POLICY IMPLICATIONS OF THE SCALE ECONOMIES OF THE UNIVERSITAS TERBUKA (THE INDONESIAN OPEN UNIVERSITY) COURSES AND PROGRAMS

BY

IBRAHIM MUSA

ABSTRACT

POLICY IMPLICATIONS OF THE SCALE ECONOMIES OF THE UNIVERSITAS TERBUKA (THE INDONESIAN OPEN UNIVERSITY) COURSES AND PROGRAMS

Ibrahim Musa

The introduction of Universitas Terbuka (the Indonesian Open University) into the Indonesian higher education system by the government of the Republic of Indonesia was designed to achieve three major objectives: (1) to increase aggregate access to higher education; (2) to promote increased equity in educational opportunities by providing those not eligible for other institutions a second chance to obtain higher education; and (3) to improve the efficiency of the up-grading programs for the Junior and Senior High School teachers.

While initially successful at achieving these objectives, the decline in enrollment between 1986-1988 has raised the question of the scale economies of the Universitas Terbuka (UT) courses and programs. Cost analysis and policy analysis have been made for the related data in order to identify the policy implications of the scale economies of the existing UT courses and programs.

The unit costs of the courses and programs offered by the School of Mathematics and Physics are relatively high compared with the courses and programs offered by the other schools. The least expensive courses and programs are those offered by the School of Social and Political Sciences. In terms of the overall operational costs, however, the cost per student at the UT system

is lower than the unit cost at the campus university systems. The comparative unit cost analysis, based on various enrollment levels, shows positive scale economies in the UT courses. Present enrollment levels for the courses supporting the programs offered by the School of Mathematics and Physics and School of Education are not yet sufficient to capture the potential scale economies in the UT system. The resent pattern of changes in expenditures and enrollments suggests that enrollment levels are not the determinant factor for the UT cost structure.

Four alternative changes in the operational policies for exploiting the potential scale economies in the UT operational systems were proposed to the UT administrators. This study shows that the administrators are confident that UT has the opportunity to provide intensive student support programs from manpower, finance, law and regulation, and technology and skills. The main constraint, however, could be the recurrent costs for tutors and program administrators. UT could gain strong support from the unaccredited private universities to implement the program transfer policy; this policy could improve the quality of these institution's instructional programs. To merge the small courses and reduce the course offerings would face resistance from the school's deans. They may perceive that implementation of these policies could reduce the school's autonomy. On the other hand, the UPBJJ administrators support these policies. Their favorable responses to these changes may reflect their expectation for greater future role in the UT system.

ACKNOWLEDGEMENTS

I would like to express my sincere gratitude to individuals who assisted in bringing this study to fruition and in making my educational program into a successful endeavor:

Dr. Douglas M. Windham, my academic advisor and chairman, who has provided me with very detailed review and advice during the entire program. For the very meticulous guidance that he provided in developing this dissertation and my study program, regardless of his busy schedule, I am extremely grateful.

Dr. Frances N. Kemmerer, my committee member, whose guidance and expertise in reviewing the dissertation was invaluable.

Dr. David W. Chapman, my committee member, who played an important role in preparing the final version of this dissertation, I also am extremely grateful.

Dr. Philip J. Foster and Dr. Gordon S. Purrington, my department readers who have provided fruitful contributions to my dissertation, I am truly grateful.

Mrs. Jeannette Windham, for her personal help and advice in language editing of this dissertation, I give special thanks.

Dr. Setijadi, Dr. Atwi Suparman, and my other colleagues at the Universitas Terbuka, which in many ways helped me to make my study a success, deserve my true appreciation.

Dr. William K. Cummings, my personal advisor, whose contribution in developing this dissertation was substantial, and he should be given special thanks.

My wife Luspinah, and my four children Dharma, Lilis, Shadli, and Romin to whom my life is dedicated, for their sacrifices, patience, and understanding, I am eternally grateful.

All my family members and friends who always had faith in my abilities, whose love and support were always there, may God (Allah) reward them.

And foremost, to God (Allah) who blessed and guided me throughout the entire program I give thanks.

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CHAPTER I

INTRODUCTION

This study is a cost analyses of Universitas Terbuka (UT), the Indonesian Open University, courses and programs. It focuses on: (1) the cost per student; (2) the prime determinant cost factors; and (3) the source of constraints and opportunities for changes in the operational system. The organization of this report is as follows. This chapter provides a description of the cost issues within the context of the scale economies concept. The discussion covers: (1) the statement of the problem; (2) the purpose of the study; (3) the potential significance of the study; and (4) the scope and limitations of the study. Chapter II provides a general description of the UT system as the background of the study. Chapter III contains a discussion of the conceptual framework for the study. The research design for the study is described in Chapter IV. Chapters V through VII discuss the data analyses and findings. The summary and recommendations are presented in Chapter VIII. The instruments used for data collection and the raw data collected are provided in the Appendix.

