to be taught carefully and in depth. On the other hand, long-list has been the conventional approach, giving students the breadth of the subject rather than depth. The widely used long-list approach is often believed to be too much for students to handle, and as a result they often come away from the course with no real understanding of economic logic. McConnell went on to argue that such a fleeting exposure to a wide variety of concepts and theories was unlikely to equip students with the tools to analyze economic problems as citizens or in business after they left the university.

This was the very concern raised by Stigler in 1963: "*...college economics does not teach the student to think on economic questions. The brief exposure to each of a vast array of techniques and problems leaves the student with no basic economic logic with which to analyze the economic questions he will face as a citizen. The student will memorize a few facts, diagrams, and policy recommendations, and ten years later will be as untutored in economics as the day he entered the class.*" (Stigler, 1963, p 657) However, McConnell's (1998) argument for the long-list approach was that many of the economic concepts like marginality, elasticity, comparative advantage, allocative efficiency and externalities are abstract concepts that students may face with rapidly diminishing returns in the learning process. Hence, if a student does not fully grasp the concept of MR = MC within a reasonable period of time, perhaps the underlying logic will be understood when another identical rule is discussed in a different topic such as the factor input rule: MRP = MFC.

McConnell also commented on the increasing comprehensiveness and sophistication of the course. Although the content has gone through a great quantum leap since Samuelson's days, the crowding out effect of content has not been so great that not only the list of contents increased over time, but the level of analysis increased as well.

In fact, contrary to the idea of Frank, McConnell felt that the provision of examples may perhaps have gone too far, so that the examples were not contributing to the understanding of the students.

The fact remains that the content coverage is too wide for a semester, and Elzinga (1998) claimed that too much was being taught to such an extent that the essence of the subject was being lost. To illustrate, Elzinga lamented that Gresham's Law[4] of teaching economics is that newest trends drive out the basic principles to such an extent that students are able to recite the conditions of Pareto optimality yet do not understand how markets discipline input users to promote consumer welfare. The wide coverage of topics could be a result of the type of textbook available today, with textbook reviewers eager to compound their pet topics together; small wonder the text today resembles an encyclopaedia in terms of scope. As a result, economics teaching is no longer an *"engine of analysis"* but an *"array of curves and intersection to wrestle into memorized submission"* (Elzinga, 1998, p 77).

In this matter of looking into the reallocation of content coverage, Saunders and Powers (1995) used TUCE III (third edition of the Test of Understanding College Economics) as a tool to access students' learning in microeconomics, with an aim of reallocating content coverage if necessary. 1,896 students from Indiana University answered 30 questions on micro TUCE III both at the beginning and at the end of their one-term course. The questions were from 5 categories of content, namely: basic economic problems (A), price mechanism (B), costs and market structure (C), externalities (D) and income distribution and government redistribution policies (E). When comparing the answers between pre-test and post-test, Saunders and Powers were able to categorize the responses into four groups, namely: continuing knowledge (choosing the correct response on both tests),

[4] Gresham's Law stated that bad money drives out good. This was the early experience of currency debasement which saw that the debased coins (bad money) remained in circulation, and the undebased coins (good money) disappeared in the economy.

continuing ignorance (choosing the incorrect response on both tests), positive learning (choosing the correct response on the post-test) and negative learning (choosing the incorrect response on the post-test).

The null hypothesis will be accepted if, for a given response pattern, the population mean percentage of content category is equal to the population mean percentage of all other content categories combined. The result showed that the null hypothesis could not be accepted for content categories on market structure (C) and income distribution and government redistribution polices (E). On closer examination, it was found that on the topic of market structure (C), many students increased their understanding significantly but even more did not. In that category, both positive learning and continuing ignorance were high and continuing knowledge was the lowest. It was therefore suggested by the authors that students' learning might increase by switching some instructional effort from content category E, since it received the lowest positive-learning result, to category C. In other words, Saunders and Powers found that costs and market structure required more teaching time allocation and that this should be taken from the teaching of income distribution and government redistribution policies.

This study is interesting because inability to cover the wide range of a syllabus is a common experience of instructors, and the study gave an indication of how content can be covered within a course. However, sacrificing Category E as suggested by Saunders and Powers, because of its lowest positive learning, may be unwise from the educational standpoint, because it implies that one should teach less because less positive learning is

derived from that category of content. More and/or better teaching should be the argument put forward in those two categories . In fact, the prime candidate for a reduction in teaching time is Category A, basic economic problems, since the students were able to answer correctly and with consistency. A crucial question that was left unanswered is in determining the level of content difficulties from the students' point of view. This would be a better indicator as to how teaching time could be reallocated meaningfully. Although the study also lacks further empirical support, it could perhaps be the happy medium to the otherwise polarized long and short-list debate.

2.3 Teaching

Many factors determine how well a course is taught and it has been a concern to determine how much learning took place in class. In the area of economics teaching, several issues dominated the area of research - and they were in the field of teaching practice, teaching presentation, the quality of staff, and to a lesser extent issues relating to the choice of textbook.

2.3.1 Teaching practice

Talk and Chalk

George Stigler once said that economic logic is not easy to learn, not to mention to teach, and he realized that the key to helping others understand the logic is to teach well. Until academics learned how to do that, it would be difficult to make economics education popular (Becker and Watts, 1995). Until at least up to the 1980s, the picture of an

economist lecturing to a class, while he writes on the chalkboard and assigns reading from a textbook, appears accurate for all courses and all institutions. Although the availability of advanced technology and the introduction of various forms of learning techniques in recent years have become popular, economics instructors have seemed unwilling to abandon the less engaging lecture format.

Despite a published article by Becker and Watts in 1995 addressing this specific issue of using alternative teaching methods and approaches in undergraduate economics, the responses from the fraternity were discouraging. A survey conducted by Becker and Watts in the following year continued to find that the manner in which economics had been taught continued: *"very few economists have taken the time or trouble to teach using any method other than traditional lectures presented at the front of the room, or any technology other than the chalkboard."* (Becker and Watts, 1998, p 4) The survey showed that while much subject teaching in the humanities and social sciences in higher education had adopted a more participative teaching approach, economics lecturers still spent 83% of the class time lecturing using the chalkboard to the extent that even the lecture-supporting, low-technology overhead projector was rarely used.

There is no lack in research of ideas to encourage student participation in class. Becker and Watts suggested the use of games, the popular business press, literature and drama, case studies and even Nobel lectures[5] as teaching tools. The most noteworthy is the Guide to Games and Simulations for teaching economics, which was written in 1971 by

[5] Since the first Nobel Prize in economics in 1969, the recipient's speech has been published in Le Prix Nobel. These speeches tend to be non-technical, as the immediate audience is not economists and thus is suitable for the use in undergraduate course.

Lewis and Wentworth and published by the National Council on Economic Education, in which over ninety different activities were found for the teaching of economics. There are currently many commercially-driven publications in games and simulations in the market and a large number of novel ideas, especially in the teaching of the free-rider problem and the Coase Theorem, are widely available. Moreover, numerous articles have also been written explaining the pedagogical advantages of particular games (Becker & Watts, 1995). More recently, given that collaborative learning has found its way into higher education, there is more research in the area of case studies, problem-based learning and other interactive learning approaches like Johnston et al (2000), Carlson and Schodt (1995), Vachris (1999) and Truscott et al (2000).

In the study by Johnston et al (2000) conducted at the University of Melbourne, the collaborative problem-solving approach was implemented in the second year macroeconomics subject. It is generally believed that to learn economics successfully, students not only need to be able to apply abstract concepts to economic problems, they also have to present and express the solution in a logical and fluent manner. This project aimed to demonstrate that the collaborative problem-solving approach promotes deep learning, and the researchers used various approaches to evaluate the differences between the trial and control groups, namely through the attendance of students, weekly tutors' review, students' comments, tutorial observations and the examination results.

The results showed that the project had the greatest benefit for the below-average international students who attended tutorials regularly. This could be explained by the

additional exposure to application problems that students had to perform in the collaborative problem-solving tutorials. Apart from this direct benefit, the researchers also found that students in the collaborative problem-solving tutorials valued their tutor more than the traditional group, where tutors usually played the role of a lecturer instead of a facilitator in a traditional tutorial.

The method of measurement in this study is mainly through survey and, based on the questions posed in the survey, the responses from the students could not sufficiently measure the objective the researchers had set to achieve, which was to test whether the integrated teaching approach could promote thinking and application in economics education. For instance, the set of questions for determining the academic applications could at best give an indication of whether the students had prepared and read the materials before their class; it could not show if thinking and other forms of higher learning skills had taken place. The responses collected could not demonstrate how learning took place with this new approach.

In addition, because the students did not comment on the methods they adopted for problem solving, the results were not conclusive to show that students participating in the project were better off in analysing economics questions, especially if they were more critical and had increased their skill in solving economics problems. This is because it is possible to achieve the desired outcome through memorization once the students came to expect a certain type of question

Despite the inconclusive results, the collaborative problem-based learning approach does have its potential in enabling students to 'think like economists' in a well-controlled environment – when a correct answer can be obtained.

If the objective of teaching economics is to enable students to "think like economists", analytical or problem solving skills are important skills to develop. Carlson and Schodt (1995) used case method for the teaching of two courses, development economics and international monetary problems. The responses from students were generally positive, not only in helping them to learn the economic theory but to gain insights into the extent of work economists are confronted with. One of the respondents wrote: *"It's very difficult for me to pick up information that I cannot clearly apply to something. Courses like microeconomics and macroeconomics are frustrating because they seem to be just a mass of garbled concepts that must be memorized for tests. Cases allow me to see those concepts as tools for problem solving." (p21)*

Carlson and Schodt pointed out that case-study enhances learning because it enables students to learn in a more circular process which differs from the sequential covering of materials from one topic to another. In other words, a case study is often rich in details that include several topics discussed concurrently. Furthermore, the introduction of real cases also enables students to use their analytical skills and judgment in solving economic problems, which is the work of an economist.

However, case studies may not be the best method for an introductory course because students coming from various backgrounds have not grasped sufficient economics knowledge and concepts to analyze cases in a meaningful manner. In the study of Carlson and Schodt, although lectures were used to introduce concepts, those represented more advanced conceptual knowledge, like that of the introduction of growth theories, for example. After all, the courses the authors had chosen were applied economic courses which are naturally more suitable for advanced learners.

Vachris (1999) discussed the experience of creating an interactive teaching and learning environment using technology. The online system is usually the least exploited resource, whilst Vachris demonstrated that with proper planning, this electronic platform could be fully utilized far beyond the general state of merely loading up lecture notes and syllabus. Vachris had shown in the article that the experience of encouraging discussion and enabling students to complete collaborative assignments was positive. The model described by Vachris was, however, mainly for distance learners, although she realized that many regular full-time students participated in the on-line platform and had found it very useful because of the quick accessibility to the tutor's support.

Although Vachris noted that the withdrawal rate for microeconomics and macroeconomics courses was higher for the on-line course compared to the regular classes (17.1 percent compared to 6.0 percent), this was in line with the findings of on-line courses in general.

However, what Vachris introduced could also be implemented in the classroom. One could argue that the contribution of Vachris's study was exploring the presentation of contents with a different communication mode. Hence, the article could not demonstrate how higher learning can take place with the aid of technology, but simply presented a case of a substitution ideal for distance learning.

Lastly, simulation games were used to promote interactive teaching in the University of Tampa. Truscott et al (2000) used the game, Summit of the Americas, to illustrate the complication of negotiating free trade agreements between countries. In this game, students were required to strategize so as to achieve the highest economic benefit for the country they were representing. A country report pertaining to the general overview of its economy was given to the students and they were required to work through the negotiation process and to submit an economic impact report which evaluated the results of the negotiated outcomes at the end of the course.

Such a game provided a sense of realism and, depending on the guidelines of the game stipulated, students could be given a rare glimpse of the complexities involved in trade negotiation. Trade-off between trade liberalization and loans for infrastructure became apparent to the students, and strategies needed to be carefully thought through, especially when domestic inflation rate and trade deficit inevitably reduced the negotiating power of the countries.

However, this simulation game was designed for MBA students, so for it to be played by undergraduates would require them to attain advanced theory and substantial practical knowledge beyond their capabilities. The game would alternatively need major modification if it were to be incorporated for the undergraduates in the introductory course. Although Truscott et al suggested that the game could be played at different levels as the instructor intended, and the game was indeed challenging and interesting because it encompassed the major issues and concepts of international trade, like balance of payments, tariff negotiations, unemployment, etc., it is difficult to integrate into the undergraduate syllabus. This is because the critical issue, which is still left unresolved, is the debate on the breadth or depth of content coverage. Until a department comes to a common understanding and solution, games would be reduced to becoming material add-ons without the intending impact on the students.

Three possible explanations were available for the lack of commitment and willingness to adopt new methods of teaching. Firstly, it was found in Becker (1997) that for content teaching that required the transmission of factual information and at the same time where, in order to appreciate the concept, demonstration of mathematical and graphical constructions was essential, lecture and blackboard might be the most desirable mode of delivery (Becker, 1997). This was supported by the survey conducted by Becker and Watt (1995) on teaching methods in four undergraduate courses - namely, the introductory, intermediate theory, econometrics and upper division field courses. In this study it was found that the mean lecture time was over 60 percent and it was a rare sight for lecturers to illustrate with examples during the lectures. This survey seemed to

confirm the hypothesis that economics instructors were not at the forefront of teaching practice or that there was resistance from them to adopting new teaching approaches. However, no data were collected to support the claim.

Another possible reason could perhaps be the status of economics departments in recent years. In the earlier section, I have mentioned that there have been fewer independent economics departments in universities and colleges in recent years, the underlying issue being the source of funding for the department, which is based on how well it is integrated with the business curriculum rather than directly tied to enrolment (Becker, 1997). In other words, the survival of the department is not determined by enrolment, so despite the fact that economics has increasingly lost popularity, there is no sufficient incentive for academics to implement new approaches to teaching. It is easier to continue doing to undergraduates what their instructors did to them.

Lastly, the lack of enthusiasm in adopting new teaching approaches could possibly be explained by the rewards system in higher education. Goldin (1991) suggested that the heavy emphasis on publications in tenure and promotion decisions encouraged a passive classroom experience by academics. Hence McConnell (1998) suggested a more realistic rewards system, one which gives due recognition and rewards for teaching and administrative service. McConnell suggested that the department should allow specialization to be practised according to the lecturer's natural ability to teach or conduct research. In other words, allowing superb teachers to teach the bulk and the exemplary researchers to spend most of their time on research would benefit all parties.

Since individual costs of research and teaching are different because of different endowment of ability and personal temperament, it is probably better to allow the relative cost of providing the services to be the deciding factor aimed to demonstrate the individual's suitability for teaching or research based on his/her ability. This is Ricardo's concept of comparative advantage in international trade extended to the academic circle, which showed that lowering the relative costs in pursuing the two conflicting objectives of research and teaching was perhaps possible.

Inspiration

Despite the strong support from a few economists for the adoption of pedagogy that requires active learning in class, most economics departments continue to operate in a manner unscathed by the new methods of teaching practice. Since lecturing is the main method of instruction, it is important to do it well by inspiring the students in the lecture setting (Elzinga, 1998). Such an issue was also recognised by Wolfe (1920), who emphasized the reflective effect in good teaching. However, Wolfe limited her discussion to the personality of the teacher as a factor that affected lecture presentation. Hence Elzinga's argument was perhaps more balanced, as he argued that teaching talent was not an exogenous variable but an endogenous one that involved hard work in the lecturer's preparation and delivery. An inspiring lecture requires two important inputs: firstly, the lecturer's ability to use real world examples to reveal the subject's hidden logic with the use of theoretical tools; secondly, the ability to present the concept with clarity (Elzinga, 1998). This was supported by Lumsden and Scott's (1983) survey involving 2,500 students studying first-year economics in nineteen U.K. universities and polytechnics

during the academic year 1979-1980. Two major factors determining good lecturing were highlighted by the students. They were the lecturer's ability to impart enthusiasm and the ability to present materials with clarity, both of which are significantly underestimated by academics, according to Lumsden and Scott.

The intention of Lumsden and Scott's research was to find out if innovative teaching techniques could effectively replace the traditional method of lecturing. Although the results at different degrees of substitution were not conclusive based on the two techniques implemented, by measuring the mean performance on each of the universities' output measures and regression analysis to determine relationship of performance outcome and resource inputs, valuable insights were obtained from the data collected.

Apart from understanding students' rating of teachers' characteristics, two other aspects were of interest, firstly with regard to the objective of students in learning. This research suggested that students wish to maximize their probability of passing the course rather than maximize their mark in the examination, which had been assumed implicitly in most research. Secondly, on the issue of teaching technique, innovative teaching has often been regarded as a superior method in teaching and learning. However, this research showed that students responded fairly equally to the use of the conventional method of lecturing and the use of innovative technology in the contribution to learning, which suggested that the claim about innovative teaching methods could be overstated. These are important areas which require more empirical studies to achieve generality.

In an attempt to further investigate the reasons that lecturers were not abandoning the less-engaging style of teaching, 34 liberal arts colleges participated in the project by Jensen and Owen (2003). Through the matching of characteristics of students and instructors, Jensen and Owen were able to assess the impact of instructors' characteristics on students' interest in economics, in particular determining the various teaching methods (namely, lecturing, group problem solving, discussion, etc.) that have a positive impact on the probability of continuous learning of students. The central theme of Jensen and Owen's research was to determine the factors and methods that appealed to good students in introductory economics.

Jensen and Owen were able to make a general observation that fewer lectures and more discussion were effective for all students, although they were not able to indicate the optimal level of lecture and other methods of teaching. Even among good students which were defined as having either high GPA, high SAT, or a high threshold for problem solving, and being more expressive and participative in class, it was difficult to determine the best teaching technique to raise their propensity to do more units of economics. Since it was shown that students responded differently to different techniques, Jensen and Owen concluded that the most successful way of appealing to the broad range of learning styles adopted by good students is hence to use a variety of teaching techniques.

Jensen and Owen went on to determine how different kinds of student viewed the relevance of economics, and found that all except for one group (those who preferred discussion but did not have high GPA and SAT scores) found that economics was

relevant when the class incorporated more discussion during class time. But this does not necessarily mean that less lecture time would also make economics more relevant. Jensen and Owen suggested that the good students preferred learning through lectures because this was a traditional and comfortable way of learning.

The important findings of this research are:

- Economics was less relevant for high GPA students; however, this was not true for students with high SAT scores or those who liked to solve problems
- Confidence in understanding economics was associated with group problem-solving and lecturing by students with high GPA and high SAT scores

In short, the good students, defined by a high GPA grade, are likely to be more confident in their ability to understand economics and receive higher grades when enrolled in lecture-based courses. Jensen and Owen suggested that perhaps one reason for instructors not adopting an active teaching approach was a result of their own positive learning experience as students.

Jensen and Owen went on to determine the factors that encouraged students in the course so that extra units of economics would be taken, which could be expressed as:

Encouraged = α (Students' attitude) + β (Instructors' characteristics) + γ (Class characteristics)

Students' attitudes included their reasons for taking the course and the year the course was conducted; instructors' roles would demonstrate the different teaching methods adopted, and class characteristics factored in the variant of combining microeconomics and macroeconomics into a semester's course.

The key results showed:

- More lecturing was unlikely to discourage students with high GPAs. However, more lecturing was likely to reduce their probability of becoming encouraged
- All the different types of good students viewed economics as being more relevant when the class incorporated more discussion
- Students generally became more discouraged when class participation was counted as part of the grade. This was true even for those students who responded positively to problem-solving and preferred more class time on discussion

Jensen and Owen concluded from this research that teaching techniques had a greater impact on encouraging students than on discouraging them, and they argued that this could be because the other first-year classes were not particularly interactive, so that having a non-interactive economics class might not be discouraging.

The research showed that good students did not respond negatively to a passive teaching method, and as Jensen and Owen have cautioned, this could be due to the fact that these students had succeeded under such teaching practices. The research was based on

economics major students; hence it would be inappropriate to interpret the results to predict the outcome for economics minor students. Lastly, although the research findings were interesting, they could not explain the students' behaviour. Researchers could only hypothesize and predict the learning experiences of the students while their own narrations of the learning stories remain unheard.

Lastly, on the subject of inspiring teaching, a lecturer is often up against a common foe – the textbook. A common criticism that *"books are better"* and that *"active participation on the part of the learner is more effective than passive listening"* worked against the task of the lecturer (Saunders and Welsh, 1998, p 169). However, there are many sources of good practical guidance[6] for the preparation of lectures, which may help to stimulate interest in the students and raise their awareness that *"the content may be the same, but the process is different."* (Saunders and Welsh, 1998, p 169)

2.3.2 Presentation of Lectures

The Use of Mathematics and Graphs in Teaching

Becker (1998) gave useful examples of how economics instructors have been causing confusion to the students - one in the use of algebra and function notation, another in the use of graphs in economics. Becker noticed that one common area is in the explaining of consumption function which is conventionally written as c = a + by where b represents the slope of the consumption line. However, algebra books define a straight line to be y =

[6] This could be found in Saunders and Welsh and The Handbook for Economics Lecturers.

mx + b where the letter b is the y-intercept. Mathematics is, after all, a shorthand form of communication and as such the use of mathematics in economics should be limited to the objective of communication between parties who already know what is being said - a means of crystallizing concepts rather than allowing them to impair learning. Marshall once wrote *"....I had a growing feeling in the later years of my work at the subject that a good mathematical theorem dealing with economic hypotheses was very unlikely to be good economics; and I went more and more on the rules – (1) Use mathematics as a shorthand language, rather than as an engine of inquiry. (2) Keep to them till you have done. (3) Translate into English. (4) Then illustrate by examples that are important in real life. (5) Burn the mathematics. (6) if you can't succeed in 4, burn 3."* (quoted in Becker, 1998, p 138)

With the use of mathematics to illustrate concepts being kept to the minimum in most textbooks today, the use of graphs is the most common method of presenting economic concepts in any introductory course. This is evident from the vast number of graphs found in popular economics textbooks today like that of Mankiw's *Principles of Economics* (2001) and Parkin's *Economics* (2003). The 5th edition of Parkin's textbook, *Economics,* published in 2000 contained 417 diagrams/graphs, which could be regarded as an exponential increase when compared to the two-volume textbook by Taussig in 1946, published before the popular textbook by Samuelson, which contained only 12 diagrams (Cohn et al, 2001). Thus the teaching of economics concepts today has becoming more descriptive in nature with the aid of many graphs and diagrams. Cohn et al (2001) attempted to find out whether graphs do promote economics learning with the

students (mostly business majors) in the University of South Carolina who took the macroeconomics course during the spring semesters of 1995 and 1997. The researchers expected the results to show that the use of graphs would benefit students, especially if the materials to be presented were abstract. However, when controls of different students' characteristics and abilities were employed, graphs appeared to reduce learning in the 1995 experiment and to have no effect on learning in the 1997 experiment.

In the study in 1995, the lecture chosen for analysis was focused on how money affects the economy. Four different graphs were introduced in the lecture. Students were randomly selected to be either in a lecture which did not contain graphs or in one that did. In both groups, a pre-test and post-test were administered. Although the post-test results for both groups were higher, it was found that the gain in scores for the no-graphs group was significantly higher statistically, so that the conclusion was drawn that graphs did not promote learning. However, for the 1997 group, the null hypothesis could not be rejected and in fact the two groups had identical gains in both pre-test and post-test scores. This could be due to the fact that the topic chosen for the 1997 study was the Keynesian macroeconomic system which contained only one diagram in the lecture, instead of four in the earlier study. But it can also be said that this kind of experiment which attempts to hold other variables constant by randomisation is problematic in that all kinds of other factors internal to the students could be having an effect.

For instance, although certain controls had been administered, a significant factor that was not discussed was the students' pre-course experience of graphs. Since this was a

macroeconomics course, students who had done microeconomics and had been exposed to the different types of costs curves, which are often deemed to be one of the most complicated diagrams by students, could be discouraged when exposed to more graphs in the macroeconomics course, so that the net gain was lower than the non-graph lecture group in 1995. This perhaps partly explained the discrepancy of results for 1997.

Cohn et al also found that students with high maths scores benefited more from graphs - but most important was the realization that graphs might not promote economics learning in situations when the concept and presentation are relatively complicated. This was made worse when the students had little time to absorb or review the materials, or opportunity to ask questions about them. In fact, Cohn et al recognized from the onset of the study that the tests might be geared towards short-term learning only; however, this was one concern that was difficult to control. Nevertheless, the main benefit of this study was the discovery that graphs might not be helpful and might even be counterproductive to learning because they might confuse the students.

Another finding by Becker (1998) was the presentation of graphs that was contrary to the conventional standard. For instance, the demand relationship is presented as $q_d = f(p)$ but price p is placed on the vertical axis and the quantity q on the horizontal axis. Furthermore, academics' own tardiness in presenting the diagram does not make it clear but may have caused unnecessary confusion to the students. He further urged that diagrams and graphs should not be overly cluttered, as more lines would just complicate them and obfuscate what should be made clear by the diagram. Hence it is good advice

from Kennedy that *"only graphs with exceptional pedagogical value....are employed...."* (Kennedy, 2000, cited in Siddiqui, 2004, p 7)

Lecture materials and notes

In the area of lecture preparation, Felder et al (2000) suggested various methods of teaching engineering students effectively. Although Felder's study was in the field of chemical engineering, I observed that the problems faced by the engineers were similar to those of economics teaching – the increasing need to bring the 'real world' into engineering design and operations and the decision over the coverage of fundamentals. Unlike in the engineering course where experiments and demonstrations could be carried out to illustrate the concepts, it is difficult to replicate such approaches discussed by Felder in introductory economics. Nevertheless, Felder et al made similar observations regarding the high tendency for academics to over-load information in lectures. This was made worse if the students resorted to memorizing problem solutions without understanding or questioning the underlying concepts and methods – which is merely short-term learning. In this regard, Cohn et al (1995) found that there was a positive relationship between working memory and learning, and suggested that lecturers should avoid presenting material in such a way that it becomes taxing on the working memory capacity of the students; monitoring the pace and density of information presented to students is essential.

Working memory is defined by the authors as the active part of long-term memory that is more volatile and has a limited storage capacity. Working memory is important in note

taking and therefore learning, because it is used for the maintenance, manipulation and interpretation of information during lectures.

To determine the interrelationship between note taking and working memory in learning economics, a total of 211 students from the University of South Carolina participated in this study. These students were further randomly divided into nine groups of different treatments before the findings were obtained. The problem with this study was the relatively poor data base because their study was based on one lecture on Money and Banking; nevertheless, the key findings are listed below:

- Attending a lecture contributes to learning because the mean scores of students who were present at the lecture was higher than those who were not.

- A brief study period of ten minutes to study the instructor-supplied notes might be preferable to attending a thirty-two minute lecture (without taking notes)

- High GPA scores were significantly related to note taking skills The determination of completeness of note taking was based on the completeness of lecture ideas

- Students who used an outline provided by the instructor which had clear headings of topics and subtopics recorded a more complete set of notes. Cohn et al found this result congruent to the earlier findings by Kiewra et al found in Cohn et al,

1995 which showed that the instructor's outline enhanced selective attention and encouraged students to record lecture ideas.

The interesting finding in this study is to think that providing lecture notes to students in advance or even uploading the materials to the learning platform hoping that students can pay more attention to the lecture is deceiving. The study has found that such an advantage is overestimated. Although it was conducted based on only one lecture, it would be interesting to observe over time whether instructor-supplied notes may discourage students from attending lectures. Cohn et al did not provide the reasons why students may be discouraged from attending lectures; it could perhaps be that students found it boring if lectures were just repeating the notes in hand.

2.3.3 Quality of staff

Is the course well taught? This is a concern many researchers have raised over the years since it is a common practice in American research universities and colleges to engage Teaching Assistants (TAs) to conduct the introductory course. Wolfe (1920) raised the concern about their inexperience in teaching based on responses from students and alumni. The teaching assistants were also perceived to be more interested in hair-splitting logic than in essentials, which had led students to perceive that they were out of touch with the actual world. Wolfe (1920) highlighted the importance of the introductory course in providing the perspective of the course and the inspiration for the students. She believed that only professors possessed the knowledge both in breath and depth, and the

maturity to explain concepts well based on the students' experience and interests, and the economic, social and political situation of the time.

Although the preference for older professors is obvious, Wolfe also recognized the possible trade-off in the lack of freshness and in a new point of view, and therefore she suggested the employment of graduate students as tutors with a condition that they should without fail hear the lectures each week. Wolfe's intention was to caution the faculty about recruiting teaching assistants since their performance was less than desirable. However, the folly would be to assume with simple deduction that the professors were better teachers.

Concern with the quality of staff was again raised by Stigler, who found the extensive reliance on graduate assistants as a major problem in huge universities in the USA (Blodgett et al, 1941). The graduate assistants, as he realized, were not able to speak well, and hence he suggested that the elementary course should concentrate on a few relatively simple theoretical cases and strongly argued against including political and sociological analyses. Blinder (1991) again questioned the rationale for the employment of foreign teaching assistants when the quality of teaching had suffered as a result. So far such concerns were from complaints by the students as well as personal observations of the researchers/economists. These concerns were later quantified in the work of Watts and Lynch (1989).

They found that students with non-native English-speaking instructors performed less well than students with instructors whose first language was English. This study was conducted at Purdue University between May 1984 and December 1985 and consisted of 2,800 students and 30 instructors. The objectives of the study were to determine the effects of learning from four different areas, namely, the structure of the course in terms of extending its duration ; staff in terms of engaging teaching assistants; the choice/use of textbook; and lastly, mixing different types of students, freshmen and sophomores in the same course. The one objective that is of interest to my study is the effect of assigning teaching assistants, especially international graduate students, to conduct tutorials.

The results showed that based on the comparison between pre-test and post-test scores of the students, the use of international teaching assistants had a negative effect on their grades - and hence learning. This was true for all the different courses: namely, a one-semester less quantitatively demanding as well as two-semester courses in microeconomics and macroeconomics. Watts and Lynch highlighted two contributing factors to their findings: firstly, the lack of communication skills among the non-native-speaking teaching assistants, which confirmed the suspicion of many economists - and secondly, the teaching assistants' unfamiliarity with the U.S.A.'s economy which had been unfairly judged by both students and faculty. Hence, Watts and Lynch suggested that these international teaching assistants be placed in microeconomics courses which had a high percentage of objective testing in the examination.

The results of this study were obtained based on pre-test and post-test scores, and there were no qualitative interventions during the semester; for example, no observations were conducted in classes of teaching assistants. This could be important, because there could be other reasons for the poor test scores of students; one could be poor attendance of students, although Watts and Lynch had considered drop-out rate, which showed in this study as similar between tutorial groups of faculty member/local teaching assistants and international teaching assistants.

This study as well as most of the studies conducted gave no indication of students' attendance or effort by the students to take charge of their own learning by participating in class. It may be an undisputable fact that the international teaching assistants do not communicate well, but the low scores negative learning tendency of the students could not be entirely explained by the poor performance of these international teaching assistants, if for instance, the students failed to put in their effort. Durden and Ellis (1995) found that attendance did affect performance for students in the Appalachian State University, at least during the period of study of 3 semesters between 1993 and 1994. They found that attendance did matter for academic achievement in a Principles of Economics course, although the effect was nonlinear, becoming important only after a student had missed four classes during the semester. Hence, rather than simply equating low scores and negative learning with international teaching assistants, it is perhaps more useful to understand how students' learning is affected by these non-native speakers. In addition, whether the faculty members were comparatively more effective in their

teaching because of the poorer performance by the international teaching assistants was left unanswered.

McConnell also (1998) noted that the most serious source of dissatisfaction among 'Principles' students were the communication problem in many PhD-granting universities. To reiterate the teaching assistants' unfamiliarity with the U.S. economy, McConnell observed that most economics departments in these universities tended to assign their least-experienced staff to the 'principles' course, teaching assistants who were mainly graduate students, of whom approximately one-third were foreign-born.

This was supported by an early study conducted by McConnell and Lamphear in Nebraska in 1970 (cited in Siegfried and Fels, 1979) where they concluded that the teaching assistants' students did worse than the students in the alternative classes - but in that study they did not control for teaching experience or attributes of the students in the class (Siegfried and Fels, 1979). McConnell further argued that since there was no consideration from the departments to place high priority on classroom performance for the teaching assistants, the quality of teaching as a result suffered inevitably. Another interesting note from McConnell was his concern that the graduate economics course in recent years had increased in specialization so that graduates (turned teacher) were less likely to be near the frontiers of knowledge of the huge array of specialities which comprised the principles course (McConnell, 1998).

However, there were other studies where results showed otherwise. Morawetz conducted a study with 1,930 students in 66 different classes at the Hebrew University from 1967 to1975 and found little difference in student performance based on the level of experience of the graduate teaching assistants (Siegfried and Fels, 1979). Saunders compared the performance of 2,136 students at Carnegie-Mellon university of those taught by faculty and those by the graduate teaching assistants, and found no evidence that one group performed better than the other (Siegfried and Fels, 1979). Oates and Quandt also found that students of faculty and students of graduate teaching assistants performed comparably (Siegfried and Fels, 1979). Their study, conducted in Princeton during 1965-69 with a sample size of 2,336 undergraduate students, of whom two-thirds were taught by graduate teaching assistants, showed no conclusive evidence that there was a difference in students' performance. However, among the graduate teaching assistants, there was variation in previous teaching experience, so that those who had more experience did better than inexperienced instructors. Siegfried and Fels (1979) hence cautioned that the Princeton experience should not be generalized, because the selection for TAs in Princeton is limited to a group of very advanced students.

From the various studies conducted, Siegfried and Fels (1979) went on to summarize that graduate students generally are just as good teachers as regular faculty, although their lack of experience may hinder the performance of their students. However the, graduate students' enthusiasm, approachability and interest helped their students to the extent that the net difference between the graduate students and the faculty was negligible. Secondly,

graduate students who had had teacher training were better instructors than those who had not.

In contrast to the use of graduate students in the principles course in the United States, tutorials in the United Kingdom are usually shared among all faculty members (Lumsden and Scott, 1983). Hence, due to the different education model in the two countries, the issue of the teaching assistants is not a concern but, given the relatively high teaching loads compared to their counterparts in the United States, the opportunity cost of the conventional tutorial system is high.

2.4 Textbooks

With regard to the issue of textbooks, much has improved since the time of Wolfe, who at that time highlighted a dire need for an introductory textbook that was unbiased in presenting economics theory yet maintaining its relevancy. The balance between presenting knowledge and reality has been incorporated into the current textbooks .

Today the development of textbooks has been so transformed, with many different products, that Stiglitz (1998) believed that the market for textbooks had reached the stage of maturity suggested by the observation of their increasing standardization , which contributed to the standardization of the curriculum, and vice versa. The number of 'principles' textbooks has increased by many times since the first publication of

Samuelson's text in 1948, but with little variation in terms of scope (Walstad, Watts and Bosshardt, 1998).

Today the textbook market may perhaps be characterized as monopolistically competitive with a high degree of non-price competition; for instance, the production of study guides, test banks, simulation programmes, the use of cartoons and "box features", etc., found in textbooks has become a standard feature/package of every book published. Although no research has been found determining how far these features are effective pedagogically, they have certainly proved attractive to the publishers as they represent barriers to entry to the industry. This is because as soon as these common aspects become a standard feature accepted in the industry, any newcomers who wish to enter the market are expected to match the industry's standard or be eliminated from the competition.

Hence, these common features serve as a novelty feature to consumers on the one hand and on the other, form a barrier against newcomers entering the industry to protect the market share of the incumbent. Not all economics instructors are satisfied with the coverage of the textbook, but no real change has taken place so far, perhaps due to the resistance by the publishers whose decision is determined by the market conditions. Hence, the current textbook market can best be described as in an inefficient Nash equilibrium state (Stiglitz, 1998).

In a more recent study, Walstad, Watts and Bosshardt (1998) found in their study that differences between the major textbooks used in the American market today were

negligible, and generally the size of the textbook is gradually being reduced, responding to the need to make economics textbooks shorter and easier to read. They have also discovered that textbooks today are more colourful, with plenty of boxed inserts and short examples, real world applications or Naturalist questions, as commonly known in the U.S.A. – which are aimed to attract the MTV generation of students.

During the course of this study, there was a lack of research carried out to determine the impact of textbooks on learning, except for Watts and Lynch (1989), who found that using a low-level intermediate theory text in a 'principles of economics' course was associated with significantly lower test scores compared to the use of a standard introductory text.

2.5 Students' background

It has long been a hypothesis that students' education and social background has an effect on college economics learning. In the area of social background, the common research field is limited to the area of determining gender differences and maturity in college economics learning. An early report from Siegfried and Fels (1979) found that there was no relationship between maturity and cognitive performance, but later reports from Bonello et al (1984), Watts and Lynch (1989) and Watts and Bosshardt (1991) found that the freshman was distinctively disadvantaged in introductory economics courses compared to the sophomore. Apart from a cursory discussion by Durden and Ellis (1995), which found that parents' educational attainment was positively associated with students'

performance in the study conducted between 1993 and 1994 in Appalachian State University, research on the impact of learning determined by family background, peer pressure and social class has been limited, if not non-existent.

High School Economics

It has been of great interest to researchers to determine if the high school economics course has an impact on the university's introductory economics course. Saunders (1970) found that research interest in this area could be dated back to 1923 in the University of Minnesota, where it was found that there was a positive relationship between high school economics and university economics courses.

Subsequently similar results were found, although earlier works tended to be more simplistic in the method of analysis with mere comparison of results without implementing variable controls. Research conducted in the University of New England, Australia, by Clayton in 1964, Dawson and Bernstein in 1967 with four colleges in the state of New York, and a more comprehensive study by Moyer and Paden in 1968 at the University of Illinois, showed similar results which saw a gain in score by students who had done high school economics (in Saunders, 1970).

However, Harbury and Szreter found otherwise in their study conducted between 1951 and 1964 in the University of Birmingham in England (in Saunders, 1970). Their results, which were published in 1968, found that based, on the total sample size of 657 students

of whom a little less than half of the students sampled had had experience in high school economics, high school economics had no significant relation to the scores in the introductory economics exam; in fact, this was also true for subsequent years in the university.

Saunders (1970) found that his study, conducted at Carnegie-Mellon University between 1964 and 1969, gave an insight into the contradictory results of earlier research work. Saunders found that the determining factor in the seemingly incongruous outcome was that the relationship depended on the type of questions used for testing. Saunders found that high school economics had a significant impact if the types of questions involved recognition and understanding but did not have a significant influence if the testing questions required application. A subsequent study conducted by Palmer et al (1979) at the University of Western Ontario found that the positive relationship tended to be an overstating effect. They found that high school economics might have caused more confusion or misled students into being over-confident at the university. Palmer et al had used 19 multiple-choice questions for the pre- and post-tests, but I could not determine the types of questions used. Nevertheless, Siegfried and Fels (1979) concluded that students who had taken previous economics courses did not begin their principles course with significantly more knowledge, nor did they learn significantly more during the semester.

More recently, Walstad and Soper (1988) conducted a survey using a standardized test bank to determine the economic literacy of high school students. A national sample of

3031 cases was observed; they used the Test of Economic Literacy (TEL) as a measuring tool and found that only 7.5 percent improvement could be observed in those high school students who had done economics using a published textbook compared to students who had used instructor-designed materials as well as students who had completed social studies with elements of economics in the course.

On closer examination, it was found that none of the three types of high school students were sufficiently prepared for the university's economics course. The high school students who had used published textbooks had the highest scores, answering 52 percent of the TEL questions correctly - and the lowest were those who had done the course with materials designed by their instructors, with a 40 percent pass rate. Walstad and Soper also found that high school students lacked competency and knowledge in macroeconomics and international economics in general. This is perhaps due to the number of applications required in these segments of the economics course.

Research in this area continues, and Brasfield et al (1993) found in their study of students at the Murray State University from 1987 to 1990 that high school economics was positively and significantly related to students' grades in introductory macroeconomics and introductory microeconomics. They believed that this was the result of an improved high school economics curriculum. Anderson et al (1994) also found that in the University of Toronto, students who had taken high school economics did better in college economics, provided that they had obtained a grade of 76 percent (a Middle B) or better. Shanahan and Meyer (2003) on the other hand found that first year students with

prior knowledge of economics done worst off than those without such prior knowledge in the University of South Australia.

The research into students' previous experience in economics has been progressive, from simple analysis to multiple regression analysis, from the types of questions used in testing to the implementation of standard testing tools, from a one-semester data collection to a longitudinal study. Nevertheless there are too many variables contributing to learning which one could not fully understand unless they were answered by the subjects themselves - the students.

High School Mathematics and English

Another concern of academics is whether high school mathematics and English has an impact on college economics learning. In the same study by Anderson et al (1994), the relationship between English and economics learning saw a negative intercept with a positive slope which showed that the better one does in English, the worse one will do in college economics. In terms of mathematics attainment, doing calculus in high school had an unambiguously beneficial effect on a student's grade in college.

Myatt and Waddell's (1990) study in the University of New Brunswick tried to discover the period of retention of high school economics, English and mathematics knowledge. They found that high school economics did give students an advantage at the university,

but there was a decaying effect so that high school performance in economics, English and mathematics abilities regressed over time.

2.6 Learning

2.6.1 Background

The literature reviewed so far showed the point of view of economists in improving teaching and learning; to a certain extent researchers were standing at the pinnacle of expert knowledge trying to understand students' inability to grasp the knowledge that had become second nature to them.

Most economists will agree that economics education is important in our everyday life, and this was cited in Wentland (2000, p 4) that *"economic education helps students develop the critical knowledge and skills they need as citizens to make intelligent decisions and to help shape economic policy."* Yet many found economics difficult to learn because, in order to be successful, *"students need to have the ability in both abstract thinking and in application and to express complex ideas logically and fluently."* (Wentland, 2000, p 4). Economics teaching has in recent years been influenced by educational research; for example, Biggs' (1996a) constructive alignment approach to teaching has begun to be integrated into the instruction design to overcome problems encountered by students in learning. The studies conducted by the economists were mainly quantitative in nature, whilst most of the educational researches have moved away

from that tradition; hence it is necessary to consider research from the educational perspective.

However, to be successful in learning economics or any subject, it is crucial to first recognize and understand how students perceive the different kinds of knowledge: inert, ritual, conceptually difficult and foreign. It is particularly important to take note of foreign knowledge which can be defined as a knowledge that comes from a different or sometimes conflicting perspective. This is an interesting idea that supports the views of students' perception of economics, which will be discussed in chapter 4. According to Perkins (1999), these different kinds prove troublesome to learners in different ways, and it is the instructors' role to be flexible and pragmatic in finding the right techniques for better learning. The exploratory attempt by Meyer and Land (2002) in integrating the different kinds of knowledge with different disciplines showed that learning and troublesome knowledge are inversely related. In this conceptual paper, Meyer and Land presented useful insights into how students perceive and grasp knowledge. It is interesting because of their attempt at integrating content knowledge with the theories of student learning which pave the direction for future research into enhancing teaching and learning in higher education. It will be interesting to determine if students from different cultural backgrounds, especially those influenced by Confucian-heritage education, respond differently in grasping difficult knowledge.

2.6.2 Definition of Learning

In exploring the meaning of learning, earlier research tended to use ready-made concepts from psychology and sociology to explain the differences in students' attainment. The students' intelligence quotient or even Gardner's multiple intelligence derived from human competencies plus the effect of home environment on performance cannot adequately explain how learning actually takes place (Entwistle, 1997).

Before I discuss the different approaches to learning, a simple explanation of learning is necessary, and is given by Ramsden (2003) as a relationship between the person and the material being learned. Saljo and the Swedish team found that over the years there is a hierarchy of learning and it can be classified into different levels which are summarized in Ramsden (2003):

1. Learning as a quantitative increase in knowledge, acquiring knowledge or 'knowing a lot'
2. Learning as memorizing, storing information that can be reproduced
3. Learning as acquiring facts, skills and methods that can be retained and used as necessary
4. Learning as making sense of abstracting meaning, which involves relating parts of the subject matter to each other and to the real world
5. Learning as interpreting and understanding reality in a different way, which involves comprehending the world by reinterpreting knowledge.

According to Saljo, conceptions 1 to 3 are things external to the learner, whilst conceptions 4 to 5 relate to the internal or personal aspect of learning. This view was similar to Perry's dualistic (quantitative and reproductive in nature) and relativistic (transformative) conceptions (Dahlgren, 1997). The intention is to encourage students to adopt a learning approach that will help them to advance to a higher hierarchy, from an educational psychology point of view, to move from rote learning (memorization) to meaningful learning. However, researchers have found that students' attributes, their previous educational backgrounds, the context of learning, orientation to study and students' perception of the task requirement could affect their experience in achieving a higher learning outcome.

2.6.3 Theories of Learning

From the late 1960s to the early 1970s the interest in learning was focused on selection and prediction, in which Entwistle and his team in Lancaster tried to identify the students' attributes (personality, motivation and skills in organizing study) to predict their academic success. Although the studies demonstrated relationships between the variables, they did not fully explain how the underlying traits led to the various learning outcomes. For instance, how the learner tries to make sense of the subject and relate it to his/her world is not known - and this is a major weakness of this early study. Learning as explained by Ramsden (2003) is not something in itself but is relational between the subject and the student.

Another shortcoming of the early approach is the tendency to blame students for their deficient performance, which pushed the problems of poor teaching onto the students (Entwistle, 1997). The weaknesses in the quantitative tradition led researchers to later adopt an alternative approach, in terms of methods and perspective, seeking to understand the involvement in learning from the description by the students.

Approaches to Learning

The Swedish group, led by Marton and Saljo, began to work on the qualitative aspect of learning by understanding the students' experience and how they organized learning tasks, commonly termed 'approaches to learning'. The work of the Swedish team is about the "what" and "how" students learn rather than "how much" they remember. The early studies of Marton and Saljo were conducted by giving out reading and comprehension tasks to university students. These students were briefed that questions would be asked about the passage at the end of the exercise.

The aim of this study was to examine the students' learning approaches and learning outcomes from reading these academic articles (Entwistle, 1997). The variations in understanding among students were subsequently explained by a combination of the intention (what) that the students had in starting the task and the process (how) used to carry it out.