The Statement of the Problem

On September 4, 1984, the Government of the Republic of Indonesia introduced an innovative delivery system in higher

education by creating the UT. Although efficiency has not been the primary cause for the foundation of any distance university (DU), there is a widespread assumption that DU systems provide higher education at a lower cost per student than do campus university (CU) systems. The DUs appear particularly attractive and appropriate when the increasing cost of higher education together with increasing social demand for entry to universities pose both political and economic problems. As a result of the assumption of cost savings, there was a marked growth of public (government) and personal investments in distance education systems. The cost saving rationale was used by the Government of the Republic of Indonesia to justify the creation of the Universitas Terbuka as opposed to increased expansion of the campus based system.

The three major missions of the UT are: (1) to increase access to higher education; (2) to provide a second chance for higher education; and (3) to up-grade the Junior and Senior High School teachers. The elaboration of these objectives and the related problems are as follows.

(1) To increase aggregate access to higher education.

Toward the end of the REPELITA I (The First Five Year Development Plan) 1969-1974, Indonesia benefited from increased oil prices which enabled the Government to increase its investments in education. During 1974 alone, 52,000 new primary schools were

built, and approximately the same number were added later under a special Presidential Instruction Program (INPRES). This promoted a rapid expansion of primary school enrollments that resulted, first, in an increased demand for secondary schools and then, in the mid-1980's, for an increased demand for higher education.

While the number of primary and secondary schools grew very rapidly, the high cost and longer lead time necessary for preparation of university staff resulted in a much slower expansion of places in higher education. From 1982/83 to 1984/85, enrollments in public and private higher education grew by 7.04 percent and 6.2 percent respectively. Since private universities generally demand higher tuition than do public universities, only an estimated 60,000 students enrolled in private universities in 1986 (IEES, 1986). In 1986 there were only 82,000 places in public universities available for more than 486,000 applicants, while the total number of high school graduates that year exceeded 900,000. About 140,000 out of the 486,000 potential university students, or less than one-third of the applicants, were accommodated by the public and private Indonesian universities (Setijadi, 1988). The UT was created to help increase aggregate access to higher education.

(2) To provide a second chance to obtain higher education.

The expansion and modernization of the economy, resulting from the political and economic stability of the "Orde Baru" (the

New Order) beginning in the early 1970s, increased the demand for more university graduates. The relatively small number of seats available in universities meant, however, that access to higher education was (and remains) highly competitive. On average only 20 to 30 percent of high school graduates can be accommodated by the public and private campus universities (IEES, 1986). This implies that the remaining 70 to 80 percent of the graduates must enter labor market. Those who had not applied for university immediately after high school (often because of the need to support their families) and those whose grades were not sufficiently competitive had no alternative route to earn a higher education degree. Given the rigidity of the instructional system of the regular universities (involving requirements for full-time study), high school graduates who have to work cannot benefit from them. Also, the admission policies of campus based universities favor new graduates rather than former high school graduates. Thus, UT was intended to provide a second chance for high school diploma holders and those who had failed to pass the public university entrance examination.

(3) To provide efficient up-grading programs for Junior and Senior High School teachers.

The rapid expansion of primary and secondary schools required more teachers than the regular teacher-training programs could produce. This need was met through provision of short-term

teacher training programs provided by the Post-Secondary Teacher Training Institutions: the Teacher Training and Education Institutes (IKIPs) and the Schools of Education within the University system (FKIPs). A three-semester program leading to the Diploma I (DI) was designed for the Junior Secondary School teachers. This alternative was instituted with the intention of further upgrading teacher skills at a later date. In practice, however, it was impossible to provide these teachers with further training at the regular "face-to-face" teacher-training institutions because the teachers could not be replaced in the schools. The Government selected the alternative of upgrading and further certification of teachers through distance education. UT was designed to fulfill this responsibility.

Given these purposes, UT provides higher education programs characterized by: (1) open admission; (2) flexible registration; (3) use of standardized self-instructional modules; and (4) provision of tutorial services (Setijadi, 1988; UT, 1989). No entrance examination is required to enter the university. The only requirement is possession of a high school diploma. Students are free to register in any semester because all courses are offered throughout the calendar year. Students can obtain their learning materials through the mail or pick them up at the UT central office or at one of the regional offices. Tutorials are provided three times a year on the basis of student requests.

This unique delivery system initially made UT very popular. In its first year, UT processed some 270,000 applications. The

original plan to accept 25,000 students in the first year of operation was later increased to 65,000. Eventually 60,000 students actually registered, of whom 75 percent were concurrently employed (Setijadi, 1988).

Despite the novelty of the UT system and its initial success, enrollment levels in the last three years (1986/87 to 1988/89) have declined. The annual enrollment levels during this period are summarized in Table 1.1. As the data in Table 1 indicate, from 1984/85 to 1988/89 enrollment declined by 31 percent. The largest decrease occurred in the 1986/87 and 1987/88 academic years with a recovery occurring in 1988/89, the last year for which complete data are available. However, even with this decrease in the rate of decline, the 1988/89 enrollments represent less than one-sixth of the 1984/85 and one-half of the 1986/1987 levels.

TABLE: 1.1

ANNUAL ENROLLMENT RATE AT UT
1984/85 to 1988/98

Year	Enrollment	Change	(%)
1984/85	61,608	-	
1985/86	53,919	- 7,689	(-12.5)
1986/87	20,053	-33,866	(-62.81)
1987/88	8,109	-11,944	(-59.56)
1988/89	9,041	933	(+11.49)

Source: BAAK-UT, Statistik Mahasiswa UT, Jakarta, 1989

As with all public Indonesian universities, UT has two main sources of income: (1) the routine and development budget allocations from the Directorate General of Higher Education, Ministry

of Education and Culture (MOEC), and (2) the funds received from student tuitions and fees (SPP). Unlike the development budget, which covers capital investments and project activities, the routine budget and SPP are allocated for supporting operational activities including personnel salary, building and equipment maintenance, tutorial and examination services, and the distribution of student learning materials.

The development budget allocation for a public university is especially sensitive to the Government revenues from the economic sectors. The routine budget allocation is more stable and is closely related to the size of the institutional operations; the SPP funds are directly related to enrollment and fee levels. When the economy prospers as it did in the late 1970s and early 1980s the Government received substantial revenue from oil sales. This condition allowed the Government to launch large national development projects in the education sector as well as in other sectors. For public universities, this meant a significant increase in revenue from the development budget allocation. As the size of the universities' operations increased because of the capital investment made from the development budget, the universities qualified for larger allocations from the routine budget. At the same time, the improved economic conditions positively affected enrollment levels which in turn increased the university's revenue from SPP. However, during the recession in the mid- and late 1980s both development and routine budgets declined because of the fall in Government income. Similarly, the revenue

from student tuition declined as enrollments fell when students and their families faced economic hardship and increased opportunity costs for their educational activities.

It has been assumed that the economic recession experienced by the country since 1986 is one of the main reasons for the decline in enrollments. Since the university's routine budget allocation and the funds received from student's fees are closely related to enrollment, the economic recession has reduced the university income from both the routine budget and student tuition sources. Thus, the enrollment decline will seriously affect UT's future ability to supply academic programs. A persistent decline in enrollment level also may have a serious effect on the unit costs of UT operations. The cost per student for course development and delivery can be expected to increase as enrollments decrease; the lower the enrollment, the higher the unit cost for producing the UT courses and programs must be.

Given these changing conditions -- the economic recession and the decline in enrollment -- it is important that the UT planners develop a strategy to maintain an appropriate scale of operation for academic programs. An investigation of unit costs, the critical components of the cost for course development and delivery, and the constraints and opportunities for changing the operational policy is necessary if UT is intended to exploit the potential scale economies in its operational systems.

In the context of the existing UT enrollment levels, this proposed study is specifically intended to address the issues

related to: "The policy implications of the scale economies of the Universitas Terbuka (the Indonesian Open University) courses and programs".

There are three basic terms used in this study that need to be defined conceptionally and operationally.

"Course" refers to a unit of academic work in a particular field that students must complete in a semester. A course within the UT system consists of two to six semester credit hours (Satuan Kredit Semester/SKS), and is presented in the form of self-instructional modules. The courses are grouped according to the requirements as: (1) fundamentals courses (Mata Kuliah Dasar Umum/MKDU); (2) pre-core courses (Mata Kuliah Dasar Keahlian/MKDK); (3) core and area of specialization courses (Mata Kuliah Keahlian/MKK), including courses in teaching methods (Mata Kuliah Proses Belajar Mengajar/MKPBM) and the thesis course (Skripsi); and (4) support discipline courses, which are the elective courses from other fields of specialization (Mata Kuliah Pilihan Bebas/MKPB). A specified combination of these courses is required for obtaining a diploma or a degree from UT.

"Program" refers to a set of academic requirements for the degree and diploma educational level qualifications that a student can earn from UT. The four-year degree programs lead to a Sarjana I degree (First Degree Level) and the two-year (D2) and the three-year (D3) diploma programs lead to an Associate Degree.