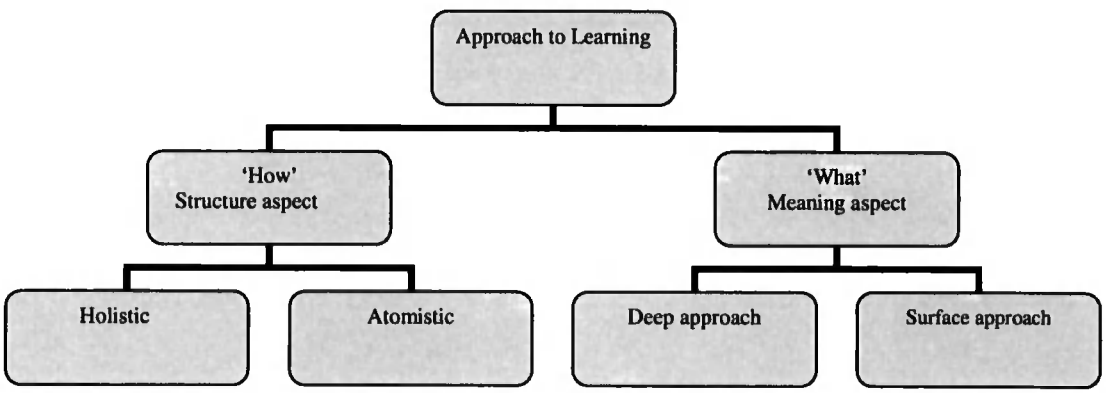
The study by Svensson which was cited in Marton and Saljo (1997) showed that in fulfilling the reading requirements, students tended to take either of the two approaches -

atomistic or holistic. To meet the requirement of the reading task, students sometimes adopted a holistic approach, which showed signs that they were moving towards the direction of understanding the text as a whole. These students did this by trying to search for the author's intention and relating the content to a larger context, whilst students who adopted an atomistic approach were often observed to be focusing on the sequence of the text but not the main parts of the content, and they often tried to memorize details. Svensson (1997) also found that the crucial difference between a holistic and an atomistic approach was in the ways students dealt with complex learning materials within an examination-oriented learning environment. He noted that since study success is often defined as success in examinations, given the huge amount of materials in higher education, students tend to be selective and to focus their studying in accordance with the examination. Memorizing with effort may achieve success but when content materials become increasingly complex, failure is likely. Marton and Saljo highlighted that the problem with the atomistic approach was that students often perceived knowledge as fragmented and they tended to miss out important ideas: *"What we found was that the students who did not 'get 'the point' failed to do so simply because they were not looking for it. The main difference we found in the process of learning concerned whether the students focused on the text itself or on what the text was about."* (Entwistle, 1997, p 18)

Another important development from the Swedish group was the understanding of how students decided on the approach taken to tackling the reading task, by way of either a deep or surface approach. The variations between the two approaches showed the distinction between knowing facts as parcels of unrelated knowledge and understanding

concepts that could be integrated with previous learned knowledge. It is important to note that an approach is not about learning facts but is the demonstration of students' ability to relate the learned facts to the concepts. Simply put by Marton and Saljo, surface is about quantity without quality; depth is about quality and quantity (Marton and Saljo, 1997). A student concentrating on surface learning tends to 'spot questions' whilst a deep learning-oriented student would look below the surface to seek for the authors' meaning (Entwistle, 1997). Marton and Saljo also found that in deciding on the approaches, students' decisions are affected by their intention and their conception of everyday knowledge, which is students' everyday experiences and observations from their world. Saljo found that such knowledge sometimes contradicted the knowledge they read in the texts. Hence students found that the world was frequently abstract and unrelated to everyday experience in any obvious way.

The diagram below shows a summary of the approaches to learning.



Adapted from Ramsden (1997).

Figure 2.1 Approaches to Learning

In a recent study conducted by McCune and Entwistle (2000) with first-year psychology students on their learning approaches, they found other idiosyncratic factors that determined the students' adoption of a certain approach. These factors are the goals set by the students, however limited their feeling of whether they have achieved these goals and their attitudes towards learning advice; all these factors determine their willingness to change their learning approaches. Hence McCune and Entwistle found that students' development was influenced by a complex combination of abilities, attitudes, belief and motivation.

While Marton and Saljo's experiments were conducted requiring students to read articles that were unrelated to their discipline, Pask and his colleagues in Richmond (Entwistle, 1997) investigated how students learned within their discipline. The article chosen was part of their normal study requirement indicating a need of understanding. Interestingly, when a deep approach was obligatory Pask found that students were able to switch from a holistic approach (searching for meaning) in the beginning to a more *operational* learning style towards the end of the learning process. The students were able to manipulate concepts and objects in the domain of their subject to streamline the process of learning within a theoretical framework such that efficiency preceded the search for and the integration of meaning. Pask found that the switch in learning style was conducted at appropriate junctures, and this demonstration of versatility allowed him to term this learning style 'a fully deep process of learning' (in Entwistle, 1997).

In this regard, Biggs and the Australian team found that the learning process of a student is affected by a combination of motive and strategy, which is in turn determined by the student's personal characteristics and external institutional factors (Biggs, 1979). The impact of motive and strategy on the learning approach is summarized below:

Table 2.1

Students' Study Process

Motive	Strategy	Approaches to Learning
Main purpose -- to meet minimum requirements	Reproductive – target to reproduce through rote learning the bare essentials to avoid failing	Utilizing (surface)
Main purpose -- to realize interest and competence	Reads widely and integrates with previous relevant knowledge	Internalizing (Deep)
Competitive in nature, tries to obtain highest grades whether or not the material being studied is interesting	Students' ability to organize time and knowledge well within the work environment	Achieving

Adapted from Biggs (1979)

Biggs and his team believed that it was possible to adopt mixed approaches to learning; rote learning in a highly organized way is surface-achieving while reading for meaning in an organized way is deep-achieving. Biggs went on to develop the Study Process Questionnaire (SPQ) to test this model on students in higher education with satisfactory results (Biggs, and Kirby, 1983). The later work by Biggs and team found the metalearning ability of students to increase with their general cognitive ability, and this was affected by students' belief about control over their own learning – locus of control as it was commonly known.

Biggs and Collins also developed the SOLO taxonomy (Structure of the Observed Learning Outcome) to describe the range of answers from a specific question (Dahlgren, 1997). Five categories were developed with increasing levels of sophistication in answer, and many studies have since been carried out across various disciplines that have increased the generality of this measure. SOLO represents the structural analysis of the outcome of learning. Although it is content-oriented, it could not account for the differences in outcome when a learner was exposed to specific content over time. Dahlgren (1997) found in the study with economics students that a change in conception exists when learning takes place; there is a shift from one conception to another which is qualitatively distinct.

Orientation to studying

Beaty et al (1997) found that there is a relationship between students' learning orientations and the way they go about working on the course. Such a relationship is

called the study contract, which students negotiated with themselves. Research carried out in Surrey University and the Open University in the UK by Taylor found four categories of orientation: they are vocational, academic, personal and social - each determined by intrinsic and extrinsic interests and with its respective aims and concerns (Taylor 1981 in Beaty et al, 1997). The complex interaction of the orientations led students to take a strategic approach to learning. Hence, apart from deep and surface approaches, strategic approach is another characterisation of learning adopted by students, mainly organized by their intention to achieve the highest possible grades by putting consistent effort into studying and managing time and effort effectively.

Table 2.2 Students' learning orientations

Orientation	Interest	Aim	Concerns
Vocational	Intrinsic	Training	Relevance of course to future career
	Extrinsic	Qualification	Recognition of qualification's worth
Academic	Intrinsic	Intellectual Interest	Choosing stimulating lectures
	Extrinsic	Educational Progression	Grades and academic progress
Personal	Intrinsic	Broadening or self-	Challenging,

	Extrinsic	improvement Compensation or proof of capability	interesting material Feedback and passing the course
Social	Extrinsic	Having a good time	Facilities for sport and social activities

Adapted from Beaty et al (1997)

2.6.4 Student learning in context

Students' learning can be illustrated by the diagram below. Many studies were conducted to find the different variable inputs that determine the learning approach of students. Although the earlier research was strongly influenced by students' attributes as a determining factor, current work is trying to discover other factor inputs that could cause students to respond in a certain way. So far I have discussed the orientation of study and the various learning approaches. The diagram below illustrates the complexity of students' approaches to learning.

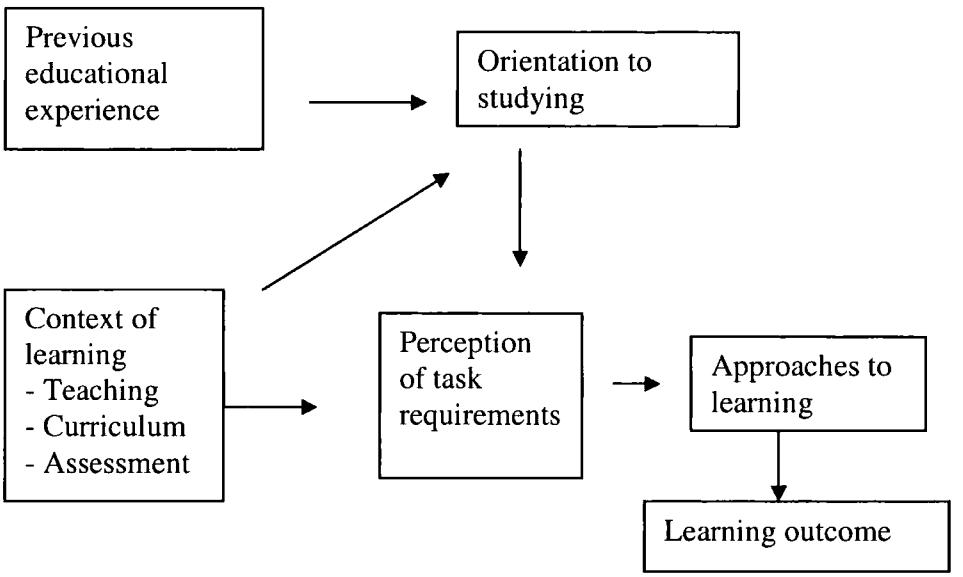


Figure 2.2 Students' Learning in Context

Previous educational experiences

From the learning and motivational perspective, it is known that students' intention to understand or to reproduce materials depends on whether they carry out the learning task for its own sake (out of interest) or in response to external requirements. It is believed that when responding to the requirements raised by others, students often tried to memorize materials because they thought that was required of them. Fransson (1997) found that students may have taken a surface learning approach for two reasons: firstly, a lack of intrinsically motivated interest in the subject, or they could not see the relevance of it. In fact, Fransson found that threat (extrinsic motivation), anxiety and the absence of intrinsic motivation correlated with surface learning. Secondly, surface learning could sometimes be the only feasible approach available to the students because they might have inadequate background knowledge of the relevant field. This is especially the case

when the learning task demands that the student has previous knowledge of fundamental concepts. Studies have shown that this is more so for science subjects than in the arts disciplines (Ramsden, 1997).

If a parallel is drawn with the research conducted by the economics instructors, a study conducted by Meyer and Shananhan (2000) with the students enrolled in the first-year economics course in the University of South Australia found that it was difficult to unlearn misconceptions learned in high school. In the study it was also found that high school attainment in mathematics and English has positive correlation with the average score which supported the findings by Fransson that fundamental knowledge is important. Another important finding from the study was in the prediction of success, which showed that students who held strong misconceptions about economics had a low probability of success, at about 16%; students who were extrinsically motivated, who memorized without understanding, who paid excessive attention to details, and who considered knowledge to be factual, had a 27% chance of passing the course. Hence, a surface/atomistic learning approach plus learning baggage are determinants of poor performance.

In short, previous experiences or the lack of it has a correlation with learning approaches.

Context of Learning

Ramsden (1997) also found a strong relationship between students' learning approaches and their experience in teaching and assessment. Assessment and the perception of the

tasks are closely related. Sometimes students resorted to a surface learning approach because of inappropriate assessment questions set by the instructors. In a study by Marton and Saljo (1997) it was found that students adapted their learning to external requirements, so that, although the mechanism of assessment may be in place, once the demands of the tasks become predictable to the students so that they can handle them with a shallow interaction with the text, they will try to economize their effort. In the study conducted, only half of the students interpreted the demand in the way it was intended – a deep learning approach. Another similar study conducted in Lancaster from 1978 to 1981 requiring students to do tasks like problem-solving, essay writing, report writing and reading showed that the students' perception of these tasks determined the learning approaches they adopted (Ramsden, 2003). On the other hand, Ramsden also found that there were assessment procedures that promoted rote-learning that required students to memorize facts and details, and if assessment were allowed to go no further than testing of these facts retained in the memories of the students, misconception would never be revealed (Ramsden, 2003).

Deep learning can be encouraged by good teaching and the elements of good teaching include the lecturer's enthusiasm and his or her ability to communicate effectively with the students. Hodgson (1997) found with the students in Sheffield University that the lecturer's attitudes towards students and the ability to teach at the students' level were more important than methods and techniques of teaching. More importantly, Hodgson found in the study that lecturers' enthusiasm, rapport with the students and ability to

maintain the interest of the students, could shift students' perception of the subject from extrinsic to intrinsic motivation.

Lastly, overloading of a syllabus tends to promote surface learning. A series of investigations carried out in British and Australian universities in the late 1970s found that the workload and pace of the course had a determining effect on students' adaptation of a certain learning approach. From the interviews conducted with the students, it was interesting to note that the students were aware of their choice that led to an inferior outcome (Ramsden, 2003).

2.7 Summary

The research conducted in this field can be categorized into two groups - from either the economist instructor's perspective or the educational researcher's point of view. Despite the differences in expertise, I could draw similarities in their discussions on various topics.

Table 2.3 Similarities of views between the economists and educational researchers

Economists	Educational Researchers
Students' background in Economics, English and Mathematics influences their performance in the university. Students who attained at least a Grade B in high school economics tend to do well in the	Students' previous educational experience influences their approaches to learning. Students with negative baggage tend to have lower success rate in university economics.

university; the relationship is inverse for English and positive for Mathematics.	
Economics teaching in the universities is traditional, and most of the economics departments are slow in promoting active learning. Good teaching includes teachers who can inspire; researchers tend to focus on the methods and techniques for better teaching.	Researchers have found that students' previous experience in teaching affects their approaches to learning. It is good teaching rather than methods and techniques that matter.
Objective (what) and content (how much) are important concerns of the instructors especially in terms of whether the syllabus should have a wide coverage of topics or in-depth analysis of a few carefully selected topics to make the subject more realistic to the students.	The primary concern of educational researchers is trying to understand 'what and how' students learn – learning approaches. In the process they also found that the overloading of syllabus tends to promote an inferior learning approach.

There are, however, other areas of interest that were not mentioned by the other camp of researchers, and they are listed below:

The economists' perspective:

- The use of teaching assistants in conducting the principles courses

- The overuse of mathematical equations and graphs that might impede learning
- The quality and choice of textbook today

Educational researchers' concerns:

- The impact of assessment on students' learning
- The various determining factors that affect students' decision to adopt a particular learning approach
- The students' perception of economics knowledge

Instead of highlighting the similarities and emphasizing the differences in research areas, it would be more productive to consider the above as potential areas for joint research between the economists and the educational researchers.

2.8 Studies conducted in Singapore

A study conducted by Tay (1994) in the Nanyang Business School during the academic year 1991/2 was the most comprehensive work in Singapore that relates to this study. The purpose of Tay's work was to determine if the findings in research in the West about engaging teaching assistants, prior economics experience and gender issues, could hold across cultural and institutional settings by replicating the studies. There were several interesting findings from the study which are listed below:

- A student's performance was determined by the student's academic background and not by differences arising from instructors
- Contrary to most previous studies in the western literature, the overall ability of the students based on their GCE 'A' level aggregates was insignificant for their overall performance in the university's economics course
- Students with previous experience in economics at pre-university level performed better than those who did not
- Male students performed better than their female counterparts, and Chinese students out-performed Malay and Indian students

Although Tay's study was conducted in the same university as this research, several qualifications are needed when relating it to this study and they are listed below:

- Firstly, the academic structure in the Business School is different from the Engineering School in the engaging of teaching staff. The Engineering School has been adopting a more British-oriented system in employing lecturers for conducting tutorials rather than graduate students as teaching assistants.
- Secondly, the economics syllabus discussed in Tay's study was very different from the course content conducted in this study, since the university's economics course in the Business School then was not only more advanced than it is today, but was also more demanding than most introductory economics courses in most of the colleges in the U.S.A.

- Thirdly, the gender issue was discussed in Tay's study just as in most studies conducted in the West. However, this issue is not significant in this study because there are generally fewer female students in the Engineering School. In addition, the purpose of this study is not to determine the gender difference in learning styles.

Ultimately, although Tay's findings were useful in testing the findings across cultures, the study lacks the insight into students' attitudes towards learning, which is the focus of this study.

Siddiqui's work (2004), on the other hand, was more relevant because it was conducted in the Engineering School. The study was an attempt to understand the attitudes of the students towards learning economics, but it lacks depth of research because of the research method adopted. Data were collected using a survey of randomly selected tutorial groups and the information was analysed by percentage ranking. However, the data collected were from less than 10% of the entire cohort, and this must be borne in mind in the consideration of results, even though the sample was random.

It was found that students learn better by way of examples and applications, which was shown to be the preferred style of learning. More than 50% of the respondents indicated this as their first choice of learning method, and this supported the study conducted by Caviglia-Harris (2003) that one way to arouse the interests of non-economics major students to take more units of economics would be to help them to see the purpose of the

field. This was followed by the use of graphs (36%) and mathematical equations (27%). Classroom experiments, group activity and the use of the computer/internet are the least preferred methods, which also showed their lack of relevance within the current teaching environment in the university.

Although Siddiqui indicated that the purpose of his study was to determine the attitudes of the students to learning economics, the approach he has undertaken is too simplistic to be of significant importance in reflecting the attitudes of the students' learning. For instance, the relationship between the frequency of students' reading newspapers and their learning attitudes is abstruse and is not a good measure of their interest in economics. Hence, the survey could at best serve as an indicator for future research work because it lacks the deeper understanding of explaining the students' behaviour.

2.9 Cultural influences

Hofstede conducted a study based on IBM employees from over fifty countries and found that employees from different countries faced similar and common problems but the solutions to their problems differed from country to country due to nationality and cultural differences (1997). A 4-dimensional model of differences between national cultures was developed, with each dimension representing an aspect of a culture that could be measured relative to other cultures. In his study, each country in his model was characterized by a score on each of the four dimensions. These four key areas that differentiate cultures are power distance (PD), collectivism versus individualism,

femininity versus masculinity (sometimes termed relational versus achievement-oriented) and uncertainty avoidance. Although the original work of Hofstede was a study in the workplace, he extended his study to explain how the state, family and school of each country are influenced by the four dimensions mentioned above. The aspect on school is of relevance to this study.

The 4-Dimensional model in Singapore

According to Hofstede, the relations between unequals are formal in societies with high PD, where the flow of information is usually formalized and restricted. Hence in the school environment, teachers are expected to take initiatives in class and they are considered *gurus* who transfer personal wisdom to the students. Students treat teachers with respect. In the study by Hofstede, Singapore has a relatively high PD index, with a score rank of fourteen out of 53 (1997, p 26).

In terms of uncertainty control, which according to Hofstede shows the extent to which a society feels threatened by ambiguous situations and how it tries to avoid them by providing rules, it is to be noted that the uncertainty avoidance index provided by Hofstede is not the same as risk avoidance because uncertainty avoidance leads to behaviour that is more aggressive than risk avoidance. High uncertainty avoidance leads to a reduction of ambiguity, and people in such a culture look for a structure in their institutions and relationships which makes events clearly interpretable and predictable as such; they tend to engage in more risky behaviour in order to reduce ambiguities.

In the school environment, students from weak uncertainty avoidance countries accept a teacher who says *'I don't know'* (ibid, p 120) and give due respect to teachers who can explain complicated subject matter in plain language. In the case of Singapore, it has a low score in uncertainty avoidance which reflects the education system as less structured compared to highly structured systems like those of Japan and South Korea, which scored higher in this respect (Hofstede, 1997, p 113).

Individualism and collectivism are defined by Hofstede as follows:

'*Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself or herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continue to protect them in exchange for unquestioning loyalty.' (1997, p 51)*

Singapore is a highly collectivist society according to Hofstede (1997) and the implication for education is that the purpose of education in such a culture tends to gear learning towards 'how to do' rather than appreciating the process of learning. The reward of education is in its value of upward social mobility in society. In the classroom, students growing up in this culture tend not to speak unless addressed personally by the teacher because it is illogical in their culture to speak without being sanctioned by the group (his/her classmates) to do so.

Lastly, in masculine cultures students compete openly with each other and failing in school is a disaster. This issue of masculinity can also be translated to achievement orientation which shows that hard work precedes success. Among the 53 countries in Hofstede's study, Singapore's score was slightly below median - which showed that, culturally, Singapore consists of elements of both masculinity and femininity within society. In other words, contradictory values co-exist alongside each other; for instance, the dominant value given to material success as well as value placed on care for people; the importance of having warm relationships with others as well as obtaining the material things of life; and at school, the average student is the norm, but failing in school is a disaster (p 96).

Although Singapore is a multi-racial society, it is primarily a Chinese society that is influenced by Confucian ethics, though eroded, which set out the rules of daily living that promote four harmonious relationships - namely, between emperor and subject (state and citizen), father and son (teacher and student), husband and wife (male and female), brother and brother (kinship ties), and friend and friend (in-group and out-group) (Ho, 2001). Unlike western values, which are influenced by the Judeo-Christian religions where God is the creator of all things and the human soul has a special place in God's kingdom, Chinese values which are influenced by Confucian ethics are different. The Christian belief system is one where God is at the core of every human soul, whereas in Confucian ethical values (which are non religious), the human soul is inter-connected to a vast web of people, living and dead, which stretches from the past into the future, and individual identity is found in the connectivity of these relationships (William Drake &

Associates, 1996). Hence, Chinese culture places great emphasis on human relationships that originated from Confucius' teachings.

Confucian-Heritage Education

Education enjoys a special significance in the Confucian tradition, it is not only important for personal development but for society as well. As recently as during the late Qing dynasty, when China was faced with crises and invasions, education was the central theme of discussions on reform and revolution for saving the nation (Lee, 1996). To the Confucianist, education and learning is always associated with effort (Lee, 1996). This is because Confucius himself explicitly disclaimed his membership of the wisest group (one which is born with knowledge) and associated himself with those who acquired knowledge through studying. Hence, the learning process within the Confucian tradition is one that consists of *"studying extensively, enquiring carefully, pondering thoroughly, sifting clearly, and practising earnestly..."* (Lee, 1996, p 35). One interesting teaching of Confucianism is the emphasis on effort in learning, which is found in the writing of Xunzi, a disciple of Confucius, *"Sincerely put forth your efforts, and finally you will progress. Study until death and do not stop before. For the art of study occupies the whole of life; to arrive at its purpose, you cannot stop for an instant. To do that is to be a man; to stop is to be a bird or a beast."* (Lee, 1996, p 32) This perhaps explains the tendency for students from countries with strong Chinese-heritage cultures to associate failure with the lack of effort rather than ability, which is more commonly stressed in the west (Biggs, 1996b).

The research work of Ho, a sociologist from the University of Hong Kong, sheds light on the understanding of the education systems of countries influenced by Confucianism, which is now commonly known as Confucian-heritage education (CHE). In his recent paper on the myths and realities in CHE, the truth in learning and education within such an education system was revealed which downplays the enthusiasm in the west to readily adopt CHE due to its higher academic achievement in mathematics and science compared to the west. Although the study of Ho was primarily conducted in Hong Kong and mainland China (2001), interesting conclusions can still be drawn from it which reflect the conditions of learning and education in CHE societies today:

- Academic qualifications are more highly valued than learning and education in CHE society today because they usually enable one to earn a better living, and to gain upward social mobility.
- A high PD relationship between the teacher and the student is found in such a system. It is commonly known that *"Teaching without strictness is the negligence of the teacher"* (p 10) reflects the respect for authority, in this case the teacher.
- Students concentrate their efforts on reproducing information accurately by memorization and repeated practice
- Teachers cover and students study only materials prescribed in the syllabus.
- The competitive examination system impedes students' thirst for knowledge and dulls their intellectual curiosity

Based on Hofstede's 4-Dimensional model in culture, a CHE society tends to have a high PD relationship, high level of collectivism, high index on uncertainty avoidance and is skewed towards masculinity. In short, these are conditions that are not conducive to good learning, which is mainly characterised as (Biggs, 1996b):

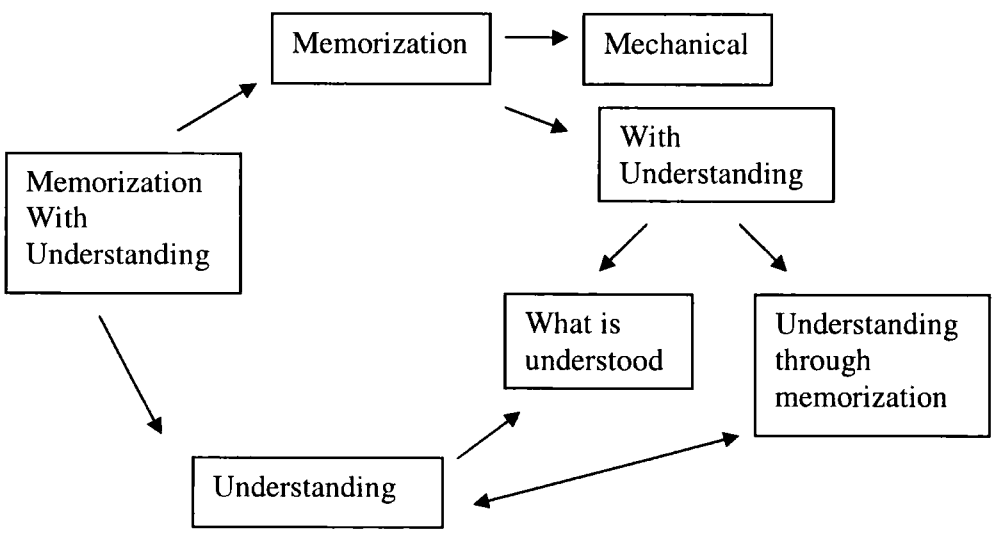
- Student-centred learning
- Content presented in a meaningful context
- Warm classroom climax
- High cognitive level outcomes

It has led educationists to believe that CHE systems promote rote- learning and surface learning. This is perhaps a misconception because Chinese teaching in general believes that skill development precedes knowledge transformation - which requires repetitive training first, whilst the western teaching stresses the process rather than the product (Biggs, 1996b). In fact, the Confucian tradition of learning and education stressed the importance of the intrinsic value of education which inclined towards the deep approach rather than the surface approach (Lee, 1996) – *"Seeing knowledge without thinking is labour lost; thinking without seeking knowledge is perilous - Confucius"* - which does not appear to encourage surface learning (Lee, 1996, p 34). In the Confucian tradition, the basic components of learning, namely, memorizing, understanding, reflecting and questioning are inter-related, integrated and repeated for deeper learning. It is believed that *"Learning is reciting. If we recite it then think it over, think it over then recite it, naturally it'll become meaningful to us. If we recite it but don't think it over, we still*

won't appreciate its meaning. If we think it over but don't recite it, even though we might understand it, our understanding will be precarious," (Lee, 1996, p 36)

Students adopting memorization as a strategy for learning is one of the most misunderstood issues in education. In understanding the role of memorization in the approaches to learning, Marton et al (1996) found that there are two types of memorization: one that is mechanical, which does not consist of much thinking or understanding; and the other that is memorization with understanding. This higher level of memorization with understanding is further divided into two senses, one sense of understanding is referred to as a subject (S) understands an object (O) which is known as memorizing what is understood; whereas the other sense of understanding is obtained progressively over time and is known as understanding through memorization. The inter-relationships can be depicted below: (Adopted from Marton et al, 1996, page 80)

Figure 2.3: The relationship between memorization and understanding



Hence, the common expression that 'practice makes perfect' could indeed be a process of deep learning in action rather than an act of rote learning if given time to develop further.

Finally, in the area of motivation, it is another misconception to associate Confucian-heritage education with external motivation. The Confucian teachings do promote learning for its intrinsic value as well because it is the ultimate goal of every man to achieve human perfection and it is written in the original writings of Confucius in The Analects (XIV25) that *'learning is for the sake of the self and not to be used as a means of pleasing others or showing off to others'* (Biggs, 1996b, p 33). However, this subject of self in the Chinese tradition is usually undermined because it is restrained within the family of relationships and as a result, the internal motivational factor to learning is buried deep within until the self is free from relational restraint (Biggs, 1996b). It is believed that the self can be emancipated so that individualism can be released once the Chinese is uprooted to a new environment like that of migrants moving to a new country or even to a new city (Biggs, 1996b).

The understanding of cultural differences - in particular the Confucian-heritage education - is interesting to this study, as will be evident later, because on many occasions it is found that students explicitly expressed the need to memorize and practise repeatedly, which perhaps supports our understanding of Confucian-heritage education.

Motivation

As for motivation, different motivation theorists conceptualize it in different ways. For example, it could be due to differences in personality traits, as well as theories that are based on social-cognitive, locus of control, etc. (Leo and Galloway, 1996). Students could be intrinsically or extrinsically motivated to achieve a certain task. Intrinsic motivations are largely internal, self-defined and intangible – or, simply put, learning is for the joy of it. Extrinsic motivations on the other hand are mostly tangible or can be considered as a desire for the sake of something else.

However, to distinguish different motivations based on intrinsic and extrinsic definition is perhaps too simplistic in categorizing students' motivational level. According to Dweck (1986), there are students (given similar intellectual ability) who are able to rise up to the challenge when they are faced with difficulties in learning, which is known as adaptive behavioural pattern or mastery oriented; whilst others tend to give up in the face of difficulties, which is called a maladaptive behavioural pattern or helplessness. In short, students with adaptive behavioural pattern not only seemed to be undaunted when they meet difficulties in learning, but their performance seemed to be facilitated by the increased challenge as well. On the other hand, students with maladaptive behavioural pattern are seriously hampered in learning when they meet the same difficulties.

The summary below reflects the different behavioural patterns of the students:

Table 2.4: Behavioural Pattern of Students

Entity theory (intelligence is	→	Performance Goal (to gain positive	High confidence in	→	Mastery oriented, that is,

fixed)		judgments or to avoid negative judgments of competence	present ability		to seek challenge and with high persistence
			Low confidence in present ability	→	Helplessness which led to challenge avoidance and has low persistence
Incremental theory (intelligence is not fixed)		Learning goal (to increase competence)	High and low confidence in present ability	→	Mastery oriented that is to seek challenge (that fosters learning) with high persistence

Adapted from Dweck, 1986, page 1041

The students' goal orientation is influenced by their theories about intelligence. If they believe that intelligence is a fixed trait - entity theory - then their goal orientation is geared towards performance; that is, to gain positive judgments or to avoid negative

judgments of competence from others. The entire process of learning is often built around their concerns about their ability level. Hence, a task will be undertaken only if they are assured of favourable judgment; otherwise avoidance is the best resort for them to either conceal their ability or to protect it from negative evaluation. According to Dweck, students with performance goals are more likely to interpret negative outcome in terms of their lack of ability.

In contrast, a different behaviour pattern is set up when students believe that intelligence is not fixed, and then they tend to orient themselves towards a learning goal which aims to increase their competence level. So the entire learning behaviour is focused on progress – and, most importantly, they believe that mastery can be achieved with greater effort. Unlike those students with performance goals where they avoid challenging or difficult tasks, students with learning goals tend to choose challenging tasks that foster learning even if they think their present ability is low. Dweck noted that they are willing to risk display of ignorance in order to learn new knowledge and skills. Hence, these students use obstacles or difficulties as a cue to increase their effort and to vary their strategies in learning. This motivational process discussed by Dweck is interesting to this study because the data collected showed high motivational level in students despite their difficulties.

2.10 Implications

This literature review has provided the theoretical framework for this study in understanding how students learn economics. This study is attempting to discover the

learning experience of the students from the students' perspective, and not merely from the perceived ideas of the instructor. The majority of the research, especially those studies conducted by economists, was one-sided yet objective in its testing methods, to determine ways to improve the outcome of teaching. Although the educational researchers are, on the other hand, discovering the many facets of learning, the development in higher education is still at the infant stage. This study aims to integrate the knowledge from the economist's perspective with that of the learning theories of the educationist to understand the learning experiences of the students.

In addition to students' personal attributes, there are other external factors that contribute to their learning experiences, which may be positive or negative. Several key findings from the literature review are of interest to this study and are summarised below:

Effects of teaching

Becker (1997) showed that lecturing is a better method of transmitting facts and concepts compared to more interactive methods of teaching. And more recent research by Jensen and Owen (2003) has shown us that good students learn more from lectures and that lectures tend to encourage students rather than discourage them. This is important because the economics course in this study was conducted using this traditional teaching method.

Due to the heavy emphasis on lecturing, the enthusiasm of the teachers and their ability to inspire are two key elements that emerged during the study. Elzinga (1998) demonstrated

that good teaching should include the ability to relate and communicate clearly to the students, which was often neglected on the part of the teaching faculty.

The provision of lecture materials, the pacing of the lecture/course as well as the quality of the staff are often deemed important considerations from the instructors' point of view, and in this study I have received interesting opinions from the students about the use of an online platform, which will become clear in a later chapter.

Effects of content

The long- or short-list debate highlighted by McConnell (1998) was transformed and emerged as an issue of balancing theoretical teaching with understanding the economic issues of the world. The prevalent problem is to determine the optimum amount of theoretical and practical relevance and the expectation of analysis from students. It is interesting to realise that both students and instructors have a common ground in this regard which will be discussed in the later chapter.

Effects of teaching and learning

The learning theories showed that students' behaviour is affected by the environment they are in. Therefore a seemingly surface approach to learning may not be due to a lack of interest in the subject but rather to the institutional setting which is beyond their control. In addition, Lumsden and Scott (1983) showed us that students' objective in their study was to maximise their probability of passing the examination rather than to maximise their score, which strikes a common chord in this study. Hence, based on the

understanding that a strategic learning approach is to maximise grade rather than to pass examinations as discussed in 2.6.4, we have seen that students' seemingly strategic approach in this study is a misnomer. However, in applying the research into Confucian-heritage education in this matter, the role of memorization is projected in a different light. The seemingly surface learning would be perhaps a form of deep learning if the students were given more time to reflect and to develop their knowledge further.

Effects of students' background and motivation

Both the educationalists and the economists have conducted substantial studies to determine the correlation between previous academic experience and future outcomes. The results so far have not been conclusive. Siegfried and Fels' (1979) conclusion that students with a high school economics background did not learn significantly more during the course was particularly interesting. Although no explanation was given it could perhaps be what Palmer et al (1979) discovered, namely that the high school experience gave these students a false confidence so that they did not learn more in the university's introductory course. I discovered this false sense of security from this study, but the main thrust of this study remains not to determine how large this effect is; rather, it is of interest in learning more about the various factors that affect the way students learn and how they view their course. Finally, the motivational pattern of the students sheds light on the understanding of students' behaviour when they are faced with difficulties.

In the following chapter I will discuss the methodology adopted in this study, which is based on grounded theory. This is an approach that stems from the educational tradition in attempting to elucidate the way economics students learn by collecting information from the subjects of interest, the students, instead of designing and hypothesizing their learning experience.

Chapter 3 Research Methodology

3.1 Introduction

Grounded theory, founded by Glaser and Strauss in 1967, is the research method used in this study. The Grounded theory method consists of a constructivist as well as an objectivist component stemming from the backgrounds of the founders. The constructivist stance derives from the aim of studying how participants construct meanings and actions by going as close as possible to the inside of their experience; the researchers using the grounded theory method tend to view data analysis as a construction of meaning that also reflects their own thinking or interpretation of the data.

On the other hand, the objectivist or positivist tradition influences the way data are collected and analyzed. The objectivists tend to view data as real in themselves - representing the facts in the world; and therefore the role of the grounded theorists is that of discovering the meanings which inhere in the data. Hence, application of the grounded theory method requires careful theoretical understanding that researchers are the conduit for the research process rather than the creator of it. Given this condition, the researchers have a certain degree of authority to separate and distance themselves from the world of the participants. Thus the integration of the two traditions brings about an interpretive data analysis method which codifies qualitative data from carefully monitored procedures so that concepts are built up from implicit meanings (Gubrium & Holstein, 2002).

In this study grounded theory is adopted to conceptualize qualitative data with the aim of demonstrating the relationships between the conceptual categories and of specifying the conditions under which the theoretical relationships emerge, change or are maintained.

In other words, the adoption of this research method has two objectives: firstly, it aims to conceptualize and categorize the different learning experiences of the students by understanding the way learning takes place during the course – based on their own accounts. Secondly, it aims to understand how these experiences are constructed within the institutional framework. Hence the purpose of this study is twofold: first, to understand the different experiences of students in learning economics; and second, to understand to what extent their learning experience is affected by the environment they are in.

This chapter is organised to discuss, first, the circumstances in which the study was conducted, and the decision not to adopt alternative methods of research. This is followed by a discussion about the issues pertaining to the use of grounded theory. Finally there is a section on how the data are analysed and the problems involved while conducting this research.

3.2 Background

The subjects of this study are engineering students at Nanyang Technological University. As part of the University's commitment to broadening the engineering curriculum and to

ensuring greater employability of the students, an important feature of the curriculum is the inclusion of non-core general studies for all engineering students. These general elective subjects enable students to select subjects of their choice within the university - and these range from foreign languages to business subjects, like principles of marketing, from the business school. During the period of the research, the Principles of Economics was a compulsory elective for all engineering students, and the course was conducted by economics lecturers recruited for the sole purpose of teaching economics to the engineering students.

3.2.1 The Previous Situation

Before the decision to recruit economics lecturers by the engineering schools, the Principles of Economics course was conducted by the staff of the university's business school. It was common knowledge among the staff in the business school then that it was 'difficult' to teach the engineering students - and the apparent outcome was a high failure rate (it was common to observe a 10% to 15% failure rate at that time) on the course.

The practice then was to conduct the introductory economics course concurrently with that of the business students so that the syllabus was uniform, but the engineering students took a less demanding examination paper. Despite the effort to maintain different requirements, the failure rate remained high and the teaching staff involved found teaching different in terms of the students' aptitude between a business major and an engineering major student.

With the college of engineering recruiting its own economics lecturers, more freedom was available subsequently in at least the determination of the course syllabus. Much of the original Principles course's syllabus was scaled down, since it was known that the engineering students were unlikely to take additional units of economics beyond the requirement decided on by the university.

Therefore the theoretical exploration of Utility Theory and the ISLM model were among the few topics that were excluded from the new Principles of Economics course designed for the engineering students. This reduction of the syllabus was not entirely the work of the lecturers, but was also a result of a greater institutional change that reduced the credit units of the subject. Nevertheless, the introductory course aims to reduce the theoretical rigour and increase the relevance of the subject to the world of the students.

3.2.2. The Present Situation

During this period of four years of the Principles course, the content of the course has undergone several rounds of change which have resulted in the simplification of the content with each change that has taken place. The current position ensures that breadth of content has priority over depth, and hence a shallow treatment of the subject matter becomes unavoidable in the process of maintaining the breadth of the syllabus. As a result of this change to a less demanding syllabus from previous years, a more easy-to-read popular textbook was chosen for the course which made a refreshing change from

the past. The new textbook was written in such a way as to make seemingly complicated concepts simple, being illustrated with many real life examples with the aim of helping to bring these perceived complicated economic concepts within the grasp of the students. Meanwhile, students' pass rate improved tremendously, with a less than 5% failure rate recorded over the years.

These changes caused a major upset to this study because the original idea of this research was to determine the cause/s of the high failure rate on the Principles course. The hypothesis then was that there was a mismatch of expectations between the instructors and the students based on their perceived needs/ideas. The structural change of the course nullified the basic premise of the study - which made the initial research question meaningless.

One could also argue that the high failure rate was in fact a symptom of an underlying problem, the cause of which could be related to one of the issues I have discussed earlier. As a result of the changes that had taken place, the symptom had disappeared, and it seemed unnecessary to pursue the subject further. However, the risk involved in not pursuing the issue further is the acceptance of a possible re-emergence of the root cause at a later stage because of our inability to resolve the problems now, or refusal to recognise them as an area which requires immediate attention. Hence, in maintaining the initial research interest of understanding the learning difficulties of the students, the focus of this study was realigned to take a broader view in understanding their learning experience.

3.2.3 Characteristics of the Students and the Context of the Study

Before I discuss the choice of the research method used in this study, I will first discuss the profiles of the engineering students and the context of the study.

Characteristics of the students

The engineering student body consists of students from the following entry points:

- Direct entry from the 'A' level science stream
- Indirect entry from the top 5% - 10% of the polytechnics' engineering faculties
- International students who are mostly the recipients of scholarships. They are largely from the Republic of China and India.

Based on the entry requirements of the university, I can deduce that its students are academically inclined and perhaps examination-smart, with a sound technique for studying. Because of the fact that these students secure a place in the university, they are the success stories of the competitive school environment, are familiar with work stress, and perhaps have formed their own strategies for overcoming these obstacles.

In the previous chapter I noted that many researchers had conducted studies to determine the correlation between previous economics experience and expected outcome in the university, and it is important to note that our school system tends to stream students very early in their academic career. Therefore it is not common for 'A' level science stream

students to have read Economics at 'A' level. The majority of them came to the university without any previous experience in economics.

One possible approach for this study was to replicate the research in this area by determining the effect of previous knowledge in the local context. However, once the focus of the research had been realigned to seek understanding of the learning experience of the students, it became unimportant to find out the exact proportion of the engineering students who had had previous economics experience and the grade they had obtained in the university introductory course. The correlation between the two variables is not the crux issue - because the thrust of this study is not to explain their success or lack of it but to understand how the students learn, with or without previous economics experience. As it turns out in this study, previous experience does not improve the learning experience of the students - as we shall see in the next chapter.

Context of the study

The university system is highly examination-oriented. Almost all of the subjects, except for some of the general elective units, require the students to sit for a major examination paper at the end of term. The Principles of Economics course is no exception to this, and the final paper accounts for 70% of the final grade. The tradition in the school is to set demanding questions in the examination, and in some cases, the lecturers prefer as few choices as possible in the examination paper.

All subjects also include a continuous assessment component in their curriculum, and in the case of the Principles of Economics course this carries a 30% weight which consists of two multiple-choice quizzes conducted during the term. Implementing continuous assessment has dual benefits: firstly, it provides for a better assessment of the students with two components for grading performance rather than depending merely on a final examination paper; and secondly, this continuous assessment can also be an instrument for pacing the learning of the students to avoid any unnecessary stress that could occur when work accumulates towards the end of a semester. However, the students still feel highly stressed and pressured due to the lack of time, and this is an issue that was consistently brought up in the interviews and will be discussed in the following chapter.

The reason lies in the number of subjects a student has to enrol for in each semester. An engineering student is required to accumulate 124 academic units within four years. By the end of the first two years, commonly termed 'the common engineering years' - when engineering students from different schools (civil, computer, electrical, materials and mechanical) take common subjects that aim to broaden their professional knowledge, they will have accumulated 75 academic units. Subjects taught during these two years include the basics from all the different engineering schools as well as compulsory general electives like the Principles of Economics course. It is therefore common for students to enrol for at least 6 subjects in a semester - and even more for those students in the accelerated programme who are expected to complete the whole course in 3.5 years.

In short, the students are likely to be highly stressed because of the numerous academic units they have to accumulate and the examination-oriented environment they are in. During the early stage of this study, one of the hypotheses for the high failure rate was the lack of motivation by the students. Since economics was not their core subject, it was likely that they would consider economics to be a low-status subject relative to their technical training. Despite the fact that the emphasis of the study has moved from measuring the motivational level of the engineering students towards an understanding of how learning takes place and how they overcome their learning difficulties, the findings from the interviews revealed a motivational level which was a pleasant surprise. The students proved to be highly motivated - and thus I reject the initial hypothesis that these students are not motivated to learn.

This decision to move away from a study of efficiency in terms of finding ways to improve the pass rate of the students was a natural progression after initial lack of success in obtaining insights in a survey conducted.

3.3 The Quantitative method

A pilot survey was conducted at an early stage of the research in my six tutorial groups. The survey was conducted after the two continuous assessments at the end of the semester but before the examination, as I knew that students were not likely to respond to the survey after the examination. These groups were randomly distributed by the course co-ordinator - and in that semester, the tutorial groups included students from all

the five different engineering schools with about 30 students per class on average. Of the six classes, only about 10 students had previous knowledge of economics. They were distributed across the different tutorial groups.

The purpose of the pilot survey was to determine the following:

1. Whether there is a mismatch of expectations between the instructor and the students
2. Whether the curriculum design helps the understanding of the students
3. Whether the skills required in learning economics are too demanding
4. Whether the teaching staff play a role in motivating their learning

The aim of the survey was to serve as an instrument to test out the research ideas and to identify the area of focus from the result. The survey also aimed at determining two other research questions - firstly in the area of curriculum design, and secondly in determining the skills requirements necessary to complete the economics course. These two questions were included as a response to the rapid curriculum changes at the time and the difference in opinions raised by the team of lecturers concerned. The question on curriculum design was responding to the concerns that the scaling down in the coverage of topics reduced students' ability to understand a particular topic thoroughly - and it was a matter of concern that some topics tend to be covered in an *ad hoc* manner which lacked continuity.

There was also the concern of some of the lecturers that there was a lack of coverage of mathematics in the syllabus, and that more time should be allocated to using mathematical equations to explain the economics concepts. They felt that these engineering students should welcome the change and accept the introduction of this because of their supposedly strong mathematical background.

Outcome of the Survey

The survey consists of ten questions which require students to rank their responses with a five-scale ranking system. A copy of the survey is found in Appendix 1. A summary of the outcome is listed below:

1. The course was often designed from the perspective of the instructors of what they thought the students should learn. This was based on the lecturers' own academic experience. As such it was a matter of concern to understand if the intention of the lecturers matched the expectations of the students, especially this group of students who were not likely to continue with their economics education. The results were not conclusive; on the one hand the students were clear about what they were expected to learn, while on the other they were not sure of their own expectations from this course.

   I recognise that it is common in the university for the students to accept the course syllabus and not to raise any expectations, and I could not determine whether the course was too demanding for a non-economics major student, nor could I find an

answer from the survey as to whether the course met their perceived needs in the future.

2. The curriculum design and the attempt to incorporate real world events into the course so as to show the relevance of the course to their daily lives were well accepted. More than 80% of the students agreed that the topics were taught in a flow that made sense to them, and that they could see the relevance of the course. So this dispelled the concern of the instructors that the course was too simple and was not taught at an acceptable level of intensity based on their own academic experience.

3. With respect to introducing more mathematics in the course, this required more consideration, because about 88% of the responses found that the skills needed by the course were too demanding. In this pilot survey, the skills requirement was not specified (although numerous students indicated difficulties in understanding the maths in economics). However, in that semester we introduced more mathematics in the lectures and tutorial questions, especially in the area of market structures where the instructor used mathematical equations to explain the concept of duopoly and game theory. From the personal experience of the tutors, that part of the syllabus was just as demanding from the tutorial point of view.

The decision to include more mathematics requires careful consideration because there is a high tendency for instructors to substitute one method of explanation for

another - and it would be too simplistic to assume that the engineering students were able to appreciate the mathematical explanation better, and as a result better understand the concepts. In the last chapter, Becker (1998) was quoted and mentioned that mathematics is a tool for communication, a shorthand, between two parties who understand the subject of the conversation. Consequently, the economics concepts must be communicated first before the inclusion of mathematical equations; the latter should not be a replacement for the former, especially in an introductory course.