"Scale economies" refer to the cost determinants that alter the average total cost (ATC) and the average variable cost (AVC)

per student for producing and delivering UT courses and programs as enrollment changes. Average total cost is defined as the unit or per student cost (total cost -- fixed and variable -- divided by the number of students), and the average variable cost is defined as the unit or per student cost based on the variable cost only. "Positive" scale economies exist when the unit cost of UT courses and programs decline as enrollments increase, assuming the quality of the educational service is unchanged.

Purpose of the Study

The main purposes of this study are:

(1) to define the unit cost of each of the UT major courses and programs;

(2) to identify the prime determinants of the cost structure of the UT courses and programs; and

(3) to assess the feasibility of changing the UT operating systems.

Significance of the Study

This study of the costs of UT courses and programs is significant for the following reasons. First, the literature on the cost structures of distance universities (Wagner, 1974, 1977;

Snowden and Daniel, 1980; Rumble, 1981,1988) has indicated two distinct factors which determine the cost structure of the distance teaching university. They are: (1) the "course related" activities, and (2) the "student related" activities. The course related activities are linked to course development (including the curriculum development, writing and production of the textbooks and media supporting materials). The student related activities are linked to course delivery (including tutorial services, registration and delivering the learning materials to students, and setting and correcting examinations). The scale of course-related activities depend on the number of courses required for a particular program and the "life" of the course (i.e. how frequently the courses must be redesigned). The scale of student-related activities depends primarily on the level of enrollment.

Information on the scale economies of course development and course delivery activities and the components of fixed and variable costs are important for consideration of policy reforms regarding the cost structure of the UT operations. A change in cost structure might be required when UT faces a long-term decline in enrollment. Such analysis can provide an empirical guide for the reallocation of resources, including money, manpower, and facilities related to the development and delivery of the UT courses and programs.

Second, the scale economy analysis will provide information about the unit costs (average total cost and average variable cost per student) for each of the UT courses and programs. Pro-

vided data on unit costs, the revenue from tuition fees, the amount of government subsidy per student, the UT planners can adjust policies related to the level of tuition, subsidies, and the cost structures. For instance, if the average total cost (ATC) for producing and delivering UT courses and programs is higher than the tuition rate and government subsidy, either the tuition rate or the subsidy must increase to make up the difference. Alternatively, the course structure may have to be modified in order to reduce the unit cost. If enrollments should increase, that will help to reduce the average cost. Thus, information on scale economies provides indications of the required level of revenue and enrollment for the UT courses and programs. Similarly, such information is also important for determining the appropriate number of courses or programs to be offered in a particular semester or academic year.

Third, information on the trend in scale economies, besides indicating the trend in social demand for the UT courses and programs, also reflects the state of the art of the management problems in the UT operations. If demand is declining, adjustments in the operational systems (course development and course delivery) are required in order to maintain affordability in the UT courses and programs. In this instance, alternative management policies could include promotional activities designed to attract new high school graduates into UT programs or reforms in the cost structure of the UT courses and programs. Thus, the identification of scale economies is an important basis for planners in

defining alternative forms of management and financing systems to rationalize the UT operations when facing a change in enrollments.

Scope and Limitation of the Study

This study is a case study of the UT courses and programs. It focuses on defining the scale economies at one point in time by analyzing the relationships between the costs for producing and delivering the courses and programs and the enrollment rates. The study focuses on the short-run scale economies of the UT courses and program during the period from 1986 to 1990. In this instance, unlike in a long-run cost analysis where all components of the costs are considered variable, the course development costs will be treated as a component of fixed costs in the total production costs for the UT courses and program.

Given the cost structure of UT, with high fixed development costs but low marginal delivery costs per student (Wagner, 1972, 1977; Laidlaw and Layard, 1974; Snowden and Daniel, 1979; Rumble, 1981, 1982) this study will not deal with the resource allocation efficiency in terms defining the optimum production as defined by equality between the average cost (AC), the marginal cost (MC), and the price (P) of the products. This study will define the "sustainability" of the UT courses and programs in terms of comparisons between the unit costs (as measured in terms of

average costs per student and per credit) and tuition rate given the amount of Government subsidy. In this way the efficient (required) levels of tuition and enrollment also will be defined.

In this study, the cost analysis is limited to the direct costs of producing the UT courses and programs, which to be self sustaining must equal the total revenue from the Government subsidy through routine and development budget allocations and students' contributions through tuition and fees. The indirect costs borne by the Government (the costs for managing the university at the Ministerial level) and by students (foregone income and leisure), however, are incorporated in this study only as a contextual consideration (e.g., as the basis for a change in marketing the UT to students).

Since this study is a case study of a particular open university system, i.e. the Indonesian Open University (UT), the policy implications will be relevant mainly for the UT system. However, the findings may have application for other open universities with similar cost and delivery structures. It is also expected, that the results of the study will contribute to the literature on the economics of distance education.