In this study, I recognise that the mathematics ability of the engineering students based on their science background was far beyond the requirements of the introductory course, yet students still experienced great difficulties in understanding the maths in the course. This was an interesting discovery because the difficulties were not in terms of solving the equations *per se*; instead, the problems were at the deeper level of conceptual understanding of the subject matter.

4. Lastly, more than 97% of the students recognised the important role the staff played in motivating and inspiring them, and helping them to understand the subject better.

The strengths and weaknesses of the survey

Despite the fact that the survey was able to give me some indication of what went on in the course, it could not quite reveal the reasons for the high failure rate. At the stage when the pilot survey was conducted, I recognised that more specific questions had to be asked in order to obtain results that were of higher quality. If that were done, the survey could be administered with a large sample size that could fulfil the reliability and validity requirements of any standard research.

However, the results could explain with statistical authority the reasons for the phenomenon, provided the causes were clearly identified; but the findings collected would still lack a deeper level of understanding about the reasons for certain behavioural patterns. In short, the stories of the students' experience could not be fully captured by the statistics.

The refocusing of the research questions was as much an outcome of external forces as of the researcher's personal progression in realising that the missing gaps in the research could not be answered by statistical data analysis. It was progressive because this understanding became apparent only after the data collected from the survey were analysed, and I realised that the quantitative approach could not substitute for the understanding of the experience of the students. Furthermore, after recognising that the students had interesting stories to tell about how they learned economics, I realized that if the research continued to originate from the perspective of the instructors, a deeper level of understanding about the students' learning would not be achievable.

In addition, during the semester immediately following the pilot survey, a subjective question was included in the tutorial questions requiring students to give their views about their expectations and how they believed economics could benefit them in the future. This was the first time that a qualitative response was required from the students about how they felt about studying the course; however, it was found that almost all gave typical answers which they obtained from the textbook. Hence, the inclusion of subjective questions still could not help me as well as the lecturers on the course to understand the students' learning experience. Finally, with the inconclusive research findings of faculty members adopting a quantitative approach (Tay, 1994), and the lack of insight in using a survey (Siddiqui, 2004) as a measure for understanding the attitudes of the students, it became obvious that in order to understand their world and their experience on the course, a truly student perspective required a different research method.

3.4 The Qualitative Approach

Recognising the inadequacy of quantitative methods in conveying the details of what the students encountered and experienced in their learning, and the inability to achieve a deeper level of understanding of their experience, I decided to adopt a qualitative research method in this study. A frequently expressed worry about adopting a qualitative research approach is in its analysis or interpretation of the data because it is often

believed that the objectivity of the research can at times be compromised by the researcher's own beliefs, analysis and interpretation of the situation.

To overcome this issue of subjectivity, a 'distant' approach is often undertaken to maintain the authenticity of the data in qualitative methods, so that researchers aim to merely present the data to the readers. However, when confronted with large sets of data, selection and interpretation are inevitable, and are necessary in order to produce an accurate presentation of the data for the readers (Strauss & Corbin, 1990).

Reliability and Validity

The reason for such careful treatment of the data is to fulfil the twin tests of reliability and validity, a standard strongly upheld by the quantitative tradition. Reliability shows the dependability, consistency and stability of the research to meet the test of time across research methods (Miles & Huberman, 1984). In other words, this fulfils the quality control of the research by placing measures at every critical stage of data collection to ensure that results produced are not falsified. One of the most common problems of qualitative methods in the test of reliability is a biased finding due to a skewed data base. Hence it is crucial in ensuring that a full range of representation is chosen so that the data cover a wide range of possibilities.

In the case of validity, a qualitative research approach requires the fulfilment of internal and external validity. The key issues in internal validity are in the data collection process, presentation of the data and the findings of the research. Internal validity ensures that the

methods of data collection are sound so that the concepts in the findings are systematically related and internally coherent. Consequently, when the data are presented to the readers, the descriptions are meaningful and at the same time able to represent the local context comprehensively (Miles & Huberman, 1984). In short, internal validity ensures that the data collected are sustainable by the data and the findings make sense to the readers.

The focus in achieving external validity was a recent development when researchers began to generalize findings using qualitative methods. The issue of generalizability requires diversity in sampling so that the conclusion is generic enough to be applicable in other settings (Cohen, Manion & Morrison, 2000). In other words, the crux of external validity is not only in finding whether the result could be tested further; it also places high value on the transferability of a study to see how it could be replicated in other contexts and settings. Researchers like Lincoln and Guba (cited in Hammersley, 1994) termed this concept 'fittingness', but regardless of the term used by researchers, the key to external validity is to ensure that the findings are representative of a phenomenon and can be replicated in other settings so that they can support the previous studies - but can also be tested further, i.e., are transferable.

This research is a naturalistic study, which aims to inquire into the social behaviour of the students; the primary focus is to discover what is in their minds. This requires the researcher to appreciate the difference in assumptions about reality from that of the scientific tradition - reality from the naturalistic viewpoint is multiple, divergent and

interrelated - and the method for discovering the truth requires the researcher to uncover layer upon layer of "truths" that are intricately interrelated so that a pattern of "truth" is eventually searched out (Guba and Lincoln, 1981). It is important to note that the choice of the research technique is very much determined by the nature of the inquiry, and based on the quantitative and qualitative approaches I have discussed earlier. It is erroneous to equate quantitative methods with the scientific paradigm and qualitative methods with the naturalistic paradigm, although there is a strong relationship in that direction in practice. The table below aims to demonstrate the interrelationships between the two research paradigms (Guba and Lincoln, 1981).

Table 3.1: The difference between Scientific Paradigm and Naturalistic Paradigm

	Scientific Paradigm	Naturalistic Paradigm
Preferred Research Methods	Quantitative	Qualitative
Source of Theory	A priori	Grounded

Adapted from Guba and Lincoln, 1981

Due to the shift in research paradigm in this study, the criteria for effective evaluation of the research had to be changed accordingly so as to better reflect the nature of the research. The basic premise of ensuring that the research is valuable remains immutable, but by the nature of the hermeneutic process, a different set of standards is required in evaluating such constructive inquiry in order to meet the standard of trustworthiness or quality of goodness. In other words, the concepts of validity, reliability and objectivity, which I have discussed earlier, become inappropriate terms for evaluating a naturalistic research method. The table below demonstrates the parallel criteria adapted from Guba and Lincoln (1981):

Table 3.2: Differences in research terminology between scientific and naturalistic traditions

Aspect	Scientific Term	Naturalistic Term
Truth value	Internal validity	Credibility – this is to ensure that the data collected, which are in the minds of people are represented appropriately
Applicability	External validity/Generalizability	Fittingness – since context-free statements cannot be made when the inquiry is concerned with human behaviour, and the worthiness of the research is dependent upon the interrelationships between the subject and the context, it is more appropriate to think in terms of how this research could be fitted into other contexts than the one from which it was derived.
Consistency	Reliability	Auditability/Dependability – to ensure that outsiders and readers could track the research process, especially the salient factors in the context which had influenced the decisions and interpretation of the researcher. This was to

		overcome the problem of fatigue in research that may have caused alternations to the methodology of the study
Neutrality	Objectivity	Confirmability – since the integrity of the findings is rooted in the data themselves, data must be able to be tracked to their sources

In order to fulfil the criteria above, the notes used at each stage of the research process and the transcribed interviews are documented in Appendix 2.

In the previous chapter I have highlighted the differences in emphasis and the approaches adopted in the research of economics education. The economists tend to turn to their statistical prowess in the quantitative tradition, whilst education researchers adopt qualitative methods in trying to understand what and how students learn - though the emphasis of their research so far lacks relevance to the teaching of economics in higher education. This study is an attempt to bridge the divide by using educational research methods in addressing the concerns of the economists.

3.5 Grounded theory

Strauss and Corbin (1990, p 24) defined the grounded theory approach as *"a qualitative research method that uses a systematic set of procedures to develop an inductively derived grounded theory about a phenomenon."* In other words, the grounded theory takes a hermeneutic approach to understanding a phenomenon by building and developing theory - and at the same time remains faithful to the data and aims to illuminate the area under study. This method aims to gather information and build theory from the data collected on the ground.

The process begins with a phenomenon researchers aim to address and with the research questions. Interviews are conducted to gather information on the ground, which will continue until there are diminishing returns from interviews in terms of new data, and some common ground has been attained. This method allows the subjects of the study to speak and construct their own meaning, without compromising the way the data are analysed. Grounded theory is not a case study but rather numerous case studies combined, to tell a story that is known by the subjects which at the crux of things explains the phenomenon. In order to gather the information, it is common that interviews and observations are conducted as instruments to allow the subjects to tell their stories as best they can with as little external influence as possible, so that the data collected can maintain their authenticity. The interviews cease once the data collected reach a saturation point, showing that no new ideas are likely to emerge with additional

interviews. The data are then categorised and analysed so that a theory can be developed to explain the phenomenon.

Given this carefully executed procedure, the grounded theory method can stand the test of validity which I have discussed earlier. This is because, firstly, the findings are a representation and description of the reality – fittingness; secondly, the outcome provides understanding that is comprehensible, especially to those who are being studied; thirdly, the data collection is broad because it is not based on the story of one subject, but rather many stories are told until a saturation point is reached so that the information is sufficiently comprehensive and exhaustive to construct a theory; and lastly, the issue of control is duly addressed as the conditions to which this theory is applied are specified. Hence, the grounded theory method allows the researchers to obtain data that have the much needed breadth as well as the richness or depth within the qualitative tradition.

The list below highlights the procedures of grounded theory:

- Determine the research questions or problems
- Interview (and observe) with theoretical sensitivity that encompasses the literature and professional and personal experience of the researcher
- Code or analyse the data
- Build and develop theory by defining the relationships of the data and integrating them into a comprehensible model

3.6 Data analysis in this study

Research questions

The first stage of the procedure is in the determination of the area of research. Despite the earlier difficulties in determining the research questions, these were subsequently overcome, and the research problem was established as an attempt to understand the learning experience of the students. The basis of grounded theory is to obtain the data on the ground by allowing the subjects of the study to express their personal experience in the way they are comfortable with. Hence initial research questions were drawn up as a guide to be used in the interviews so as to open up conversation with the students. The aim of the research questions was to set the stage for students to relate their experience and to talk freely without having to go through a detailed pre-determined set of questions. These interview questions were influenced by personal experience as well as the literature in economics education. In order not to confine the boundaries of the interview, these research questions were deliberately general in nature and aimed at inviting students to talk. They were intended to discover the expectations of the students, and their experience of the delivery of the course both in terms of content as well as issues related to staff. In short, the framework of the questions was derived from the questions of the pilot survey.

In this study, the main challenge was allowing the students to take the leading role in the interview - which requires the researcher to conduct the interviews in such a way that there is freedom of expression and ideas within a well-defined boundary so as to ensure

that the data collected are relevant yet comprehensive. The grounded theory method requires the researcher to be keenly attentive, and at the same time to possess the ability to enter into the students' world yet maintain the right level of research objectivity. Such skills were found to be crucial during the interviews - and the latter were to a great extent influenced by the theoretical sensitivity of the researcher, the result of which is a set of rich information obtained that was beyond expectation at the start of the study.

One of the problems I encountered initially was in the coding/analysis of the data which were collected in a non-linear/sequential manner. This is because the flow of ideas from each interview was different, so that the data collected were 'messy' - unlike well-structured interviews.

Sampling

The next step in the study was finding students for interviews. It was a matter of convenience to invite students from my own tutorial groups to participate in this study on a voluntary basis. This invitation was later extended to all engineering students who might be interested to talk about their experience. This was to ensure that as many potentially relevant categories would be uncovered as possible - and it was also a result of the lack of participation by my own students. This inertia could have been due to their discomfort in giving an honest account about their learning experiences, and not wanting to offend their teachers; this is a common cultural trait in an Asian society where the relationship between the teacher and student is strongly influenced by the power-distance cultural dimension discussed in the previous chapter. As it turned out, only two out of the

twelve participants were from my own tutorial groups. The others were from the various engineering schools.

The length of time of each interview varied between forty minutes and an hour. These interviews were all recorded and transcribed verbatim. The saturation level in data collection was evident when I found little or no new information in further interviews. Within each interview I was satisfied that saturation was reached when I saw from the student's demeanour that he had no more to say. Interview or operational notes were also written after the interviews, which are written directions of dos and don'ts of how the interviews should be conducted in the future. These operational notes were important in the early stages of the interview because they were usually written as a result of mistakes made during the interviews. For example, while I was transcribing the first interview, it became clear that the student was not freely expressing himself: a lot of prompting, guiding and confirming were required in order to understand his experience in learning economics.

There could be two possible explanations: One highly plausible cause was that engineering students are known to be less expressive in general; another probable explanation for this lack of spontaneous talk is that it was the result of inappropriate questions asked so that they could not lead him to talk freely. In any case, it was a learning experience in conducting interviews, and it was crucial to learn the trick of making the students feel at ease and asking simple questions that could easily lead them to talk about how they felt about learning economics.

As it turned out, the research questions operated as a general framework and the amount of prompting and guiding depended on the personality of the students as well as the chemistry between both parties. It was also important to establish at the onset that the interviews were not an interrogation (as a few students tended to perceive them) but a social chat to learn more about their difficulties as well as achievement on the course. Eventually, the role of the operational notes diminished as the interviews progressed because of the confidence and experience gained in the exercise.

Problems faced in sampling

During the interviewing period, I could categorise the students who participated in the study into two groups, the characteristics of which are summarised below:

Group A

- Scholars or those who had excellent academic results
- Those without 'A' level Economics

Group B

- Repeating students of the course
- Those with 'A' level economics

Although common ground was soon obtained in both groups, it was surprising to discover that the repeating students were those who had had previous experience in

economics. In order to establish more insights, selective sampling for Group B was conducted but was unfortunately abandoned because of the lack of volunteers - even when payment was offered. This outcome was disturbing, though not surprising, but I had to proceed with the study because the expected impact of the lack of success in data collection from this group was small. This is because the primary focus of this study was to understand the students' experience in learning economics in general. Hence, once the focus was aligned to the central theme of the research, it became clear that since the percentage of the size of the repeated students was less than 5% of the entire cohort, additional interviews were unlikely to make new discoveries and to purposefully seek out persons that matched the criteria would not have significantly altered the findings.

Nevertheless, it is an area for further research for two reasons: first, from the educator's point of view, to understand their learning difficulties through their experience may help us to improve our own teaching; and second, more research and insights are needed to understand the impact of previous experience on the outcome of the university's economics course.

I have pointed out in the previous chapter that many researchers have conducted studies in this area - and the story in this study seems to support the discovery by Palmer et al (1979) that high school economics may have caused more confusion or misled students to be over-confident in the university. It could also be that these students obtained a lower grade in their 'A' level economics examination, referring to the study of Anderson (1994) which showed that students who obtained a grade B or better were likely to do better in

college economics (Anderson, 1994). However, based on personal experience in teaching the course, I feel there are many other contributing factors, like the design of the tutorial and/or examination questions. Staff interference could alter the outcome. It is hence important to continue research in this area.

Coding

Coding is a process whereby data are first broken down, conceptualized and then put back together in a new way. The coding process used in this study is illustrated by Strauss & Corbin (1990) and consists of three stages when analysing the data. At every stage, coding notes were written to record the phenomenon, concepts, features, etc., that helped to find and determine the relationships from the sets of data that were collected in a non-sequential manner. The following is a summary of the procedure adopted when coding the data:

Stage 1 – After transcribing all the interviews, a coding note was written for each interview - and in this study, this coding note is in the form of a drawing that showed the interrelationships of all the variables that make up the experience of the student. At the end of this process, commonalities started to form and a summary note, like the example given below, was drawn up to show the common issues that were constantly brought up by the students.

Table 3.3: The Emergence of Common Grounds

Common Grounds	Categorisation of Issues
Engineering undergraduate	Context

Heaving workload	Context
Examination-oriented environment	Context
Personal interest in the subject	Background
Clear career path	Background
Quality of staff – inspiration	Delivery of the course
Quality of staff – relating subject to the world	Delivery of the course
Quality of staff – poor teaching technique	Delivery of the course
Determination not to give up despite the difficulties	Motivation
Examination smart	Strategies
Some deep learning strategy, but the students are unable to form their own views	Strategies

Once this was done, the 'raw' ideas that explained the phenomenon started to take shape. However, in order to understand the students' experience of learning, the data gathered were once again broken down to determine the different categories of experience. Categories were eventually identified based on the students' experience or the different adjectives students used to describe their experience. For instance, several students stated that they had found the learning of economics difficult, and so a category of 'difficult' was established. All the summary notes from the interviews were analyzed in order to clearly identify the emerging themes or phenomena.

Stage 2 – With the coding notes from stage 1, a phenomenon started to emerge and the causal conditions that gave rise to it, in the perceptions of the interviewees, were

determinable. A model that consisted of all the interrelationships of the variables was drawn with the aim of explaining the phenomenon. The flow of the model is as follows:

Causal conditions	• Family influences • Matching of perceived expectations – to learn new things relevant to career choice • Clear career path • Ability to see the applicability of the subject
↓	↓
Phenomenon	Interesting
↓	↓
Context	• High degree of workload • Study time constraints • Examination oriented environment • Language barrier- extra effort needed
↓	↓
Intervening conditions	• Repeat the exercises in tutorials • Read the textbooks to understand the examples • Ask for help in tutorials
↓	↓
Action/ Strategies	• Implement strategies to

	become exam smart • Do past years' examination questions and obtain answers from the tutors - "drilling" exercise as commonly termed by students
↓	↓
Consequences	• Aimed to pass examination • Believed that new skills have been obtained that are different from the technical subjects • Realised that knowledge is absorbed better in lectures and through the reading of textbooks

Table 3.4: The Paradigm Model of Grounded Theory

Stage 3 – A storyline starts to emerge after clearly identifying the different categories. At this stage, it is crucial to see if the literature supports the story - and at the same time to be able to constantly validate the relationships against the data.

3.7 Lecturers' Perspective

The lecturers' view about their teaching experience and their views about students' learning were both collected in this study. The purpose of collecting data from the lecturers was to ensure that a balanced view about students' learning is obtained and

hence the data collected were used as supporting evidence to be analysed in the light of what the students had said.

The interview was conducted based on two premises: first, that the engineering students were not motivated; and second, that they were not spending time reading because economics is a low-status subject. These were the initial hypotheses of this thesis and so the interviews were conducted on that basis so as to understand the teaching experience of the lecturers and their views about students' learning.

These interviews were conducted during the same semester as those with the students on a voluntary basis. Unlike the problem I faced in interviewing the students, where much guiding and prompting was necessary to invite them to talk, less persuasion and guiding were needed in the case of the lecturers, and in fact they talked almost freely. However, the problem I encountered was their unwillingness to the interviews recorded, one to the extent of just wanting a chat. Nevertheless, interview notes were written and verified by the respective lecturers.

For this group of interviewees, common ground emerged very early during the period of interviews. Four interviews were conducted, of which one was in a form of social chat and one was not recorded. At the analysis stage, four themes about the teaching/learning experience emerged and they can be categorised into four issues: teaching methods, assessment, motivation, students' workload. All these four areas will be discussed in Chapter 5 where the lecturers' views are discussed.

3.8 Conclusion

One of the major problems encountered in this study apart from the sampling problems (student interviews) discussed earlier, was in the finding of suitable material or a relevant study that was related to the education field. The examples given in the literature (Strauss, 1987) written on the use of grounded theory method were produced for the nursing profession which I found difficult to relate to in this study. This problem of finding direct relevance resulted in the difficulty in understanding the operation of the method in the early stages of the research. For instance, in explaining the issue on sampling and the coding process, the researchers illustrated it with a study of understanding how cancer patients deal with pain. Although both the nursing and teaching professions are service providers, and the products under study are similar in their intangible nature, the understanding of pain for nursing and the understanding of learning in education, the knowledge of collecting data that shows the intensity and duration of pain experienced by patients is difficult to be replicated in the educational context. Nevertheless, once the storyline starts to form based on the data collected, the final step of the process is to present the data.

Chapter 4 Students' theories of learning

In the last chapter I discussed the procedure of data collection and the stages involved when analyzing the data. I will now present the analysis of my findings in this chapter. The most interesting part in this study was in the discovery of the various themes that have emerged from the interviews. As I have mentioned earlier, all the interviewees were from the various engineering departments, taught by the same lecturers, placed in the same highly competitive environment and yet having different learning experience, some more negative then the others, which shows the complexity of the students' journey in learning. I have discovered five different themes from the data collected: difficulty, interest, dissatisfaction, pragmatism and enrichment. I have also discovered that these themes are not isolated, but rather very much interconnected and woven into the students' learning experience.

In this chapter, I will first present the various themes individually by stating the causes of each and then integrate them to show their interconnectivity. In the final section, I will relate the findings in this study to the literature review of chapter 2 to highlight the similarities of results as well as to present the insights from this study that could improve the learning experience of the students.

4.1 Theory of Difficulty

I have found that the most common conceptualisation of their experience by the students is the concept of 'difficulty' because, from their point of view, economics contains concepts that are abstract, different from their other technical subjects, complex graphs and 'grey areas' that are beyond their comfort level.

4.1.1 Abstract Concepts

Economics is difficult for the students because they have found the concepts too abstract to understand. Concepts perceived to be abstract by the students arise from three sources: first, those seemingly not explaining the current issues in the economy; second, those that are not encountered in their daily experience; and finally, those that are not picked up naturally. For instance, one student mentioned the concept of international trade as being difficult to comprehend because, in his view, the gap between knowledge learned in the classroom and current issues was not bridged. Another pointed out that the concept was not clear even when a simple numerical example was given which did not explain what happens in the real world.

Recording #7: For me I think some of the concepts that are abstract are difficult to understand. Like the stuff in International trade, when one town is producing car and another town something else, and they start to trade and benefit from it. I find it abstract

and I don't understand how they did it and with fictitious examples given, really don't make a lot of sense to current issues.

In the above example, the rejection of what is considered 'abstract' is further qualified by the reference to fictitious examples. So for this student examples given to explain abstractions are not helpful unless they are 'real' examples.

Recording #9: I think International trade is difficult. The way to calculate the quantity of exports and imports and finding the equilibrium point is not very clear. A simple numerical example was given, but is this always the case in the real world?

Here the student does not reject the example even though it is fictitious, but does question whether such examples are realistic.

Other students who formed the theory that economics is abstract and hence difficult pointed out that the lack of exposure to macro-concepts had led them to believe that studying economics require a lot of abstract thinking or imagination.

Recording #12: I have found macro difficult because I am not used to these things, not really aware of those stuff. So I find it very difficult to grasp the basic concepts, they are just too abstract.

Recording #1: Those concepts like marginal theory are too abstract, I can't see it. I don't know there are such things. In economics, you need a lot of imagination....engineering I can do testing but not in economics.

Their theory that economics is difficult arises from their inability to grasp abstract concepts that cannot be tested in an engineering laboratory, and this problem is made worse if the students are not directly exposed to the economic issues in their world. Thus there is a tendency as we see in these examples to equate theory with abstraction and abstraction with difficulty.

Concepts are also deemed abstract by the students if the ideas are not explained by the natural sciences, which from their point of view are 'natural'.

Recording #11: I mean I accept that MB=Demand and MC=Supply; it is difficult to appreciate it because it is really too abstract. Of course I can understand once I am told about it, but it doesn't come naturally. It is not like the Law of Physics – gravity. It is true and we know it.

Here the student accepted the marginal concept but felt that it was difficult because it was beyond his normal boundary of knowledge; something that he wouldn't have learned unless he had been introduced to it.

4.1.2 Complex graphs

Students have also formed their own theory that economics is 'difficult' because of the many complex graphs they have to deal with. Within the context of 'difficulty', I have classified the complexity perceived by students into two areas: primarily as mere confusion when they are confronted with too many curves in a diagram; and secondly, difficulties in drawing the curves accurately in order to obtain the desired results. The first example was a student who was lost in the arrays of curves in microeconomics, while the second student expressed the difficulties in drawing all the curves accurately in one diagram when analyzing economics problems.

Recording #11: The production curves are really complicated, you have AVC, ATC, and then MR and demand curve all in the same diagram. I don't know where to begin to look.

In this case the student found it difficult to understand the construction and the interrelationships of the various cost curves.

Recording #1: Those ATC curves where one graph has more than 5 curves are too much. Then you will have the shifting where once you draw it a little bit out, I will get a different result.

Here the problem is aggravated when the analysis is in disequilibrium, and this student found it difficult to shift the curves in order to bring it back to an equilibrium state.

Despite the fact that engineering students were familiar with graphical representation in their other technical courses, they expressed difficulty in reading graphs presented in economics which showed their lack of understanding of the construction and derivation of the various cost curves.

The student below went further in expressing the difficulties and complexity in understanding diagrams over time.

Recording #1: The hardest in the macro part is the ADAS curve; there are too many curves in one diagram! Year 1, year 2 then LRAS, it got too confusing to have so many curves in one diagram, too hard.

In this case, the student struggled to understand comparison of the different levels of national output at different intervals, which showed his discomfort with multiple graph analysis.

4.1.3 Grey Area

The engineering students are not very comfortable with ambiguity or possibilities when approaching solutions – in their own words grey areas:

Recording #8: In engineering there is always a right answer, for economics if the external factors changes, then things are analyzed differently. But in engineering, this can never happen....too many different sets of answers that seemed to be right.

Recording #1: I find that there are so many grey areas in this subject, not like engineering subjects which is clear cut, you have input and output, use variables to substitute and you see a process and one solution.

The grey areas mentioned by the students showed their discomfort in obtaining answers that were not always absolute and conclusive. The existence of grey areas alongside the students' need to obtain one right answer contributed to their notion that economics is difficult. The following student aptly pointed out this tension at the beginning of the course:

Recording #8: Economics is not really about right or wrong answers, you are right if you can support by facts and evidence. And many times, the solution to economics is arguable. This is my own conclusion and it was very difficult in the beginning to accept that.

However, in this case there is a hint in the last sentence that the student acquired a different attitude as time passed.

4.1.4 Different

Students have also formed their own theory that economics is 'different' from their engineering subjects. With close examination, their theory of 'difference' arises from three areas: that the approach to finding a solution in economics is different, and the knowledge may apparently contradict their understanding; the ways answers are derived in the tutorials; and thirdly the contrasting methods of learning the subject (learning by practising and learning by reading and understanding). In this context, the students' perception of difference is complex, but they believed that their problem in learning was aggravated when they were unable to allocate time to reading and understanding the concepts.

Firstly, students felt that the methods used to reach a solution might not always be the same. There is, of course, no method that is universal of solving all the problems in economics.

Recording #14: Every question has its own special case. I may be thinking this way and another question comes, I need to change the way I approach it. A different answer a different reason and sometimes I find that it contradicts life, like the paradox of thrift we discussed. Other subjects are not like that, there are laws to apply and put in the variable and are clear.

So it is clear from the use of the word 'laws' here that the student expects laws to be generalizable and to be 'covering laws' - as the student has met them in the natural sciences.

Although the respondent seemingly pointed out the grey areas involved which were discussed in the earlier section, the response was distinct because the emphasis was on how economics was different and at times different from normal behaviour, rather than on showing uneasiness in dealing with possibilities.

The ways answers are obtained in economics classes often required discussion, which was different from the technical subjects, where solutions were obtained from the tutor. From the responses below, we can see that students' theory of 'difference' is constructed on the basis of incorporating discussion in the tutorials with an acceptable comfort level.

Recording #11: Engineering is a lot about solving problems and often copying the answers from the tutors in class but in economics, it is one of those humanities subjects where we really have a discussion. People will ask questions and I enjoy it although it is different from my other subjects.

Recording #12: I think economics tutorial is most inspiring when it comes with discussion. It is different from other engineering subjects or even mathematics for example. I mean for mathematics we need to solve the equation and so we just copy from the tutor.

So for these students 'difference' is a positive experience, and is analyzed in terms of the contrast between mathematics and sciences on the one hand and 'humanities' on the other, placing economics in the humanities - which may surprise some economists.

However, not all students share the same level of comfort in engaging in a different teaching style. On one hand they may recognize the different approach to obtaining solutions; on the other, they may not be very comfortable with it.

Recording #10: I don't like the questions and answers thing we do in our tutorial; I see it as I need to pass this course, why can't the tutor give me the correct answers like other subjects and we can get on with it? It need not be different from other subjects.

Recording #12: I think we students have made tutors feel like it is their duty to give us the solutions and we just sit in tutorials to wait for the answers. I think the economic tutor gave up and gave us the answers.

In the second example, however, it is also clear that with hindsight this student is beginning to recognize the justification for what others above called 'the humanities approach'.

Most importantly, students' explanation of what is difficult about economics is the different method they have to adopt in learning the subject. Rather than learning by

practice, which is common in their technical subjects, economics is different and hence difficult because it requires a lot of time to read and understand the concepts. It is made more difficult when time is not on their side; and it also confirmed their theory that economics is difficult if language skills are not their strength.

The following respondents believed that learning economics requires lots of time in reading and understanding the concepts because it is different from technical subjects and the concepts are new to them.

Recording #12: All these concepts are all so new to me and I have not found my own method to study this....I need time to grasp the basic concepts and need time to read and think because it is very different from my other subjects.

Recording #15: There are a lot of readings in this course which is different from others. Not those other subjects do not require reading, it is that the materials are often repeated as we move on, so it sort of reduces the actual time spent. The same theories and laws are used again and again, economics is different.

The students also expressed their belief that economics requires more of an understanding of the concepts than merely applying formulae. This requirement is not just for comparing between subjects but between different parts of the syllabus as well.

Recording #9: I do have to spend a lot of time reading and understanding. Economics is lots of reading and understanding. It is different from chemistry that is memorizing and applying formula which I can't remember a thing after exam; economics I can still remember because it is more understanding but really a lot of reading.

Here then the distinction is between reading and memorising - and in the eyes of the student, reading leads to what in the academic literature would be called 'deep learning'; memorising is 'surface learning'.

Recording #15: Economics is about understanding and application. Subjects like mathematics and power engineering or most engineering subjects, is lots of practice and practice. I just need to keep on practicing on the sums to understand, this is not the case for economics, here is read and understand.

Recording #14: Mathematics is something that you read and then spend time practicing. Economics is reading and understanding and to see how we can apply it.

Here the emphasis is on understanding – again this would be described as deep learning – and the distinction is that understanding can come from reading or practice.

Recording #10: When I don't understand something and just try to remember, like calculating the Reaction curves and finding the equilibrium points for the Kuznets

equilibrium is difficult, because I don't understand and have no time to read. I can solve the equations but it is meaningless to me.

In this case practice is seen as NOT leading to understanding - but just a form of mechanical memorization which does not involve much thinking or understanding.

Thus although there is on the one hand a complaint that they do not have time to read and understand, and that economics requires understanding – unlike chemistry, for example – these students are also beginning to recognize the value of understanding. If there is no understanding, then things are forgotten after the examinations, they say, or remain meaningless.

The students emphasized that the approach to learning economics is by way of reading and understanding rather than by practising - which is the common approach for the technical subjects.

Students who have weaker language skills further developed their theory that their learning was more difficult because they had to put in extra time and effort.

Recording #12: There are so many readings and my language skill is not strong, I find it tough to go through all the required readings. Extra time and effort is needed, I need more time to read and understand the concepts.

Recording #9: I need to spend more time to read compared to other students because English is not my first language. Subjects that require lots of reading and writing is difficult for me; I need more time to read to understand and when I understand I can't write it out.

The theory of learning economics is established on reading, and time is a major constraint factor for the students. Even for students who believed that understanding the concepts was not a problem, the lack of time to read was still problematic and confirmed their theory that economics is difficult.

Thus the requirement of economics for reading and understanding has made these students also realize something about the way they are learning other subjects and the problems of a university course which is too full to allow for understanding.

Recording #15: It takes a greater effort to remember and understand economics as it requires more than just copying solutions in tutorials and go home to read. I can do that for my engineering subjects, but not for economics.

The students' approach to learning economics is hence quite different from that in the engineering subjects. Although the students do have a theory of deep and surface learning, deep learning in engineering (for some of them – not all) comes from practice and in economics comes from reading - and some have a theory that practice learning is only surface learning. This is shown in the diagram below:

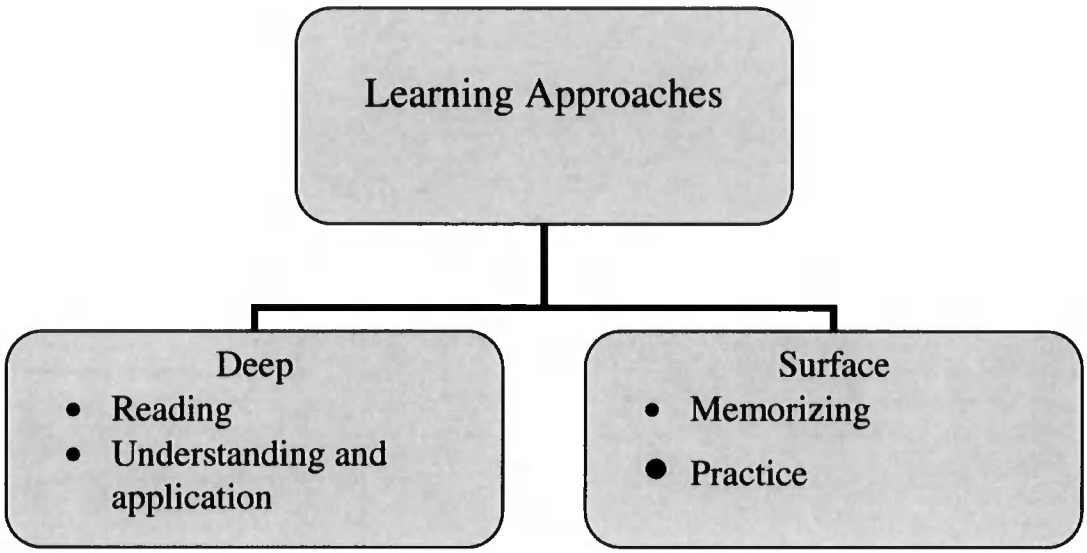


Figure 4.1: Deep and Surface Learning

4.1.5 Summary

The first theme that emerged from the data collected was the concept of 'difficulty' and I have shown above the reasons that contributed to the students' difficult learning experience. During the data analysis, I also realised that these causes were not independent; in fact they were interrelated: for example, I found that there was a strong relationship (based on the frequency of students relating these factors) between abstract knowledge and the complexity of graphs. It is also true that the students found learning difficult because the knowledge was too abstract and different and the graphs were too complex for understanding. There is, however, a weaker relationship between grey areas and complexity of graphs. All these relationships are summarised below:

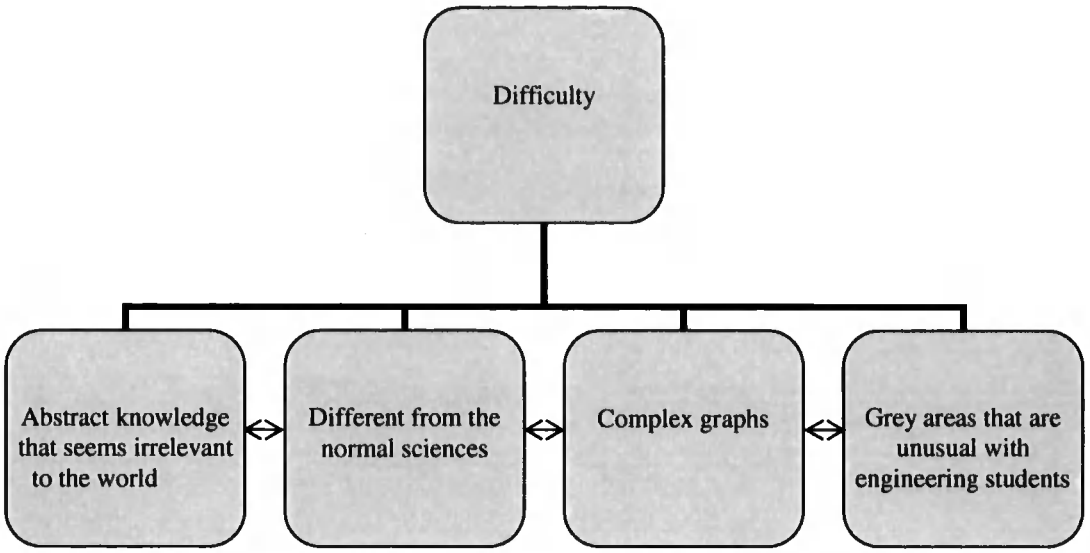


Figure 4.2: The Students' Concept of Difficulty

4.2 Theory of 'Interest'

In the earlier section, I discovered that students developed their theoretical concept of 'difficulty' because the knowledge learned in economics was abstract, vastly different from the science they understand from their technical subjects, ambiguous and containing many complex graphs. However, despite the perceived difficulties, there are students who have found the learning of the subject interesting. Their concept of 'interesting' was developed mainly from a positive learning experience, developed over time during the course, stemming from their ability to perceive that economics was a subject that could help them to understand the world, and as such was intellectually stimulating. It was also perceived as a complement to their other, technical subjects.

4.2.1 Understanding the world

Recording #9: ....it is different from chemistry that is memorizing and applying formula.....but economics helps me to understand the newspapers, articles from financial papers and the economists. When I start to understand the concepts, sort of realize what this subject is all about, the subject becomes more interesting to me; but at first, I don't feel that way.

As discussed earlier, one of the major factors of difficulty was the emphasis on the value of understanding instead of learning by practice. Here the student who had earlier mentioned that learning economics was difficult was able to realize the usefulness of the concepts and to formulate a theory of interest during the semester after he had understood them.

The determining factor for this student to develop his theory of interest was his ability to realize that the knowledge gained from economics helped him to explain the world despite the initial difficulties he encountered. In fact, such a sentiment is consistent throughout the interviews with other students; namely, that the concept of 'interest' was not developed immediately, but was one that required perseverance and determination and not succumbing to immediate difficulties.

Recording #12: Economics gives me the basic knowledge and the tools to analyze how the world works around me. So it is quite interesting to me. Although it was very difficult

in the beginning, I kept telling myself to have an interest and then slowly the concepts seem to be able to explain the world issues around me.

In the example above, the student pointed out that he had to '(keep) telling (him) self to have an interest' which showed his determination not to give up. Such a demonstration of positive learning attitude was a desire from within.

Recording #2: When I could overcome the initial difficulties of absorbing too much technical knowledge, and start to relate that to the current affairs with the help of my tutor who encourages debate and discussion in her class, economics becomes very interesting to me. I started to enjoy it more and don't see new concepts as difficult but willing to spend time reading about it.

Here the student's main problem was his inability to absorb too much knowledge within a stipulated time; however, he was able to develop his own theory that economics is interesting with the help of the tutor. Here, the student's perception of interest was not derived from within, as in the example given above, but through external intervention. In this case the tutor's teaching style provided an environment conducive to learning, and effective in developing the theory of interest. This student's initial concept of 'difficulty' was transformed into or replaced by the concept of 'interest'. Thus, despite the fact that the difficulties of the concepts remained constant, the intervention by the tutor had helped him to change his perspective of learning, as he no longer believed that economics was difficult. This was shown by his willingness to spend more time reading.

Hence, two things I have learned from the students' theory are firstly, that understanding precedes interest. In order to understand the concepts, time is an important factor that the students must invest in. Secondly, students have demonstrated that the interest can be 'cultivated' either within through sheer determination, or through outside intervention - which is the role of the tutor or lecturer.

The responses so far show that 'interesting' could be equated with their beliefs that

- Studying Economics involves understanding (acquired through reading)
- Economics helps to explain world issues

4.2.2 Intellectual stimulation

Once students realize that economics is an intellectually stimulating subject, they start to believe that the subject is interesting, and form their concept of 'Interest'.

Recording #11: Economics is not an easy subject, but an interesting one. I began to be interested when my friends who took the subject kept talking about it then when it is my turn to do it - it was interesting; the discussions really helped me to start thinking about the problems in the world. This is unlike the normal sciences we study, where we conduct experiments and the problems are dealt with in a theoretical and idealized way, economics has a more diverse way of dealing with problems – different ways to solve a problem. It is really intellectually stimulating. It is an opportunity to learn new things.

Here the student was first exposed to economics through his peers. This first encounter soon developed into a concept of interest when he was further exposed to problems in the world and able to relate these concepts to the real world. This is contrary to his other peers who found the concepts abstract and hence developed the concept of 'difficulty'. In this case, although the student recognized the concept of difficulty which was developed in the earlier section, he was not hindered by the different types of knowledge (presumably humanities and technical) which for some make economics 'difficult'; instead the experience had been intellectually stimulating because it gave him opportunities to learn new things.

Recording #2: This subject really gets me to think about how well our government is handling the economy. You know using the fiscal policy and monetary policy option, the different point of views, especially in the recent recession I started to think for myself and not just being 'led' by the government. It really opens up my horizon and gets me thinking like never before. It is stimulating to the mind.

The above student points out that economics is stimulating because it had opened up his horizons to be more critical of the policies implemented by the government. In his view, this was made possible through training in economics so that he was able to understand the different policy options available to the government and perhaps gained a sense of independence in opinion which perhaps was important to him.

The students regarded economics as an opportunity to learn new things which were not available in their technical training. As such it was interesting to them because it increased their awareness of problems around them and at the same time helped them to maintain a critical attitude in problem analyses. Hence, the theory of interest was formed because economics gives the students the power to form independent views relating to government policies. Although this was less explicitly mentioned in the earlier example, 'economics has a diverse ways of handling problems' gave a subtle hint that the student was aware of the various policy options.

In short, some students found economics intellectually stimulating because they believed that they were learning new things and that this new knowledge allowed them to form independent views.

4.2.3 A complementary subject

Another factor that has caused students to develop the theory of interest is their perception of economics as a supplement to their technical training. There are two contributing factors: firstly, students are able to develop the theory of interest when they foresee the complementary effect of this subject on their technical career. For example, the student below recognized that it was insufficient to rely solely on technical knowledge in his career, and he perceived the need to take more units of economics.

Recoding #11: I find the subject interesting like when we did duopoly and understanding the stuff is very interesting and I also find that it is important to supplement engineering subject with some other subjects. I mean we must know the technicality of the product but we must also know the market. Like what we have learned in economics, to know how a firm operates in different types of market and I think this is very important to my career because I am not likely to stay as an engineer forever, but there is no more economics to take after I am done with this unit.

Secondly, the ability to understand the 'business side of things' through economics reinforces the students' theory that there are other non-technical subjects that could assist or expand their career choice.

Recording #12: I slowly began to have an interest in the subject and that is why I am taking marketing subject right now. Economics inspires me or open up my thinking to look into the business side of things, not just the technical aspect of engineering. It is inspiring and good for me in the future, and I might do another unit if the school is able to offer it.

In the earlier section this student had mentioned that economics helped him to understand the world. His idea of 'understand the world' is further expanded here to mean the ability to 'look into the business side of things'. Hence, once the student slowly cultivated an interest in the subject and in his case by way of self-determination, the perception of

economics as interesting soon developed because he was able to understand the business world much better, which in his view was crucial in the future.

The theory of interest led the student above to further expand his desire to know more about the business world by reading other non-technical subjects. The student below expressed the similar idea that once an interest is cultivated, it opens up possibilities for him; hence economics is interesting as it complements this technical training and opens up this horizon.

Recording #8: I began to be interested in this field; in fact I took up marketing subject after that. They are quite related and I think if I didn't take up economics I wouldn't have done marketing and I may not be looking into a marketing sales job now. I will remain to be a very technical person. Now because of economics, I am proficient in my technical field and have the confidence in other business skills which gives me more job option now.

Thus from the responses of the students a better job prospect is the determining factor that has led the students to develop their theory of interest.

The theory of interest was formed based on the students' experience and perceived future needs, regardless of the different reasons for interest; this theory was not usually formed immediately at the introduction of the course. It is a transforming theory, one which progresses from the theory of difficulty to that of interest. Whether the theory of

difficulty has been completely replaced by interest is not clear, but the students have shown the ability to overcome their difficulties and started to form their theory of interest.

4.2.4 Summary

From the responses analyzed above, there seems to be a set of beliefs about the world in which they live and some expectations of what the course should provide for them. When they found that the course helped them to better understand the world around them and their expectations were fulfilled, then they began to see it as 'interesting' – even though it might remain 'difficult'. This is based on their belief that the world is interconnected and since they are an integral part of the world, it is essential to understand the issues around them. Hence, when an elective subject like economics provides them with the opportunity to understand the economic issues or the world, it engages their attention and so the initial concept of 'interest' is formed.

Similarly, students also considered the voting rights of a citizen as important because of their belief that every citizen should have the freedom to evaluate the effectiveness of government policies. Hence, once the students had obtained knowledge of the different policies available on economic issues and a firm understanding of their effects on the economy, especially when they are able to evaluate the different policy options from the different schools of thought, economics becomes interesting as it stimulated their thinking and gave them the freedom to form their own opinions.

Finally, the students also mentioned that economics was a complementary subject that allowed them to secure employment in the future because they believed that 'engineers do not stay engineers' and so they needed a non-technical subject to increase their chances of securing employment in the future. Economics was that alternative choice.

Eventually, when the course matched their perceived expectations, the theory of 'interest' was developed. The students developed the theory of 'interest' because they were able to relate themselves to the world around them, with a progression from their immediate concern about employment to being a responsible citizen, then to being a member of the world. This is a belief system that is not primarily focusing on themselves but a forward-looking one in which the self is placed in relation to the work environment, community and the world. Such an attitude allowed the students to find interest in learning a subject that was different and at times difficult.

This can be illustrated by the diagram below:

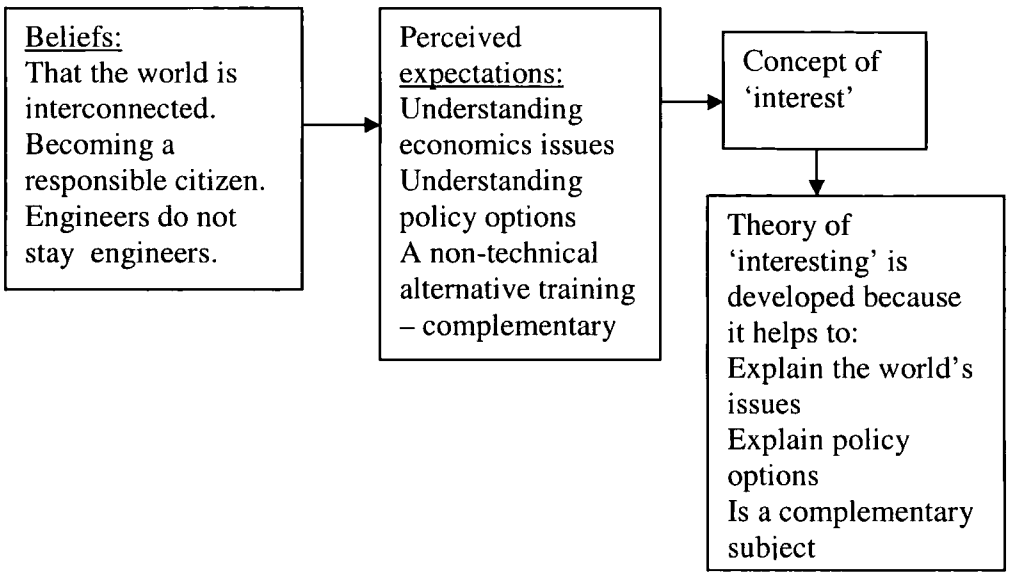


Figure 4.3: The Students' Concept of 'Interest'

In the earlier section on the concept 'difficulty', the interrelationships between the factors of influence was depicted. In the case of 'interest', I found a cyclical relationship rather than a sequential one that best reflected the students' theory of motivation. It was shown earlier that despite the difficulties in learning, students in this study persevered to overcome the obstacles and finally found economics interesting. This form of motivation is partly intrinsically as well as extrinsically driven. This cyclical relationship is illustrated below:

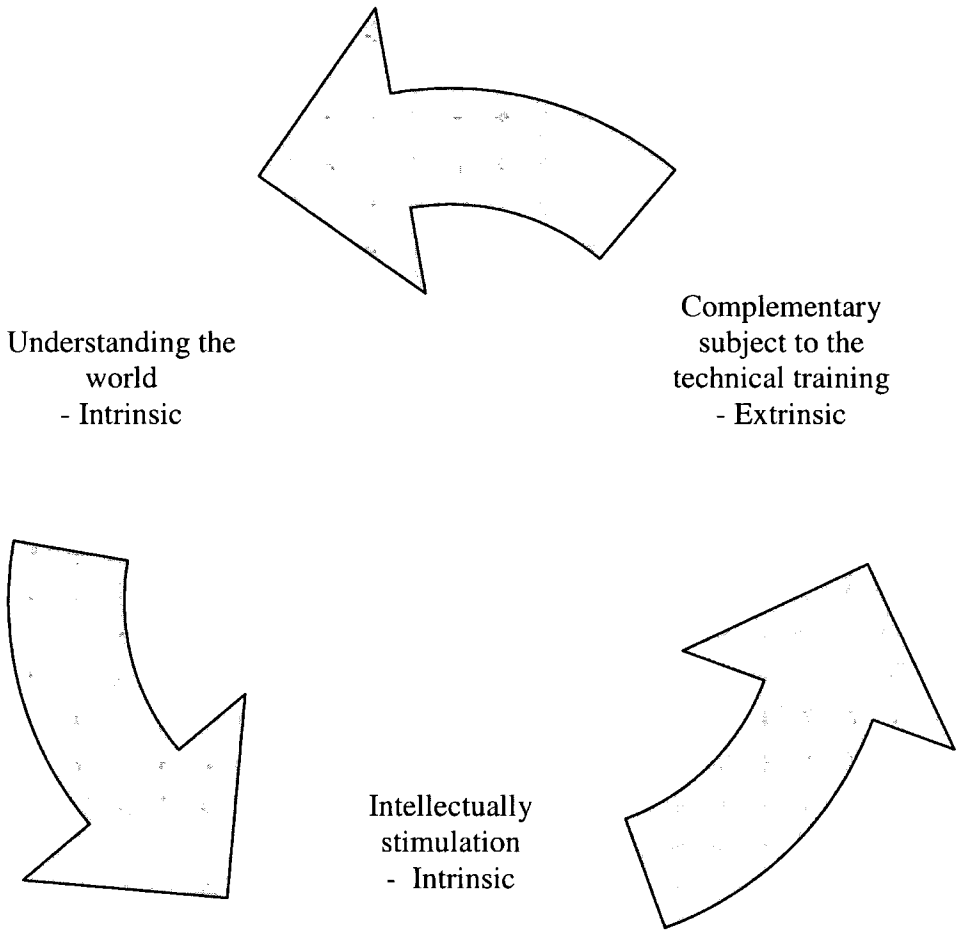


Figure 4.4: Theory of Motivation

Based on Dweck's research on motivational process, the students' behaviour can be explained by their having learning goal orientation. Hence, regardless of whether they had a high or low confidence in their present ability - and in this case the students had demonstrated a high confidence level - they believed that persistence in making an effort would increase their competence in learning.

4.3 Theory of 'unsatisfactory'

The third theme derived from the interviews was the lack of satisfaction experienced by the students. This dissatisfaction was found in three areas: first, in terms of the students' inability to understand economic issues due to a lack of application of concepts and a narrowly defined course objective; second, the undesirable choice of textbook which students regarded as 'irrelevant'; and finally the teaching approach of staff.

4.3.1 Lack of application

Contrary to what was discussed in the earlier section, some students sometimes felt dissatisfied with the course because they were unable to form their own opinions with the knowledge received, since they needed applications of concepts to be incorporated in the delivery of the teaching.

Recording #7: I don't feel like very much satisfied after doing this course because what we did was just graphs and mathematics and some formulas. It should relate more to the current situations in the world so that I should be able to understand what is happening in the world and comment about the economic scenario, which is not the case in this course. Right now I can't even contribute ideas or opinions in discussion with my friends.

Here the student felt that the course was unsatisfactory because it was 'just graphs and mathematics and some formulas' - which ran contrary to his belief that economics should help him to understand economic problems by presenting more current economic issues. So when his expectation was not met so that he was not able 'to understand what is happening in the world', the theory that the course was unsatisfactory was formed. In this case, when the integration of economic concepts and current issues was not a purposeful exploration, the student was frustrated and left feeling 'not quite satisfied.'

Such a concept of 'unsatisfactory' was a relative one; this is because one student realized that the course was not that satisfactory only when he was immersed in a foreign environment.

Recording #8: In economics, I am made more aware of the current affairs which I am very happy to have learned. But when I was in Canada for an exchange program, I then realized that I am not as good as the other western students, that was the time that I feel that the course that I had was too basic, should have more analysis and so that I can have an opinion.

In this case, the student felt 'unsatisfied' during his overseas immersion programme because he was unable to analyse problems in a deeper manner compared to his western counterparts. Without this comparison he might not have realised it.

This sentiment of lack of analysis which led to a concept of 'unsatisfactory' was repeated in the experience of other students. The graphs and mathematical formulae were technical knowledge that was too elementary from the students' point of view as they expected something more from the course – analysis and not mere introduction of definitions.

Recording #15: I find this course too elementary; it is just about concepts and some simple calculation and nothing else, should really tell me more about the real issues in the world and to analyze stuff.

In this case, the student felt that studying economics should not solely consist of defining concepts and formulating simple equations. The learning becomes unsatisfactory when there is a lack of applicability of concepts in the course.

Recording #11: I think this course gives me all the technical knowledge but doesn't tell me how to apply it in the real world. I know we don't have the time to teach us both the ABCs and the analysis, but I really think it will benefit us if we have both the concept learning and in-depth analysis.

Here the student understood the trade-off between learning the fundamentals and application of concepts, but stated his preference for analysis.

Some students are more explicit in their belief of what the economic course should be; that is, to help them understand the economic issues by citing real examples.

Recording #14: We don't have real current affairs stuff, only learning the concepts, solving fictitious problems, doing MCQ and that is about it. Nothing about how it is relating to the real world, like monopoly, giving examples like Microsoft would really help me to learn and see the relation, to understand how economic concepts can be applied in the real world. Really, given real life examples will be so much better.

The issue of fictitious examples was brought up in the earlier section when it was found that the students needed realistic examples to understand abstract concepts. Here the student reiterated the need for better examples that could reflect the real situation in the world. Instead of finding economics 'difficult', he found it unsatisfactory.

This lack of concept applicability is again aptly expressed by the student below:

Recording #9: I think it is better to give examples in the lectures to help me link the concepts with the world issues. This is better than repeating the definitions which I can find them in the textbook.

Here the students placed high value on learning through real life examples in order to understand the world. Hence the concept of 'unsatisfactory' was formed when the lectures were reduced to a platform where concepts and definitions were repeated and used for solving seemingly irrelevant problems. In other words, the students' perceived

expectation of receiving real examples of the world to explain economic concepts was not matched.

In relation to their concept of 'unsatisfactory', students also believed that the environment in the university was too examination-oriented, so that more time was allocated to the preparation of examinations and less time was available for truly exploring the subject. This frustration was pointed out by the students who believed that learning should not be confined to the questions in the examination, so that when the course was too narrowly delivered and a restriction of their learning became apparent, they became dissatisfied.

Recording #7: The general attitude here is clearing the exams. The basic idea is we want tutors to help us complete the questions and get the 'model' answer. It has become a moral responsibility for the tutors to complete it. Even the lecturers are doing this, they tell us what we should be studying for exams, study this and that and we should be okay in the exams. This is not just in economics, but all the subjects in this university.

Recording #11: The lecturers in this university do not teach beyond the notes or textbook. And if students want to pass exam they will follow the specific areas the lecturers mentioned in the notes, like definitions and concepts and memorize them, and just leave out certain topics although it is in the syllabus. After all, our entire future depends on that 3-hour examination. Somehow, I just find this whole culture very unhealthy, I really

don't appreciate it, this is not what learning is about but the lecturers are doing it and the students are doing it.

The concept of 'unsatisfactory' was formed when the students felt that their perceived expectations were not met; that is, the ability to relate to the issues of the world with the application of real life examples and that the course should not be too focused on examination. These expectations were the result of the students' belief that economics should help them to make sense of the world and that learning should not be constrained by any form. And this corresponded to the concept of 'interesting' above - which in fact is the reverse of the understanding from the concept of interesting.

Thus the concept 'unsatisfactory' can be equated with several different but related beliefs:

- The course is too elementary
- It is not analytical
- It does not use real examples
- It is oriented only towards examinations

4.3.2 The choice of textbook

To purchase the prescribed textbook is strongly encouraged for every course in the university. In fact, most course coordinators place much emphasis on ensuring that the prescribed textbook is fully utilised by adopting review questions from the textbook for

tutorials and examinations. Hence the choice of the textbook has an effect on the overall experience of the course itself. In this study, the choice of the textbook was part of the reason why the students felt dissatisfied. It was not a case of bad choice due to a too difficult text chosen, but it was a decision to pick a seemingly 'irrelevant' textbook which did not relate to the issues in the Asian region.

Recording #7: I'm not satisfied with the textbook we have. I didn't enjoy reading it because the textbook has so much context relating to the U.S.A., it really doesn't make sense to me. It's not applicable to Singapore and South East Asia. I think I could say that the Americans see things differently from us and I want to know our view; textbooks are all written by westerners.

Here the student has a strong opinion that the western view is different from the Asian perspective, and that Asian students should learn more about the issues relating to their own region rather than learning concepts and examples that are relevant only to western societies.

The textbook issue was not an easy problem to resolve because when a locally written textbook was added, it did not consolidate the students' interest in the subject; instead it reduced their enthusiasm for learning.

Recording #2: This textbook written by two professors from the school, I think it was written to pass examination. It was so dry and boring and economics should be an

interesting subject. I think they have summarized the content so much so that it is just not worth spending time to read it. It is just too 'Singaporean' (denotes the culture of being too examination-oriented). It doesn't satisfy my curiosity in the subject.

In this case, the locally written textbook was published with an objective different from that of the students. Instead of bridging the chasm between the western and Asian perspectives, the textbook was written with the objective of summarizing concepts and condensing knowledge - which failed to arouse the interest of the students.

Hence, the choice of the seemingly irrelevant textbook led students to form the idea that the study of economics was 'unsatisfactory' because they believed that the Asian view was not adequately addressed in those textbooks written primarily for western students. The students felt that voices from this part of the world were lost in the world of powerhouse economies; their expectation of reading a textbook that illustrated economic issues from the Asian perspective or analyzing economic problems from a different angle was not met by the current choice of textbook. This expectation is strongly felt by students from the developing nations. Therefore when their expectations were not met, the theory of the course being 'unsatisfactory' was formed.

4.3.3 Teaching approach

The students have strong beliefs about how teaching should be conducted; they believe that a teacher's job is to inspire students by arousing their interest in the subject.

Therefore they expected lectures to be interesting, stimulating and delivered in a well-paced manner.

Recording #7: I think the lecturers are not here to teach but to arouse the interest of the students. When he is able to do that, there is no limit and the students can go to any extent. But the lectures were so boring; I think the lecturer is bored of the subject, we can feel it. What happened in the lectures was the lecturer would come and put up the transparency, draw the lines and talked to the OHP. I mean it was really very boring.

Here the student accepted the teaching style of the lecturer, with the use of OHP rather than the more common powerpoint presentation - but the lecturer's seeming lack of enthusiasm displayed during class caused them to feel that the subject was boring – in their words, he himself was 'bored with the subject'.

Recording #11: I think most of the lecturers just go through the presentation without talking to the students. I think it is better to talk to the students than showing us the slides and reading the definitions from the slides which we can find from textbook and notes from edventure (online learning platform).

Recording #9: The lecturers were really bad, they kept reading from the slides and repeating the definitions; this is not teaching.

In the examples above, students felt that the lectures were not at all interesting because the lecturer failed to communicate with them. Over a prolonged period, this estrangement between the lecturer and the students caused the students to feel left out in the process of impartation of knowledge, so much so that they were bored in the lectures. Such experience caused them to form the concept of 'unsatisfactory'.

In addition, when the lecturers failed to inspire and stimulate their interest, it became another cause of an 'unsatisfactory' learning experience.

Recording #11: I really feel that the lecturers should at least try to inspire and stimulate the interest of the students. I also feel that it is not true that just because the lecturer has a PhD and so he is able to teach, I have found it absolutely not true. They just really failed to stimulate the interest of the students; a slight show of enthusiasm and by talking to us will at least get us interested in the subject.

In this case, the student felt that the professors were not necessarily better teachers/communicators compared to the non-PhD lecturers.

Recording #14: I expected the lecturer to be more stimulating that is getting us to think rather than reading aloud from the slides projected. Lecturer should link the materials from the books with the real life; it becomes more realistic, so that I could see how each concept can be applied in the real life.

Here the students have expressed their idea of good teaching, one that is inspiring and demonstrates the ability to arouse their interest by illustrating with real-life examples. I have stated earlier that when communication was not facilitated in the lectures, students were bored because they were detached from the lecturer. Worst of all, it is the lost opportunity in stimulating their interest that should be of greater concern.

Here is a direct contrast with one of the dimensions of what is defined as interesting in the earlier section where 'interesting'; was equated with 'intellectually stimulating,' and where a teacher was inspiring in the seminars because s/he stimulated the students.

Finally, the concept of 'unsatisfactory' was formed because of the pace of the delivery of knowledge. When too much knowledge was loaded on them within a short period of time, more often than not the lecturer lost the interest of the students.

Recording #2: I really think the lecture is just a place for extensive information loading. The lecturers here really just pouring out technical information from slides to slides, without any break and there were sometimes 80 slides in a 2 hour lectures. This is really too much to absorb and this is really not good enough and to tell you the truth, the lecturers have lost me; I am really 'turned off' by them as I just felt that they did not give me time to think and explore, I am just there to receive a large amount of knowledge which I don't know how to use it which is not good enough.

Here the student felt a lost of control over his own learning; when learning is determined by the lecturer without considering the needs and expectations of the students, the outcome is as discovered above, an 'unsatisfactory' one.

Hence, the teaching approach of staff in terms of their communication skills, including their ability to inspire, and their ability to control the pace of lectures and the amount of information to teach, is important to the students' learning experience.

4.3.4 Summary

The students hold certain strong beliefs or theories about the way learning should take place in a university: that it should have no boundaries and that the teachers' role is to inspire the students to passionately pursue knowledge rather than just aiming to pass examination. They also believe that opinions about economic issues should not be dominated by the view of the west, and as such, they believe that students in Asia should learn and understand more about the economic issues from the Asian perspective and form views of their own.

Hence, certain expectations are formed by students given the beliefs they have. I would not know how and when they were formed but they are clearly significant. They expect the lecturers to help them understand the world through the lens of Asia with real-life examples illustrating the concepts and principles. They expect the lecturers to display enthusiasm in inspiring them to explore the wealth of knowledge rather than focusing on

completing the lecture notes. The failure to meet the perceived expectations of the students led them to develop this theory that the course is 'unsatisfactory', that it is just too elementary in analysis, too narrowly delivered and too boring, as the lecturers are not engaging them.

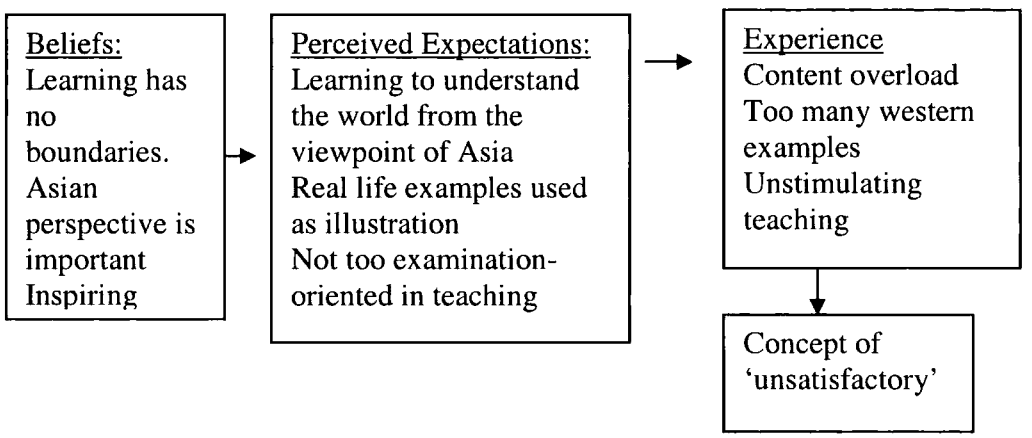


Figure 4.5: Students' Concept of 'unsatisfactory'

Again I realised that the lack of concept application, the undesired teaching approaches and the choice of textbook were interconnected, and this is illustrated below.

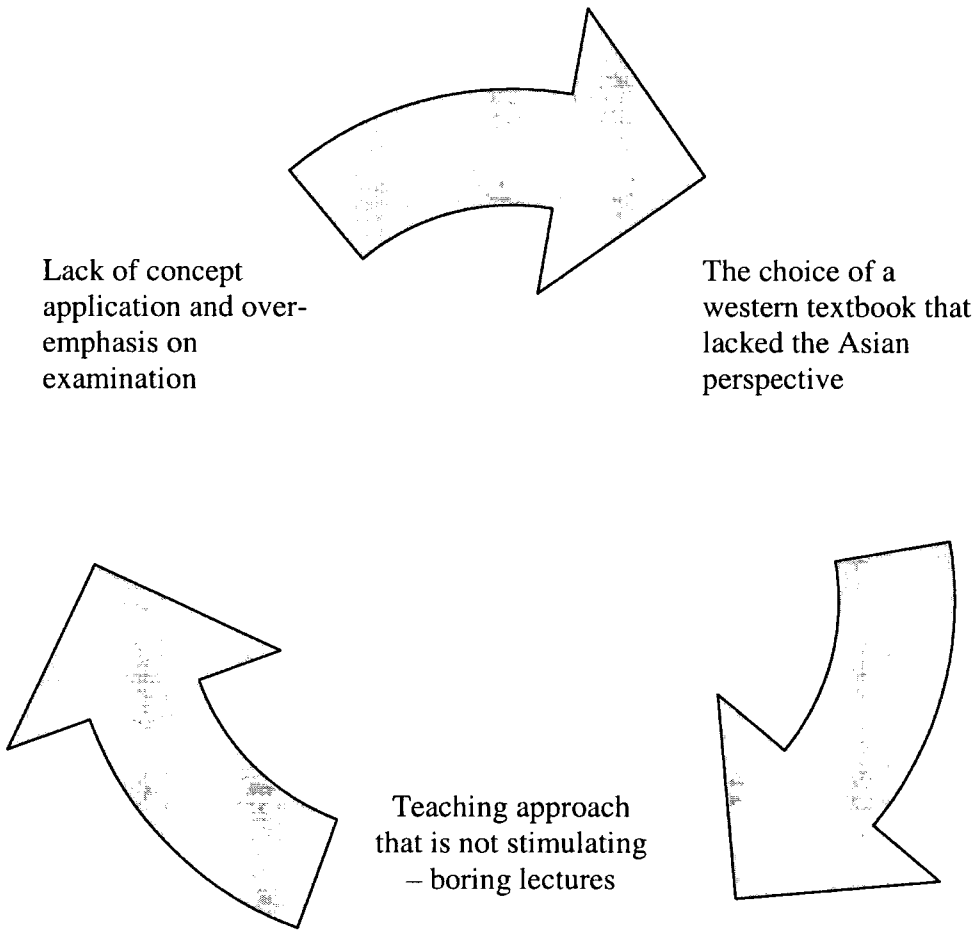


Figure 4.6: Theory of 'unsatisfactory'

In addition to the direct relation each factor contributes to the students' unsatisfactory learning experience, these three factors are also interconnected. I have also discovered that students whose learning was more independent, and who relied more on their own reading and understanding, were less affected by the lack of concept application, but they were dissatisfied with the uninspiring lectures and the choice of textbook used in the course.

4.4 Theory of Pragmatism

Another theme that has been consistently brought up by the students is the approach they have adopted in learning – the concept of 'pragmatism'. I have in the earlier sections discussed how students form their concepts of 'difficulty', 'interest' and 'unsatisfactory', and in the next two sections I will discuss the remaining two peripheral themes - namely, the strategy adopted by the students in approaching economics study, and their concept of 'enrichment'.

4.4.1 Hard Work

The students approached study with a sense of determination and diligence; they recognized that studying economics requires a lot of hard work, and that to sustain the effort requires motivation on their part.

Recording #1: I must put in the effort and time to learn economics and what motivates me is I need the degree. My motivation is simple; I need to pass the subject in order to obtain my degree. I will do all my tutorials again and again. Although some of the concepts are not easy to understanding, many times I even have to come out with my own 'template' to help me understand and remember things; I will do it because it is necessary. It is hard work but I know there is no short cut to passing exam.

Here the student recognized that in order to pass the examination and obtain his degree, sheer hard work by reviewing the tutorials is an essential exercise which he must undertake. So this student has a theory that learning is by practice, similar to the theory proposed by some students in an earlier section that practice is a form of surface learning. Although he was also thinking in terms of surface learning as the earlier ones did, he was also linking it with examinations - i.e., examination learning is surface learning. He also expected that his hard work would be duly rewarded. Passing the examination is so important to the student that it becomes a source of motivation to see him through the process of learning. In his case, although his goal orientation is performance driven, he did not withdraw from difficulties, because of his quiet confidence that all his effort will bring about positive results - which is a display of a mastery-oriented behavioural pattern. It is interesting to note that his concern was with passing the subject and not with maximizing his score.

Recording #10: What motivates me to study is to pass exam. So it is a lot of hard work but I will do it. I want to get the answers in tutorials, pass the exam and get on with it. I try not to skip any lessons as they are crucial to passing exam. And I will do the tutorial questions and past year papers over and over again to improve my score.

Recording #9: I will do the tutorial questions over and over again to raise my score. There is no other way but to work hard because passing exam is very important to me.

In the above examples, the students stressed the importance of practice and repetition for passing examinations. Here the motivation is slightly different from that of the first student. The above examples showed the desire to improve their scores, whereas the first student just aimed to pass the exam. The behaviour of the second student is what certain educationalists call 'a strategic learning approach' - intending to achieve the highest possible grades by managing time and effort effectively, as was discussed in section 2.6.3. Nevertheless, these students have responded by doing the tutorial questions and past years' exam papers as a means of achieving their objective.

Regardless of the learning approaches taken, I have found that the students' behaviour is a practical response to an environment that tends to overload the curriculum, and one that is too focused on examinations. I have stated in the earlier section that the students mentioned a lack of time to reflect upon the knowledge they have learned. Hence, given the time constraints, the best strategy and the most practical approach they can adopt is to increase their effort in practising tutorial questions, since they provide a good indication of the type of questions in the examination.

Hence, the students believed that passing the examination is important, and they formed the notion that they needed to be pragmatic in their approach to learning when they recognized that the amount of time and effort needed to achieve their goal vis-à-vis the time they had was limited. And pragmatism seems to include the idea of practice and surface learning. They have expressed how their belief acts as an impetus to their learning. Consequently, the role of intrinsic motivation seems to be underplayed in this

situation. However, this concept of being pragmatic about examinations contrasts with the idea other students have: that what makes the course 'unsatisfactory' is that it is too exam-oriented - as pointed out in section 4.3.1.

4.4.2 Examination 'smartness'

The students also recognized that they could not be too idealistic in learning given a competitive environment. It was important to be practical and implement strategies in order to increase their chances of passing the examination.

Recording #2: To study economics is a lot of strategy. You need to be exam smart. All you need to do is to get the past year papers and read them, do it over and over again and memorize the answers. By reading through the old examination papers, it gives me an indication of the difficulties of the exam and then the tutorial questions tell me the score of the exam. So, it is a lot of strategy as to how to allocate my time and effort; I don't have to study everything in the syllabus, just the selective ones. I know learning a subject should read everything but there is no time, so for now passing exam is more important. I will appreciate the tutors to do to help us pass exam.

In this example there is evidence again of the theory that practice is a way of learning - and in addition the belief that passing exams is more important than spending time on deep learning.

Recording #9: I think the tutor should give us hints of how to pass exam and how to answer exam questions. All these will increase my score. Since it is usually not the case, I need to work even harder.

Here the student expresses his strategy for passing the examination – or, in his own words, 'to improve my scores is to obtain examination cue from the tutors'.

These students had a belief that one needs to be pragmatic in order to pass the examination, and they expected help to be given during the course either by the tutors or some form of 'drilling' exercises to familiarize them with the types of examination questions to be expected. It is not clear why the students are dependent on the tutors in learning; however, there are two possible explanations:

Firstly, this could perhaps be explained by the dominant teacher-student relationships present in educational institutions, so that regardless of the level of learning the students continue to consider the tutors as *gurus* who transfer information and knowledge to them, which corresponds to the concept of Confucian learning discussed in Chapter 2 section 2.9. Secondly, the highly examination-oriented environment coupled with a full curriculum led the students to take a pragmatic approach to their learning.

4.4.3 Summary

In short, there is a belief among the students that having good grades is very important; they may have recognized that their approach to learning was less than ideal since I have evidence in earlier sections that some students recognise the value of deep learning and understanding through reading. However given the circumstances, they prefer to be pragmatic rather than following their ideal in order to achieve their objective. Some students expect, firstly, to work hard on the course by practising and memorizing their tutorial answers. This form of hard work includes establishing their own template or designing a strategy to help them achieve their goal. Secondly, they expect the tutors to provide some form of help to increase their scores - but when such help is not given, they accept the need to work even harder on their own. Hence, they conclude that learning economics is a lot of hard work and one should not dwell on the ideal but rather be pragmatic in dealing with learning.

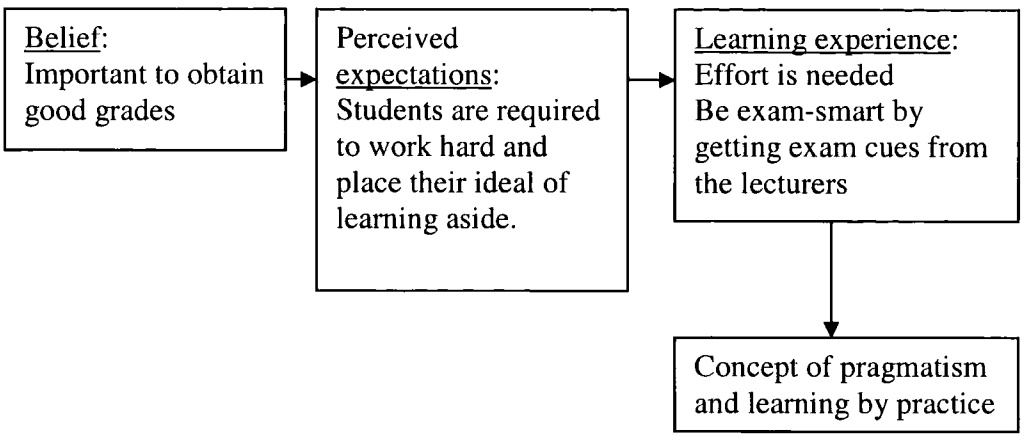


Figure 4.7: The Students' Concept of Pragmatism

I mentioned at the beginning of this section that the concept of pragmatism is a secondary theme in this study because it was not the first response from the students when asked about their experience on the course. In other words, students often stated that the course was difficult or uninteresting or unsatisfactory. Only when they were asked further questions about their course of action when studying did the concept of pragmatism emerge as the strategy for survival in this fast-paced environment. It is interesting to discover that regardless of how they felt about the course, whether it was difficult, interesting or unsatisfactory, eventually there was a tendency for them to adopt this pragmatic approach to study. This interrelationship is illustrated by the diagram below and will be explored further in the next section.

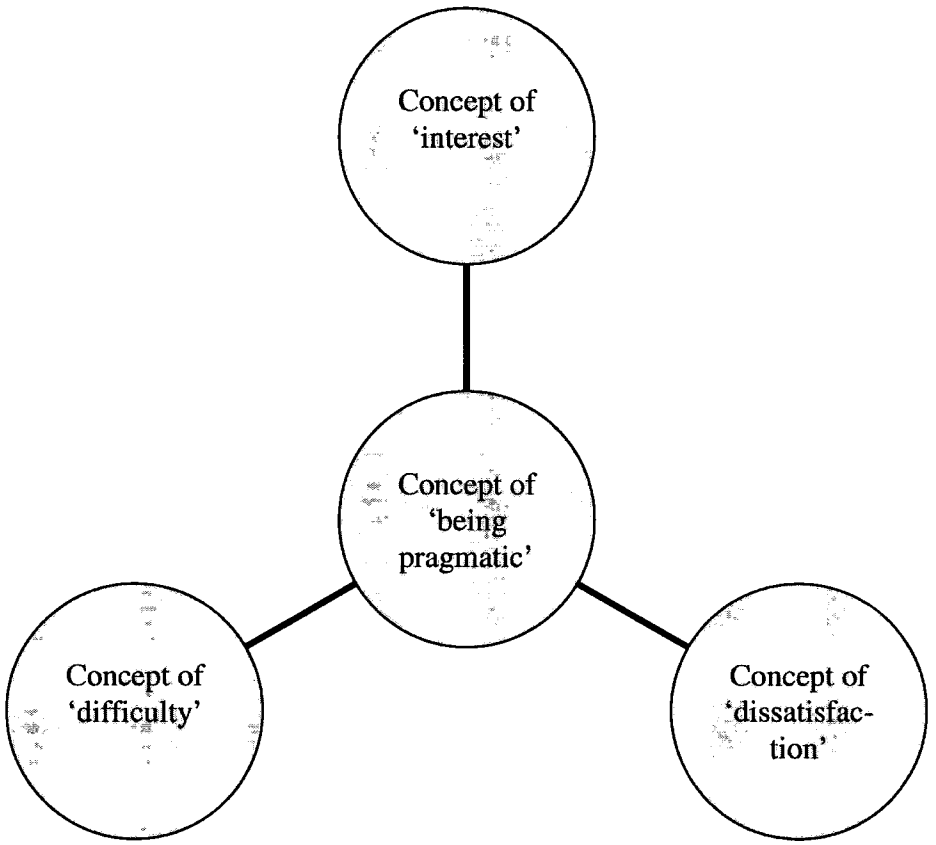


Figure 4.8: The interrelation of the various students' concepts of learning

4.5 Theory of 'Enrichment'

A final theme for discussion is the concept of 'enrichment' that students experienced. This notion of 'enrichment' is slightly different from that of 'complementary' in the 'interest' section 4.2.3 in the sense that 'enrichment' indicates their personal development whilst the idea that economics is a complementary subject refers to their professional development. In addition, this concept of an 'enriching' experience could either be

formed before or after the course. Sometimes it became clearer to students after comparing their experience with that of students in other countries, as illustrated below:

Recording #8: I found this subject enriching, in the sense that at the end of the day, I'm able to walk out of the classroom with knowledge which I think is very important. This course really proved to me that a broader education is always better so that I don't have to confine to a small window/area. I am exposed to new concepts to see my strength and interests; it is like an add-on to my professional technical expertise.

Here the student recognised the potential in his personal development when he summarised his overall experience – an enriching one that had broadened his perspective.

Recording #14: I really appreciate my experience here, to be able to learn economics and other soft skills, although they have made it compulsory. I think after 4 years I would have gain more knowledge about myself compared to if I were to stay in India. The system back home does not allow me to explore beyond my core subjects, so in a sense I find I have had a more enriching experience.

This student found the study of non-technical subjects like economics an enriching experience because he believed that it was useful for his personal development, which was not possible if he were to study in India. This sense of being enriched was in relation to his peers' experience at home.

Recording #15: I see this as an experience to understand things around me better; it is really an opportunity to see things differently from my normal training, so in a sense I would say this is an enriching experience because it is a more well-rounded education. I know it when we are made to study this subject.

In this case, the student's enriching experience was because of the well-rounded education the university provided. The student implicitly acknowledged that, in addition to the technical and professional skills that are necessary to enter the engineering profession, there are other skills and knowledge that are equally important, and would help him to be a 'well-rounded' individual. So this student had the concept of an 'enriching' experience before the course started – *'I know it when we are made to study this subject.'*

The consistent theme from the students above was the realization of an enriching experience. In their own words, *'I don't have to confine to a small window/area...I am exposed to new concepts to see my strength and interests', 'learn other soft skills.....to explore beyond my core subjects'* and a *'well-rounded education'* all indicated that economics provided them with the opportunity to learn beyond their normal scope of work, which enriched their life experience in the university.

Hence, the students' theory of enrichment came about when they realized that the principles and concepts learned opened up their opportunity in life. This theory of 'enrichment' could come about at any juncture of the course, however; more important

was the students' ability to recognize the added advantage in learning these 'soft' subjects. This concept was formed based on their belief that education should be broader in scope so that the economic concepts and principles learned stretched them beyond their comfort zone; the concept of 'enrichment' was established because they had received the 'extra' which was not available otherwise.

Here I discovered that students could form their theory of 'enrichment' at different stages, but it was not significantly important to know when it was developed because eventually, all of them experienced difficulties in their studies. In this last theme, it is clear that this concept of 'enrichment' should not be considered in isolation but should be presented in connection with the other themes which I have discussed earlier.

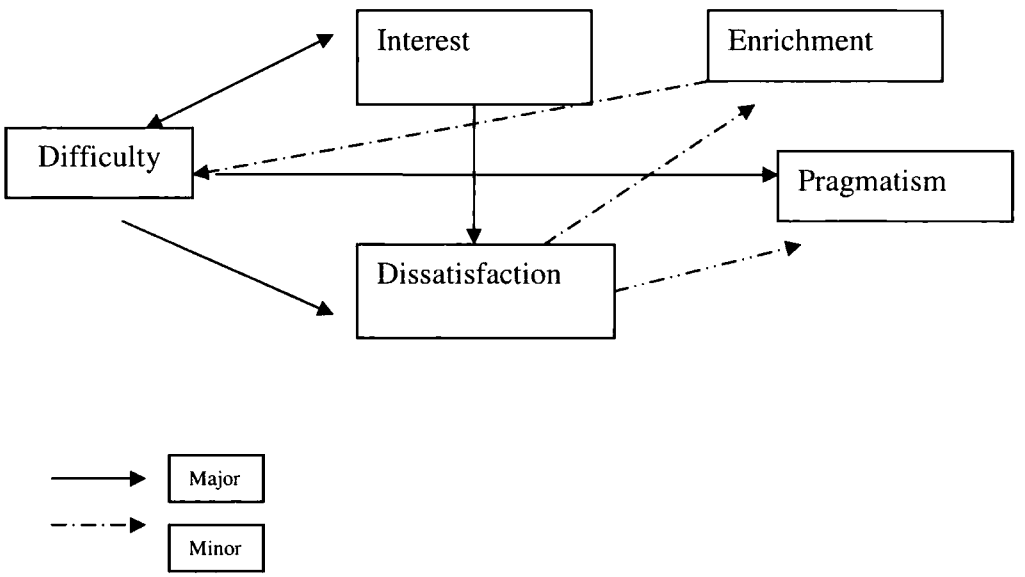
I have so far presented all the themes in a mechanical way. In the next section I will bring together all the different learning experiences of the students in order to present the interconnectivity of all the themes with the aim of improving their learning experience and the way teaching is carried out in the university.

4.6 Interrelationship of the various themes

It is interesting to discover that the students' ideas are not constant; they seem to say contrasting things at different times during the interviews – or, to put it differently, their learning experience is not confined to one concept at a time but is a combination of a few

- which shows the complexity of their learning experience. These relationships are illustrated below:

Figure 4.9: Interrelationship of the various themes



These relationships are listed below:

Firstly, I realised that all students except one had experienced the difficulty of understanding complex graphs, and/or found the knowledge different and abstract and felt uncomfortable with the ambiguities in the knowledge learned. Hence I discovered, on further analysis that their experience, in general, started with the concept of 'difficulty'.

The interesting discovery was in understanding how students progressed to the next stage of their experience; a few students' experience remained at the stage of 'difficult', while others started to change their ideas and began to consider economics as a subject that is in fact 'interesting'; again, another group of the students felt that it was 'unsatisfactory'. These different progressions are represented as:

- Group 1 - These students are those who strongly believed that economics is 'difficult' - not only because they could not accept the abstract concepts and the graphical presentation in economics, but because they disliked the approach to learning, which tended to be more discursive than in their technical subjects.

- Group 2 - There was, however, another group of student who were able to overcome the initial difficulties and started to form the theory that economics is 'interesting' because they began to realise that the subject allowed them to understand the world's problems and at the same time stimulated their thinking intellectually. They were able to appreciate the subject quite easily because they believed that it was a subject that complemented their professional training.

- Group 3 – Finally, there was yet another group of students who found the learning of economics 'difficult' - but instead of moving to the theory of 'interest' like those in Group 2, they started to develop a theory of 'unsatisfactory'. It is interesting to note that these were the students who struggled with the time factor

in studying humanities subjects - which require understanding rather than practice.

Secondly, to further trace the progress of students in Group 3, I realised that they soon developed the concept of 'unsatisfactory'. According to what I discovered earlier, this concept was developed when there was a lack of integration of theory with application, so that students felt inadequate in using analytical skills to understand the world's problems, or the inability to form their own opinions. This unsatisfactory feeling was aggravated when the textbook chosen for the course did not present the Asian perspective which they deemed important. Finally, when the uninspiring teaching approach could not match their expectations, the students felt that the course was unsatisfactory. Hence, the journey of students in Group 3 could be explained as follows:

- Group 3 – I found that this group of students expressed the need to have more time to read in order to understand the subject, so when they realised that the external environment was unfavourable to their need, the 'interest' factor was not able to be fully developed. In addition, this group of students was especially negatively affected by two factors: firstly, the lack of application, and the examination-oriented approach to teaching; and secondly, the uninspiring teaching of the lecturers. For this group of students, their learning journey ends at feeling 'unsatisfied'. They did not possess that zeal for memorizing 'model' answers because they believed that understanding was more important than practice. Perhaps their learning experience could have become more positive if

they had had inspiring teachers who could guide them and help them overcome their difficulties.

I also found that students who previously found that economics was 'interesting' could feel dissatisfied as well.

- Group 2 – For this group of students, it was unfortunate that their theory of 'interest' did not last. It soon became transformed into a feeling of dissatisfaction – because, as the course progressed, the gap between their expectations and the reality of how the course was delivered widened.

Thirdly, given the institutional structure and the competitive environment the students are in, a pragmatic learning approach is often adopted. I could see this being developed by students in Group 1.

- Group 1 – These students took a very practical approach towards learning. They would put in more effort, despite past failures, to focus on those areas which they believed were important in examinations - obtaining 'model' answers from the tutors, doing past years' examination papers, memorizing work and even devising templates that could ensure their success in this course. All these supported the notion of surface learning. I noted that they did not lapse into a helpless state. Instead they did whatever possible to pass their examination, rather than maximize their scores.

- Group 2 - I have realised that only one of the students in this group went on to adopt a pragmatic learning approach whilst the rest of them completed the course feeling dissatisfied. This should not be surprising because these students, who had found economics interesting in the first place, were more keen on understanding the world. Hence it is not surprising that they did not go on to adopt a pragmatic approach towards learning by memorizing past examination questions.

It was mentioned earlier that there was one student who did not find learning economics difficult. In fact, this was the only student who found that it was 'interesting' first and then found it difficult because of the many 'grey areas' in economics. He then soon found his learning experience 'unsatisfactory', but, in retrospect, he expressed the experience of learning economics as 'enriching'. This is an unusual discovery because apparently this student has a higher preference for his personal development - more so than his peers.

Lastly, in the discussion of the concept of 'enrichment', I pointed out that the students had the idea that economics could broaden their education and help them to become 'well rounded' individuals so that their life experience could be enriched. However, I also found that this concept was soon replaced by the theory that the course was 'difficult' and became 'unsatisfactory' as the course progressed, when they realised that the approach of exams and the intensity of the workload could not sustain their theory of 'enrichment'.

Although economics contains concepts that are abstract and laws that are different from the natural sciences, and that seemingly are not obvious in our daily lives, from the account given by the students, it can nevertheless be an interesting subject if the lecturers could attract their attention, arouse their interest in the subject and inspire them to seek knowledge beyond the boundaries of the lecture notes. In short, good teaching is the lynchpin of a positive learning experience.

Learning and motivation

With regard to the students' approaches to study, I have in this project found that they do have a theory of surface and deep learning. Their ability to contrast memorizing with reading and practice with understanding and application give a hint that they are aware of the different approaches to learning.

Based on the earlier diagram found in section 4.6, below is a summary of the students' learning approaches:

- Group 1 – This group of students who could not overcome their learning difficulties took a pragmatic approach to overcome their obstacles to studying. Memorization, making more effort in practising tutorial questions and past examination questions are just some of the strategies students took, which sufficed for surface learning.
- Group 2 – All except for one student adopted a deep learning approach. In the earlier section 4.2.4, students gave three reasons why economics was interesting:

- It helped them to understand the world
- It was intellectually stimulating
- It was a complementary subject to their technical training.

Based on the types of motivation, the first and second points are related to intrinsic motivation whilst the third point is extrinsic motivation. I have found in this study, which supported the literature on motivation, that students who are intrinsically motivated are more inclined to adopt a deep learning approach whilst the surface learner is likely to be extrinsically motivated (Dweck, 1986). Hence those students who placed a high value on understanding the world and had found economics intellectually stimulating ended up feeling 'dissatisfied' when they found that the course did not meet their expectations. This group of students did not go on, like some of their peers, to adopt a 'pragmatic' approach to learning.

- Group 3 – Finally, this group of students clearly displayed their preference for deep learning. I have found that their need to have more time to read and understand the concepts, the lack of applicability of the theory to practice and their dislike for teaching that is geared towards examinations were on the one hand contributing factors to their feeling 'dissatisfied'; they also revealed their orientation towards deep learning.

In considering cultural differences in learning approaches, I have found that researchers may have been too eager to generalize memorization as surface learning. As mentioned in section 2.9, there is a difference between memorization with understanding (deep

learning) and memorization without much thinking (surface learning). In this study, I cannot draw conclusions as to whether the apparent surface learning that Group 1 students demonstrated was instead a form of deep learning in disguise. Nevertheless, I realise that there are two important factors in analyzing this issue: firstly, the degree to which students are influenced by a Confucian-heritage education; and secondly, the impact of a highly examination-oriented environment on students' learning approaches. This is beyond the scope of this thesis, but is an interesting area for future research.

4.6 Summary

I have in the literature review chapter highlighted four main strands of ideas that could be integrated with the findings from this study. They are listed below:

A. Teaching and Learning

As for the surface learning approach, this study supported findings by Ramsden (2003) that overloading of the syllabus tends to promote surface learning. In the earlier section, I found that the group 1 students supported the findings of Lumsden and Scott (1983) that students' objectives may not be to maximize their score but to maximize their probability of passing the examination by adopting the rote learning approach. The reason could perhaps be explained in the study by Svensson (1997) that students tend to skew their learning towards an atomistic approach (rote learning) when they had to deal with complex learning materials within an examination-oriented learning environment. Svensson further explains that memorizing with effort may achieve success in the short

run; however, when the materials become increasing complex failure is likely - which I found in Group 1 students.

As for the rest of the students, they seemed to be able to find their own meaning by combining the learned knowledge with their everyday experience - which according to Svensson (1997), is the deep learning approach. This group of students is perhaps better described by Biggs' achievement learning approach, where students are able to organize their time and knowledge well within a competitive environment. They are able to effortlessly switch between surface and deep learning approaches at appropriate intervals.

Finally, there is an area which is not found in the literature on economics education; this is in discovering students' responses to different types of knowledge, i.e., the technical knowledge that is so familiar to the students versus foreign knowledge like economics, which sometimes conflicts with what they know. Perkins (1999) would recommend implementing discussions in the classroom to allow students to understand the different perspectives. However, in this study I found that students responded in a somewhat similar way, by requiring more time to read, understand and reflect upon the new knowledge they have acquired. This is because they understand that this foreign knowledge cannot be transferred from their other technical knowledge, so that more effort is required from them.

B. Issues of content

Given that this is a one-semester course, the task of condensing the complex knowledge of economics into a coherent introductory economics course is daunting, and McConnell (1998) raised the issue of the long- or short-list debate. As I pointed out in chapter 2, the crux of the problem is in determining the right amount of theory and application in the course. At the operational level it is not just a philosophical issue but one that affects the course design.

There are two possible solutions to the problem. One is to develop a theoretical course that contains all the essential principles and concepts of economics - but which by doing so would ignore the application of theory and assume that the students would be able to draw their own conclusions from the knowledge gained. The other is to design an application-oriented course or one that involves case study in explaining the economics principles. From the responses of the students, I realised that the content mix of theory and application is not ideal, and that students preferred to have more application than theory exploration. However, if we were to fulfil their requests and meet our own objective of teaching them to think like economists, this would inevitably require the use of case studies. But the responses from the students found in Section 4.1.4. that the different teaching method of economics, i.e., more discussions, is part of their theory of 'difficulty' and would be an obstacle to integrating case studies in the course. A more critical discussion in this case would definitely place more pressure on the need for excellent teaching and communication skills from faculty members to lead and guide the

discussions. Nevertheless, given the cultural differences with the west and that assessment in this part of the world tends to continue to place high value on examination, the real tension is between curriculum design and assessment.