CHAPTER: II

BACKGROUND OF THE STUDY

This section provides a general description of the UT system. The discussion focuses on: (1) the UT operational system; (2) the financing system of UT; (3) the structure of UT courses and programs; (4) trends in UT enrollment and registration; and (5) recent cost studies of UT programs. The main objective of this presentation is to provide a background for understanding the issues regarding the scale economies of the UT courses and programs.

The UT Operational Systems

UT was structured and designed to meet distinctive goals and functions which are typical of a distance education system. There are three organizational models for institutions that offer distance education (Kaye and Rumble, 1981; Rumble 1986b).

They are:

(1) single mode institutions are founded for the purpose of offering distance education only;

(2) dual mode institutions provide both conventional face-to-

face education and also distance education;

(3) consortia are groups of autonomous institutions (educational, publishing, broadcasting) which agree to combine to offer distance education.

The "single" and "dual" models of organization have very strong supporters, while consortia generally have not proven to be practical (Rumble, 1986b). UT is a single mode institution which provides instructional activities using specific learning materials in the form of self-instructional modules accompanied by limited amounts of tutorial service. However, UT courses and programs follow the same curriculum as do the campus universities' courses and programs.

As a public university, the UT organizational structure was defined in the Presidential Decree No: 41/1984, and its educational functions are specified according to the MOEC decree Number: 0211/U/1982. Based on these two decrees, the UT organization has 11 functional units at the central office and 32 regional offices.

These functional units are:

(1) Rectorate Office;

(2) Office of Registrar;

(3) Office of Central Administration;

(4) School of Education (Fakultas Keguruan dan Ilmu Pendidikan/ FKIP);

(5) School of Economics (Fakultas Ekonomi/ FEKON);

(6) School of Social and Political Sciences (Fakultas Ilmu

Sosial dan Ilmu Politik/ FISIP);

(7) School of Mathematics and Physical Science (Fakultas Matematik dan Ilmu Pengetahuan Alam/ FMIPA);

(8) Center for Research and Public Services;

(9) Center for Educational Media Production, Information, and Data Processing;

(10) Center for Examination Processing;

(11) Regional Offices (Unit Program Belajar Jarak Jauh/UPBJJ).

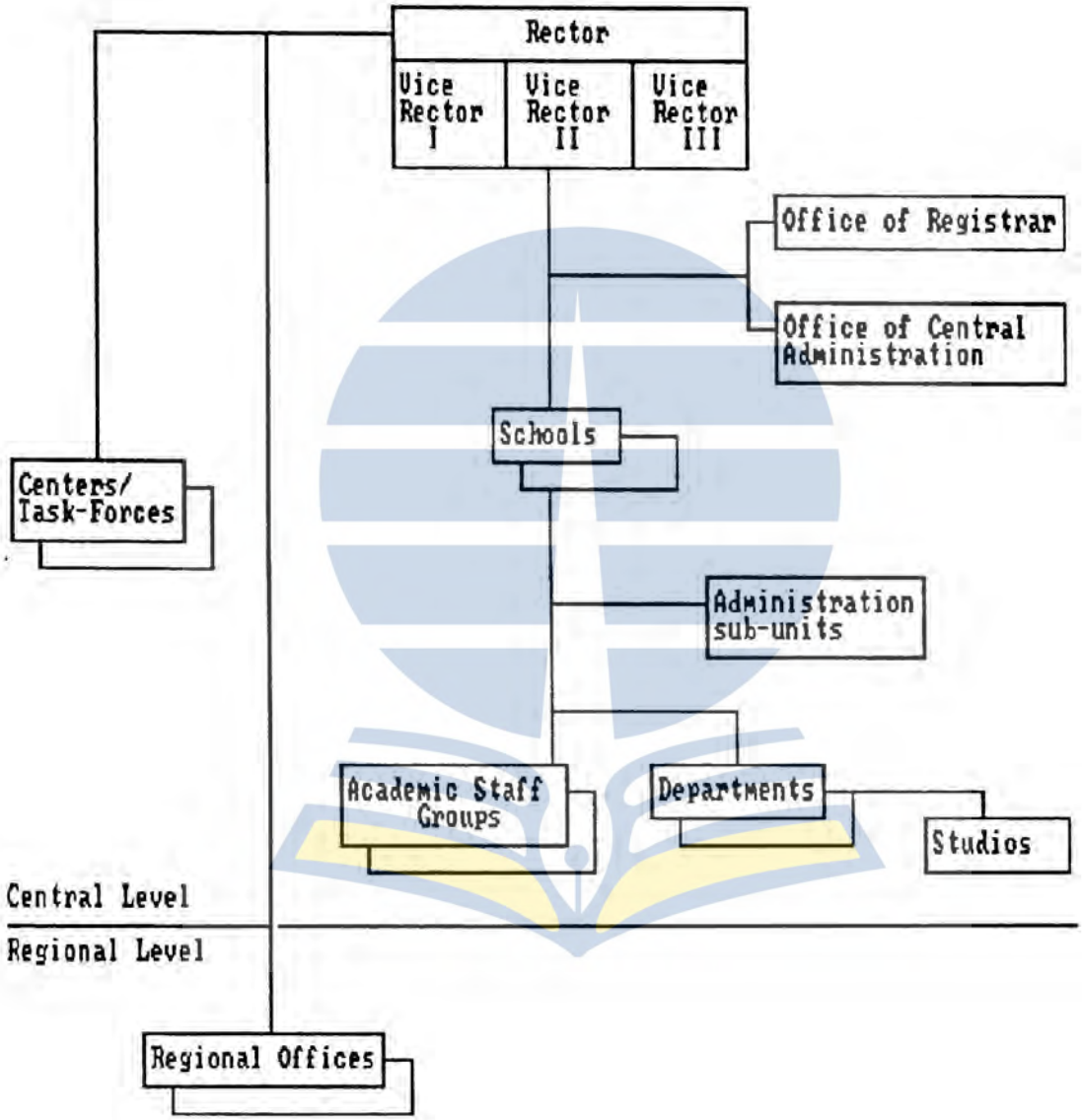
The interrelationships among these functional units are defined in the organizational chart shown in Figure 2.1.