C. Issues of teaching methods

Firstly, I have noticed that much has been written about the non-interactive style of teaching in economics which is deemed undesirable in the world today, but Becker's (1997) discovery that lecturing could be a better method for the transmission of facts and concepts rather than the more interactive methods of case studies, problem-based learning or even the use of ICT, has perhaps given lecturers using traditional teaching methods an opportunity to stay complacent. In this study, although the mode of teaching remains traditional, I have found that the crux of maintaining the interest of the students in the subject is not in the methods of teaching, but the attitudes of the teachers themselves. Good teaching is pivotal - to arouse the interest of the students by way of stimulating their critical thinking and expanding their knowledge beyond their comfort zones. It should allow the students to see the applicability of the concepts to their daily lives and become more aware of the world around them. Hence, the use of the latest teaching methods is not the solution for good teaching. Too often we have been substituting them rather than using them as a tool with the purpose of enhancing teaching.

This study supported Elzinga's (1998) research that the lecturers' ability to communicate clearly is an important criterion for good teaching. In addition, I have also found from the students' accounts that an inspiring lecture is more important than one that covers all

the lecture slides within lecture time. Hence, the topic remains unknown if the lecturers do not have the passion to impart the knowledge to the students, and lack the ability to communicate the ideas clearly to them. Here I am influenced by the view of many economics lecturers that the primary objective of teaching economics is to be able to arouse the interest of the students and inspire them to think like economists, and therefore my preference for sustaining the students' theory of 'interest' is higher than for the theory of 'pragmatism'. Thus, I have found in this study that there are students who prefer to have lectures and tutorials that are closely related to the examinations. This is, in my opinion, a myopic view of learning, although some of the students may be victims of circumstance.

The research by Cohn et al (1995) raised two points: first, lecturers should not overload the amount of information presented within a lecture. In this study, the students mentioned that lecturers kept rushing from slide to slide without talking to them, and this appears to be engaging in bad practice from Cohn's view - but interestingly the students seemed to accept such practices because it appeared to be the norm in the university. Secondly, the claims that providing notes in advance would encourage students to be more attentive in class have proved to be an overstatement according to Cohn et al. Although they did not provide any reasons to support this, I have found in this study that such practices may have unconsciously placed more pressure on the lecturers to teach well because if the lecturers are uninspiring, the students become 'dissatisfied', hence the overstatement of the benefit.

D. Students' background and motivation

With regard to the students' background, only one student had completed 'A' level economics, and he was also one of the two repeating economics students in this study. His experience could perhaps be explained by Palmer (1979) - that high school economics experience may have caused more confusion or misled the students to be over-confident in the university so that they did not learn more in the university's introductory course. In this study, it was not the case of learning more or less but a false sense of confidence that resulted in less effort and poor results. I also understand from Myatt and Waddell (1990) that there is a decaying effect in the retention of high school economics knowledge. I have found that there was a lapse of four years, which perhaps explained his poor performance.

This contradicts the study by Tay (1994) who conducted his research in the Business School of the same university. In his study Tay found that students who had 'A' level economics did better than those who did not, but he did not provide grading information for these students, which is important because according to Anderson et al (1994), the better-performance students were those who obtained a grade of 76 percent (a Middle B) or better. In this study, I have found that, in general, the admission grade of the Business School is generally better than that of the Engineering School; hence, it is possible that the 'A' level grades of those students in Tay's study were better than those scored by the subjects of this study.

Tay's study was an important attempt to determine if some of the conclusions from the research in economics education, which is primarily conducted in the U.S.A, hold across cultural and institutional settings. However, an important question on cultural issues was left unanswered in his study - which is why the Chinese students outperformed the Malays and Indians. Tay implicitly pointed to the different academic standards between the mainstream school system and the religious schools in Singapore, but this is not convincing because the university's standardized admission criteria would rebut this claim.

The aim of this thesis is not to replicate the study by Tay but it is my intention to provide insights into what goes on in the minds of the students or to understand their learning process, as it is called by educationalists, to improve the level of teaching. The quantitative approach, the approach adopted by Tay, is able to provide a general framework but is lacking in substance to achieve understanding. Hence, this thesis is an attempt to provide a different perspective to the traditional way of understanding learning and teaching.

In terms of the students' motivation, I have found that they were highly motivated - which rejects the lecturers' hypothesis that the poor results are related to the students' lack of motivation. Based on Beaty's (1997) illustration of learning orientations, I found that the students had not only a clear orientation towards their learning in spite of the difficulties they encountered, but, more importantly, a high level of confidence in their present ability so that they were able to motivate themselves to achieve vocational,

academic and personal excellence. I have found that the students in this study who adopted a pragmatic approach towards learning are likely to be more extrinsically motivated in their personal orientation because of their concern with passing the course, and less likely to be affected by non-stimulating lectures, which is categorised as being extrinsically motivated in their academic orientation and to a lesser extent able to see the relevance of learning economics to their future career.

In addition, based on my understanding of Confucian-heritage education, students within this education system tend to associate failure with the lack of effort rather than ability. This further supports the findings of this study that many students, though not all, have a learning goal orientation and they tend to increase their level of effort in the face of difficulties. They are able to do so because, as Dweck (1986) explained, the students with learning goal orientation consider intelligence as malleable, and are more focused on the progress of learning rather than the outcome alone.

4.7 Conclusion

I mentioned at the beginning of this chapter that the learning experience of the students is complex, and I have in this chapter attempted to present the various types of experience and their interrelationships in a meaningful way. This is done by drawing on the work of educational researchers as well as economists. I have also identified in this study four areas to improve the learning experience of the students which I believe are the core concerns that need to be addressed – namely, the issues of workload, assessment,

teaching, and motivation of the lecturers. These issues will be discussed in the concluding chapter as an attempt to improve not only the learning experience of the students but the teaching experience of the teachers as well.

Chapter 5 Final analysis

At the beginning of this thesis, it was found that the engineering students were seemingly not motivated to learn economics - and it has always been assumed by the faculty members that this was a result of the low subject status economics has in the engineering school. I have found that the results could not support the claim and it was a pleasant surprise to discover that the students were not only highly motivated, but had a high level of confidence in their current ability to succeed - and in a few instances to avoid failure.

During the course of the interviews, it was also found that none of the students mentioned or implied that economics was a low status subject. No matter how dissatisfied they had been or how difficult they had found it to learn, their behaviour did not seem to suggest that the subject was inferior to their technical subjects. I have in the previous chapter revealed why some had found economics difficult to understand or unsatisfactory despite there being others who had found economics learning an interesting and enriching experience. These learning experiences are important because they have a far-reaching implication for how teaching can be improved within the department. In addition, these stories also complemented the research so far carried out by economists who primarily adopted quantitative approaches in this area which could not achieve the aim of understanding how students learn. Furthermore, educationists in the area of teaching and learning have yet to conduct studies focusing primarily on engineering students in learning economics and the discovery of the various students' theories of learning,

difficulty, interest, unsatisfactory, pragmatism and enrichment have provided important understanding of how engineering students perceive economics learning.

I have in the introductory chapter mentioned that the lecturers' view in this study is to support the data analysis by describing how teaching takes place in the classroom. The data collected will be analysed in the light of what the students have said. In this concluding chapter, I will first present the ideas of the faculty about students' learning which are categorised into four areas: namely, teaching, assessment, motivation and students' workload. Although these four issues are not a direct match with those of the students' perspective which were discussed in the previous chapter, a few similarities can be observed; but most importantly, the different perspectives between the students and the lecturers show how students' learning experience can be affected by lecturers' attitudes. The table below highlights the four issues from the two perspectives about learning and teaching.

Table 5.1: The different perspectives of learning

Students' perspective	Lecturers' perspective
Teaching and Learning: Students' different learning approaches	Teaching: Content issues in terms of finding the balance between current economic theories and application; technical teaching versus descriptive exploration
Content: Finding the balance between theory and	Assessment: Issues about continuous assessment

application	
Teaching methods: Students' idea of good teaching Pacing and intensity of each lecture	Students' workload: which resulted in the lack of reading by students
Background and Motivation: Previous knowledge of economics Students' motivational level	Motivation: Students are not motivated to learn and hence not making sufficient effort in learning

From the table above, it is clear that there are two issues that are important to the students but are not mentioned by the lecturers: teaching, and learning and teaching methods. On the other hand, assessment is an important issue from the lecturers' point of view, but it was not brought up by the students. Before further analysis is carried out, lecturers' views are presented and the implications of them discussed below, followed by a section to highlight several areas for future research, and finally, a conclusion to this study which includes the researcher's personal reflection.

5.1 Lecturers' perspective

The lecturers' views are collated from four interviews, and they are categorized according to the four issues mentioned above:

Issues of teaching

The main concern of the faculty is in the applicability of the course. In this study, the faculty members involved in the teaching of economics to engineering students showed a clear preference for the short-list approach. It is inevitable that each member of the

faculty has their individual ideas about what should be included in the syllabus, but most importantly there is an unspoken common understanding that it is necessary to look again at the syllabus. One of the lecturers has aptly pointed out the need to design a suitable syllabus that reflects the changes of time,

#3: In fact we are pre-occupied with topics which have been taught for many years, the way we were taught in the universities. Many events have taken place since then, but the way we teach economics remains the same. We need to reconsider the existing topics we are teaching.

However, the topics that should be included and how the course should be taught are issues that are not easily resolved. For instance, the following example showed the preference for teaching of an advanced macroeconomics model - the ISLM model to demonstrate the equilibrium state of the economy. This model has, however, been excluded from the contents of many Principles course textbooks and it has been the position taken by the faculty members to exclude it from the current syllabus:

#1: The ISLM model is actually pretty useful but it is a bit too technical. I have more problems with the consumption function and the utilities functions and I think it is better to retain ISLM than to go through consumption functions.

The term 'technical' perhaps has been over-used here and it means different things at different times to different people. In short, 'technicality' refers to the derivation of certain concepts or ideas, the use of mathematical equations and graphical presentations.

I have discovered in this study that the faculty members do have an idea of the objective of the course - which is to ensure that the engineering students understand the world with the knowledge taught in 12 weeks. They are, however, sceptical about whether this objective is achieved in the course currently.

#3: Globalization is an important topic that we have not dealt with explicitly. This is a growing phenomenon that cannot be neglected and when the students step out into the real world, they are faced with real issues like this which we did not prepare them for the changes in life.

One common theme that surfaced is the need to ensure that the course is more applicable to the students. Some practical examples were suggested during the interviews as to how local examples could be integrated into the course. For example,

#1: Why does the government want to regulate bus fares? Is our transport system a duopoly? How do we regulate monopoly in Singapore? These are the things we should be teaching the students instead of solving simultaneous equations which even I do not see the relevance of.

Here, the faculty member believed that spending more time on analyzing local problems was better than solving mathematical equations that seemed unrelated to the topic.

#3: We must bring the reality of the world to the class and help them to see the government's monetary and fiscal policy at work each day. The classes will not be mere testing of concepts and calculation.

Again, the faculty member expressed the need to reduce 'technicality' in terms of calculation in the course and for this to be replaced by practical examples that students could easily draw from the world around them.

However, in order to increase the application part of the course, changes to the sequence of teaching may be required.

#2: We need to bring in more examples from the world and in market structure, examples of companies in the world, introduce oligopoly and discuss its features and what is really happening in the world, then introduce the competitive state. Graphs and maths are tools to help us to achieve this.

Hence, the highest objective is to help students understand and interpret the happenings in the world. This is done by introducing examples from our daily lives so that the economic logic and the way economists derive their conclusions, a series of sequential deductions, is clearly presented to the students.

From the discussion in the previous chapter, the lack of applications is just one of several issues that had caused the negative learning experience. To increase the concepts' application would certainly increase the students' level of interest in the subject - but this is not sufficient to improve their learning experience. As I pointed out at the beginning of this chapter, two important areas - neglected from the lecturers' perspective - which are important to teaching are, first, the assessment of the lecturers' own teaching approach, and second, an understanding of teaching and learning approaches.

The responses from the faculty members seemed to support the findings of Lumsden and Scott (1983) that lecturers tend to underestimate the importance of classroom communication and enthusiasm in class. In this study, these areas were not mentioned at all during the interviews - which showed that they are not important enough to attract attention. Although I could not know for sure the reasons for the lack of pedagogical interest, one plausible explanation could be that none of the teaching staff had any formal training or knowledge of teaching except to do what their teachers had done to them. Hence a lack of understanding of the students' difficulties creates the gap that seems impossible to bridge. This is clearly expressed through the frustration of one lecturer.

#1: It depends on whether they want to see from our point of view or not. If they refuse, all concepts are difficult. If they refuse to see it our way, what can we do? Economics is so rational and logical.

In short, in terms of good teaching, there is a perspective incongruity between the students and faculty members.

Assessment

With regard to assessment, this is an issue that was not directly addressed by the students but was implied when they stated that the level of stress is high in the university – a matter which was discussed in the previous chapter. From the lecturers' perspective, assessment is considered to be an important issue affecting students' learning and their teaching, Two issues had been raised: firstly, the use of multiple-choice questions as a tool for assessment; and secondly, the rigid examination system consisting of continuous assessment and end of semester examinations. Here the faculty members recognised the shortcomings of MCQ, but from the examples below it is clear that given a resource constrained situation, efficiency precedes effectiveness in assessment.

#1: MCQ is probably the worst type of assessment possible. But the cohort is too huge; there is just no other way to do it. Ideally, we should get them to do some research and writing and present it in class, not MCQ.

#2: We don't have the manpower; if we do have sufficient amount of manpower then we can get them to do project work which is more time consuming for both students and us (consultation), and this will help the students to learn better.

Here, the common response is for the students to do a project, and this idea is further expanded by the lecturer below:

#3: There should be a seminar, students may pick a topic for presentation or some form of discussion about world issues. We could introduce the foundation, the basic concepts in our lectures, during the seminar, the students will be required to discuss the world events, really focusing to understand and interpret.

Although the assessment system is rigid, the one advantage is that it gets the students to revise their materials:

#2: Every time when it comes to a quiz then they get everything revised, that is good. They start to clarify ideas.

Hence, the students tend to accept the examination system, and the faculty members seemed pleased with the assessment, apart from the use of MCQ. The introduction of seminars would require, as a lecturer pointed out, a more concerted effort by all faculty members involved in the course.

#3: If we are going to do this seminar, it will require more communication between the lecturers and the tutors. This form of communication is lacking in the current structure, we do not hold regular meetings to discuss the syllabus and topics for teaching. There is no communication between the lecturers and the tutors.

Currently, the lack of communication has resulted in inconsistency in the way the course is taught by the lecturers and tutors.

#1: We can't get everyone to agree on everything, so in my small way, I would introduce topics that I think is important and teach it.

Generally, the issues on assessment are acceptable to the faculty members because, given the lack of resources, there seems to be no better alternative.

Motivation

The hypothesis at the beginning of this study - and a presumption of most faculty members - is that the students lack the motivation to learn. This could be found in the interviews with the faculty members, albeit implicitly,

#2: I think the students' self motivation is more important than us motivating them. They need to want to study for exam, the interest must come from them and they must see the usefulness.

Here, the motivation comes from the students and the teachers seemingly play a detached role in this motivation process.

#1: If the students come in with the pretext of just wanting to pass exam, then I will give that to them. I will go through the tutorial with them, I will clarify idea with them and they can go off.

Here, the faculty member took a practical approach towards teaching, and is implicitly indicating that the students would have to show more interest to learn before a more inspiring session took place.

It is clear from the previous chapter that the students' motivational level is high. Dweck (1986) showed that students who possessed a goal that was geared towards learning were motivated because they tended to take every opportunity for either success or failure as a learning experience, whilst students with performance-driven goals might try to avoid tasks if they did not have confidence in their present ability which is not evident in this study.

The students with performance goals in this study demonstrated a high level of motivation because of their confidence in their ability, so they believed that with more effort, they would be able to succeed. Hence, I have found the students in this study highly motivated - but I have also found that the students felt that the tutors and lecturers were not interested in teaching beyond the tutorial questions - which implicitly indicated the lack of motivation on the part of the lecturers/tutors.

I could not conclude in this study if the lack of enthusiasm or motivation from the faculty members was the cause or effect of the students' behaviour. Nevertheless, the uninspiring lessons and the presumption that the students are not interested in economics have perhaps led to the current state of boredom. This lack of motivation in teaching can perhaps be explained by the study of McConnell (1998) that the priority of economists is never on improving teaching, and in this study it is perhaps due to the lack of pedagogical understanding and interest.

Students' workload

Lastly, with regard to the issue of the overcrowded university content, the lecturers believed that, as a result, the students are not able to prepare well for examination,

#2: The students would come to see me one week before exam to clarify concepts. I should come earlier but I believed they have no time, they are always so busy; time is so tight for them.

Here, the faculty member believed that certain concepts take longer to appreciate and the students do not have the liberty to come earlier.

Another issue which I have learned from the students is the lack of time to read and understand; however, this constant struggle to find time to read can be misinterpreted by the faculty member.

#3: I noticed that the students are not reading the textbook, perhaps they do not want to buy the textbook because we do not cover all the topics in the text but whatever it is, they are not reading.

Here, the faculty member believed that students were not reading because they did not buy the textbook - which was a result of lecturers' selectivity in chapter/topic coverage so that not the entire book was useful. The issue of time constraint was not explicit from the faculty's point of view.

#2: I do encourage them to read, but I also realised that they don't seem to have the time. Where the time has gone to, I really don't know, I suspect is their heavy workload, only they know and they have to deal with it.

Here, the faculty member realised the students' problems but is not sure of the reason for their lack of reading.

This matter of students' workload is considered by the faculty member to be the primary cause of the students' lack of knowledge and understanding, but from the students' perspective, it was a result of a rather full curriculum at the university. The views presented above showed the lack of understanding of the faculty members, but this was perhaps because the learning processes of the students had never been revealed until now.

I have so far discussed the views of the faculty members, and it is clear that the two perspectives, those of the students and the faculty members, are not usually congruent. Hence in the next section, I will highlight ways to improve teaching methods with the aim of improving the students' learning experience.

5.2 Implications

I have in this study attempted to step into the world of the students to understand their learning experience, and highlighted four key areas: teaching and learning; content; teaching methods; and background and motivation - that had influenced the ways they learn or explained their learning behaviour. I then presented in the previous section the views of the faculty members about how students learn. In this section, I will present the recommendations and implications for improving teaching and learning on this course by integrating the two perspectives.

Students' workload

This is a macro-management issue that requires policy change at the institutional level - which is beyond the scope of this study. However, the increasing trend to equip the students with more skills resulting in a curriculum that is too full may have a negative long-term effect. The broad-based education system adopted by the University may prove to be theoretically and conceptually sound to give the students supposedly the right skills in a fast changing world; but in practice the inevitable outcome, as I have found in this

study, is an overloaded curriculum that restricts the students' freedom to explore and deepen their knowledge.

The constant struggle to find stability in a changing world tends to place too much emphasis on acquiring skills or transferable skills for industry. If the role of higher education is to supply a pool of critical beings, individuals with the capacity for critical thought, critical self-understanding and critical action that operates within the domains of knowledge, self and the world, then a curriculum that places high value on skills competence will inevitably fail to fulfil this aim of increasing individuals' capacity to form a deep understanding of the world around them. Barnett (1977) argues that this lopsided approach to critical thinking is likely to lead to rote learning and the over-emphasis on performance which is evident in this study. In short, the idea of higher education should be to fulfil the critical function of *"not simply holding up a mirror to society but by enabling society to see itself anew."* (Barnett, 1997, P 47) Hence, it is perhaps time to teach less of the 'how to' and more of the 'why' in university to bring the level of criticality beyond the level of critical thinking skills.

The learning experience of the students described in the previous chapter, their constant frustration in not finding the time to think and reflect upon the knowledge they have learned but just to read within the boundaries set by the faculty members, not just in economics but generally in all their other subjects, shows that the university has perhaps 'produced' cohorts of students that are examination-smart but has neglected the more general development of an educated person. This means one that is able to understand,

interpret and analyse problems with soundness - and most of all has the spirit to create new knowledge by engaging in research work.

As a result of a heavy academic curriculum, it seems that, in a normal lecture/tutorial setting, it is not likely that the students are able to explore beyond the boundaries of the textbook or lecture notes with the aim of passing the examination. As a result, it is not surprising to note that the university has 'produced' students who are more dependent on the teachers to provide model answers and explain the solutions as they progress in the university, as the stakes of passing the examination gets higher (Ng, 1994). Hence, can the technocrats who excel within such a highly structured environment adapt to a world that is constantly changing, is one concern that should not be ignored.

Assessment

The issue of assessment is one that requires a more concerted effort from the department. The examination-oriented system has always been considered a more objective way of assessing and ranking the students compared to subjective measures like submitting research projects or students' portfolios to reflect his/her learning process. These assessment methods are often deemed to be not good enough indicators because of the high element of subjectivity involved – not to mention the emphasis on the process of learning rather than the outcome. Given the influence of the CHE system, it is understandable that the faculty members may not be comfortable with this method of assessment - not on the grounds of competence but of inappropriateness in a cultural

sense. This is because Asian societies have a high level of the power-distance cultural dimension so that the presence of a dominant teacher-student relationship is strong. Given this cultural dimension, it is likely that both the faculty members and the students will be uncomfortable in this learning environment that places higher value on process than on outcome.

Although the faculty members in this study only highlighted the high level of commitment required to replace the tutorials with seminars, it is my hypothesis that when the change finally takes place, the problems and discomfort will start to emerge when they realise that it is not merely an increase in commitment in preparing the materials but a paradigm shift in dealing with a switch from focusing on educational outcome to educational processes.

On the other hand, the resistance from the students was more obvious in the study as shown below:

Recording #10: More discussion is bad news for me; let's not change the system at least I can rely on the technical part and getting a model answer from it.

Here the student showed his dislike for a system that is less objective perhaps because of his low threshold for ambiguity, which was found in Section 4.1.3. However, other students had also expressed their uneasy feeling about an education system that places too high a value in examination; in their own words, *"our entire future depends on that*

3-hour examination." As discussed earlier, both students and the faculty members as a result become too focused on examination, so that comments like *"The lecturers in this university do not teach beyond the notes or textbook"*, *"It becomes a moral responsibility for the tutors to complete the tutorial questions...and the lecturers tell us what to study"* and the practical approaches by the students found in Section 4.4 are undesirable outcomes of any education system. In fact, this is an unfortunate state which Ho (2001) found as a reality in CHE classrooms in Hong Kong and mainland China - and it is also evident in this study.

Lastly, I have found in this study that although the reason for MCQ assessment is a matter of achieving efficiency given the limited staffing resources and increasing student numbers, I believe that cultural influences play an important role as well, though not consciously to the minds of the faculty members.

Motivation

I have found in this study that good communication skills, enthusiasm and inspiration are highly valued traits from the students' perspective but insignificant from the lecturers' point of view. It is hence important to recognise the needs of the students; but I know real change can only take place if the faculty members are motivated to make the change themselves. The findings of Elzinga (1998) give us insight that good teaching requires hard work in terms of preparation and delivery of the course, to communicate well by presenting abstract concepts with clarity, and to reveal hidden logic with examples from our daily lives. However, in the long run, in order to sustain this high level of

commitment and motivation, one requires not only the endogenous factor but exogenous rewards as well. In other words, the issue of motivation of staff requires the input factor of both the staff and the institution.

The implication is to reassess the current reward system in higher education where performance and promotion are both highly dependent on content research output. Although the appraisal system includes the teaching component, the low weight allocated to it and the method of assessing good teaching are not encouraging factors for sustaining the motivation level in the long run. This would require a change of policy - to recognise and reward research/project work by staff in improving teaching and not to reduce staff's teaching assessment to mere statistical indices. This is especially true in this study where non-core-subject faculty members do not usually receive the deserved attention. McConnell (1998) suggested a paradigm shift in the rewards system to duly reward the faculty members with a passion for pedagogical research; it is perhaps timely not to ignore this issue because, as I have found in this study, good teaching is a rare phenomenon in higher education rather than the norm.

Teaching

In this study, important data were collected from both the students and the faculty members whose views at times supported each other. For instance, in this case the faculty members had shown their effort in incorporating local examples, which produced positive learning benefit - and the need for more application than theory was expressed by the students as crucial to their learning as well.

However, I have also realised that the faculty members' effort is largely individually driven and lacks consistency and continuity. Hence, it is essential at least to form communication channels between the faculty members involved in teaching the course. It is interesting to note from the interviews that the faculty members do have shared objectives, though not communicated, which could be further explored for the common good. For instance, good examples that could be applied in explaining a concept could be shared among staff, which could ultimately be integrated into the course so that the objective of bringing the world into the class with an Asian perspective is achieved.

There are other aspects of good teaching which I have discovered in this study. They are listed below:

- Avoidance of an overload of facts in lectures
- Clarity in explanation, especially of abstract concepts
- Illustration with real examples that could help the students to understand
- Graphs and mathematical equations as tools for explanation and not ends in themselves
- Inspiration of students to explore and seek knowledge beyond the text

These are achievable targets within the means of individual faculty members except for the last item, which requires a change in policy at an institutional level.

5.3 Further research

There are three main areas which require attention, and are areas for further research listed below:

- The participants in this study are from the various engineering schools and, as I have mentioned in the earlier chapters, it was difficult to encourage the *repeating students,* i.e., those taking the course for a second time, in economics to participate in this study. The lack of views from females requires further research to be conducted to understand their learning experience.

- The issue of assessment of learning is absent from this research, and this would be another area of research interest to understand how the students are affected or not by the assessment on the course. The learning theories showed us that in addition to issues I have discussed earlier, assessment is another important determinant for students to adopt a surface learning approach. Hence, it would be interesting to conduct further research in this area, since one of the assessment components is the use of MCQ.

- The impact of Confucian-heritage education on students' learning should be further explored. The current literature on teaching and learning has been concentrated on the experience of western students, and therefore the learning

experience of students influenced by Confucian-heritage education requires attention.

- Lastly, staff motivation and the effect of this on the learning experience of the students requires attention, especially since I have discovered that students' interest in the course is so closely related to the enthusiasm of the faculty members.

5.4 Conclusion

I have in this study attempted to understand the students' learning experience by using grounded theory. This research method has allowed me to collect abstract and complex data in allowing the students to tell their stories in an uninhibited way. The data analysis not only revealed the students' experience of learning economics; it also provided interesting discoveries, one of which was in the early hypothesis that economics is a low-status subject. As it turned out, the issue of low status perhaps reflects the views of the marginalised economics staff, vis-à-vis the engineering academic staff, rather than those of the students.

Finally, in this study, I was able to obtain a deeper understanding of the students' learning difficulties and frustrations, which are useful information for the improvement of teaching. For too long most faculty members have assumed that learning takes place

almost automatically in higher education, and that good teaching is presumably imbedded with the qualification of the professors. I have in this study found not only that learning difficulties are real in higher education, but that poor teaching is just as common. Hence through this study, I hope to increase the awareness of the need for research in teaching and learning in higher education.

The researcher's reflection

This study has benefited me in a very concrete way as an economics lecturer as well as a researcher. As an economics lecturer, I realise that I have become more sympathetic towards students who struggle constantly to understand certain concepts without much success. Knowledge from the literature of economics education enables me to predict, with a high level of accuracy, the problems students may encounter during the course, and to take steps to simplify the difficult concepts into manageable ones. Most importantly, I have become more sensitive to the needs of the students in my teaching and hence the greatest 'achievement' so far was allowing them to set the direction of the tutorial rather than this being dictated by the tutor, because different students respond differently to teaching methods. Therefore students who 'learn by doing' are given case studies to help their understanding, and those who enjoy discussions of current economic issues are given more thought-provoking questions to arouse their economic curiosity.

I have observed a higher level of engagement from the students when my personal opinions were expressed during these discussions - which I think is because it was a chance for the students to experience what it means to "think like an economist" through

my own expression of opinions, and in the course of it allowing them to reflect and form their own opinions, which may or may not be contradictory to my values. From the teaching point of view, it has been a challenging time to be constantly engaging the students without losing sight of the need to complete the syllabus and to prepare them for the examinations. Given the experience I have had with them, I am more confident and comfortable when varying my teaching methods according to the needs of the students in the future. It may perhaps sound strange, but I have learned more about economics as a teacher than when I was a student in the university.

It has also been a good learning experience, though painful, as a researcher. Given my economics training it was natural, I think, to gear the research towards the quantitative approach. As I soon found out that the method is inappropriate for research that aims to understand rather than quantify results, a qualitative method was subsequently chosen but with much apprehension in the beginning. Finally, when Grounded Theory was chosen as the method for this study, it was a test of my perseverance, which turned out to be a good learning experience. The problems and lessons I have learned regarding methods were discussed in Chapter 3.

In summary, I have found that any well-designed research project could stand the test of validity and reliability regardless of its traditions. I have also, as a result of realigning the research focus, learned more about students' learning theories, motivation and even issues about Chinese-Heritage education which are topics that do not usually cross my path. An important lesson I have learned during the course of research is to be able to

appreciate the meaning of 'ambiguity' when the students mentioned it during interviews -- because this was the exact feeling I had when learning a foreign knowledge.

In addition, I have also experienced a certain degree of uneasiness in managing the project with regard to the treatment of new ideas and updated literature reviews during the course of research, especially when nearing the completion of writing. I only discovered the issue of Chinese-Heritage education towards the tail-end of the writing, and have decided to include it despite the fact that it may make my data analysis chapter less appealing. I understand that it would have given more strength to the data analysis if I had been exploring the matter from the students' theories of motivation and the Chinese-Heritage education perspective. Nevertheless, the decision to include them is to throw light on the data I have collected and I know that further research will be needed to investigate the theories students, as well as the lecturers, hold about motivation and how they are influenced by a Chinese-Heritage education. Hence, this has been a rewarding experience, in learning to build up a logical and comprehensive research within a reasonable boundary and at the same time maintaining an open mind for the sake of the advancement of knowledge.

To conclude, this research project has not only helped me to be a better teacher but it has also provided an opportunity to apply and be comfortable with research methods that are not primarily forming equations and testing statistical data. I have learned that to understand what goes on in the minds of the students is an interesting and exciting process, and the best reward so far is in identifying an area of personal interest in my

future research direction - the impact of cultural influences on learning, which only emerged towards the end of this study.

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Appendix 1

Sample of Pilot Survey And Interview Guide

1. I have achieved my objectives set earlier in the course? Please give example.
2. It was clear to me what I was supposed to learn in this unit.
3. The topics seemed to follow each other in a way that made sense to me.
4. I could see the relevance of most of what we were taught in this unit.
5. The teaching encouraged me to rethink my understanding of some aspects of the economic problems in the world.
6. The unit encouraged me to relate what I learned to issues in the wider world.
7. The skill needed in this course is demanding.
8. Staff helped me to see how I am supposed to think and reach conclusion in the subject.
9. Staff tried to share their enthusiasm about the subject with us.
10. I have learned a lot in terms of knowledge and understanding about the topics covered.

7/12 Stage 1

Personal Background → don't have economy language skill. → Knew the importance of economics; adds value to whole life
No A level economics background

Interesting - a break from boring ... Exam - ... Lecture - ...
Challenging → very different, steep learning curve ... → more applicable and link to the world outside, helps me to learn better

Experience — Interesting + challenging; Worried + difficult

Reputation of this course was bad among ... students.

Textbook
- too different for me to understand
- ... easier because there were short cuts.

Tutorials
- do tutorials and understand the concept
- For MCQs why the other options are not chosen helps to clear the concept
- → Not reading ...

good strategy

Lectures
- Poor ... doesn't help me to learn
- I have to copy down in lectures and then try to understand later.
- Professors/lecturers to follow lecture notes closely.
- I need to clarify with my tutors.

Micro → understand the 4 ...
- easier but ... encounter many problems in the beginning

Macro
- more difficult
- more abstract
- link Macro and Micro together

same strategy but took a while more

Overcome
- 'Personalize' it and try to find the logic
- Write own summary
- ~~highly motivated~~ keep trying self to get interested
- understand that memory work doesn't ...

- Learning economy ... same ... need to understand ... concepts, then becomes easier later
- Borrow books and notes from seniors to try to make sense of it

→ Overcame the difficulties and is doing ... now. Will take one more ... of Econ in summer break

Everything prepares ... Exam. But Tute should not be used to pass exam but ... understanding

Tutorial Qs
- Structure Q is perhaps a way of linking the world's ... I can appreciate that as a result I'm doing ... now. More aware of what's happening in the world.

I = Interviewer

TB = Interviewee

Recording #2

I: Which school are you from?

TB: I am from Mechanical and Production Engineering, my major is in aeronautics.

I: Do you have "A" level economics?

TB: No, nothing at all. I was a polytechnic graduate and joined NTU.

I: Tell me your experience in learning economics in NTU?

TB: First of all, I learn economics because I don't have a choice. But before I came into the lesson, I was quite excited about it. Because when you read the news, you get to listen to a lot of things, I am a pure engineering student. I have no economics background at all and do not know what it is about. So when I started learning, it was interesting because I get to learn more about current affairs.

I: Do you think the lecturers have met your expectation?

TB: From my point of view, it gives me the concept of what is happening and from there I need to go and explore on my own. Because the principles of economics is just the beginning..... it gives me the whole picture of what it is about, it is very different from engineering. Economics is about phenomenon or an art.

I: Any example of things you discover it yourself?

TB: From my own experience, what I see about economics is, in school, all of you (lecturers) have put it until very technical, so students normally will take it because they have no choice, and they don't find the fun learning it. Economics is a very fun unit, it is very interesting subject. In the sense that, you.....I am impressed by economists who actually noticed a phenomenon and they find the theory to support it. This is very different from engineering. So when you all teach, you all are..... I feel that..... actually towards certain part, I've lost interest... because the lecturers have made it very technical may be because you all understand what economics is all about and then you all didn't understand how we feel about economics. Should try to make it fun and is fine with me

because I read other text, I forgot which text it was, but there is explanation of certain phenomenon, why it happens and from there explain by using the theory. Sometimes, theory must come at the right time, before we know anything, you tell us about x and y and graphs...what are these all about, it really has no applicable meaning.

I: Economics explains phenomenon, what about engineering?

TB: Engineering is the law of nature – what is happening. Economics wouldn't be there if there are no people. Economics can be linked to engineering in the sense that it is also about nature, but it has to happen only when there is human being (human is the centre piece of economics)... when there is vested interest, this is how I feel.

I: There is a lot of interdependence among the agents of the society.

TB: Right....

I: When you study economics, could you remember the difficult concepts you have to learn?

TB: I think....initially when the lecturers tried to teach, they used too many technical terms, this is how I feel. When you talked about fiscal policy, monetary policy...what is that?? Instead, they could put it in another manner, for instance, given this phenomenon, how do you then explain...the lecturers need to spice up the interest in the students, this is what I feel the lecturers should do.

I: So...in microeconomics.....

TB: Marginal theory....initially I was shocked by it.....I can't understand why (the use of) we study marginal theory. I find it very silly, but eventually I kind of use of more often in the sense that, when my girlfriend ask me "do you think this is nice?" Well, from marginal utility point of view, I think it doesn't fit my marginal utility, because I don't want to buy.

I: And you do understand the concept and you can use it in your daily life?

TB: Yes.

I: What is then the concept you most liked in microeconomics?

TB: Forgot.....but....marginal utility, the structure of the firms.....monopoly...

I: So you still remember some of these things?

TB: In fact I'm using these concepts for my report currently for HRM. So I can use this theory when I discuss about competition. If I were to set up such a company, monopoly, for instance, my discussion can be more focused.

I: it is a good thing?

TB: Yes....of course economics is very important. But at that time I was learning it, it was during the showing of the movie "The Beautiful Mind", and it helps me to appreciate it even more.

I: Were there any fear in learning economics in your case?

TB: not really.

I: You mentioned that the marginal utility concept was a little difficult, how did you overcome it?

TB: Read...and read. I need to spend a lot of time reading and understanding this subject. But in NTU, I find it frustrating because we are deprived of this time. Time is really the problem, I really need to read and just don't have the time to read, think and reflect when it is most needed. I have eight subjects in a semester. And I need a lot of this time to read up a lot of text to understand the concept to know what the lectures are talking about. In fact, I enjoyed reading but I don't have the time, you see.

I: How about engineering subjects, do you have to spend an equal amount of time reading it?

TB: Not really....may be I'm equipped with the necessary background, so I could understand directly....like this is discussing about 'stress'...

I: Do you find that coming to an economics class is a complete mindset change?

TB: In the beginning yes. Because in engineering I can easily use the law of physics to help me to understand and explain concepts, but in economics is different. As I said earlier, is all about human being.....you can't explain why....it just happened that way.....a phenomenon.

(Physical science explains engineering; but can't really explain economics concept)

I: and you overcome this by reading, is it just the required text?

TB: No, I cannot understand the required text honestly speaking.

I: Is it too difficult?

TB: This textbook written by two professors from the school, I think it was written to pass exam. It was so dry and boring and economics should be an interesting subject. I think they have summarized the content so much so that it is just not worth spending time to read it. It is too 'Singaporean'. It doesn't satisfy my curiosity in the subject.

I: Which is the text you bought?

TB: I didn't buy the book.

I: Did you have the chance to take a look at it?

TB: Yes, it is that thin green book. It is too exam orientated, I feel. I study economics for my interest....though I didn't get a good grade, but I enjoyed it. Because you are treating students to be exam oriented, just being exam smart so this is not the point.

I: So this book didn't allow you to explore different and other issues of economics?

TB: Yes.

I: So you read other texts from the library. So they are better because the authors tried to explain the scenarios and explain it?

TB: Yes.....the story behind everything....it satisfies my curiosity. In fact, they spiced up my curiosity with questions like have you wondered why? ...and who is who in economics?

I: In your two hours lecture, was it too heavy going? Was there time for you to think and to reflect on the concepts?

TB: I really think the lecture is just a place for extensive information loading. The lecturers here really just pouring out technical information from slides to slides, without any break and there were sometimes 8u0 slides in a 2 hour lectures. This is really too much to absorb and this is really not good enough and to tell you the truth, the lecturers have lost me; I am really 'turned off' by them as I just felt that they did not give me time to think and explore, I am just there to receive a large amount of knowledge which I don't know how to use it which is not good enough. And in the afternoon, I am so tired....plus most of the time I don't understand anyway. So at the end of the day, I skipped all the lecturers.

I: How about the tutorials? The pre-set questions do you think they helped you to understand economics better?

TB: Hmmm.....not really. It gives me an idea of how the lecturers are going to set the exam questions, it tells me how I am going to prepare myself for this exam. But if you were to ask me ....it is just like you tell me the answer and then I vomit out the answer to you. If I am a person who just wants to pass the exam, then it works. But if you want me to apply the concept.....I don't know. When I could overcome the initial difficulties of absorbing too much technical knowledge, and start to relate that to the current affairs with the help of my tutor who encourages debate and discussion in her class, economics becomes very interesting to me. I remember my tutor did a lot of debates over current affairs....how we tried to apply the concepts....and in fact that was how I learned economics. I started to enjoy it more and don't see new concepts as difficult but willing to spend time reading about it.

I: So in your case, you learn not just from doing the tutorial questions but through what is happening in the world.

TB: Yes, current affairs....yes.

I: So can I say that economics is a very applicable subject?

TB: Yes...it is current affairs you see.

I: You have mentioned economic concepts are very technical, is it theoretical as well?

TB: I don't understand why people feel this way...I don't get it. Because I will ask this question of 'Why it happens this way?' Then how will it affect the economy? Economics is the other way round of engineering. Engineering is this is the law of physics, and through the law of physics we invent something. But in economics, it is how human beings behave, and from their behaviour apply this particular theory. We invent this theory to apply to this situation. And in engineering is...this theory is this theory...you use this theory to apply to this. It is different. Of course you can apply it.

I: Why do you think someone may it difficult to apply economics concept?

TB: Then, I think it is about two things. Did I as a lecturer taught him well? Gave him a good introduction. And if I did, and he still has no interest...then too bad.

I: Is your motivation to learn just to pass exam?

TB: No...well, in the beginning I have no choice but to take economics, but when it comes to the semester I have to take economics I was quite excited about it. Because before then I felt like being crippled, there were a lot of things in the news which I don't

understand. So my motivation is because I want to understand more about stock and share, the market, and I was hoping that this course will help me to understand these things.

I: Are there any other problems in learning?

TB: Time is really the problem. I need to really read a lot .....for example about a phenomenon and how the economists use the theory to explain this.....Time is really the problem, sometimes there are makeup lessons, but I really need is the time to think and reflect. At that time I had 8 subjects.

I: How would you advice a junior?

TB: I don' like to teach them how to pass.

I: How to learn?

TB: Hmmmm.....first of all you must have the interest in it.....that's what I always tell others. Of course you have to pass, to pass an exam and to learn a subject is different. To pass an exam, you just need to know what kind of questions will come out in the examination. Get the past year papers and read it up; then plan your strategy and plan your time, that is being exam smart. To study economics is a lot of strategy. All you need to do is to get the past year papers and read them, do it over and over again and memorize the answers. By reading through the old exam papers, it gives me an indication of the difficulties of the exam and then the tutorial questions tell me the score of the exam. So it is a lot of strategy as to how to allocate my time and effort; I don't have to study everything in the syllabus, just the selective ones. I know learning a subject should read everything but there is no time, so for now passing exam is more important. I will appreciate the tutors to help us pass exam. But ff you ask me how to learn economics the right way, and then of course firstly you must get updated with current affairs. Ask yourself why these things happened? And ask yourself when I learn this concept can I explain it, does it apply to here? Does it answer the question? The direction is different.

I: Do you have a study group in learning economics?

TB: No. I did it on my own and close friends. I email my brother, to check concepts. When the government implements a policy, I will use based on my economics learning and concept, try to explain what possible impacts it would have to the economy. I think economics is quite an open-ended subject. So, can still argue on different point of views.

I: How can we make it more interesting, reduce technicality?

TB: Systematically, plan the scenario, spiced up with questions – why? Have you thought of that? In the newspaper politician implemented something, how would it affect the economy. Then, the theory to support.

I: So in macroeconomics, anything that strikes as important that you have learned?

TB: In macroeconomics, I feel that this is where I gauge and judge how well my government is performing. When I cast my vote, I want to know whether this government is competent or not. We are going to be graduates; we need to think about it. Then, we need to know how well the government handles the economy. This is when macro is important and comes in, using fiscal policy and monetary policy. The subject really gets me to think about how well our government is handling the economy. You know using the fiscal and monetary policy option, the different point of views, especially in the recent recession I started to think for myself and not just being 'led' by the government. It really opens up my horizon and gets me thinking like never before. It is stimulating to the mind.

I: Can you see the purpose of engineering students to study economics?

TB: Of course, it is for everyone. In fact at home I tell my mom, who is uneducated, I could explain to government policies to her, from the knowledge I gain from economics. Everyone should study economics. You all shouldn't set rules like economics is for this level of students; no economics should be for everyone. As long as you can explain well to them, economics is about the world.

I: Your learning experience is quite good? A nightmare? Difficult?

TB: For me, the learning never stops, it happens to be the beginning, it is still on going and I am still learning, given time to read.

I: So, it opens up your horizon, and especially as a civil citizen, economics is necessary...

TB: Yes, right.

Recording #3 – same interviewee

I: shifting of curves, was it a problem?

TB: It is not a problem

I: In MPE, you study the patterns of curves, does that kind of knowledge gets in the way to learn economics?

TB: Right.....I take it as a new phenomenon. Someone has discovered that when this happens, the curve will shift from here to there, and when that happens, like fiscal policy will shift the AD curves to the right. I try to ask myself why I must shift the curve. Then I somehow, discovered reasons behind it. For exam, have no choice but to memories it. So, that's how I understand. But don't know if it is right.

I: You have not experienced a bottleneck situation where there is no breakthrough in understanding the concept.

TB: At that level no.

Recording #15

I: Where are you from?

DER: I'm from the Philippines, this is my third year in Singapore and I am in the 2nd year in EEE. I studied economics at NIE 2 years ago, so it was easy. I went to NIE for the Bridging programme that is for the foreigners without the GCE'A' levels; and I did economics back home in the Philippines.

I: So how is your experience in learning economics in NTU?

DER: I think the course is really basic, in the sense that compared to what is taught in NIE and in Philippines. We discussed more in-depth theories and not merely covering through the basic concepts, there are much more discussions. In the sense that back home we do discuss more on macroeconomics because it is needed; we need to know why more about the macro policies for the country. I can say that I had a good foundation in economics and G240 is really a breeze. This course is too elementary; it is just about concepts and some simple calculation and nothing else, should really tell me more about the real issues in the world and to analyze stuff.

I: G240 will be the third time you are studying the foundation of economics.

DER: Yes, really doing it three times.

I: You have no problems learning the concepts.

DER: Yes, not a problem.

I: Do you find the text for G240 too simple?

DER: Yes, too simple. I am familiar with books I used at home like Samuelson. I am more familiar with his style and the Parkin book is quite simple. But many of my friends find economics difficult because they did not take it in JC and they can't appreciate economics itself. They don't have a good background in understanding, they are lost. I think having economics in a 2nd year in the engineering course is very useful as it shows us how it is like in the outside world. It is applicable. Personally I think it will be applicable if we are going to buy stocks for example, I can see the relevance of things.

I: Do you think G240 is better if it is introduced after the IA?

DER: The thing is I could see the usefulness of this subject. I think is if a student could see the usefulness of the subject, it doesn't matter when it is introduced. If one really cannot see the usefulness, it will remain as a burden for me, just like another subject to study. Perhaps, a virtual game to show us how economics work. I guess because I do understand it and have done it before, it is okay.

I: Do you find G240 is too technical?

DER: No. It is the least technical subject. The highest level of math in G240 is derivatives.

I: Was it a burden we have added on to your engineering subjects?

DER: No, I guess because I am very comfortable with the subject.

I: Do you need to have a mindset change when you walk into a G240 class?

DER: Not really. Because I always find that being critical is a very important tool in engineering as well. So a change of mindset may be in the initial stage, but as I go on to do other subjects, we do have to use the common skills like analytical and critical skills in the other subjects as well. The only difference is economics is simple (to me) and it is based on real life. There is still research and experiment in that sense in economics, so it is just like any science subjects, I feel.

I: Do you think that economics require too much reading?

DER: Yes, I think it is true. There are a lot of readings in this course which is different from others. Not that those other subjects do not require reading, it is that the materials are often repeated as we move on, so it sort of reduces the actual time spent. The same theories and laws are used again and again, economics is different. This is one requirement actually put people off guard. I am more comfortable as I have done it before, but I can imagine the amount of effort my peers have to put in when studying economics. It is just like material science which requires a lot of readings. But economics takes a greater effort to remember and understand because it requires more than just copying solutions in tutorials and go home to read. I can do that for engineering subjects, but not for economics.

I: Do you think the amount of readings is much more than your core engineering subjects?

DER: To be fair, the core EEE subjects require readings as well. But the thing is, it is often repeated as we move on, so it sort of reduces the actual time spent. A lot of law is based on the old theories we have learned earlier, so it is like an addition. And since we are doing the few subjects at the same time, then the theories and what we read can be used again and again. G240 is different; it is about understanding and application. Subjects like mathematics and power engineering or most engineering subjects, is lots of practice and practice. I just need to keep on practicing on the sums to understand, this is not the case for economics, here is read and understand.

I: What is your experience in attending G240 classes?

DER: Yes, it is positive. I sort of have an edge, or I have learned this subject before and I can do better. I don't have to spend so much time learning it so it is an advantage to me.

I: Do you find G240 is a good break from your normal technical subjects?

DER: Yes, it is indeed a very good break. Basically it doesn't require that much formulae, not that much of technical calculation. It is a good break because it is the class where it is related to what is going on in the world and in the country. I get to know why this is happening and what the consequences of doing something else are. It is a refreshing change in a sense. So I see this as an experience to understand things around me better; it is really an opportunity to see things differently from my normal training, so it is an enriching experience because it is a more well-rounded education. I know it when we are made to study this subject.

I: Do you study economics to pass exam?

DER: One is to pass exam, which is very important to me. Another is trying to know the real world, a transition to the business world. I like to in the future to go into business, so economics serves as a background, a transition for me to go into business later on. Motivation in the sense in this course, I would say is not very high. I think is because I already know the subject. I would think people with higher motivation would push them to do well, but in my case as I know the subject and G240 is really very basic, I didn't spend much time in it. But it doesn't mean that I don't like the subject. Even then, I feel that economics is a course that brings the world into the classroom.

I: Since you have done economics, and you know that the syllabus is scaled down in G240. Do you think economics should be taught in the way that it should be taught and

not to cater for the needs of engineering students? In the sense that some people felt that G240 needs to be less technical, or there should be less or more theories.

DER: Too technical? I thought subject like Power is technical. Economics is not a technical subject, just like communication skills.

I: So what does technical mean to you?

DER: I mean it is much more than what we are doing, perhaps formulating equations and solving equations which is not the case in G240. I'm just wondering if sometimes questions are posted up and just allowing students to find their answers, in whatever way may be easier. Then it becomes a project so that the course is not so exam based. That's why I find it refreshing in these business subjects which I am doing now. I find it quite refreshing, and I don't feel like a chore to go to another tutorial. Seminar type format is quite useful. The current way may not be the most effective; people just go to tutorials and just copy from the tutors or other people. Let the people think by having seminar and these ideas and knowledge will be embedded into their minds.

I: Do you think the tutorial questions are designed in such a way helping students to passing exam or to learn economics?

DER: I think yes it is to passing exam. Most people take the view that tutorial solutions are preparing for exam. We tend to read before exam and will forget after exam. We are too exam-oriented.

I: Do you think we have made our course attractive?

DER: I am attracted to doing a business minor because I want to make money, and I am now investing in stocks and learning to do that. I think the financial investment course I am doing now really gives us the experience in investment. We are given money to invest and we need to be accountable to how we spent those money. So in that sense it is a real life situation, which I think is attractive and I will tell my friends about it. So to make the course attractive I think the main method is by word of mouth, students who had done it and found it interesting. So if there is a new G240, make it more student-based, instead of exam-based and textbook-based, and then it will really make it more attractive to students.

I: How can you sum up your experience in learning economics?

DER: I think learning economics is like learning how to walk. It is a first step in life; you need to know something somehow, and if you want a real education, you need to learn economics. I know how a budget cut is going to affect me, how changes in interest rate is going to affect my savings etc. So in that sense, as long as we are living in this world, we will not get out of the realm of economics. So I feel that what I learn is the basic and there is more in life. Economics is everywhere; there is no way to get out of it.

I: So you don't find it as a waste of time.

DER: No, definitely not. I don't think it is a waste of time, in fact I see it as an opportunity. Perhaps for others they will view it as a burden, a problem. Some have understanding difficulties like appreciating this course, then I think it is helping them to see the practicality of this course.

I: So there is a real interest in you.

DER: Yes, I think it just flows out quite easily from me. I will be motivated to do this and that without having to feel being forced to. After the tutorials, I can still make some notes and don't feel pressurizing at all. Sometimes the class dynamics is important, it encourages one another.

I: So economics is important to business students, as well as engineering students.

DER: I think economics is very important for every one. No one should be exempted, in fact the works of economics is already out there, we just need to learn it better. As to how to make the market works better, how to ensure policy works etc.

I: What advice would you give to new students?

DER: To bring examples into the concepts. Must see the practicality of the concepts. So is the understanding of concepts. Encourage them to read, to reason it out.

I: Have you encountered any difficulties in G240 or economics?

DER: Well, I think is using the right term, and to express it out. After all I am an engineering student. Most of the time, I already know the concepts and ideas, but I do forget. But, just reading a while, it comes back. The exam back home is quite different from here; the questions are usually a case study so not really a concept checking. So, sometimes I find that I need to be specific in answering the questions here.

I: Any other experience to share about G240?

DER: I think the lecturers are not quite good, especially the last one. I think the lecturers do not attempt to make themselves clear to the students. So I know lots of us do not go to lectures and don't attend lectures. In fact this is true in NTU in general. Instead of learning in lectures, we just try to read the book ourselves. I believe that face-to-face learning is still important. And tutorial questions are there to help us to pass exam and students do have that mentality to get the solutions and read and sit for exam. After that just forget about it. If the goal is to learn economics, then it got to be more student-centric rather than information-centric.

The reference books are okay. G240 is teaching engineering students who are not going to be economists, so I think the book is simple enough for that purpose. The only problem I think is the student, understanding and memorizing the topics. Many people memorize economics but only a few remember. It takes a greater effort to remember and understand, as it requires more than just copying solutions in tutorials and go home and read. If G240 is more interesting and a good experience, I am sure more people will remember the subject.

I: Do you use the same method of learning in all your subjects?

DER: In terms of practicing on a particular subject like math, economics will be quite different. There are subjects where the old method of practice makes perfect still counts, and economics is more of an understanding subject. So a different method.

I: What are the other subjects that use the same method of learning as economics?

DER: That will be communication skills, material science though with a bit of calculation, life sciences and the business subjects. So for these subjects, understanding the concepts is very important, after that I will try to think of its practicality, applying it to real life. I can see it everyday. So this method works for me. As for subjects like math, Power engineering and the engineering subjects, it is lots of practice and practice. Keep solving the sums to understand and more practice.

I: Do you tend to spend your time equally on all subjects?

DER: The most important ones will be the EEE core subjects. I put equal emphasis on all my subjects. They are all the same to me, regardless of their status, whether is an elective, core or minor. But having said that, I personally prefer finance to marketing, so when I

completed finance, it is likely that I will still remember what I've learned in finance, I will constantly check the interest rate, stock prices or things like that even when I have completed the course. As for marketing, I guess I will use what I've learned when I have my own business later on in life.

Recording #12

DA: I'm from SAJC and am now in school of EEE. I don't have economics background. When I came here and learned that I need to do economics, I was a little bit shock as I learned from my JC friends; it was supposed to be hard. When I took this subject, the starting part was alright, I could still understand, but when I reached the macro parts, I could see stars around me.

I: You must be a pure science student in JC. Did you take further math in "A" level?

DA: No, just the basic math. I took triple science subjects.

I: With your 'A' level basic math, does it help in learning economics?

DA: Actually no. I don't think math is the key to economics. I think I learn economics from logical thinking. So, if I can't remember some theories, I like to refer it into some common things I see around me. Like price ceiling, imagine that if there is an equilibrium point which is the ceiling and if I am above the ceiling, I will be under the sun then I wouldn't be happy. You know simple things like this. I tend to refer to normal human cases to remember stuff like that. So, I think that is the reason why I like the initial part in economics, the micro part because I can refer to many things in my daily life. But the macro part, involves some formula like the GDP things, it is too overwhelming and I can't use my method to make sense, until very much later into the course.

I: Do you recall any particular concept which you struggled with when you were learning micro?

DA: The initial part, because they are all so new to me and I have not found my method. So the first tutorial was quite tough, then when I got used to it, then it is okay. All these concepts are all so new to me and I have not found my own method to study this, I need time to grasp the basic concepts and need time to read and think because it is very different from my other subjects. So I think the most difficult part perhaps is the 4 markets, I really couldn't see the sense of it. Until someone suggested to me to summarize all the 4 markets on a piece of paper to see the whole picture and it works. In fact I use the same method to coach one of my junior who is struggling with economics. I told them to do the summary with similarity and differences.

I: Are there examples in your summary?

DA: No, kind to keep it as precise as possible. So the examples I wrote it somewhere else and the 'relationship' or little things I use to help myself to remember, I wrote it down.

I: From your experience, the first few tutorials must be quite overwhelming.

DA: I think overwhelming is an understatement.

I: How did you overcome it?

DA: I just keep telling myself to have an interest in this subject. It seems to work for me but not my friends. I think how to overcome it is actually.....must really understand the underlying concepts, even if you memorize it you can't apply it. So this is what I keep telling myself. I borrowed some books and notes from my senior who had done the course, and grab hold of them until I finally understand what the underlying concepts are. Then I can do on my own, sort of then do I start to appreciate the subject.

I: So that must be a lot of hard work?

DA: Yeah, it was about two weeks of hard work.

I: Was the textbook difficult for you to read?

DA: The textbook yes. In fact I didn't use the recommend text I use the book my JC friend used. Because there were a lot of notes written alongside that text, and there are a lot of short cuts written. So it is very easy for me to understand.

I: Do you have the chance to read the required text?

DA: After a few weeks, I stopped. I think because I have read my friend's book so maybe the required text is not that appealing anymore. Well, I think the lecture notes itself is quite sufficient.

I: What other advice would you give your friend regarding how to learn economics?

DA: Do the tutorials. Since our present tutorials is in terms on mcq, so I will recommend my friends to look not only on getting the right answer, but to look further as to why the other choices are not the answer and if those choices are right, what should be change. This is how I learn and I recommend my friends. Not only do the tutorials but do it with understanding, understanding the ideas.

I: How about reading the textbook?

DA: I myself don't like it. If they need to then perhaps they should. I got a friend who doesn't have economics background and do not have friends who can help him, so what

he did was to buy the textbook and read. He told me it is okay, and he managed to gain the knowledge as well. So my study method is different. So some may like and need to read the textbook.

I: As a Singaporean do you find the language of the textbook too difficult?

DA: A little bit tough. My language skill is not strong; I find it a little bit tough.

I: During the lectures, do you have enough time to reflect on the concepts learn or were just absorbing ideas?

DA: You see some lecturers just stand down there and throw ideas at us, they don't care whether we are following or not. We just have to take down everything. It is as good as we go there copy notes and go home read the notes. But some really, explain well with good examples that I can relate to.

I: Does giving examples and relating the lectures to the lecture notes, follow can't closely in that sense, does it help you in your learning?

DA: It helps a lot. If I am just being thrown with ideas, I could simply take the textbook and learn at home, why I should sit in lectures. The reason why I attend lectures is when I read on my own and I don't understand, I attend lecture hopefully the lecturer would explain those things. If not after the lecture, I will look for lecturers. So I read ahead of lecture. But I still face some lecturers just come in and throw ideas, like really not teaching, even after 50 minutes I don't know where to begin asking questions. It sometimes really kills my enthusiasm.

I: So what did you do?

DA: Well, my tutor actually suffers. I clarify with my tutor. I think during tutorials a lot of questions are thrown to tutors even after we have gone through the tutorials, students stayed back to ask the tutors regarding questions from the lectures. In that sense, the lectures were not clear. Of course this does not happen in all tutorials. Only particular tutorials when particular lecturers did not explain well; for those who lecture well, the tutorials were smooth and well.

I: Do you find the tutorial questions helpful in helping you to learn economics?

DA: Depends. Using the mcq as an example, it will really depend on how you treat it. If you just by merely choosing a question without looking further into why the other choices are not right, then perhaps it doesn't do much. In that sense I may know that the

answer is A but I don't know why it is not B, C or D. During the tutorials if the time perhaps, tutor should tell us why the other choices are not right, and if we go further we could discuss what must change to make B the right answer. It will be very helpful.

I: This is the way you learn. Are the structure questions challenging enough? Or speaks of the real world?

DA: Yes, sort of. I am taking marketing now; I guess it gives me a basic concept and idea of the real world.

I: Do you find the tutorial questions prepare you for the exam?

DA: I don't think my Quiz 2 was very hard. To me I think everything prepares me for the exam. The questions are there but sometimes the exam format may change. Sometimes format does change and it throws students off balance. But personally I feel that tutorials should not be solely used for preparing exam, but subject understanding. I think we students have made tutors feel like it is their duty to give us the solutions and we just sit in tutorials to wait for the answers. I think the economic tutor gave up and gave us the answers.

I: So it should help you to learn economics and not just to pass exam.

DA: Yes.

I: Did you have any expectation before you took the course?

DA: The first impression was economics is very difficult. Not expectation, it was the reputation of economics among engineering students; it is a very difficult subject to do well. I guess now that I have done the course, I could understand why there are price changes and it does make sense. I guess there wasn't much expectation in terms of things I want to learn in this course, I was more worried than anything.

I: You have not really mentioned macroeconomics, why do you think it is tough?

DA: May be I need to think in a very big picture. For micro I can see goods, I can see price, a physical idea which I can see and relate to. GDP, the initial idea of GDP is not very physical for me to see and touch, I only see stars. It is too abstract. After learning so much about macro, I tend to bring micro and macro together and find it difficult to link up the two concepts together.

I: Was it a mindset change to learn such an abstract concept?

DA: Not exactly. May be I have found macro difficult is because I am not used to this thing. There are so many readings and my language skill is not strong, I find it tough to go through all the required readings. Extra time and effort is needed, I need more time to read and understand the concepts. I think my learning style is quite flexible. EEE is a lot of technical stuff, when you come down to the basic concepts, it is difficult to learn those basic concepts, once you have overcome it, and everything else is easy. I take the same view in learning economics; I see that once I can grasp the basic concepts, everything else should be okay.

I: Did you gain interest during the course of learning?

DA: Oh yes, that is why I am taking Marketing subject now. It inspires me or open up my thinking to look into the business side of things, not just the technical aspect of engineering. It is inspiring, if I have the time, I might do another unit of economics. As of now the core EEE subjects are really difficult, if economics is offered during the summer break as a general elective, yes I will come back for it.

I: Do you think all engineering students should do economics as a core subject?

DA: I think it is important to know how the business world works even if you are an engineer. It is good to have this basic knowledge of how the world works. So to me, it is not a chore to learn economics and it is not a waste of time in that sense. It is going to be of some use later in my life. When I go out to work, when people tells me that the market is like that, I will at least understand what is going on. I will be able to make my own decision. It adds value rather than causing a burden. Economics gives me the basic knowledge and the tools to analyze how the world works around me. So it is quite interesting to me. Although it was very difficult in the beginning, I kept telling myself to have an interest and then slowly the concepts seem to be able to explain the world issues around me.

I: Do you think there are many who think like you?

DA: No. Most of my friends do not think so. My junior is having a hard time with the economics course now, she doesn't understand anything. To be exact she doesn't understand any of the subjects she is taking this semester.

I: What do you think is the biggest turn off for economics?

DA: I think you need to inspire the students. Like in the lectures you must not just throw the ideas to us, don't care whether we learn, follow or not. Tutorials are inspiring with discussion. I think economics tutorial is most inspiring when it comes with discussion. It is different from other engineering subjects or even mathematics. I mean for mathematics we need to solve the equation and so we just copy from the tutor.

I: You mentioned earlier that macro was harder for you; did you use the same method of reading and asking friends to get you through?

DA: Not really. Because by then, I am quite seasoned and some of my friends told me that you can still relate macro concepts to micro. So GDP is like a price and kind of link them up and it works for me. Macro is many times of micro. Anyway, I have found macro difficult because I am not used to these things, not really aware of those stuff, so I find it very difficult to grasp the basic concepts, they are just too abstract.

I: How would you rate your experience in learning economics?

DA: Interest and challenging. Interesting because for engineering, our subjects are actually quite boring, we don't need to analyze in that sense. So it is interesting as it requires me to analyze the situation and the market. Challenging is because this is really different from what I am used to all these while. Another interest thing about economics is even when the answer is for instance A, but your argument is strong enough; we can still challenge the answer. The answer is not exactly fixed, so it trains my argument skill. Overall, it is quite fun to learn economics. My friends always find me weird to like economics.

I think the learning curve in the beginning was steep, so I feel that the course should not be too technical. Especially for those without the background, more technical stuff will really turn me off. More examples of what is going on in the outside world are sometimes what I need to see, not the mere technical concept.

Recording #10

I: Can you tell me your name and school you are from?

Chua: I'm Soon Heng and I am from the school of MPE, 2nd year.

I: How has it been for you in learning economics?

Chua: Being someone who has taken economics in 'A' level, supposedly, there should be a foundation for me to fall on. So, it would not be a very difficult thing for me to learn. Especially that the syllabus is so much lesser than the 'A' levels. But unfortunately, after one year haven't touched economics and having to do economics in the 2nd year, it will be quite hard in the sense that I have to think through what I have learned before. I suppose that most of the engineering students who have came into engineering; we tend to focus on the math and the sciences. Humanities and language are not our strength.

I: Personally, do you face conceptual problems?

Chua: I don't think so but I think is in the understanding of the questions when it comes to the exam. But when it is the lecture or the tutorials, the concepts are very similar to 'A' levels, no changes in that sense. When it comes to demand and supply, the concept is the same but probably it will be the kind of questions that are raised, what is needed from the questions, perhaps require one to think more in how to use the concepts learned and the things that we know to answer the question. Other than that, syllabus wise what is taught in the 'A' level is very similar to what is taught here.

I: So your problem will be applying the concepts you know to the question.

Chua: Yes, application.

I: With your 'A' level background, do you think you are equipped to do this?

Chua: To be honest despite that we learn more in 'A' level, I don't think so. Basically what we learned in 'A' or 'O' levels are things to equip us to sit for the GCE exams and not really into the practical world. So to say that if you want to apply economics in a higher level, into practical application, I suppose we have to take economics at a higher level, at the university level and not just like what we do here in engineering course, taking it just as a general unit. You probably need to go to humanities to take economics at a more in-depth level. Probably that will be sufficed for us to really apply economics. Other than that, the information we have is just to cater for examination. I think, we Singapore students are exam smart, we study for the sake of getting a grade and not really study to learn in that sense that we might get to use it or apply it to our lives later.

I: So you study with an aim to pass exam?

Chua: I used to take 4'A' level papers, physics, economics, math C and Further Math. But I didn't do well in my Further Math, so I was forced to drop the subject and I had no other choice but to continue to do economics. Actually, I would prefer to do F Math. To be frank, I study just to pass exam. Because economics is just a general course, it is not a school specific subject. The G subjects are the core and the whole cohort has to take, in my case I am in MPE, so the M subjects will be school specific core subjects which is what we are here to learn. From what I know, when I first came, economics cease to offer in year 1 and starts to offer it in year 2 instead; we have a hard time remembering what we've learned in 'A' level. I think the year one subject is supposed to be quite related to perhaps 'A' level, a foundation year before we go on to do our specialization.

I: So your aim for G240 is just to pass it?

Chua: Yes, I think the main concern is whether I can pass the subject in order to go on rather than thinking whether how I can apply these concepts. Last semester when I was also taking G240, those who have not done economics will be very worried whether they would pass the subjects rather concern with learning. Whilst those who have done the subjects in 'A' level were pretty complacent yet we were aiming for grade A or B because it is easy. But in the end, we were very disappointed with the results, we had lower grades. We were disappointed. Those who have not done economics before tried to aim for a pass whilst those who have done economics before aimed for A or B, so it is all about grades. I never or we never talk about whether we can apply the knowledge from G240 in our future careers, or is there any conjunction with the engineering subjects we are taking.

I: How do you go about planning your time to achieve your objective of getting a grade A or B? What was your strategy?

Chua: Last semester I did not put a lot of effort in G240 because the syllabus is so much lesser compared to 'A' levels, concepts are so basic. Before the lecturers explained the diagrams, I already know, so the concepts are very basic stuff which I have done it before. Like demand and supply, why they are sloped as they are, the shifting of the curves and the movement along the curves are pretty obvious to me. It was just a

recollection what I have learned. It is something what I already know, so I really didn't listen much and study.

I: How about tutorials?

Chua: It is a revision for me, since I didn't pay much attention in the lectures. So I do the multiple choice questions and the structured questions, to test me whether I do understand or whether the foundation from 'A' level is sufficient to bring me through this course. So far, through them, it is able to. Multiple choices are easy because once you have a general idea, there are four choices to choose from; can't go very wrong with it. One may be out but you will still be within the range. For example the law of diminishing returns, more or less you will know that it is about the quantity of inputs to output quantity, so you have these two variables, then just read through the options to see which fits most to the question. So when it comes to the tutorials, it is more a building on what I already know and to check whether what I know is right - a reinforcement exercise.

I: Do you think the tutorial questions are a good gauge for what the exam questions are to be like?

Chua: No, I don't think so. Tutorial questions are so much easier compared to the questions in exam. Like this semester's tutorial questions, some of it was taken from last semester's exam paper, but last year tutorial questions, we don't have that. The last semester's tutorial questions were straightforward, like the simple calculation of output and price and to find the equilibrium. Unlike exam questions that were more difficult and not straightforward. So commenting on last semester when I did G240, the tutorial questions are not a good gauge for exam. I think is the tutorial questions have a lot of multiple choice questions, I feel that it doesn't usually require me to put in a lot of effort into it, it is just simply put in a choice and just gamble a bit. In the exam there are no multiple choice questions. All the exam questions are structured; this is quite different from our tutorials. The tutorials do not train us to answer like a 10 marks questions in the exam. In our tutorials, probably allow us to answer those short structured exam questions.

I: When you were sitting for your GCE, was there a lot of drilling from the teachers?

Chua: Yes, we have. We had 3 papers in economics, multiple choice section, data respond and essay. The data respond is like our structured questions and the essay is 4/7 and each essay is required to write 2.5 pages. So we were trained to write. We had more

preparation, 2 years is quite a sufficient period of training to write. We were drilled a lot in writing essay type questions because it has the highest percentage in marks. In my junior college, since we were science students and language is not our strength, so the teachers drilled us on essay writing. Our tutors were not worried about the multiple choice questions, they leave it to us to do the 10 year series and the data respond questions just requires you to read the data and answer based on what is given. So being science students, the teachers are most worried that we are not able to write essays. Our language and perhaps clarity in expression are properly our weakness compared to humanities students. It seems that science students traditionally in my junior college do not do well in economics compared to the arts students. So we did a lot and a lot of essay writings.

I: Relatively speaking, our tutorials do not give you that kind of drilling to answering essay questions.

Chua: Yes. I think it is pretty obvious that in the tutorials there is not enough drilling and there are no essay type or mini essay type questions. It is basically just helping us to understanding paragraphs of information, just deduce from that, not much thinking.

I: Do you think it helps to clarify concepts?

Chua: Perhaps pretty 'dead' type of understanding.

I: Knowing the definition, technical definition kind of stuff?

Chua: Yes, not much analytical kind of work.

I: Can you see the meaning of calculation?

Chua: The p and q do not mean a lot to me, I'm finding it in G240 to find the answer. If this is put in a certain sense, it doesn't mean much. Like when we read the papers or watch the news, we don't really go and draw the diagrams. Like economic growth and government budget, I don't go and analyze. But I do have a better knowledge now. During the junior college years, it doesn't really mean anything to me. Perhaps in that sense G240 is applicable to me.

I: In tutorial 6 when we tried to calculate the p and q and drawing the reaction curves. We got the answer, but could you appreciate it as to what we were trying to do?

Chua: Frankly no. I just accept it and I just try to remember it. In the notes it wasn't emphasized and I wouldn't spend time in the library to find out what it is. After all it is

just a small part of the entire syllabus and G240 is just one subject I want to pass. Even when I don't understand when the tutor was explaining, I don't really ask questions. I don't see that I will be using it later on. Honestly, those calculation exercises are quite meaningless. What I will do is when I don't understand something, I will just try to remember, like calculating the Reaction curves and finding the equilibrium points for the Kuznets equilibrium is difficult, because I don't understand and have no time to read. I can solve the equations but it is meaningless to me.

I: Do you think there is too much calculation? A little too technical in the sense?

Chua: It is very technical. A lot of calculation which I can't see the reasons for doing so. Like for instance, given an equation, find the equilibrium point. I found it, it becomes very mechanical to me, given this equation, find this and that, and it doesn't mean anything to me. This is what we are expected to do and with a bit of math background, it is okay. Somehow or rather, those analytical question in part d or e in exam, it was quite unexpected. I wasn't prepared for those questions; I thought the exam couldn't be too difficult but I was caught unexpectedly with those thinking questions. For those who studied diligently because they have not done economics before, I think they should be able to do well in all those parts.

I: Are there enough time for you to think through the economics problems and questions? Reflecting on what you learned so that you could understand why these concepts are introduced to you?

Chua: Supposedly G240 like other G subjects, there are 3 hours of contact time. Time allocation is standard. We need to know all these knowledge in 3 hours, and most of the time the lectures/tutorials is quite fast, you want to know more you got to do in your free time, which I don't have that free time. Besides sleeping, I don't have time. I have a lot of General electives subjects even in the 2nd year as well on top of my MPE subjects. It is very difficult to multi-tasks. Like I am going to a mechanical subject and then later I may need to study power engineering which is an electrical subject, and then come back to economics. So it is all so different, not much of a link between subjects.

I: So was it a mindset change to study economics?

Chua: Yes, it is like a transition. For example, I just come out from a math lecture and the next one is thermal dynamics, it is like...wow I was just learning about differentiation 5

minutes ago and then now the thermal dynamics, too different. Then an economics class after thermal dynamics; suddenly I have curves now and was heat transfer a while ago; so it was in a sense a mindset change. Usually I am not that receptive during lecture. Just going through the routine and just go and sit in there. Perhaps the retention rate is about 30% to 40%. Perhaps that is the reason why many of my peers do not go for lectures. They feel that they are not going to absorb in the lectures anyway, and since we can read the lecture notes, it is better to spend that 50 minutes doing self-study.

I: How about you?

Chua: So far I tried my best not to skip any lectures. But there are times when I will not go for lectures like when there is a quiz the next day, I would like to concentrate on it and skip the lectures. The traveling time to school for me is quite long, so I have to choose the most effective way to study.

I: Can I say that the motivation for you to study economics is to pass the exam?

Chua: Yes, what motivates me to study is to pass exam. So it is a lot of hard work but I will do it. I want to get the answers in tutorials, pass the exam and get on with it. I try not to skip any lessons as they are crucial to passing exam. And I will do the tutorial questions and past year papers over and over again to improve my score.

I: Do you find study economics useful?

Chua: I guess. Every subject would have its own usefulness at a certain point of time. It may be handy to have learned it in the university. But right now, I see it as something that I need to study and I need to pass this course. I suppose a lot of other students feel the same way. I think most of all are not that enthusiastic during the tutorial, may be one or two may be different then again I don't know they are just blurting out the answers without thinking. We just want the answers and get on with it. Anyway I don't like the questions and answers thing we do in our tutorial; I see it as I need to pass this course, why can't the tutor give me the correct answers like other subjects and we can get on with it? It need not be different from other subjects.

I: How about you?

Chua: I tend to be a little quiet during tutorials. I try to a listen more in the tutorials, those concepts that were discussed in the tutorials. Unless I have a big problem.

I: Do you have to re-learn those concepts?

Chua: Fine tuning and recollection. It has been at least 3 to 4 years since I did the 'A' level economics. It was more like a jigsaw puzzle that I am trying to pick up the pieces. I would consider myself having to re-conceptualize and fine tuning those concepts learned. I think economics may be important to those technopreneuer. For the rest of us, it is to pass exam; whether I apply it in life, it doesn't matter.

I: So far have you encounter language problem in learning?

Chua: No, not really. I use the old Parkin textbook which I use in the junior college days, and no, I don't really have a problem in understanding it. The only problem is when it comes to the application part in the textbook. It will be examples of the USA and is not quite relevant to me. I have not been there, and it is too 'US-centric'. It is not applicable to my world in Singapore.

I: Do you pick up any other materials? Perhaps magazines?

Chua: No. I only read the lecture notes, tutorials and textbook. Even if I have free time, it will be resting. I think our workload is quite heavy for engineering students; we have a minimum of 7 subjects in the first two years. Some of us may have to overload if we do not clear the previous subjects. It is actually quite a long day for me; from about 9:30 to 4:30 for 5 days, by the time I get home, I am almost too tired to do anything. Actually this is a common thing among my peers. We are generally very tired from the heavy workload.

I: How would you sum up your experience in G240.

Chua: I think my problem is how to answer the exam questions. It is quite obvious, that the quiz is not quite representative of the final exam grade. Perhaps the quiz is in multiple choices; not really prepare us to write. All is needed is read the question and choose. That is not the case in exam. The parts in exam are not to choose, it is to answer those questions. Frankly if I have not taken economics before, I would have a bigger problem. I think the science students usually find this quite tough. Although I have done a 'humanities' subject like engineers and society, it is nothing compared to economics. There are much more concepts here and that engineers and society is more like history, which I can read through. Economics needs facts and concepts.

I: How about the diagrams and curves, how was your experience learning those things?

Chua: I probably don't have a nightmare learning these things because I am quite drilled in junior college. I can pick it up quite easily, or perhaps accept it. If there is a case study on the firm's different cost curves, I guess I am able to analyze it and make sense of it. If not, a cost curve is just what it is, I just accept it.

I: Did we give you enough training by bringing the reality to you, helping you to analyze and make more sense of things?

Chua: Not really but I am okay. But if you link too much of it, I don't think I like it because it is just a general elective. Why do I need to place so much effort, I just need to know the basic and move on to the next semester. Just like in Chemical engineering, it was offered to us in the 2nd year, for those who have not taken chemistry before, they are in the same situation as not taken economics, please just let me pass and let me go. I am not going to be an economist nor am I going to be a chemist. If you want me to be all-rounded, okay just give me the basic foundation. Take away all the frills, the inflation rate and GDP fluctuation, what causes it with different views; the impact on the economy in the next 10 years, you know some of these analysis is too much, just keep to the basic. I think the foreign students will be more anxious to pass the course. I think among students, this is really not a subject we place a lot of effort.

I: What would be your advice to do well in G240?

Chua: With 'A' level economics background, I will advise him not to be complacent especially now that the structure of the exam is different, it is not that direct, especially when the tutorials do not quite prepare us for the exam. The in-depth concept is still important, if you still have your 'A' level notes, may be good to revise them. You still need to read the text and must still put in the effort. The lecture notes is more focus on the syllabus, use that as a guide. Those without 'A' level background, I will say it is not that tough. Though I didn't pass in the first sitting, I would say it is not that tough. The concepts are not hard to grasp, quite mathematical with graphs. The best is to read with understanding, to apply and perhaps do past exam questions. To have a feel before exam, so they wouldn't get a shock.

I: Do you think the tutorials test on your economics knowledge? Exam?

Chua: Yes, I think is okay. Even in GCE exam, the questions are quite similar. There will be equations to calculate, find the p and q and the equilibrium points. The essay questions

in GCE, they pick up a statement from a magazine for you to comment. But the thing is, now that I am doing G240, it should not be that way, as it is just an elective. I think if I had put in more effort, I would have done a good grade, since the syllabus here is scaled down.

I: If G240 has less calculation, will you like it?

Chua: It will be worst. I have calculation to fall back on and we are not that responsive. More discussion is bad news for us. Technical questions are better for us. I think no matter how others feel we have changed to be more outspoken, I really don't think so as every tutorial I go to seem to be the same.

Recording #9

I = Interviewer

Ngu = Interviewee

I: Tell me a little bit of yourself.

NG: My name is NG. I studied economics in Semester one and I come from Vietnam. I came to Singapore to study engineering. I like the subject economics because I think it is very good for the students in the future. I like economics because it can be applied in my life. And in Vietnam, before at the entrance examination to the university, I intended to study economics. But my friends in Vietnam then advised me to study science so I can study technology (engineering) as it is better for me (better prospect). I thought about it and because I like economics, it becomes a struggle for me. I like to read the business section of the papers and like to pick up books to read. After consulting with my parents who think that I should take up engineering first and study economics later, I took their advice and am here studying engineering in Singapore.

NG: So, I am very excited to talk to you about how I feel after taking up this course. I have learned a lot of things; in semester one when I did economics, I got a lot of information. I learned about the price and demand, the principle of economics, I also know about monopoly, (about different market structures) when there are many firms and how do firm decide on the quantity to sell and the price to set. This is very good, after that I think I can apply. I think these principles are very common, like in stock exchange, we can apply the principles. I know about that profit and loss and the changes in interest rate and the response from the government. The government can decide on the policy that is better for the country. Information in economics helps me to understand the ways of government policy and how they do it. But I am quite 'bored' (disappointed) with my grades now. Because I think I did quite well in the quizzes, but in the exam I probably don't know one question about price determination, I really don't know what went wrong, because I really like economics.

I: What is it that you really like about economics?

NG: I want to be in business after I obtained my engineering degree. I want to be able to manage people and have a company. If you know so you can head the firm to do the right thing based on the principles. Later on if I become a politician, I also have a good idea in what to do. It is especially important to know economics in my country if you want to be a politician. And I intended to do a minor in business so it will be good for me in the future. But the school doesn't have it, so I only do a general elective in Principles in Marketing in NBS. Now (due to the changes in NTU) if it is possible, I really want to do a minor in business.

I: Was economics difficult to understand?

NG: Yes, sometimes. In the lecture, sometimes I don't understand because they lecturer draws those graphs. Like the MR=MC and how the price and quantity is determined and what it means, was it a firm or the market, or one product. But I go home and study, and now I understand. If there is a firm selling a product, what the price is going to be and if there are more sellers, what the price is like. I think in the examination, there was a question.

I: Do you think the lecturers speak to fast for you to understand?

NG: Well, the lecture notes contain all the information. If you read the lecture notes first, it is okay. If the lecturer focuses on the important points, the principles behind it and gives examples to illustrate the point, then it is okay. If the lecturer does something else in the lecture, then I am usually confused, I don't know what is going on. I don't know the topic well, so I can't follow but can read up later. It will be okay. I think economics for engineering students is very good; they know the principles and can apply in the future.

NG: I am more confident now because I really know something about supply and demand, cost curves, government policies. I know that now if I have to talk about something about economics, I could really talk about it and friends at home do listen.

I: What you have just said is that lecture notes have many slides and in the lecture, it is good that the lecturer picks up the important slides and explains the principles behind it.

I: Do we allow you to reflect in the lectures?

NG: Sometimes I don't know what was going on, why and stuff. I know not much and if the lecturer gives sometime new, not in lecture notes, I have to quickly copy down and I

go home and read it and think why. I think it is better to give examples and you understand examples, you will be interested. Just repeating the definition is difficult to understand sometimes, but examples will be easy.

I: How about your tutorials? Does it help you to understand your lectures?

NG: Yes. Tutorials are quite good. You have a small class, and the tutor can talk about it. If you don't understand, we can ask questions. Sometimes in the textbook, we don't understand, and sometimes different from the lecture notes, we can ask.

I: Which was the most difficult concept to learn?

NG: I think it is the trade between countries; to calculate the quantity of imports and exports, to calculate the equilibrium of import and export. It is quite complicated. The textbook is not very clear and the lecturer does not quite cover the topic. The lecturer only talks about the principle of comparative advantage, it terms of how cheap is supply, but we don't talk about the quantity of the trade. It is quite easy in the example, the numerical example is quite easy, but it does not show me if this is always the case.

I: I think this concept of terms of trade issue will be dealt with in a more advance course.

I: Do you find economics abstract, technical or theoretical?

NG: I don't know. I think technical....in the sense that it is a scientific subject. But economic theory can be applied and is more interesting because it can be applied in your life, in the world, in the company. You can understand the theory. So the study in economics is based on your own focus, like what you want to do. I like to study about the price and demand, to decide which price and quantity is better. If the government implements a policy, I want to know how I make my decision.

I: So, not that difficult to understand.

NG: I like it and so I study it. So it is not difficult.

I: Do you read the textbook?

NG: Yes, because it gives me a lot of examples. I learn with examples. It is quite easy to read, it helps me to understand and make it more interesting. And sometimes the examples really help me to understand more. Like I may be confused with the principles and the examples help me to understand and remember. In marketing, the lecturer gave us a lot of examples and I know that I learn more when there are more examples. I learn

how to apply examples in that course and in economics, it seems to work this way for me too.

I: Are there discussions in your tutorials?

NG: I think it depends on the tutor. Sometimes tutors ask a lot of questions, like my mathematics tutor asks each student a question and we must prepare, then we will have to prepare. Sometimes we (students) teach each other in class, like some still don't understand after the tutorials, then I tell them. In economics tutorial, there is a break and we have time to ask questions. Sometimes we have a group of about 5 and we talk about it and we present. Sometimes the students are very friendly, so we talk.

I: Do you think the tutorial questions helped you to pass your exam?

NG: Yes, I think help me to pass my exam and learn. To pass exam, if the student study the lecture notes and the textbook, do the tutorials then surely can pass exam. If you go to the tutorial, you can remember easily and clearly if you prepare, so that I can remember the difference between principles. Sometimes they are quite the same. Like change in demand and change in quantity demand. Then when the tutor talks about it, I can remember and become clear.

I: So, the tutorial questions help me to pass exam as well as helped me to understand and remember the principles well.

I: What motivates you to study economics? To learn about economics or to pass exam?

NG: To get a good grade is quite important. Some students like economics and some don't, so I think the motivation is different. If you like it, it is better.

I: And you like it.

NG: Yes.

I: Do you think learning economics is very different from learning any engineering subject?

NG: I think it is very similar to engineering. Because there is theory and you apply. The thing is I think the students don't know about the theory, don't know clearly what the theory is about, like how can we find this and how can we get that. In economics, it is important to know and apply the theory. In engineering it is about the same, but we can just memorize the formula, and most of the time it will be enough to get through. Very boring and very dry. When I don't understand economics, sometimes by just drawing the

graphs, it helps me to understand better. I find it interesting, not dry. Like Chemistry, I study and memorize the formula but I can't remember now; economics, I can still use it.

I: Do you need to change your mindset to learn economics? (don't understand)

NG: In engineering class, I study the lecture notes and do the tutorials. In economics, on top of that, because I like it, I read other books. But I don't do that for other subjects. I read for examples and experience. When I read the papers, I can understand better. And when I study finance, and read economist, I can understand and it makes me easier. Reading becomes a hobby, I enjoy it and don't find it tiring. But, it takes a lot of time to read.

I: Do you regret taking economics?

NG: At first, I wonder why I need to study economics, I am a engineer. But, when I return to Vietnam, my friends told me it is actually quite good. And I start to understand why I need it if I want to be a boss.

I: Would you recommend this course to your friends?

NG: I would ask the person what is his hobby? If you like it, it is easier and better. Economics is very important for the future, it is a life skill. Because we study now, but the future change and don't need engineering, but we still have economics, it is still flexible. I can be a businessman or anything. It will be better. Economics, show me a lot of things.

I: Is there bad experience you can remember learning economics?

NG: Yes, I sometimes do have. For example the Kinked demand curve, I read the lecture notes, the books and don't understand. But I asked the tutor at the last tutorial, and I understand then it becomes okay.

I: Were the subjects in your high school taught in English?

NG: There were 11 subjects and only one in English. When I come to Singapore, it was quite difficult, like economics, I just keep trying and try to understand and try to write. Sometimes I understand, but can't write out. Engineering subjects, or mathematics is easier for me, not so much writing. But I try to write and speak more English, and read. I know read faster than when I first came. But when the lecturer talks too fast, I still don't understand.

NG: If I do economics again, I try to do tutorials many times, do the books and try other exercises. So I feel confident and can do the questions faster. I know all the questions in exam, but I don't have time to do all the questions.

NG: When I go home and talk to friends who study economics, they are quite surprised that I do it. And I think we cover a lot here and the experience is very different from home. In Vietnam, the lecturer and tutors only write on the blackboard, quite slow and the students have to copy it down. There is not enough information as well, not enough textbooks and information. So, I enjoy all these good things in Singapore with a lot more information I have learned.

I: Do you think there are too many subjects in NTU?

NG: I think is okay. Compared to Vietnam, I think is okay. There are still free time and afternoon I am free. I hope that lecturers or tutors could spend more time on helping us to do well in exam. Like how to answer questions. Tell us the right ways to answers.

Recording #1

I = Interviewer

BH = Interviewee

I: How is it like studying economics?

BH: Definitely something different from engineering, is more theoretical, a lot of words to study, a lot of things to memorise. A lot of concept……concepts is very important.

I: Economics Concepts

BH: Yeah, the concepts, especially those……..I think all comes from the basic of supply and demand. But as I carry on, things get more and more confusing to me….. from my point of view. But everything goes back to the basic, the supply and demand curve, that is what my friend told me, and I also figured that out later.

I: So the confusion is because economics concept is so different from engineering?

BH: Yes, very different from engineering.

I: Can you just give me an example what is so different from engineering?

BH: Yes…..especially certain curves, the patterns of curves. For me I study the curves' patterns, and sometimes in economics, the way the curves move in economics is very different. So when the curves shift and move along the same curve is very confusing.

I: Shifting of the demand curve and the movement along the same demand curve for example?

BH: yeah. Sometimes it is not just shift from one point to another. Sometimes, we stop in the middle to see what happens, we do not move from point A to point B. When they stop in the middle to see the outcome, it is very different from engineering. In engineering, we move from one point to another. We start from one point and we sub (substitutes the variables) and we go to another point.

I: So probably the engineering concept is more clear cut to you

BH: yes more clear cut. There are so many grey areas in this subject, not like engineering subjects which is clear cut, you have input and output, use variables to substitute and you see a process and one solution.

I: probably you are more familiar with the engineering way of thinking?

BH: Yeah....I think the mindset is there already. Since many years I have been trained to think that way and I have been involved in the field of engineering for so many years.

I: Yes, so it is easier to understand and build new knowledge, the engineering way?

BH: yes.

I: Since you find learning the economics concepts is difficult, how do you overcome the problem?

BH: to overcome the problem.....hmm...study....keep on studying, to conquer the fear, as long as you conquer the fear, then there is no problem.

I: What is the greatest fear in economics?

BH: in terms of syllabus.....the topic I fear most, ...micro side is that ATC....the one with a lot of curves....the one where one graph has more than five curves I think. Then the shifting, when you draw it a little bit out, may get a different result. Then are those concepts like marginal theory, too abstract, I can't see it. I don't know there are such things. In economics, you need a lot of imagination, engineering I can do testing but not in economics.

I: Micro has a lot of graphs and is difficult to understand them.

BH: Yeah....a lot of graphs in micro. Especially the shape of the graphs.....every curve tells a different story. Too steep, too straight, everything is so different. Those ATC curves where one graph has more than 5 curves are too much. Then you have the shifting where once you draw it a little bit out, I will get a different result.

I: You mentioned you keep studying. So do you just keep on reading? Or you ask your friends or do you read and study on your own?

BH: first attempt, I ask around. Yes, last minute (before exam) I asked around.

I: Could your friends tell you the answers?

BH: They are able to tell me the answers but not very convincing. Because some of them their standard is almost the same as me, but I guess they are luckier than me (as I didn't pass at first attempt.) Then, the second time, okay I was confident but don't know why I still didn't make it. Then the third time, yes I asked around, the professors and friends, oh no, not friends. Just asked the professors.

I: What kind of advice would you give to your junior taking the course?

BH: Just...treat it as a hobby just study, when you have nothing to do, just take out to study, to memorise it.

I: As your problem is in the understanding of the graphs, so you just keep reading.

BH: Yes, it is the graphs .....many said economics is all about the graphs, once you understand the graphs, you can say whatever thing you want. (Allowing graphs to illustrate the answers) This is what some of my friends advised me, so you must get the graphs right then you can tell a lot of stories.

I: When comes to Macroeconomics, in terms of the graphs, which is more difficult?

BH: Macroeconomics.....it is the.....ADAS curves.

I: What is so difficult about the ADAS analysis?

BH: .....

I: Why is ADAS the hardest to understand?

BH: so far, as ADAS curves.....it shifts like.....it has year 1, year 2 curves, there are too many in one diagram, so it got too confusing to have so many curves in one diagram, too hard.....If possible, it is better to split up the graphs in different year.

I: How about the Keynesian Cross Model?

BH: That is okay, I find that graph is much more.....I find is more simple to understand. Is more on calculation, that one I have no problem. That graph is just one straight line to find income, that's all.

I: So your problem is when several curves come into one diagram.

BH: Yeah, and a few sets come into it.

I: So for ADAS, it is when the LRAS comes in.

BH: Yes, you have AD, AS and LRAS, three curves. So when you come to three sets, all these gets jumble up.

I: In terms of the mathematics derivation....

BH: Yeah, mathematics, differentiation and .....I have no problem with that. As long as I know why I need to differentiate, for what purpose, then there is no problem. In my first attempt, I have no idea what the differentiation is for, I can differentiate but what is it for, no one tells me. Until this time.....I think I know what it is for when I differentiate in respect of the quantity, now I think I understand and appreciate it more....a little better.

I: So, if you are advising the junior, you will be advising them to read the textbook.....do you have any problems reading the textbook? Is it easy to understand?

BH: Yes, the textbook has no problem, easy to understand. The latest textbook that I used...Parkin....is very good.

I: So you do understand what the author is trying to tell you?

BH: Yes....the Parkin text is very good.

I: Is the language too difficult to understand?

BH: No, the language is not too difficult. But whenever they describe the American history or what, I just skipped it as not that relevant.....but for general knowledge.....very good.

I: So you use your textbook to supplement your lecture slides?

BH: Yes, definitely.

I: So are you able to do your tutorials and understand your tutorials?

BH: Tutorials, yes no problem. But, definitely when you can do the tutorials, doesn't mean that you know how to do the exam questions.....not that exact.

I: Is there a very huge jump between tutorial questions and exam standard?

BH: Compared to last time, yes a huge difference. But this time, I find it is a bit easier, because the exam format is a little different this time. But, I need to complain....the marks allocated for each part is stingy. You explain a few lines to get one mark.....It is easier as there is a lot of concept check, if you can secure that....get the one mark.....no problem.

I: So the exam format this time is requiring the students to do all the four questions and the choices are within each question. Do you prefer this exam format better than last time when you choose four questions out of five?

BH: I prefer this time....this exam format.....because I passed. Last time, I didn't do one question, for me there is not enough time.....

I: Did you do "A" level economics?

BH: No.....especially for someone with engineering background and studied engineering....it is tough!

I: What is the most important concept in micro that you've learned?

BH: Supply and demand……that is the basic. Because when you go to other things……it is still about supply and demand. The only difference is the ATC…..is a bit different apart from that, the foundation is still about supply and demand.

I: You will be going out to work soon; do you see the relevancy of microeconomics in your work?

BH: So far in terms of work, I don't know yet. But when I talk to my friends, I can bring in supply and demand. I can contribute…..at least I know a little about supply and demand and know how it works. I talked to my families and friends, I showed them about supply and demand, but they are not interested.