The operational system of UT differs from those of the campus universities chiefly in the methods used to provide instructional services. At the campus universities, the instruction is carried out by the faculty. Each faculty member plans the content of instruction, and delivers it directly to students through face-to-face communication. At UT, the instructional activities are carried out directly by the institution, instead of by the staff. The institution plans the course content and delivers it to students through educational media in the form of self-instructional modules, radio, audio, video, or TV programing. Thus, the institution itself is the "teacher" in a distance education system (Kaye, 1988).

Given the characteristics of the UT instructional system, the tasks and functions of the units can be grouped into two main activities: (1) course development; and (2) course delivery.

FIGURE: 2.1

THE STRUCTURE OF UT ORGANIZATION



The course development or course related activities include the following:

(1) curriculum development;

(2) production of textbooks (self-instructional modules);

(3) production of manuscripts for the support materials in forms of TV, radio, video, audio cassettes programs; and

(4) production of packages (kits) for courses which require laboratory experiments.

Curriculum development, production of textbooks, and production of kits are carried out by the UT staff: the curriculum developers, course designers and subject specialists operate under the coordination of the School Deans. Most of the curriculum developers, module writers, and kit designers are university staff from campus-based institutions; they work under contract to UT. To date, UT has produced 444 modules (courses) for the 22 degree and diploma programs. The course production rates from 1984 to 1989 are summarized in Table 2.1.

The production of script and print materials for TV, radio, audio, and video programs is carried out by a group of UT media specialists under the Media Production Unit. This unit works closely with transmission and broadcasting specialists from the Directorate General of Radio and TV, the Ministry of Information. The UT Media Production Unit has produced 107 cassette and 47 radio and TV programs. The overall course development activities carried out by the Schools and the Media Production unit are coordinated by the Vice Rector I.

TABLE: 2.1

THE COURSE PRODUCTION RATE AT UT

Schools	Programs	1984	1985	1986	1987	1988	1989	Total
Education (FKIP)	D2	-	1	58	2	-	-	61
	S1	-	19	55	69	2	-	145
Economics (FEKON)	S1	2	11	13	19	24	6	75
Social & Pol (FISIP)	D3	-	-	4	4	6	5	19
	S1	2	13	20	11	24	-	70
Physics & Math (FMIPA)	S1	-	10	19	11	17	5	62
Fundamentals (MKDU)	S1	5	7	-	-	-	-	12
Total:	22	9	61	169	116	73	16	444

Source: Universitas Terbuka, **Lima Tahun Universitas Terbuka**, Jakarta, 1989
Note: D2 and D3 refer to the two-year and three-year diploma programs leading to an Associate Degree, and S1 refers to the four-year degree program leading to the Sarjana 1 degree.

The course delivery or student related activities include:

(1) the provision of registration services;

(2) the distribution of learning materials; and

(3) the provision of tutorial services and examinations.

Registration services are provided at UPBJJs (regional offices) as well as at the UT central office. Processing and recording of student registrations and academic data are the main tasks of the Office of the Registrar and the Computer Center. Students apply and register for specific courses by using the computerized forms available at more than 2500 Post Offices located in 120 cities

throughout the country. All UT courses are offered in both the Fall and Spring semesters. Students can register at any time for taking courses and examinations in Fall (June) and Spring (January) semesters. Students are allowed to retake the examination for a course if they fail on the first attempt. However, if they fail the second examination, the course must be retaken.

The distribution of learning materials is the responsibility of the Center for Distribution. Students can obtain the materials from the central UT office, the UPBJJ offices, or from designated bookstores in the large cities. Students pay for the learning materials, but they are not required to buy them. They can share the learning materials with their friends.

The 32 regional offices (UPBJJs) are responsible for the provision of tutorial and examinations. The UPBJJs are under the supervision of the Rectors of the campus universities in their geographical area. The MOEC decree on UT organization stipulates that the Rector of each public university host the UT regional office (UPBJJ) and act as supervisor for the office on behalf of the UT's Rector. The regional office recruits tutors and proctors and arranges rooms for tutorials and examinations. In connection with the provision of tutorial services, the UPBJJ also coordinates the activities of the student study groups. There are more than 1300 student study groups which organize students' requests for tutorial services from the UT system. The tutorial services are provided for selected courses based on student requests, and are scheduled up to twice each semester, at the middle and the

end of the semester. In areas where students are far from tutorial centers, tutorial services are provided by two-way (Single Side Band) radio using the national domestic satellite "Palapa".

The UT examination process consists of two parts, a take-home mid-semester examination, and a classroom final examination. Students receive their take-home exam papers along with their learning package and return their answers directly to the Center for Examination Processing for grading and recording. The final examinations are administered simultaneously for the entire system at the UPBJJ examination centers. The final examination paper is mailed from the UPBJJ office to the Center for Examinations for grading and recording. The take-home exam represents 20 percent of the final grade, while the final examination represents the remaining 80 percent of the grade. The test materials are developed by the Schools, while the production of the tests are the responsibility of the Center for Examinations. Vice Rector I coordinates the activities of the Center for Examinations and the Schools regarding the development and production of the test materials. The provision of tutorial and examination services are centrally planned and conducted at 78 tutorial and examination centers.

The supporting units include the Center for Research and Public Services and the Library; the management units include the Rectorate Office and the Office of Central Administration. The Center for Research and Public Services is responsible for conducting institutional research related to the efficiency of UT

operational systems. The Center, in collaboration with the Institute for International Research (IIR) and the Educational Development Center (EDC), has conducted two cost studies of the UT diploma teaching programs. The International Development Research Center (IDRC) and the UNESCO have provided assistance to the Center for the evaluation of the tutorial services and the use of communication technology for distance learning in Indonesia. The Library is mainly designed to meet the needs of the module writers, program specialists, and media specialists.

The Rectorate Office and the Central Office of Administration coordinate the overall operations of the UT. Thus, their activities are considered part of the "overhead" management activities for UT operational systems.

The Financing System of UT

UT has two main sources of income to finance its operations. As a public university, UT receives routine budget and development budget allocations from the Central Government through the Office of the Directorate General of Higher Education, the Ministry of Education and Culture (MOEC). The routine budget, as the name suggests, is a recurrent budget and covers personnel salaries (administrative and academic staff), travel, office supplies and materials, and building and equipment maintenance. The budget allocation to the UT for salary is based on the number of

personnel, their ranks and positions, and their educational backgrounds and experiences (the criteria are standard for the civil service). Thus, the larger the number of personnel, the higher the ranks of the personnel in the functional units, and the higher the educational attainment and experience of the staff, the larger the routine budget allocation. Salary funds are received monthly from the Treasury Office of the Ministry of Finance.

The routine budget allocation for travel, office supplies and materials, and building and equipment maintenance is dispersed annually. The budget for travel is based on the estimated number of trips made by the head of the units, while the budget for office supplies and materials is based on the number of positions within the UT organization. The budget for maintenance of buildings and equipment is based on the size (area) of the buildings and the quantity of equipment owned by UT. This part of the routine budget is reviewed and renewed annually as the size of UT operations increases or decreases.

The development budget, which is a zero-based budget, is provided by Government to finance capital investments and special projects. In the case of UT, the development budget covers the costs of building construction, and expenditures for course development and equipment (such as computers for data processing; TVs and cameras and other equipment for the studio; and fork lifts for the warehouse). The development budget allocation is made annually by the National Development Planning Bureau (Badan

Perencanaan Pembangunan Nasional/ BAPPENAS). UT submits a development budget plan to the Directorate General of Higher Education (DGHE) for review and the final version is forwarded with the proposed development budgets of 44 public campus based universities to the Office of Planning of the Ministry of Education and Culture (MOEC) to be processed with the entire MOEC development budget. The proposed MOEC budget is then submitted to the BAPPENAS to be reviewed and synchronized with the budget requests from the other ministries. The fiscal year of the development budget is from April 1st to March 31st of the following year.