I: How about macroeconomics?

BH: May be when we talked about American economy. But, no.

I: Do you see the economics at play in your daily life? Now that you are out in the job market looking for work, going to job fair etc.

BH: There is little connection……I don't really feel it. Unless when I get into the managerial level, then I will try to remember. Now, it is just something I need to pass. There may be some connection, due to work scope.

I: Do you have any seniors who are at work whom you know?

BH: Seniors, no I don't.

I: When you did G133, where lectures were two hours, how was it like?

BH: Definitely tiring……and restless. Mind was floating……

I: Since it was a two hours lecture, did the lecturers slowed down and allowed you to think?

BH: No….no time to think. Over here in this place, there is no chance for you to think, they just move on. Over here it is very heavy going, the students just busy copying; they don't listen to the lecturers…..that's what I find. Whatever slides or transparency they put up, although the lecturers may say that it will be given to the students later, we will still keep on copying.

I: But we do have lecture slides uploaded in the edventure for students to download before the semester starts, why do you still need to copy? Or is it because the lecturers teach something different in the lecture which you can't find from your students handout?

BH: Yeah, sometimes they do that....so we have to copy. For me I don't copy. Some may bring out their books to see where the lecturer is going.

I: So the two hours is quite busy?

BH: Yeah....depends on the atmosphere, and the topic.

I: Have you enjoyed any of the economics lectures? OR was it too dry? Or do you find that you have learned something after an economics lecture?

BH: Yes, definitely I have learned something new, is only whether I can still remember after a few weeks time.

I: When a concept is introduced in the lecture, do you think the lecturer was just covering the surface, or was there in-depth analysis to help you to understand?

BH: somewhere in the middle. Sometimes they just touch and go, sometimes they do explain a little more.

I: How do you find the tutorials so far?

BH: Definitely, is the most important thing for me. It is the only time to clear all my doubts and questions.

I: Do your discuss questions with students near you during tutorials?

BH: Hmmm.....last time yes, this time no, I am on my own.

I: Guess it is the atmosphere in the tutorials that actually encourages you to discuss?

BH: Yes. Most of the time, we don't know the students in the same tutorials. As for me, since I am a repeated student, the more I don't know them.

I: we have structured questions for tutorials and tutors usually used up to the maximum two hours? Would you suggest more discussion during tutorials so that there are not too many structured questions to do?

BH: For me I prefer this kind of structured questions, so I can see how to answer the questions. If we just discuss, no one has time to copy down. If solution is given out after discussion, then okay.

I: You prefer the structured type questions, is because it helps you in your examination?

BH: Yes, yes....it helps me to see how to answer the questions and recognize the patterns, what kind of templates I should use. You see I study economics using patterns and templates.

I: Is that what you do in other engineering subjects? Patterns and templates?

BH: No, ...this is how I learn. My theory is to come out with a template, and fixed everything into the template and come to results.

I: Is this an engineering process?

BH: Yes.....well it works for me.

I: So your advice would to read the textbook, attend all the tutorials. Is there anything else?

BH: Have doubts, must clear it. Even when it is a day before examination, if it is not clear, must not feel shy or anything, must come to tutor to clear the concept.

I: Can you see the usefulness of studying economics?

BH: No, right now no.

I: What motivates you to study economics?

BH: I must put in the effort and time to learn economics and I need to get the degree. My motivation is simple; I need to pass the subject to obtain my degree. I will do all my tutorials again and again. Although some of the concepts are not easy to understand, many times I even have to come out with my own template to help me to understand and remember things; I will do it because it is necessary. It is hard work but I know there is no short cut to passing exam.

I: After reading through the textbooks, have you started to like economics?

BH: Better than the first attempt.....first time, I don't even bother about the subject, never read the textbook. This time, may be I feel that it is the fear I need to conquer, so I read the textbook more, every day.

I: Why didn't you put in that effort the first time?

BH: May be because it was something really new, and when I don't get it, I just mentally shut off.....so second time round, I read more.

I: Now do you understand the newspapers better with some economics background?

BH: Yes, last time I don't even read the business section, but now I read it no problem and understand.....may be not all but I understand what they are trying to tell me.

I: You think is the studying of economics that has helped you to understand?

BH: Yes, definitely the learning from economics.....it helps me to understand.

I: Would you pick economics again when you come back to school for your postgraduate studies?

BH: Depends. If I have a choice.....if other subjects are tougher than economics, I will definitely choose economics, since I have the foundation already, just put in more effort and read up more. Better than pick up something totally new, and I don't know what is going on.

I: Was economics a nightmare for you?

BH: Yes, definitely a nightmare, last time.

I: Have you learned to love economics yet?

BH: No, I have conquered my nightmare, but .....no.

I: Lastly, the economics concepts like opportunity costs, marginal concepts are very abstract? Something that you can't see.

BH: Opportunity cost yes, I have no problem. Are the most useable concepts I have used in my daily life. The rest are grey areas. Engineering subjects has less grey abstract concepts, it is input and output.....and use variables to substitute and it is a process. But economics concept is a lot of imagination. In the beginning I can't even understand price ceiling and price floor.....now I can.

I: Was it an extra

BH: It is really an extra effort....a new technology....a new concept.....I need to read and ask around my friends. I will need illustrations.

End

Footnote:

1. BH appears to be highly motivated under adverse condition. I could see his determination to pass the subject.
2. He is a surface learner.
3. What he does must be linked to the exam
4. he came up with his own 'theory' to pass exam – templates seem to work for him
5. he is extrinsically motivated

Recording #11

I: Which engineering school are you from?

PU: 2nd year in MPE and I am taking G240 now.

I: So how has G240 been for you?

PU: I think it is a very good subject to learn, especially for engineers. Because we can always think of projects to do, but when we bring proposals to the management that are not financially feasible, they will reject us. We need to know about to know how to minimize expenditure and then also understand the repercussion of valuing a product in a market without advantages; apart from that, it is really a good break for me to listen to something that is not that technical like all my other subjects.

I: A change in mindset for you?

PU: No. I think we still think like an engineer, whenever we face a problem we are likely to respond in our usual 'short' way, like not written long essays and stuff. Still engineering mindset, but when come to economics, we know that what we are going to learn is a very broad subject in which we are not really concentrating in the very small mistakes we made in the calculation like the other subjects. In those subjects we have to be very careful with the calculation. But in economics, we know that when we couldn't fully understand the lecture, we know that when we think through it logically, we will be able to understand it.

I: Do you find it difficult to learn?

PU: I don't think it is an easy subject, but it is an interesting subject. I began to be interested when my friends who took the subject kept talking about it then when it is my turn to do it – it was interesting; the discussion really helped me to start thinking about the problems in the world. This is unlike the normal sciences we study, where we conduct experiments and the problems are dealt with in a theoretical and idealized way, economics has a more diverse way of dealing with problems – different ways to solve a problem. It is really intellectually stimulating. It is an opportunity to learn new things. When it is interesting, one just feels like knowing about it. In fact I have some friends,

and in my economics class, it is one of those classes where we really have a discussion, people ask questions, others are enjoying it compared to other subjects.

I: How did you cultivate the interest?

PU: In my case, I did my JC here from India and I had no knowledge of economics. When I came here I had two friends and one of them is doing economics and the other really wanted to take economics but couldn't due to some module clashes, but he was very knowledgeable about economics. It was through the discussion that I realized that the subject is really quite interesting. And that fellow who did economics is now in LSC for further studies. I could appreciate through my friends that this subject has a lot of thinking involved and the point is there is no one right answer to a good problem. And everything varies in a different way unlike the normal sciences we study. In sciences, we can conduct experiment but we deal problems in a theoretical and idealized way. Economics has a more diverse way of dealing of problems. I find that this subject is very intellectually stimulating. The personal interest is very important.

I: It is not to pass exam?

PU: No, no nothing like that. I think the interest is very important as it can spur you on to learn more.

I: Do you read the textbook?

PU: Yes, I think it is a very good textbook. Because it is explained in a simple way and it comes with real life examples and then evaluate the whole scenario. The only problem I have is that too much is covered in a very short time so I don't get the time to appreciate each and every aspect. Concepts are introduced and skipped on very quickly; so even if there is interest but at times I can't appreciate the subject.

I: Are there enough time for you to reflect on the concepts learned?

PU: Tutorials are useful and perhaps time to explore the topic further. The thing is the course is very interesting and tutorials are useful, I'm just wondering if there are any other courses for me to take up after G240. I want more in-depth study, and G240 is not sufficient. I have friends in Cornell and they took several units of economics, like microeconomics and game theory, I don't seem to get these things in G240. I really hope I could do more of economics later, and go beyond the introductory course. However, I also know that there are a lot of students who finds G240 boring because there are a lot of

words in it, especially to the polytechnic graduates. But those students who have done economics in JC have found it very easy and for us who had not done it before and are interested, I have found it challenging.

I: Do you think economics is going to help you professionally, as an engineer?

PU: This is something I always feel so strongly about. Personally I do not agree with this segregation of engineering like EEE engineers, MPE engineers etc. Because at the end of the day, when we graduate, what engineering has become professionally is more like an Arts BA degree, similarly in sciences, you have a BE degree, this is how I personally feel about engineering. Because as an engineer, at the workplace you have to handle all sorts of situation, not everyone is only to be graduated as a MPE student and employed as an engineer alone. In fact quite a number of friends are.....like some of them are going into academics after their PhDs. In fact hardly anyone is going to do engineering all their lives, many of my friends are not thinking of pursuing this technical career, engineering for 20 years, we are just going to be doing it for may be 3 years at most 4 years. Then when we have subjects like economics, it is much more tangible and 'real life' and this subject is really going to be very useful at some point in time when we are thinking of changing career.

I: Professionally, you will be working as an engineer for 4 to 5 years and you will move on.

PU: Yes, this is the basic understanding of the world. Let say if I were to go into finance, quite a number of my seniors are employed by Citigroup, Standard Chartered Banks and some international banks. If you want to go into banking or investment, you must know something about money, economics. I think if we have some backgrounds in this subject and in fact quite a number of them do MBAs, it will be very useful.

I: There are multiple choices and structured questions, how useful are they to you?

PU: First of all it helps me to recap what we learned in the lecture and the book. But of course not everyone gets the time to read the book. The tutor will explain the basics and then go into the tutorials or sometimes by doing the questions, recap all the important concepts. I can say that we actually learn the concepts for 3 hours and not just 50 minutes. So I think it is quite a fruitful experience. The multiple choices are good because some of them are really easy to answer; they are there to see if you have read the thing, if

you have read you can definitely answer the questions. Some would require you to apply the concepts. So it is useful to help me in the understanding of the concepts. May be one or two higher level multiple choice questions will be very useful in that way. Like it will give me a very good idea whether I have really understood the concepts or not.

I: Though I am aware that you have not set for the exam, do you think it prepares you for the exam?

PU: I have not started preparing. I may be a little worried as exam has no multiple choice questions. Just wanting to understand the concepts, I think it is quite useful. As far as exam is concerned, I may not feel that quite confident, may be a few more structured typed questions or format we are likely to see in the exam. May be extra tutorials at the end, for all and run through structured questions or you know mock exams like what we do in JC.

I: I think for you to study economics is more than just passing exam; you would like to learn the subject. So how have we done in inspiring you to learn economics?

PU: I think the lecturers have done well. In fact I enjoy your lectures and my tutor is quite good. Bedsides that, I think microeconomics is simpler than macroeconomics, so since I have not started on macroeconomics yet, I don't know if I still feel the same way then. Experience in microeconomics is quite good. Most of my friends generally enjoy it. In the class, I have a friend who is a PRC scholar; of course she has some difficulties due to the language, but she is very smart, and she enjoys the course.

I: So unlike her, you don't have the language problem to learn the concepts. Despite that, during the last 6 weeks have you come across any concepts, which you found it difficult to grasp?

PU: The production curves are really complicated. You have the ATC, AVC and then the MR and demand curve all in the same diagram. I don't know where to begin to look. The marginal concept is another thing. I mean I understand it. The marginal cost curve is basically the supply curve, I accept it and as well as why the demand curve is the Marginal Benefit curve, I accept it but it is quite difficult to appreciate it. Of course I can understand once I am told about it, but it doesn't come naturally. It is not like the Law of Physics – gravity. It is true and we know it. I think the curves are a bit abstract.

I: Do you look at curves in your other engineering subjects?

PU: Yes. But those are mathematically defined. Here we are just told about the curves, you have to accept it. I feel that why we need to accept it as it is.

I: So an equation to help you understand why the curve is what it is, would it help you to accept it?

PU: Yes, in fact perhaps a table to show me how the values are fluctuating. Then I think it might be useful. By just showing the curves, I think it mean nothing to me. Even the tutor needs to spend quite a bit of time, trying to explain the curves and concepts. One example would be quite sufficient. Like why it looks like this, and as one variable increases, what would happen to the curve. I think giving me the reasons of why it looks like that is very important. It helps me to sink in the concepts.

I: So, how did you overcome the problem you just described?

PU: I actually tried to think of the possible causes why the curves look like that. But I may not be right since I have not set for the exam. I discuss with friends, read the textbook but due to the time constrain, I don't spend enough time reading. But I will think about it, of course I can approach the tutor but we always have limited time anyway. Then I can go back the following week and ask the questions, but by then sometimes I forgotten the question. But I do try to think it over and resolve the problem. I think the lecturer may not have time to explain to me given the tight schedule.

I: Fair enough. You tried to go back and think through your problems. When it comes to exam and if you still have this nagging problem, what is your usual response?

PU: Then, I will definitely clear it with my tutor.

I: So to recap on the curves problems, by just telling you what they look like does scare you.

PU: Yes.

I: Would it interest you if we bring you real life situation? For example based on the cost curves concepts, we bring in a company and ask you to analyze the situation.

PU: Yes, I think with a hypothetical company and variables. That's why textbooks are useful as it guides us through all these problems. One or two questions like that in tutorials will be very useful.

I: Would you like to see if we introduce seminars? We perhaps use this seminar to introduce the different market structures from a different starting point. For example,

discussing the price structure of a firm in various situations, when there is no competition versus a highly competitive market.

PU: I think it will be interesting if students are interested in the subject. What about the time I'm only to spend on this subject. I think it will depend on the time spent. I think for arts students may like it, but engineering students like me will find that I may be spending too much time writing it out, though I understand it. Engineering is a lot about solving problems and often copying the answers from the tutors in class but in economics, it is one of those humanities subjects where we really have a discussion. People will ask questions and I enjoy it although it is different from my other subjects.

I: Do you find that what we have done is to give you a lot of technical knowledge without giving you the explicit knowledge as to how to apply it in the real world?

PU: Yes, I think it is true but it is true for all the subjects. What I perceived the situation is that without the basic knowledge, we can't even go further. It is like we need to learn the ABC before learning writing. Of course you need to give us the technical background but in a short course it is not possible. I think this course gives me all the technical knowledge but doesn't tell me how to apply it in the real world. I know we don't have the time to teach us both the ABCs and the analysis, but I really think it will benefit us if we have both the concept learning and in-depth analysis. At it is, those with economic background will not benefit from it but if it is too in-depth, those without the background may be lost. I think the ideal situation is make this course into a 2-semester course, with introduction in microeconomics in one semester and followed by introduction in macroeconomics. Then let the students decide if they want to do another unit of economics in semester 2 as a general elective. As it is now, any change may be difficult for the students as well as the teachers.

I: Would you advise your peers to take economics?

PU: I will be a definite yes. For an engineer it is a very useful subjects, in fact I find that economics is more useful than some other engineering subjects for EEE students, for instance in the case of fluid mechanics. Fluid mechanics is not really that useful but economics is really crucial because quite a number of us will be going into the management side. Economics is useful everywhere, at least the basic knowledge of it.

I: You know I don't have enough students to think like you.

PU: I know and I think the reason is you should not put economics as a core module. Let the people choose it as they need it. In the sense putting the subject in the 2nd year is forces all of us to take economics. Some people takes a greater time to realize its importance, some don't. Some people may take it in their 2nd year so allowing people to take the course as they need it, really allows those 'latecomers' to hear it from their peers and start to getting their interest in place and they may want to take economics in the 3rd or 4th year. And I think we will get to realize how important economics is, as we get to read about it and as we approach the graduating year. I find that when people were forced to do a thing, even if they study and pass, I don't think they will remember it. Just to pass exam will be the objective. I think this is partially because there is only one economics course, so people will think that I will just pass and get away with it. Math is a little different from economics, because if you don't pass math, you can't do many other modules. So I think subjects like economics and law as well, I think it should be made very optional. So it will reduce the burden on the students and the interested ones will take up the subject. And since only the interested ones take up the subject, they will actually do well in it. Even if they don't, at least they do justice to the teachers. Those who learn with interest, I think the knowledge will stay with them forever; those who have not even if they get a distinction in economics – though unlikely they will get it, I think the knowledge will stay.

I: So you have not found learning economics particularly difficult.

PU: No, nothing like that. I find that it is a subject where I can study at my own pace, like bedtime study. I think this first term has been quite enriching and stimulating to me. I have a friend who found economics interesting during the JC but whenever mathematics come into play, it becomes hard.

I: Do you find there is too much math?

PU: No, not at all. They are mostly very simple calculation.

I: Do you find the meaning in doing the calculation?

PU: Well, if the question asks for something, I will try to relate the answer to the question, to ensure that the question been answered. I generally wouldn't think beyond that.

I: Whether is by way of describing, math or diagram, we are trying to explain a concept. They are just different ways of saying the same thing. Do you realize that?
PU: Yes, I am probably better in math. But I remember a distinct example in the demand elasticity and the tax issue. So we have the math, diagram and description, I think that was very clear.

Another thing is the duopoly. I think it interesting like when we did duopoly and understand the stuff is very interesting and I also find that it is important to supplement engineering subject with some other subjects. I mean we must know the technicality of the product but we must also know the market. Like what we have learned in economics, to know how a firm operates in different types of market and I think this is very important to my career because I am not likely to stay as an engineer forever, but there is no more economics to take after I am done with this unit. The reaction curve is a very interesting thing. I watched the movie and it was inspiring. If we go back to the particular dialog in the pub, he was discussing about the reaction curve. It is enriching if we can see it but not everyone can follow it. I think my problem is the time constrain. If I have the time to read and the think about things, all the subjects are very interesting.

Sometimes I just don't have the time to think through everything I am doing. I don't have the time to read up though I wanted to. That is why I find the system in America is better. Because people have the freedom to do what they wanted to do, everything is possible for them. To be a loner or whatever, it is possible.
I: So you wouldn't have the time to go to the library to pick up a book, for instance.
PU: Yes, that is right which is very unfortunate. Last year I had a little bit more time and so I started a book which is about Keynesian model on unemployment, though I have not done economics, I pick it up because I thought that was a very interesting book to read. I am quite half way through. I think this interest must come from the students. I am an accelerated programme student, I am overloaded in every semester. But I don't want to have an unfulfilled education, I like to learn as much and as widely as possible. So sometimes I've found the general electives as more interesting than the core subjects. I

may not solely look into whether this subject is useful for my engineering career. I think that education is supposed to be without borders and general.

I: Anything to add regarding your experience so far?

PU: I think what is important in learning is at the end if I can understand magazines like the economist. It is a very good general magazine; sometimes we can relate things to economics. We must be able to read the newspapers.

I: Do you?

PU: I can't understand the money section much. But I tried my best to understand the implication of some of the economic stuff that was reported in the newspapers. Like budgets and things like that.

I: Perhaps we have not covered the macroeconomics. You will understand them soon and you are reading ahead, that must be the interest within you.

PU: Yes, and I think it is also the people around me, my peers as well as my teachers. I think if the teachers can stimulate interest of the students by 5%, I think it is very good. Although most of my friends are from India, and they have done economics. They may not have done well in the sense that they didn't score an A, but most of them said they enjoyed economics. It is especially interesting for me who hasn't done the subject, it is really an opportunity to learn.

Sometimes I also feel that the lecturers should try to inspire and stimulate the interest of the students. I think most of the lecturers just go through the presentation without talking to the students. I think it is better to talk to the students than showing us the slides and reading the definitions from the slides which we can find from textbook and notes from edventure. Of course the lecture group is so huge, to talk to so many people. To arouse the student's interest is quite difficult. I think it is not really true that just because the lecturer has a PhD, he is deemed to be able to teach. I found it absolutely not true. Some lecturers really fail to stimulate the interest of the students, a slight show of enthusiasm will be quite sufficient. People will feel like studying. But most of them will just go thru the presentation, without talking to the students. I think it is better to do without it.

I: We need to be aware of not allowing technology to control our lecture.

PU: Yes. Sometimes it is better to just talk to the students without showing us the slides. I feel that the slides are used as notes. In Singapore, there is really too much spoon feeding. I friends overseas have to make their own notes in lectures. We have the edventure, and really showing the slides again is excessive. As I said earlier, I really feel that the lecturers should at least try to inspire and stimulate the interest of the students. I also feel that it is not true that just because the lecturer has a PhD and so he is able to teach, I have found it absolutely not true. They just really failed to stimulate the interest of the students; a slight show of enthusiasm and by talking to us will at least get us interested in the subject.

I: I remember when I was in university, my lecturer just talked for 2 hours without using transparency, slides or whiteboard. We have to make our own notes.

PU: I think this is good but only if we have few subjects to study. We don't have the time to do so now. Generally, the lecturers in NTU do not teach beyond the textbook or notes, people take it for granted and not explore beyond that. And if students want to pass exam they will follow the specific areas the lecturers mentioned in the notes, like definitions and concepts and memorize them and just leave out certain topics although it is in the syllabus. After all, our entire future depends on that 3-hour examination. Somehow I just find this whole culture very unhealthy, I really don't appreciate it, this is not what learning is about but the lecturers are doing it and the students are doing it. I know that my friend in LSE, students are involved in many seminars and projects and they only have one exam, so they are involved in many things beyond the textbook. My other friend in Cornell, he is free to take up any modules he wants, although he is in engineering. He took up microeconomics with game theory. Another one is doing a minor in economics and all of them found it very enriching, so economics is so important. And they feel that economics should supplement engineering so that we know both the technical product and the market.

Recording #14

I: We were discussing the other day and you mentioned that economics should be taught like an economics subject, and not to cater for the needs of engineering students. Do you feel the same way?

RO: No, I think the problem is economics is a new subject for foreign students but for local students, some has found it to be an old subject some has not. I think the student's background is too diverse. So it cannot to be taught in such way that everyone knows economics. We cannot assume that everyone has the same background knowledge. I think what needs to be changed is to change the system of delivering in the lecture. You should expect the students to read the chapter of the lecture before attending the lectures. And during the lecture itself, you should link the materials with the real life, it becomes more realistic. Because if you say that price increases, and if you have backup data to support the issue, then it becomes more interesting. Because we do read newspapers but we can't analyze it as to why it happens. So the lecture links it to the real world, then people will find it interesting and will come to the lectures. Currently everything in the lecture is in the book, the book is clearer than the lectures, people will tend to stay at home to read. The economics lecture is different from technical subjects, because in technical subjects sometimes after reading the book we still don't understand and we need to attend lectures. But for economics, the book has example and is written simply so if we can read and the lecturer has not made it interesting for us to attend, it is better to just read the book at home.

So the second lecturer, his style of teaching is not good. As he teaches no one listens as he keeps showing graphs, and doesn't show us how. He doesn't teach well. He has the knowledge but he is unable to express himself to the students, to allow the students to understand. He teaches as if come to the lecture and we will read with you without teaching us the theory. I expect more stimulating and perhaps questions that will get us to think rather than just running the presentation slides. I expected the lecturer to be more stimulating that is getting us to think rather than reading aloud from the slides projected.

Lecturer should link the materials from the books with the real life; it becomes more realistic, so that I could see how each concept can be applied in the real life. Anyway this problem is common in NTU. Lecturers should expect students to do the background reading first and come to class for discussion. And you have to link to the real world, if not it becomes meaningless.

I: Have you found any particular parts in economics difficult to learn?

RO: Not really. This is my first time, it is quite clear. If you read the book, it really has no problem actually. I can understand by reading the book, in that sense the book is quite good. Of course the problem is you need to devote time, this is a lot of time and as I have a lot of subjects to study, it is a big shock to engineering student like me it becomes a time management issue. The thing about economics is that most of us feel that it is not related to engineering, though it is good as it teaches us about the real world but it is not that meaningful to us. Those who are not interested, they just did it to pass or score an A or B, and we don't devote so much time to think more. For engineering subjects, not just to score but it is what we are here for, so we spend more time in those subjects. In my case I am interested in the subject, yet I still find that I have to struggle with the time issue.

I: I would say that you are quite motivated to learn the subject?

RO: I am motivated because I wanted to learn more about what is going on in the real world and this is a new subject to me, which is new. I did it because I am interested in the subject though I didn't score well. In the exam, I was so saturated with the book because I read so many times, I just go with what I have. Some of the numerical questions got me stuck, not the concept ones. But for me it is learning this subject and knowing what it is all about that is important, well the grade is not the only thing. The technical subject I score well, if not it will be a problem. For subjects like economics and the business subjects I take, I do it because I enjoy it. Scoring is not the main issue; I know that in these subjects if I enjoy it, I know I am able to get a B. The good thing about economics is after learning it, I can teach my friends. But for other subjects I can; I guess I care about the subject with my full heart. In the sense the objective is different between my technical subjects and economics for instance.

I: What advice would you give new students about to take up the course?

RO: First to find out the field of interest in him. If he is very technical people then will advice him to really read the subject and try to understand and link to what is going on in the world. Not just to gear into what to score, but if you try to understand it and later on at work, we are perhaps able to link why a certain technical engineering product can't be successful in the market, if the margin is not there etc. So for the engineering students, I would really tell them to read it and understand it so we can understand what is going on in the real world.

I: So your advice would not be just focus on certain thing to pass?

RO: No, but of course my advice is not for all the people. If you can enjoy it, just enjoy it, by the way it is not very easy to enjoy it.

I: How was your experience so far?

RO: My experience is quite positive. I think my problem is I didn't attend all the lectures; I read it from books. The book part is good and the tutorials are very very good. Honestly, compared to my other subjects, the tutorial questions are very good because it makes you to understand the concepts. Because when you read the book, it is quite different. When I do the tutorials, I understand much more from the tutorial, the issues of economics. In tutorial, my tutor was helpful in explaining the concepts, but she was not that good in lectures.

I: So tutorial questions help you to understand economics, and not a method to help you pass exam?

RO: Yes, I agree.

I: So you read and attend tutorials, apart from that is there any special technique you use to help you to learn?

RO: Not really, just read and do the tutorial questions. In the book there are series of questions, in the beginning I used to do for a few chapters, just leisurely doing the exercise and learning the concepts gradually. The book is quite book for people who are just starting out in economics.

I: Do you use this method of studying for all your subjects?

RO: Not really. Mostly for GE subjects and perhaps math, due to my interest in it and it is easy to use this method as it is not a chore. But for some EEE subjects, you don't feel like studying it, I put in the effort to score. You know subjects like thermal dynamics and

fluid mechanics, you don't feel like studying them as basically I am only interested to study EEE subjects and these are not, but are core subjects for all engineering students. So I study to score; scoring is not a big problem in me. I study the subject and I score well. I study it for the sake of studying it.

I: So what are those subjects where you adopted the same approach of learning as economics?

RO: Accounting and math subjects. To be honest, for accounting and economics I do devote a lot of time into it. This is not to complain as I truly like these subjects, but I know that I also spend a lot of time in it. I want to learn more and more. Math is something that you read the book, understand the concepts and the rest is easy just to spend time practicing.. You practice and that is enough but economics is reading and understanding and to see how we can apply it. These are perhaps the subjects, accounting and economics where a lot of time is needed to read, for the technical subjects, not so much reading. Once you understand the concept you can apply to it, as many questions as it comes. But this is not the same for economics. Every question has its own special case, in that sense. I may be thinking this way, and another question comes, I need to change the way I approach it. A different answer a different reason, and sometimes I find that it contradicts life, like the paradox of thrift we discussed. Other subjects are not like that, there are laws to apply and put in the variable and are clear. Even when during the tutorials when the teacher is explaining something, there is contradiction, between the teacher's and mine. So I need to think about it and clarify.

I: So during the course, is there enough time for you to think about it?

RO: Enough time if I am only doing one subject but if you add up all the subjects we are doing, there is not enough time. I have to do seven subjects; you just can't afford to spend too much time on one subject. If you start thinking about one subject, you lose the time to study for other subjects. I always feel that if you don't score well in exam, you are foolish. So I must management my time well to score well in all subjects. So using my time wisely and if I lose the opportunity to score, is like I am limiting my opportunities. I come from India and the education system is very competitive. There are not many good universities and there are so many poor people around; if you want to get out of poverty you got to study well and be competitive.

I: Is there any thing to add after taken this course?

RO: I feel strongly that the style of lecturing should be modified. And I think there are too many chapters in this course to read, 25 chapters in all. The first part goes smoothly but the 2nd part really requires attention and needs to make changes. I think many of my friends lost interest when it comes to the 2nd part. It is quite tough compared to the first part; part two I feel that should be deleted or put into another course, because you can't expect all to know everything in one introductory course. If it is deleted, students can understand that the concepts in the 2nd part of the course are quite 'different' in that sense. In my case, I did the first part in quite leisurely pace and enjoyed it and did notes for myself; in the second part, I can't catch up with the last part as the syllabus go so fast, I can't do those exercises in the book I used to do in the 1st part. I too need time for my other subjects. I just feel that the 'standard' is so different between the first and the second part.

I: Do you find the course too technical?

RO: No, there is no math concepts involved. When there is math it becomes quite complex and you can't expect us to do it in this introductory course. You can't expect us to learn everything in 12 weeks. But I think the last part, might really need to scale down. Even the lecturers have to rush through quite a lot in the last part, to be fair this is true to all the subjects in NTU. They teach you so smoothly in the first part that you tend to relax, and then the 2nd part becoming such a rush, is like they are saying hurry up and go to the next chapter. This is quite killing. We students really have to compromise on something. There are too many chapters to read for the 2nd part in economics. The first part the pace was fine, up to the market structures was okay. Then the 2nd part is really rushing through.

I: It will really help you if we try more to relating the subject to the real world?

RO: Yes, it will really make more people interested in the subject.

I: Are you likely to take up another unit of economics?

RO: I don't think so as I have 3 semesters left. I have not rounded up enough business subjects which I want to do, so I think given the structure now, I am not thinking about it. My intention is to get the technical degree and read enough business units and after about 3 years of working, when I do my MBA, I will have a better idea of what subjects I want

to be involved at. I will be able to choose well, those that I am interested in. So it will be good if I can get a good exposure of subjects in NTU, like exposure in economics, accounting, and financial investment etc. All these subjects are very good because at first I didn't know why I am doing engineering; I did it because everyone else is doing it. But now, I have a better feeling of engineering because of common engineering subjects which allow me to have a feel of what other fields of engineering is about. And the business subjects are similar in enable me to have a good feel of the course, it helps me to find my way.

And in economics, it is that foundation for me to know about the course. I think every topic is the opening of my study and it does give me a good overall view of what economics is all about. I think one chapter may be in mathematical economics and reduce one chapter in the last part. This will introduce us as to how math is involved in economics. Those chapters on stock market are quite unnecessary as it is not necessary. It is not sufficient for financial investment and it is not that useful. Foreign exchange may be cut down as well, just concentrate on how the industry works. I think by introducing math might arouse the interest of those very technical oriented students. Most of all you must read. You may tell me how good the course is but if I don't read, I still don't get anything out of it. You must spend time reading.

One course of economics is really very necessary. Handouts of what is going on in the real word will be really good. People will be more interested; the textbook has a little write-up on Adam Smiths and stuff like that which is quite good. I think if this is brought into the lectures will be really good. We don't have real current affairs stuff, only learning the concepts, solving fictitious problems, doing MCQ and that is about it. Nothing about how it is relating to the real world, like monopoly, and give an example on Microsoft or something would really help me to learn and see the relation, to understand how economic concepts can be applied in the real world. Really, given real life examples will be so much better which brings creativity into the lectures will be very interesting. More real life examples and how each concept is being introduced in a real life manner will be a good approach. Videos, or some other media to make it really interesting for us

at the receiving us, really trying to make something different from the book and the handouts will be really good. People will be willing to come to the lectures perhaps it is fun, that will inspire the students. All these, it will help in the learning. Edventure doesn't really help as it is optional and it is exactly like the lecture notes. Frankly lecturers are downloading more things into edventure, my other engineering subjects as well, but it is a very dry mode of learning. I don't understand why people do not know it doesn't work. Students who are not very interested will not go to edventure; and those who are interested, there are many more interesting course sites available which edventure is not attractive enough.

My personal opinion is the lecture notes actually destroy the whole essence of study, because give handouts before hand, then 50% of the motive of going to lectures is gone. My foreign friends go to lectures because they are not so comfortable with the book, with language problem. With Indians, it is not a problem. So most of us and I included wonder why waste my time going for lectures when I can read it at home; I can make more productive use of my time, you save time and gain more knowledge – tradeoff. This is why economics is very good for me, as it helps me to realize the situation around me, perhaps not current affairs issue. But like this, I know there is a tradeoff and I also realize that not everyone is the same, some is good in one subject others are doing something else.

My experience in NTU is quite something. I really appreciate my experience here to be able to learn economics and other soft skills, although they have made it compulsory. I think after 4 years I gain much more knowledge about myself compared to if I were to stay in India. The system back home does not allow me to explore beyond my core subjects, it is just too competitive in India. I find I have a more enriching experience. Over here, I appreciate the subjects like the GE and communication skills. It helps me to gain experience in knowing how to handle staff in the work situation, managing and communicating. So you see, all these soft skills are to me very important and given the limited time, I need to manage my time well so if there are things I can read myself, I wouldn't waste time attending lectures but spend the time learning these things instead.

Many other foreign students may feel the same way, when I ask them why still attending lectures, they told me they are not confident with the language, that's why the continue to attend lectures. They need to work much harder than Indians or Singaporeans, not that they are not good enough it is just a language problem. This is true for other subjects as well, not just economics.

One major negative point about keeping a positive attitude in studying economics is that it is not the 'core' subject, in the sense it is not related to engineering.

I: Interviewer

TH: Interviewee

Recording #8

I: Which school are you from?

TH: I am from the school of EEE and I major in photonics.

I: Are you a Singaporean?

TH: I was born in Hong Kong but I am now a Singaporean.

I: When did you come to Singapore?

TH: I came to Singapore to receive my secondary education, more than 10 years.

I: Have you done 'A' level economics?

TH: No.

I: Are you a polytechnic graduate?

TH: No, I am from JCs.

I: Could you tell me how it was like when you studied economics in your second year?

TH: Okay, I think it was the 1st year. The curriculum changes every year over here.

I: Could you tell me how it was like?

TH: I really find economics meaningful and enriching, because it was one of the few subjects that we had that was very interactive and that was the only subject at that time where there is no right or wrong answers. They were more case based and I really enjoyed the interactivity a lot.

I: Did you have some expectations when you attended the course?

TH: Yes, definitely. I expect to be more familiar in the micro and macro aspects in economics. Before the course, I don't even know there is a difference between the two. After the course, I found the course interesting and enriching because at the end of the day, I am able to walk out of the classroom with knowledge which I think that is very important. This course really proved to me that a broader education is always better so that I don't have to confine to a small window/area. I am exposed to new concepts to see my strength and interests; it is like an add-on to my professional technical expertise.

I: Can you still remember some of the microeconomics concepts you have learned?

TH: I'm in my final year and maybe because economics was the only subject we have done in the 4 years here, in terms of the theory and concepts I really cannot remember quite honestly. But personally I love economics and because of the knowledge I build up in year one, I tend to read financial reports and economics book. That is how I remember economics, in that sense. Not a particular theory that comes to mind.

I: Was learning economics difficult for you? For instance when we introduce the microeconomics concepts which you have not heard before, was it difficult to learn.

TH: I think in terms of concept it is not as difficult as I thought at first. Actually, what pulled us (me) back is because, many of us do not have experience in economics in junior college days. So compared to those with 'A' level economics, in deed I feel there is a draw back or limitation.

I: Limitation, in the sense that you have to spend more time learning those concepts?

TH: Yes, that's right.

I: How do you learn those concepts? Especially now that you know some of your peers do understand those concepts?

TH: I think it is the interest and the people that have made the course enriching. Because the lectures were interactive and the tutors like to talk to us, so that the class is very interesting and there is harmony. That's why people prefer to participate. I think after all, for economics which is a talking subject or dynamic subject, it really requires interacting and participation in class.

I: Do you think the course was too technical or theoretical?

TH: No, I think it was a mixture of both and I think is very good.

I: So in those days, there were 2 hours lectures, do you think there was time for thinking? Reflecting on the concepts introduced?

TH: I don't think we really have the time during the two hours to integrate what the lecturers have just mentioned because after all it is a new concept a new look of works, but anyway two hours is not a very long time for two hours of lecture materials. Well basically what we are given is an introductory course of the concepts, and then a lot of self studies at the end.

I: Do you learn the concepts by just reading the lecture notes?

TH: Reading the lecture notes and textbook. I personally read the textbook, I find the lecture notes too concise and too brief; I think it is more for revision purposes.

I: Do you have enough discussions about the current affairs during your tutorials? As you have mentioned that there was a lot of participation.

TH: I think my tutor tried to relate current affairs but as a year one student, we didn't really even read the textbook at that time, what we actually discussed was more of the tutorial questions. She made us do presentation; we had group discussion and then present to the class. I find that the presentation is very enriching because you got the chance to speak up, you mind then start to think economics. Economics is not really about right or wrong answers, you are right if you can support by facts and evidence. And many times, the solution to economics is arguable, so through the participation, you can see the dynamics of the class. This is my own conclusion and it was very difficult in the beginning to accept that.

I: So tutorials are still constrained by the questions we need to complete.

TH: That's right, unfortunately.

I: Do you think these tutorials help you to understand the lectures and concepts better?

TH: I find the tutorial questions are very much related to the lectures. In terms of relation to the real life or current affairs, it is not that much related.

I: Do you think the tutorial questions should be incorporated more of the current affairs?

TH: I think that will be better. Like if you are talking about economic crisis in 1998, we could talk about those issues related at that time. Now we can talk about perhaps how bird flu affects the economy or Asia Pacific.

I: So were the tutorial questions helpful in your understanding of economics?

TH: It is helpful but there were a lot of tutorial questions.

I: Do you think those questions help you to understand and learn economics or pass the course?

TH: I think more importantly the tutorials are stirring our interests in economics. If we are interested, it actually helped us to score but if you are not interested, it will help us to pass the subject.

I: Do you feel that the tutorial questions were set that way to help students to pass exam?

TH: No exactly, not in economics.

I: Could you remember the textbook you used?

TH: Not really, but everyone used that book.

I: Was the book easy to read?

TH: Yes, it is in story form, so I thought it was easy.

I: Do you have any fear learning economics?

TH: It was the only 4Aus subject we had last time, and comparing economics with other engineering subjects, engineering subjects require mathematical background, the calculation of equations; whereas economics introduce a totally different concepts, it is actually based on theories, based on how you argue the points. It is like a general paper during the junior college days, so it requires a totally different set of skills. One is mathematical skill, and economics is writing skill. And I think not many engineering students are good in writing.

I: Do you then have to switch your mindset when coming to economics classes?

TH: Yes. It is the case. Like first of all in engineering subjects, there is always a right answer. But for economics, there is no one right answer, as long as you can support your points, you are right as well. That's why I find that sometimes we need to be ambiguous in our stand sometimes.

I: There are right answers in economics as well like, reasons for the movement along the demand curve for instance.

TH: In that sense, I find that in engineering, if the equation is right, it has to be correct. For economics, if the external factor changes, then the demand curve will be shifted. Then, in that sense, the circumstance can change the way we analyze the problem. But in engineering, this can never happen.

I: because engineering comes from the law of physics and you can't change it. But in economics we are trying to use the theories to explain the situation.

TH: I always find that economics is one subject that stands on its own. Whilst in the engineering subjects, they are very much related in terms of logic and theories and perhaps problem solving skills. I find it quite unfortunate as we don't have any other similar subjects later on and we tend to forget about the concepts we have learned.

I: Do you regret taking economics?

TH: No, in fact I love economics.

I: Do you think by moving this course to a year 3 or 4 syllabus, it would help the students to understand better?

TH: I think economics is a 'natural' subject; it is very easy to pick up if you read. As a final year student, as I read the papers everyday, it will be better in that sense. But we will have to justify for this move because we do have other workload.

I: Do you think economics is better learned once students have gone out for their Industrial Attachment?

TH: Yes. And I think students have to understand why they have to study this subject. I think this is important.

I: Why do you want to study economics?

TH: I think it is very much related to our working life. No matter which industry or profession you are in, you are going to meet economics, you are going to meet finance even if you don't buy stock you need to know what is going on in the market. Or else, you wouldn't be able to communicate with people in the world. I think I have benefited from it and coupled with the industrial attachment, I am able to understand the workings of the world and more mature in my thinking. I don't feel isolated, and it is very important for engineers to learn economics as it gives you a more all rounded education. Economics really fit into this picture of providing an all rounded education of a person.

I: Do you find that the costs curves were a nightmare, completely defying what you know about curves from your engineering subjects?

TH: I agree actually. I find that the curves are very much different from our other subjects. I remember that I paid a lot of more attention in economics compared to my other engineering subjects. In those days we had two hours of lecture and two hours of tutorials, and that is a lot of time each week. And if I don't understand, I have really got to understand if not the accumulative effect is quite bad. On top of that, I have not done this subject before, so it was extra difficult. I did spend a lot of time.

I: What motivates you to spend so much time on this subject?

TH: I think it is the lecture and tutor who encouraged us to participate, and to be involved in the discussion.

I: So, it is not merely to pass the course.

TH: When the tutor asked questions and if you always can't answer the questions, you will read up. You will learn to be prepared for tutorials. The tutorials in that sense whether positively or negatively pushed us to prepare.

I: Having to spend so much time in this subject, you don't find it a chore?

TH: I think it is very interesting as it is only one subject where we need to discuss.

I: What do you need to do to do well in economics?

TH: You need to understand why you are doing this. If a person's mindset is I'm learning economics because I have to learn economics because it is a core subject I need to do, I think having this mindset, you will not do well. Whereas if you can see the link, the relationship in why the school wants us to read economics, because they want us to shape us to be a well rounded person, because they want us to learn about the current affairs. If you understand why we are doing this, then we will be interested to do the subject, I think because of interest, you will tend to read more.

I: Do you find the course too technical? Too theoretical? If we were to do it differently, what can be done to gear up the interest of the students even more?

TH: I think since all students in NTU, whether business or engineering students are all doing economics, why can't we put them together. For the business students as they know why they are doing the course, they will naturally show more interest. As for the engineering students, they may not see the point yet, when the two have the chance for interaction, they will be able to encourage one another. I think after all, the peer pressure is a very important thing.

I: Would you have chosen economics if it is not a core subject?

TH: I will definitely choose economics but not in year one. Maybe in my final year or 3rd year study when I am more mature. Because it is not that easy to write a sensible essay, so it will be more beneficial if this subject is done when I know more about the world, the current affairs and when I am more mature.

I: You would still do it but in a later year?

TH: Yes.

I: You will not find this subject irrelevant to your profession?

TH: If it is too relevant to my profession, then I will not take it as a general elective. It is not relevant but it is useful. Actually, I found that when sometimes the tutor made mistakes and clarify later, it is something new to me.

I: So lectures and tutorials were complement and tutorials aim to realign concepts.

TH: Yes, but I don't like the multiple choice questions.

I: Why?

TH: If someone has the time to read the textbook and memorize the content, you can do the multiple choice questions. To me I think economics should be an understanding subject. It should not have just an a, b, c or d to answer the questions. May be more choices. It does not tell you how I got the answers.

I: Could you say that your experience in learning economics is quite positive?

TH: Yes. In fact because of economics, I start to be interested in this field; in fact I took up marketing subject after that. They are quite related and I think if I didn't take up economics I wouldn't have done marketing and I may not be looking into a marketing sales job right now. I will be a very technical person. However, now because of economics, I am proficient in my technical engineering field and have the confidence in other business skills, which gives me the all rounded person and I have more job option available now.

I: So it is not impeding your career advancement?

TH: I think it actually helps you to advance further. The thing is when you are studying you don't think so positive, it is actually after you have done it all. During the time, it was a pain because there were too much things to read, to remember and too many curves to remember and too many different sets of answers that seemed to be accurate. It is only when you do the exam, then you realize that it is not testing on your memorizing skill but your understanding of economics, which I think that was very good.

I: Do you think scaling down the technical concepts would have made your life better?

TH: Well, perhaps we should concentrate on either micro or macro but not both at the same course.

I: Which would you have chosen?

TH: Microeconomics because it is more relevant when I go out to work. Though I may learn about fiscal policy and monetary policy, but I am not in the position to change or

impact on it. But when I learn the cost curves and demand and supply and if I go into business, I will find it more beneficial to me as a new graduate. I am able to make changes for myself and people around me.

TH: I would advice the new students to take economics if you want to do well. A broader education is always better so that you will not be confined to a small area or small window. If you have a chance you should always try to expose to new concepts to see your strength and interests. I think that is very important. One positive think about after taking the course is that I learn to like reading and am made more aware of the current affairs which I am happy to have learned.. When I was in Canada during the exchange programme, I then realized that I am not as good as the other western students, that was the time that I feel that the course that I had was too basic, should have more analysis and so that I can have an opinion. A lot of my classmates in Canada were business students and they did economics, for them they found it strange why we put the micro and macro components together as for them these were done in two separate courses. Then after micro, they will do macro, then Asia economics or European economics, they don't all cramp up together at one go.

I: Did you have fun communicating with them?

TH: Well, they definitely understand and know more than me. In Asia, we talk about Singapore, a little of China and Japan but they have more knowledge of the current affairs, the bigger world. Economics has really helped me a lot.

I = Interviewer

VK = Interviewee

Recording # 7

I: Which school are you from?

VK: I'm from EEE.

I: Are you on a scholarship?

VK: Yes, SIA.

I: How long have you been studying in Singapore?

VK: I came to Singapore last year, so this is my second year.

I: Where do you come from?

VK: India.

I: Have you done economics before, in India?

VK: No, this is my first subject, doing this G240.

I: Can you tell me how it has been studying economics for you.

VK: Actually before I start doing this course, I do not anything about economics. It is just my father used to read some newspapers, economics times and things like that and I never bothered about it at all. So, when I started this course, the thing I had in mind was that may be now I will be able to understand what my father used to talk about, like budgets and managing budgets and he used to listen to all the news and reading economic times, starts to making sense to me, should make sense to me. But what I thought was that after going through this course, I don't feel like very much satisfied after doing this course. Because what we did was just graphs and mathematics and some formulas and we are there, which I mean if you were ask me now after I have cleared the subject, I don't think I can remember them. I may be able to remember the concepts, but the formula...I don't think I am able to do it. And I think that the course should aim more at building the.....or relating more to the current situations in the world. So then if we have done the course, I think we should be able to understand, what is happening in the world and the economic scenario, which is not the case.

I: We didn't meet your expectation of understanding the newspapers. (I have decided to ask this question because I feel that we have given them the tools to understand, there must be something else he is referring to when he said he cannot explain the happenings of the world)

VK: Yes.....probably the problem is because we now do not have any views, when people talk about economic issues, I don't get anything in my mind. I don't know what to say, I cannot contribute to the discussion. But I have in mind that I should be able to do it after I have done this course. A little bit I could understand what others were talking about but not to a large extent.

I: How were your tutorial sessions? Did your tutor try to bring in real examples to illustrate the concepts? Discussion about how to explain the world using the concepts you have learned.

VK: No never, it never happened that way. In fact the examples he gave was very fictitious examples. Just like when a girl is going to buy apples and oranges.....they don't make a lot of sense to current issues.

I: Not that applicable.

VK: more applicable to probably the Singapore context or probably to the South East Asian context, which never happened.

I: Is discussion encouraged? Is there sufficient discussion time in your tutorial?

VK: Well it is better to prepare your tutorials; discussion is limited to that part. Well I don't blame the tutors for that, they don't have time also. In those two hours you can't do a lot. And then I think many of the students....., I think the basic idea of the students here is to clear the exams and so they want their tutorials to help them complete the questions by the tutors. And it becomes a moral responsibility for the tutors to complete it.

I: Do you find the tutorial questions helpful for you to understand economic concepts or do you think it is a tool to help you to pass exam?

VK: I think it is a tool to pass exam. And I think that most of the tutorial questions just require us to applying the formula and we will get the answer.

I: So you can't relate why we are drawing the diagrams or solving the equations for? Could you use these tools to explain the world?

VK: Probably yes, I think I can explain it. But then it is just like physics, there is one branch of physics that is all done in mathematics, and there is another physics (branch) that is all dealing with philosophy and I think that, well because we are studying engineering we are already dealing with a lot of mathematics, there is no point in teaching mathematics to us. I think economics would be better if you pick the mathematics completely away just focus on the concepts. Just focus on the philosophy behind the thing.

I: For instance the history of economic theory like how the marginal concept comes about. Does your tutor have time to run through briefly?

VK: No, nothing like this.

VK: In fact our textbook also. I have read the textbook but I didn't enjoy reading it. Because the textbook has so much in context to the USA, that it doesn't really make sense to me. Because being from India, I could see that they see things differently from us.

I: Could you elaborate on that. Is it a different viewpoint or just the examples given were not applicable to you?

VK: I think it is more of the examples.

I: Is the textbook too difficult to understand?

VK: I think when English is concerned is quite easy.

I: So it is just the examples given that are not applicable to south East Asian students.

VK: Yes.

I: You could understand the concepts from the textbook?

VK: The concepts are quite clear.

I: Boring, not arousing your interest for the subject?

VK: Yes. I mean okay, the textbook is okay. In fact some of the lecturers are exactly quite dry, the lectures were really quite dry, and I wouldn't name the lecturer. I remember for the first few lectures I used to write a lot in the lectures and then I used to give the lecture notes to one of my friends. He asked me what happened after three lectures, because I wrote a lot of notes during the first 3 lectures and after that there is nothing, I said I used to sleep most of the time. What happened in the lectures was this, the lecturer

would come and put up the transparency, draw the lines and talked to the OHP. I mean that was really very very boring.

I: Do you think it is because your lecture notes were too much that you can read on your own or that the lecturers do not arouse your interest – lecture style?

VK: Well, when my friends often complained that the lectures are boring. I used to tell them that we are no longer in a school, we are undergraduates. Here the lecturers are not really here to teach you, here the lecturer's job is completed at the time when he arouses the students' interest. When he is able to arouse the student's interest, there is no limit, the student can go to any extent. Then the lecturers come in to help you, when you have any doubts, the lecturers should help you. I mean if he is doing it, then he is doing a good job; if he is not doing it, it seems that the lecturer himself is bored of the subject and if he is bored in the subject, there is no point teaching it.

I: during the lectures, do you have time to think through the concepts introduced? Or do you think the lecturers have rushed through it or going too slowly?

VK: Sometimes a lot of things are introduced in a very short span of time.

I: So most of the time you do have to go back to read on your own?

VK: yes.

I: You mentioned about your tutorials just now, do you spend a lot of time to find the answers for the tutorials?

VK: No. As the structure is as such, the tutorials are all covered in the lecture notes. All you just need is to apply the formulae and you get the answers, and the formulae are given in the lecture notes. And I think usually there are two chapters in a lecture, and by just reading the two chapters of the textbook, should be able to do the tutorials.

I: When you are learning economics, are there any difficult concepts which you find it hard to grasp?

VK: The microeconomics is okay; as for the macroeconomics part, I think the last part where they talked about foreign exchange, yeah I think that was a little difficult. Then later on, I can't remember the term, like if one town is producing car and another town is producing something else, those were a little abstract. I find it a little difficult and perhaps it was very near exam time and I don't have a lot of time to think about it. I think they were difficult.

I: So how do you overcome the difficulties in learning comparative advantage? Do you keep on reading or do you try to discuss it with friends?

VK: No, I don't discuss with friends. I keep doing the questions in the tutorials and read the book, I think that's it. And use lots of common sense.

I: Do you find it useful to study concepts like comparative advantage?

VK: In a personal life yes, now if there are two persons, and one is good in doing one thing and the other is good in doing another thing, then I could see that they should swap and I could see it in my personal life. But I don't see the relevance of it in the world. I mean I really don't know how this can be applied in the world.

I: Do you see that comparative advantage is perhaps the basis of international trade? Trade negotiation? Linking back to what we did in microeconomics, the study of economics is actually about how well we can allocate scarce resources.

VK: .....Suppose so.....but perhaps there should be better introduction, like newspapers to help us understand the purpose and usefulness of the concept.

I: Do you think the lecturer's style of teaching and his/her enthusiasm affects your learning of the subject?

VK: Yes, to a very large extent.

I: Tutorials style is rather constrained by the structure and when students are exam-oriented. Are most of your classmates like you?

VK: The general attitude is clearing the exams. I feel this for all the subjects, even the technical subjects, not just economics. They have this general attitude of just wanting to pass exams and I am really disturbed. Even the lecturers are doing this, they tell the students what should study for exam, do this and that and you should be able to clear the exams. I don't really appreciate this. In fact, I was looking at other universities, most of the subjects don't even have exams, so I don't see the purpose of exams. In fact the economics exam, I can't even complete the paper. I don't know, I feel that we are tested on writing speed and not on economics.

I: Back to your learning style. Do you find the way you learn economics quite different from your other technical subjects?

VK: No. I think everything is logical.

I: Do you find economics too technical and the concepts too abstract?

VK: It never happened that way. I never feel that it is very tough to understand, and everything is fine. I have never complaint about the course. The course is fine; it is the way it is introduced to us which is the problem. You have to show us why it is important and relevant to us.

I: Do you regret taking it?

VK: No, I think I am quite glad that despite all this I did one course in economics. I don't know if I have the chance to do it again. In fact I think as well as most of my friends feel that there should be one more course in economics, a higher level offered for general electives.

I: Will you take up one more unit of economics?

VK: Well, I don't know. I think it will depend on what year I am in and whether my interest changed. But I think if this course is shifted to the first year, it may make more sense. Because what we find is that the basic stuff should be introduced as our course seems to get more and more technical and specialized as we advance in years. So I think the basic general stuff should be introduced as early in our course as possible.

I: Have you ever had problems understanding the diagrams, curves and the logic behind it?

VK: No, it is not a problem to me. I am able to figure out why it so happening. I think I had problem but it was because I never go back and revise on the same day, I always do all the elective subjects together, so it kind of cramp up. But it is never an understanding issue.

I: Can you say that you apply economics concept in your daily life now?

VK: No, I don't know.

I: Are you more aware of happenings around us?

VK: No.

I: Perhaps in applying the marginal theory to explain why one is not willing to pay a high price of a product for instance?

VK: Not really. I think that is too simple. Even a uneducated person will know that you buy the cheaper thing.

I: Do you not think this is economics at work? You are able to explain a human behaviour?

VK:Yeah....maybe. I don't really think about it now. Sometimes, on bigger issue I would like to know.

I: Are you still reading the Business times and magazines these days?

VK: Yes.

I: Are you able to understand better and able to see the economics at work?

VK: No.

I: How about your other friends?

VK:I don't think so.

I: Given a scale of 1 to 10, what would you say your learning experience is?

VK: 7. I'm happy that I did it. I always wanted to study economics, since my JC levels. I didn't get the chance to do it during my JC days because I want to do engineering.

I: Have you ever go to the library to pick up books to read on economics?

VK: No, because there is simply no time. I am overloading my subjects this year, to find time to go through the textbook is already quite tough.

I: Is the lack of time stops you from learning more, in depth?

VK: Yes. Time is a crucial thing. I think another thing is the size of the class, it is simply too huge. It is okay if you are learning mathematics or physics, because it is just facts and you don't have to discuss a lot of things. Economics is something that if you don't ask when it comes into your mind, you tend to forget it. Perhaps sometimes a combined tutorials and at times a smaller class discussion may be helpful.

I: Do you think, a combination of lectures, tutorials and seminars sound interesting?

VK: I think a podium discussion is helpful. A workshop kind of thing, just discussing about current issues. Most of us do not read any way, may be this will push us to read articles and discuss about issues. Even if the discussion board is more populated, it can be a useful tool.

I: Do you think it is a waste of time for engineers to learn economics?

VK: No. I think it is quite useful to learn such things. Because at least we have learned something different, especially when as we go out to work, we can participate in the discussions. I have gone through that, when I can't comment and develop my ideas, it is not a good feeling. The only thing is it should be done in the first year.

I: If economics is an optional subject, would you have taken it?

VK: After taken it, I have no regrets. But, if I do have an option, I may not have taken it. I would probably have done something else, maybe a introductory course in mathematics. And may be peer pressure as well. It does have a huge influence on me.

I: How about peer pressure in tutorials?

VK: There is no peer pressure in tutorials. It is the tutor who talks. It is just not economics, all the courses are alike. When you have done your tutorials and attended the lectures, then going through the tutorials is really quite boring. They are just going through the same thing.

I: What kind of advice would you give to the next cohort?

VK: Read the lecture notes, you can pass exam. Read the textbook, read a little more perhaps. I don't know. You need to work hard. Those who has done economics in JCs, they have done it more than G240, which is easy for them.

When we are doing the structure questions, we just use the formula and explain the formula. I think it should be explaining the concepts and then derive at the formula and then the answer. So I think it is the approach that needs to change. Rather than using the formula being the reason for the answer.

Interviewee requested that the session not to be recorded

How was it like teaching economics to the engineering students?

I'm mostly doing the tutorials and only in this academic year, I am doing the lecture as well as the tutorials. So, I think I can only safely comment on the tutorials. I think the tutorials are not interesting at all. We are always constrained by the type of tutorial questions that we need to discuss in class. The problems are:

- The topics do not reflect the real situation in the world;
- It lacks the link with reality
- Personally it is too technical for the engineering students

After all it is unlikely that any of the engineering students are to take up more units of economics. In fact the students we are teaching are all non economics major students; what we need to do is to help them to understand and explain the world to them, rather than follow religiously with the tutorial questions which do not meet those needs.

Changes must take place in several forms:

Tutorial design
Lecture design
Textbook

Tutorial design

The current structure of the tutorials which consists of a combination of multiple choice questions and structured questions in my opinion assists students to pass examination. Changes must take place if we want to make this course more interesting. Firstly, we must try to make this course less technical *(how do we define technicality, if it means the*

foundation of economics, how can we not teach them that to give them the necessary tools to understand and interpret the world?), instead we need to help them to understand and interpret the happenings of the world. We need to help them to understand the reality. We should spend more time explaining what is happening in the world, for instance the reasons for the change in price. We need to reconsider the existing topics taught. Some of the topic may be deleted and we really need to look into the framework of the tutorial design. Given the macro objective of the course – to help students to understand and interpret the world, we need to change the thinking method of the students. The tutorial questions no longer should merely test the concepts or calculation, but with a wider objective of bringing the reality of the world to the class. For instance, globalization is an important topic that we have not dealt with explicitly. This is a growing phenomenon that cannot be neglected and when the students step out to the real world, they are faced with real issues like this which we did not prepare them for the changes in life. In fact we are pre-occupied with topics which have been taught for many years, the way we were taught in the universities. Many events have taken place, but the way we teach economics remain the same. It is impossible to give the students all the tools necessary in a short 12 weeks for them to analyze the world's event on their own. We need to infuse such learning in our tutorial questions.

I would prefer a structure that consists of seminar. Students may be able to pick a topic for presentation or some form of discussion about world issues. We could present the foundation, the basic concepts in our lectures, during the Seminar, students will be required to discuss the world events, really focusing to understand and interpret. This will make the learning fruitful. However, if we are going to do this, it will require more communication between the lecturers and the tutors. This form of communication is unfortunately lacking in the current structure. We do not even hold regular meetings to discuss the syllabus and topics for teaching. There is no communication between the lecturers and the tutors.

Lecture Design

I find that the students respond very positively whenever I tried to introduce or link the world's issues in my lectures. The lecture slides would have the basic ideas or concepts; we need to help them to see beyond the slides, by bringing the reality to the lectures. In that matter I have found it useful in my case.

Textbook

I think our current textbook (Economics – Parkin) lacks the discussion of special issues relating to this part of the world. Although it is well structured, it is not related to our local issues.

I don't think it is case of whether we are picking up a textbook that was written by an American author or British author. Neither would have the localize context that can relate local issues to the students. In this regard, I would prefer a local written textbook be used. Furthermore, students are not reading the current textbook we are using; they do not buy the textbook because we do not cover most of the chapters. So, the outcome is students are not reading enough.

Types of students

There are generally two types of students we face in the classroom, those who have 'A' level economics and those without. However I do not find that those who have done 'A' level economics are any better than those without. In other words, the previous knowledge of economics does not necessary place them in an unfair advantaged position. In effect, it may place them in a disadvantaged position because it often takes more time and effort to unlearn and relearn the concepts which they have got it wrong in their 'A' levels. I do often find that this group of students, with 'A' level economics background usually does not pay attention in class.

Conclusion

I think economics is very important to all, not just the economics major students, but everyone. It is a general subject that is essential to all in our lives. The engineering students may not require the type of knowledge necessary to be an economist, but I think it is beyond argument that the general knowledge of economics and the understanding of how it works are still crucial in our society. The question is how we are going to teach it? Which is the most appropriate method to teach our engineering students? Perhaps it is because the lack of knowledge of the how and what that has led us to be where we are today, allowing economics to becoming a low status subject.

It is challenging for us to change this perspective. The challenge for us is to allow the students to really see the government's monetary and fiscal policy at work each day. Allowing them to see how the governments of the countries in Asia make decision and the consequences we have to bear today. This is the real challenge for us.

I do not think that the good passing rate is a result of us scaling down the syllabus. We have scaled down the syllabus because like other core subjects in the engineering school, the credit unit allocated is reduced from 4AU to 3AU. So, correspondently the syllabus is reduced with fewer lecture contact hours. I think if the passing rate is improving is due to the setting of the exam paper. *Students' result is affected by the exam papers because we teach according to the syllabus, either 4AU or 3AU, that is constant from our part. If they have fair better now, I think it is the easier exam papers set.*

Recording #5

I: How long have you been teaching economics to the engineering students?
HWY: It should be about 3.5 years. In fact I joined in year 2000. And I know that this group of engineering students is taking the course as a compulsory subject yet not related to their main field of studies which is engineering.
I: Have you seen any changes in terms of syllabus within 3.5 years?
HWY: Syllabus has changed because the main engineering syllabus has changed so it was a result of the changes at the management level. (From G133 to G240 a reduction of Aus from 4 to 3 across all subjects)
I: How is it like teaching them?
HWY: In fact my experience is dependent on what types of student I get. There are mainly two groups, one that comes from the 'A' level cohort and those who come from the polytechnics. I can feel that there is a big difference.
I: In terms of?
HWY: The 'A' level students, they grasp the concept much easier maybe because some of them have taken the subject before, also may be because their grounding in theoretical concepts is much better. Whilst the polytechnic students, I think their background is more on practical work, like when the do engineering, they will do applied engineering and they like to see something that is concrete. So I think the challenge is to bring in concrete examples to relate to the theory. So in that sense, that is the difference. If there is no relation, then that becomes a little trying.
I: You have mentioned that the 'A' level students could grasp concepts better, do you have an example?
HWY: Yes, like the MR and MC ruling. If I use mathematical concept, the first order differentiation, it gels quite easily for the 'A' level student. Whilst for the polytechnic intake I would have to throw a diagram. I would have to use more illustration or I would have to look at the concept from various points of view, like using a container containing water, then you have an outflow of water and inflow of water, and if the rate of inflow and outflow is the same, then what would happen...the level of water will be stationary,

that will be the maximum profit. I mean I do it this way, so my perception is that some of them beginning to see it but not too sure if the entire class gets the picture. But I guess they will come along as we do more of such concepts, may be at the end of 12 weeks.

I: Do you get many 'A' level students with economics background?

HWY: For this academic year I feel it more strongly, I think it is because the students for last semester is the 'A' level cohort; the classes are much easier going. Whilst in this semester, I think a lot of them are from the polytechnic intake, especially in the school of EEE where the segregate the intake, 1st and 2nd semester swap, so when they are concentrated in a class, I think it is more obvious. If it is polytechnic students mixed with some 'A' level students, I think it is easier to teach. As in, possibly the 'A' level students could help out in the coaching of the weaker students.....may be I shouldn't be drawing this distinction.

HWY: Sometimes my tutorial session is more than 2 hrs; I can't finish in two hours.

I: Is it because you have to go back again and again to revise the concepts?

HWY: I have to keep revising, as in whatever that is covered in the 1st two lessons; I have to keep going back and explain. To explain the concepts again, like consumer surplus we have touched on it and we are doing this week, I have to go back to the definition, explain again what it is all about and it takes some time.

I: Must be a challenge to you?

HWY: Yeah, it is a different approach. It gets a little bit annoying when they can't remember, but I guess I understand.

I: 'A' level students and polytechnic students, how's their result generally, any difference?

HWY: Results are not so obvious. There is no correlation.

I: Bo you think the 'A' level students find G240 boring?

HWY: May be a small proportion of them will it a bit boring as they have already done it. But then again, we do it in a different way as what is designed in the 'A' level. So I think it is a different twist to it, I think this is what is about.

I: If you have an ideal way of teaching economics, what would it be like?

HWY: It will be teaching by examples.

I: Could you elaborate?

HWY: Like when we do market structure, I will bring in a group of firms, that is similar to a market structure, like oligopoly, and then describe the features in terms of what is really happening in the industry, then the competition, I think that will be much better.

I: What we are doing now, lectures, tutorials, are not quite good.....

HWY: We have improved; we have improved quite a bit. From a 4aus which is very much more theoretical, and doesn't go quite well with our engineering students. We have actually, take away some of the add-on, that is making it very basic, and tried to bring in a lot more examples, ...it has helped a bit, probably.... we can do more.

I: Do you think that when we removed those add-ons like utility functions, ISLM, derivation of that to ADAS, we have diluted the knowledge engineering students should know or helped them to appreciate the course better?

HWY: Whether it has helped them to understand it better, I am not sure. But.....as long as we can teach the engineering students in a very intuitive approach, and brings in real happenings to match those economics intuition, I think that will be sufficient. Whether we do it graphically or mathematically, it is just a matter of techniques. I know some students are very good mathematically but not all students, even though they are engineers, are very comfortable with using equations. Although it is a matter of getting used to, personally I feel that classical analysis is very illuminating, very clear, but maybe we have done it for such a long time, I just take it for granted. Not many people like it, but I always thought that it will help to understand. But apparently not so, I think is a matter of getting a feel of it, although economics is a thinking subject, a feel of how the real world works, the economics thought...I think that is the key to me.

I: Could you give me more example of how you bring the real world to the students in helping them to understanding of concepts?

HWY: Examples.....really the graphs are from the theoretical foundation.....using the demand and supply curves.....

I: what do you think they need to know?

HWY: Economics is just a branch of logic. Is just a series of sequential deduction, the end result is not really important, but the tools and the concepts of how we derive in the conclusion is most important.

I: The learning process of deduction analysis is more important.....how we analyze economics problem.

HWY: Yeah, for example the money supply topic is always quite challenging for me. To separate the concept of money as it is, and how money is created and eventually how it is linked to the inflationary pressure. I think the whole process, if the students can get it, it can be quite a fabulous thing.

I: What is it that they don't understand here?

HWY: I think is the way.....the definition itself, the concept of money. Just as a medium of exchange, that's how we define money. But to them, money is everything. Money is income; money is pocket money, credit card.....so it is this definition.

I: So how do you change their perception of money? Such an abstract concept.

HWY: I try to think of very simple example. We use monopoly money, if the monopoly money increase by certain amount, houses you buy, what happens to this little green house, things like this to help them. But again, some may, but I do not know those who are quiet, what is their reaction or feedback.

I: So going back to the two types of students, so after all these effort you have put in, after a while they will be at a level playing field?

HWY: Oh there is one more thing about the 'A' level students, it is of course easier to teach them at this conceptual level, but they come in with a lot of misconception. This is the flip side of it.

I: Supports the idea that those with 'A' level economics doesn't mean that they do better in exam.

HWY: Yes, I think some amount of time is wasted in clearing up this misconception. Probably sometimes is easier to teach with a blank piece of paper.

I: Text selection, as you have the opportunity to do so. How do you choose the textbook?

HWY: Look for examples, relevant examples, and also if the textbook is interesting enough. Minor details like presentation, colour as well, but there is additional feedback that sometimes the textbook is too wordy. I don't know how to handle that.

I: Do you consider the level of language use?

HWY: By and large, most of the American textbooks are quite clear, clear in the sense that more often than not they are quite similar, being able to explain.

I: Have you considered non-American text?

HWY: UK texts are even wordier actually. The others do not have....are not so prominent and also the internet reviews are also limited to those large publishing houses like Pearson, McGraw Hill etc. So it is actually, we pick up from these large publishing houses and they have good supporting materials and databank.

I: So the lectures are based on the textbook?

HWY: Much more wholesome.

I: How about the tutorials? Any comments on structure?

HWY: ***I think the structure of the tutorials is quite good. I like the MCQ even though it is not good for but it is good as a learning point. Because we can go through the right answer and why the answers are not so good 15:32.*** And from there we can explore quite a bit. The structure questions are basically preparing them for the exams.

I: Do you think it is enough preparation for exam? Given the structure questions in tutorials?

HWY: I think it is enough but I think students should be expected to do more. To read up or to think more into the issues then merely relying on the tutorial questions, where we don't have time. We can't give them everything.

I: Going back to the lectures, do you rush through the lectures?

HWY: With one hour was very rush, the speed and pace was bad. I don't know whether the 2hours lecture and 1hr tutorials will be better, from a learning point of view.

I: How about when you were given the 2hr lecture in G133?

HWY: But with the added content, the speed was just as bad.

I: So clarification will come during tutorials.

HWY: Yes, during tutorials the problem will be how we pitch in terms of clarification. To what extent we have to clarify, how much do we have to clarify; I think it is dependent on the class.

I: How motivated are the students?

HWY: I think it is a very wide range of reaction I get. Some are quite enthusiastic, may be because of their previous good experience learning economics, or maybe ....some of them do part-time work, they find it quite relevant to what they do in their part-time work. Some of them, doing some sales, so they find it quite applicable. Of course some of

them, they take it as just another subject to take. Nevertheless, I think they know that they need to do well or they need to pass, so there is no disciplinary problem, there is no unwillingness to learn. The only problem is how we make it interesting for them so that they go through the tutorial sessions as enjoyable as possible.

I: In that sense, they are keen to come to tutorials?

HWY: Yes, they are not, not keen.

I: How do you find our assessments? Quizzes and Exam are adequate? Improvement?

HWY: CA is good for getting the students to keep up with the pace of the lessons. But again, it is good because some of them tend to not follow up, follow the lessons because of time constraint or whatever. Every time when it comes to quiz, then they get everything revised, that is good. But for efficiency we use MCQ, so if we do have more manpower or sufficient amount of manpower to assess the students, maybe other forms of assessment can be considered. Like getting the students to do project work, actually is more time consuming for students and to us as well, if we do consultation. But this (project work) would actually aid their learning.

I: Eventually, if the student numbers reduce...

HWY: It will be nice to teach. More discussion.

I: Do you think there is enough discussion in our course?

HWY: Not much in tutorials. Most of the time is recap and emphasis and going through the tutorial questions. In fact drawing out the answers from them is already quite a challenge. I mean sometimes they are really not too sure, you know Asian context when they are not too sure and they don't want to lose face, I think we can all identify. And our very correct society, wants to be correct all the time, so once they are not sure of the answer, they are not so willing to participate. So we need to draw it out from them.

I: Tutorials are still very much a one-way communication process, like a mini-lecture?

HWY: Yes. But some classes are better than the rest. When the rapport is good, the chemistry is there or the class dynamics is good, sometimes when they know each other, sometimes they are quite humorous, they laugh and they are more relax then the things get a bit smoother.

I: How well tutorials go depends a lot from the students too.

HWY: Yeah, sometimes they come from all over the place, they don't know each other, and then atmosphere is tenser.

I: Do we allow them for reflection? Is it in-built in our lessons? Or we are just pre-occupied in getting them to get the right answer?

HWY: My assumption that they will go back to think about the issues.

I: Is your assumption always right?

HWY: I think is wrong. In fact, my feeling I get is that they never do any more than the one lecture or two hour tutorials that we have for them, until the exam or the quiz come near. That is quite disheartening. And I think it is common to all. They will get the tutorial answers at the end of the tutorial and the second semester students will be the answers from their friends in the first semester. They will come with the answer, but some of them are really quite weak, they don't really understand the answers. So they come to tutorials, to get an understanding of how to get the answers. So I think there is quite a huge gap.

I: Do they come back to you to clarify ideas? Or do you find that those who often speak to you are the bright ones and the really weak ones are usually quiet?

HWY: Not really. One or two would go through the answers and I not clear, they would check if their methods are correct. One or two, not many. They don't usually come and see me; probably they are very busy as well. Near the exam, during the one week break, they will make arrangement to see the tutor. But again I think time is very tight.

I: So they just go through the tutorials, get the answers and do the exam.

HWY: The loading up other subjects so they don't really have time.

I: When come to Exam, have you ever been presently surprised? Or you think they just memorized the materials?

HWY: I think our exams are structured in such a way that the first part is usually the knowledge gathering questions and the difficulty level will increase. So generally, students tend to do well in those definitional types of questions. That is where they collect most of the marks, those questions in which are close to their tutorials. I guess the understanding of the questions, those which have not been asked in the tutorials before; I think they answers we can get in the exam can be quite varied. It is also a reflection of whether they understood the question first before they attempt the question, or they don't

spend enough time reading the question, or they read the question and assumed that it is asking for this other thing.

I: Could be a misconception of what they learn?

HWY: Yes, like section b, the applied portion.

I: How would you want to teach the engineering students, if you have the power to change?

HWY: I believe in selling the course to the students. Make them understand that it is important for them to be economically literate. I don't mind doing away with some of the not so necessary components, probably I need to re-look into the course to tell you specifically. But I think it is always important to always emphasis in class why they are doing this. I think the students being self motivated is more important than us motivating them. As much as we say that they exam is drawing near and get them to study, I think to see them through life, continue to have that interest in economics, comes from them, is within themselves. So for them to realize the usefulness of economics is more important.

I: Have we achieved this?

HWY: Looking at the reaction after the tutorials, not really actually. I think the contact hour is quite limited, looking at the entire engineering degree, there is so much more things to achieve, so I think based on the constrain that we faced; we have actually tried our very best. Ideally of course, the student ratio should be smaller, smaller class size, more time given.

I: Drastic revision to sell the course, would you implement more discussion, building that into the lecture and tutorials?

HWY: with the background of this being the first or second year course, that the students are quite new, and it is the first course in economics. More discussion, I think is being quite hopeful. I think ultimately interest must be there foundation must be built, so things must be made very clear as to what is the definition of terms and how economics really works. Then we can bring in the examples for discussion. Of course it will be ideal if we can do it on par, how we are going to do it, is really going to be quite a challenge, to do it concurrently. That is concept grounded real well, and instills the interest, examples given for them.

I: Are we constrained by the experience and qualification of teaching staff?

HWY: I think we are constrained by the system. By the things we have 3 hours contact hour, constrained by the class size, sometimes it can go as huge as 30 students. So when you have 30 students and to get everybody to talk within that two hours can be quite a challenge. I think these are the constraints. Teachers, I think we are all qualified, we are young, we are enthusiastic, and our age group is quite close to the students, so we are from the same generation. So there is no generation gap, I think the rapport with the students is quite good. Except that, I think teaching is a very collaborative subject, but students have other attentions as well, so in the sense we are competing for time and attention from them.

I: Probably we are in the losing end as this is not their core.

HWY: Yes.

I: Have you received remarks that economics is a completely different thing from their core subjects?

HWY: If they come in with a generic background, that means with 'A' level, grounding in mathematics, physics and they have not done their engineering work before, then it is okay, quite easy to teach. But students who came in through a different route, who has done engineering since 16 years old (polytechnic) or some came in with ITE background, then they come in with working experience, studying part-time, there is some mention that this is a paradigm shift. In electrical engineering, the utility is actually the power box, which is different from economics.

I: With such added experience, easier to understand the course or hinders?

HWY: I think depends on individual, how much of an interest they have taken economics to be applied into their personal life.

I: Have you seen an ideal textbook? Some students think that economic concepts are very fragmented, have you seen an ideal text?

HWY: I think there is no ideal textbook unless we write it ourselves.

I: American texts are not relevant to us, how do you overcome this? Or do your students read?

HWY: When we come to that, we just have to explain that Central bank.

I: Do you really encourage them to read?

HWY: Yes I do, but at the same time I recognize the fact that they don't seem to have the time. But again where the time has gone to, I really don't know. I don't know how heavy the other courses are, it is left to them.

I: In short, how would your experience in NTU?

HWY: I would say quite a pleasure. Because when I was teaching in the polytechnics, on younger students, discipline was quite a challenge; the class management was quite a challenge. Over here, I think the students are pretty much more mature, there is not much disciplinary problem, that part is taken away and I can concentrate in the academic teaching. I think teaching always has its ups and downs. Sometimes you get very good classes, and sometimes not so good, which doesn't matter I guess. As long as we could see students improve to when they first came in, I think that is more important and the interest continues thereafter, I think that is more important.

I: Perceived objectives vs. what they have learned is very much unknown unless students come back to tell us.

HWY: I would like to leave it independent of the exam results, whereas the students may not see it this way. For me teaching is...the process in the classroom, the fact that time flies, that is more important than the results. But the students, wants to do well in their exam, that is their objective. I think I would try to have an enjoyable time in class. That is my objective, whether they do well or not....if they do, it is a bonus, if don't, we will try again.

I: So far your experience has been quite positive; as you enjoy your class I am sure the students do enjoy your class as well.

HWY: Provided they have the interest.

I: Any frustration?

HWY: I do have things that are annoying, I do have my days that students keep looking at their watches, and it is okay. It will annoy me for a while.

I: Frustration not from the fact that you have teach the engineering students?

HWY: No...not from that.

Recording #4

I = Interviewer

HY = Interviewee

I: What is your experience in teaching engineering students?

HY: How well do they learn or how well do I teach?

I: Both.

HY: Ideally, what I think they should learn. From the simple basis that after the engineering course, they should be able to read and understand newspapers. This sounds a little ridiculous, but many people read newspapers but they don't understand the newspaper. They read about the Government statistics but they don't have a clue what does that mean, how does that affect their lives and how does that affect their choices. So my idea is to teach them enough to help them to understand what is going on. As for our course, how do we teach it……Actually, I don't like the way the course is being run.

I: How can I improve it? The perspective so far is that it is too technical and it is not useful, how should we address this?

HY: Economics to me is so useful that it actually distinguishes between an intelligent person and a stupid person. Like Prof LCY has always said, 'a personal who has a degree but is uneducated.'

I: For example?

HY: Their minds are…..let us not interpreted what he says, but let us interpret what I said. You see a lot of graduate engaged in coffee shop talk, the level of intelligent they have, when they look at a government policy, can they comment on it. Do they always see things from their own personal interest? Because this is the difference between coffee shop talk and the way economists look at things. Many of the graduates, they are still engaged in coffee shop talk, they never be able to see things from a macro point of view, they always see things from their own self interest. And I always feel that the purpose of learning economics is to correct that perception, may be not perception but to teach them the right way to look at things. Is that you could still argue for your own self interest but

you should be able to know that from the macro point of view that is why things are being done this way. So this is my ideal idea of teaching economics to the engineering students.

HY: What we are doing right now is slightly better than last time (G133). At least we have given up teaching them.....ISLM....ISLM model is actually pretty useful but it is a bit too technical. The problem with the course is that we never go beyond the technicality to the application. We spent so much time on the technicality, assuming that based on what we have taught them to apply but students never proceed beyond that set. So, my idea is since we only have 12 tutorials/weeks, we should keep as much as the technicality as possible and go straight into the application. And teach them this is how you could look at things and this is the reason why. ISLM is okay, I have more problems with the consumption functions and the utilities functions those things.

HY: What we are doing now is much better than what we were doing in the past, because in the past students end of doing things like solving simultaneous equations. To them economics is simply to identify equations and to solve them. This is what Asif is doing, which is what I hate. To me you are not doing the students a favor, even at the PhD level; we do not see a lot of relevance in solving simultaneous equations. That one is really opting for an easy way out; you teach market structure without telling them what the real implication is. Market structure is so interesting. For instance, why does the government want to liberalize the Telco market? By liberalizing the Telco market, what is the impact? We can talk about why government wants to regulate bus fare? Is bus fare duopoly? No they are not duopoly, they are monopoly. Because in their own bus route, they are a monopoly. That is why we need to regulate them. So how do we need to regulate them? How do we regulate them? How in practice we regulate them in Singapore? These are the things we should be teaching the students.

I: So this is what you mean by understanding the application of it rather than teaching the technicality in the economic course?

HY: Yeah. Even the first three lectures you did. Of course we don't have enough time; minimum wage is so interesting topic. There are so many countries who have already implemented minimum wage, what are the actual problems they are facing? Singapore, the opposite party is asking for Singapore to implement minimum wage, why didn't the

government give you? What are the types of minimum wage that in practice people do in their countries? Does that improve your welfare or not? This is a form of government intervention, they thing is the way we teach them is quite sad,.deadweight loss, loss in consumer surplus and loss in producer surplus.....

I: Are we constraints by the textbook we picked?

HY: Possibly. Because I don't think there are any textbooks in the market that really.....you see most of the textbooks are written for people who are doing an economic degree. I would have no problem, if we are teaching a student who is doing an economic degree, and this student will eventually be learning a lot more and what we are providing is just a foundation for her to learn more. What we are teaching and the textbook is all fine. But for engineering students we have to bear in mind that after we taught them for these 12 weeks, they may not touch economics ever again. All their economics training is just based on this very short 12 weeks. If we didn't do it well, they will be forever untrained. And we are really...and they are not going to be an economist, they are not going to have anymore economic training after this, so what we are teaching them is pretty pointless actually.

I: They don't see what economics is all about.

HY: I think some of the more intelligent ones may be able to see beyond it. Like I said we teach them the entire technicality and assume that they know how to apply. But I must say that among the teaching colleagues, not many of them appreciate the application part.

I: What do you think of the expertise of the staff members that affects the content?

HY: All of us should know all those areas.

I: Maybe one may be interested in for instance minimum wage policy and could contribute articles or latest debates on that issue that may make the course more interesting?

HY: Let me tell you what we should have done in the beginning. All of us should have set down and talked through the topics that we really want the students to learn. It should go by topic based, then come up with 12 topics, under the 12 topics, everyone pick one. Go and research on the particular area, what is our local application, what is the global application and do out something like that. That would anytime be more useful than using any textbook. Especially textbook, I really don't care. Students would come and ask me I

really didn't buy this year's textbook, I can use 'Chew and Chew'? Go ahead, textbooks are all the same. There is no difference, every year we keep changing the textbook, I also don't know for what?

I: We were told to change textbook so that it looks different year to year.

HY: But this is very bad for students, because they buy already they can't sell it.

I: Yes, no resale market.

I: Would you push for your ideal idea?

HY: WY and I had come up with the course outline already. We actually forwarded that to the Dean and he wasn't that interested. That time we were trying to sell this idea to protect the turf. I actually went to The Dean trying to convince him. Instead of opening economics into a General Electives, he should keep economics as one of the compulsory subject. Or within economics, we can try to offer more subjects. So no matter what, they have to do one economics subject, but they can have a choice now. So we actually came up with this application course, which is quite similar to what I have told you.

HY: Basically what we conceived teaching in this new course is not very far off from what we are teaching now. Like we still teach market structure, but instead adopt a totally different approach. They still teach whatever macroeconomics, teach inflation still but it is totally different. They emphasis will be on inflation, what problems do inflation bring? What causes inflation? Instead of inflation what happens when we have deflation? We will learn about exchange rate, like US dollar, if the value keeps dropping, would it destabilize the whole global market? Or why do we think that the US dollar will keep declining? Based on what other factors? How do we look at the national account and think whether this currency is going to increase or decrease in value. So actually, in terms of the content, it is not very far off from what we are teaching right now, is just that the approach is very different.

I: DO you think the Dean and his deputy are looking at it?

HY: I don't think they are. I don't think they like the idea that we want to keep economics as a core. They probably don't mind if this kind of the subject is under the General Electives. WY and I were trying to protect the jobs for all 11 of us...so, if we can't achieve that (to protect the jobs for us), we don't even want to pursue.

I: While teaching the engineering students, do you find them difficult to teach? Since their background is so different from humanities students.

HY: I have not taught the business school students (Nanyang Business School) but I heard they are not easy to teach, because they are too smart! Engineering students....it all depends. Depends on what we want to achieve in class, if simply to go through the tutorial questions and clearing the concepts with them, up to 60% of the students I think they will understand. I mean they will walk away from the tutorials understanding the concepts better than before and they could at least answer the exam questions in case it comes up in the exam. But to appreciate economics, very few students come to appreciate economics. But I do have few, a handful who tells me they really enjoy the subject because they actually see this subject as a very important very useful subject. And usually would tell me because their parents are in businesses and I could see the relevance of this in what you are teaching. But really not many. Most of the students, they are okay. They could pass.

I: DO you think most of the students are exam smart? They do their tutorials.....

HY: The thing is our tutorials didn't even prepare them for the exam. Especially last semester, I nearly died when I saw the exam questions.

I: How do you then think the students passed economics, they probably must have understood the concepts?

HY: But what was the point? Solving simultaneous equation? I don't know. Given the constraint that I am facing, the type of syllabus I have to teach, the type of tutorial questions I have, the type of exam my students are expected to sit for, I think the objective is to help them to pass exam. Understand enough things, fair or not, maybe memorize enough things, go to the exam hall and throw back everything, write and pass the exam. For that, I think we have done it quite well.

I: The bigger objective of helping them to appreciate economics...

HY: That one cannot be achieved at the end of one tutor you see. It must be a collective effort; it must be everybody shares the same idea. Even WY and I we talked a lot of this, about what we really want our students to learn. And everybody has very different idea of they want the students to learn. Like WY would think that we just teach them the technicality, her ideal is that with all these basic information, they....next time they can

go forward, they can if they are interested they can go to the internet to look it up themselves, because we have provided them with the foundation that enables them to do it. So that is her ideal which is very different from my ideal. My ideal is a little bit more realistic than hers in the sense that they will not take anymore units of economics...that's it. You teach 100% of the student, may be only 2% falls into the category WY described, that is only 2% will eventually go on to do more economics. But what about the 98% of the student, they have wasted....not that they have wasted their time, but they have wasted the opportunity to learn economics. And I have never said enough, economics is so important. It really makes a difference between a person who talks with sense or without sense.

I: I suppose we have just been following what has been done so far without challenging the status quo, in terms of the lectures, tutorials, type of assessments. Perhaps change must come from the top, so that your ideal idea could be implemented?

HY: I guess in our own small ways we can still make a difference. Like when I was lecturing, I throw in a huge part of taxation into the lecture notes. Because to me taxation is so important, is like how can they not know. Is like if nobody is going to teach it, I am going to teach it. So that is in our own small world we can try to make a difference.

I: But that will be quite piecemeal and fragmented, and we can't see the continuity, being carried down from one academic year to another.

HY: Yeah. As I said, among the 11 of us are all pro-students and really want them to learn, even then we are going to disagree on the approach, because everyone has different emphasis.

I: When you are teaching them, do you see a difference in students with 'A' level background and those without? Or do you recognize a difference at all?

HY: 'A' level student....actually this is another problem with this course. 'A' level student will probably find what we are teaching quite boring, as they have learned it before. But having said that doesn't mean that they are any better. They may not have understood it during their 'A' level also, but basically they find it boring, the same old stuff all over again. They may not put in anymore effort. So, again this is....for this course, if we are going to continue to teach both the 'A' level and polytechnic students,

we really must try to find a niche whereby it is substantially different from the 'A' level syllabus.

I: Yet applicable and manageable for the non-'A' level student.

HY: Yes. I don't believe in giving too much of theories and.....I still believe that the only way to teach them is to teach them the application side of the economic theory.

I: How do you feel about the assessment of the course?

HY: MCQ is probably the worst type of assessment possible. The only thing is because the cohort is too huge; there is no other way to do it. Ideally, if it is manageable.....you see economics with everything said and done is still a social science subject, students should learn to write article, it is almost a must. Ideally they should be given topic for them to research. And in research I don't mean for deep research, but just to go and read a couple more articles, and then summarize them and put them together and present it in class. Economics assignment should always be conducted that way, not MCQ.

I: How about examination?

HY: Examination is okay. Exam is not a good ideal but it is necessary part of assessment. I think exam is okay, I don't have problem with exam.

I: Do you think we should change the weightage of exam?

HY: The thing is it depends on how well we can do the assessment, as it is if it is just MCQ, then I think 30% is more than enough. If it is assignment, then it will depend on how much time we can devote to it. Because if we are not going to devote much time into it, then students are not going to get a reasonable assessment of how well they are doing in terms of their ability, then too much weightage on that is also wrong. So, looking at our constraint and our capabilities, I think 30% is about there.

I: If we were to change to that ideal way of teaching you have described, would it affect the assessment weightage?

HY: No, because as I said it depends on the capabilities of the tutors to do the assessment. The lack of that, 30% is alright. When you come to assessment on presentation, the marking of essays can be very subjective. Especially when the topic written by all the students are different. If you have a large number writing the same topic, we can be quite objective, but .....giving them marks must be as objective as possible. So due to this objective, I don't like the idea of increasing weightage in CA.

I: How do you hold the interest of your students in your class?

HY: I usually ignore them. If the class is half 'A' level and half polytechnic students, this is the most difficult class to teach. Because my way is I always imagine that they don't have any economics background. That is to be fair to the polytechnic intake. So I ignore them. If they class has 90% of 'A' level students, then I go thru it a little faster. Again as I said, having done 'A' level economics, doesn't mean they are good in it or they are interested in it. And most of the time, they are just totally disinterested in it. Very difficult to teach and I don't quite bother. I just go through it. You see, if they come in with the pretext of I just want to pass exam, then I will give that to them. I will go through the tutorial with them, I will clarify idea with them and they can go off.

I: Is that very often?

HY: 'A' level is usually in semester 1, semester 2 is all polytechnic intakes.

I: So their attitude is so far alright?

HY: I think they are okay, occasionally I do get someone who is quite good in economics; they are quite alright. They will just sit around, keep quiet.

I: Are there any difficult concepts of teach the students?

HY: Nothing, there is no concept that is difficult to teach.

I: Or perhaps difficult concept for students to understand?

HY: It depends on whether they want to see from our point of view or not. If they refuse, all concepts are difficult. I did spent a lot of time with one girl to explain the difference between increase in demand and increase in quantity demanded. If they refuse to see it our way, what can we do? I have not come across anyone who says that the concept is difficult. The thing about economics is it is so rational, is that it is so logical, you think about it you will agree with it.

I: Do you think the way we conduct our classes help our students to think about the big picture?

HY: No.

I: Is it not inbuilt in our lessons?

HY: No. I come from a background of a reporter. I know a lot more of general knowledge than others. But that is my background. If you look into our tutorial notes and lectures, nothing okay. If the tutor is a relatively inexperience young tutor, and her job is

just to go through the tutorial, no I don't think so. If this is the objective, it must be within the question itself. Like I said, my tutorial, based on what I know, I can share it with my students. What happens if I don't know? The thing is that it is the way we take wholesale from the American textbook is not very helpful for that matter. They way XQ teach, the MCQ question, she has totally no idea how the actual world works. When 2 countries trade, the settling currency will be determined between them, she can't even see how FX market works and the business dealing in the real world. When you have tutor like this on board, I don't care.

I: How to minimize this problem? Tutorial answers must be substantiated with more articles

HY: It is difficult now as my ideal can't be implemented with what we are currently having. You want people to think more, you must give them questions that allow them to think more. You cannot give students questions that only test them on the shifting of the demand and supply curve or how to draw the MR curve. This kind of questions will not set them thinking. The questions have to be more than that.

I: Any good example? For example, the questions from G133 which was set by NBS?

HY: NBS problem only want to do one set of tutorial questions and they want to pitch it at the NBS student, so the good students there would end of doing a major in economics. So when we say this is the foundation of economics, it must be the foundation of economics. You must give them enough foundation to go on from there. So, everything can be written down in equation basically, as you know everything about economics can be written down in equations. So whether you understand or not it doesn't matter because it is suppose to be foundation. Engineering students found that course G133 very difficult because same exam questions was being used and they have less self- study time compared to NBS student. So failure rate used to be very high. So when we took over the lecturing, over the years I have seen that we have made positive changes. Like when WY was lecturing the market structure, I like her exam questions. Asking the students to quote in real life examples of price discrimination. This kind of thing sets people thinking, can you give me an example of price discrimination? Why do they want to do it? How do you think they can do it? What is the situation must have before they can do it. So these are the things that make people thinking. Price discrimination is it good or

bad, is it fair or unfair? But the other lecturer overturned the whole thing, went backwards.

HY: When I wrote a demand equation for the students, $P = a - bQ$ and they can't even see that it is demand equation.

I: It seems simple, but it doesn't mean that since you have done mathematics, you would naturally understand the economics equation.

HY: Yes. But by teaching them equations, how does that help them in understanding?

I: Are we doing justice to the students?

HY: No, we are not. The thing that we are stubborn about what I think is right about the students. Everyone will think differently, even WY and I had the argument on what is the right way to teach. But I am more stubborn, over the years, she has come to accept my idea.