In addition to Government allocations, UT receives revenue from student tuition. In the public university system, student tuition is treated as a form of government revenue. Students pay their tuition at selected government banks managed by the Ministry of Finance. The universities receive their share of student tuition from the Ministry of Finance in the form of a budget allocation called the Sumbangan Pembinaan Pendidikan/ Dana Penunjang Pendidikan (SPP/DPP). In the case of UT, students pay their tuition at local post offices, which in turn deposit student payments in the UT account at the Bank Export Import Indonesia (BEII). The rationale for the SPP/DPP budget allocation system is that the Government provides a guaranteed budget, based on an estimated amount of revenue from student tuition.

The tuition charges for public universities are determined by the joint decree of the Ministry of Education and Culture and the Ministry of Finance (Ministerial Decrees No: 0623/K/1986 and No:

807/KMK.03/1986, dated 13 September 1986). The decree stipulates that monthly tuition charges should vary with the date of enrollment and the location of the institution. There are five tuition categories for continuing students who enrolled in academic years 1985/86 or earlier; and eight tuition categories for students who enrolled in 1986/87 or later. This classification is made based on the estimated student's and/or parent's ability to pay the educational costs given the economic condition in the region where the university is located. Thus, the universities located in relatively affluent regions have higher tuition charges than do those located in the poorer economic regions. For instance, the tuition fees of the public universities located in Jakarta are higher than those in Palembang or Jayapura. The decision on the tuition level for a particular university is made every year by the Rector based on proposals from the School Deans and approval from the University's Senate. The distribution of the tuition rates for public universities in Indonesia is as summarized in Table 2.2.

The tuition fees for UT students stipulated by the decree was Rp80,000 per year students registering after 1986/87. UT tuition is in the highest category because the university legally is located in Jakarta. The total amount of money that students must pay, however, depends on the number of credit hours (SKS) the student takes in a particular semester. The tuition rates, effective July 1, 1990, by the number of credit taken are shown in Table 2.3.

TABLE: 2.2

THE DISTRIBUTION OF TUITION RATES FOR PUBLIC UNIVERSITIES

Enrollment Date	Tuition Categories per Month: I	II	III	IV	V	VI	VII	VIII
1985/86 or earlier	Rp.4,500	3,500	2,500	2,000	1,500	-	-	-
1986/87 or later	Rp.10,000	7,500	5,000	4,500	3,500	2,500	2,000	1,500

Source: Department Pendidikan dan Kebudayaan, (1986), **Keputusan Bersama (The Joint Decree)** No: 0623/K/1986; No:807/KMK.03/1986, Jakarta, 1986.
Note: In July 1990, the official exchange rate was US $1.00 equals Rp 1,830.00

TABLE: 2.3

TUITION RATES FOR UT STUDENTS

Enrollment Date:	Total SKS Taken for a Semester: 0	2-9	10-12	13-15	16-18	19-21	22-24
Before July 1, 1990	Rp15,000	36,000	48,000	60,000	72,000	84,000	98,000
July 1, 1990 or after	15,000	45,000	60,000	75,000	90,000	105,000	120,000

Source: Universitas Terbuka, (Memo), Jakarta, 1990.

The SPP/DPP budget allocation for UT is meant to cover the registration costs, instructional costs (such as for tutorials and examinations) and the costs related to distribution of learning materials to students. It also is intended to cover part

of the expenditures for honorarium, travel, and of the office supplies. The budget is made annually based on the estimated total enrollment for the coming academic year and the tuition rate applied for the university. A study of the government subsidy through the routine budget and development budget allocations, found that the subsidy is equal to about 85 percent of the total costs for higher education (IEES, 1986).

Structure of UT Courses and Programs

One of the factors which is assumed to affect the costs of the UT operational system is the structure of UT courses and programs, that is, the type of courses required and the number of credits (SKS) required for a particular program.

UT courses can be grouped into four types:

(1) Basic or fundamentals courses (MKDU);

(2) Pre-Core courses (MKDK);

(3) Core and Area Concentration courses (MKK/MKPBM); and

(4) Support Disciplines and Electives courses (MKK).

The basic or fundamentals courses (MKDU) are designed to support citizenship and moral development. The courses cover issues in basic social and cultural sciences, religious teachings, the Five Principles of moral education (Pancasila), and nationalism. Each student is required to take these courses. The pre-core (MKDK) courses are intended to serve as a basis for

professional specialization at the university level. The number of required MKDK courses varies by program area. The core and area concentration (MKK) courses include those courses required for each specialization including the courses on teaching-learning methodology (MKPBM) for the teaching certification programs, and the thesis (skripsi) course for the non-teaching degree programs. Support discipline courses consist of elective courses from other fields of concentration, which are also the MKK courses. Each of the UT courses has a specified number of semester credit hours (SKS). The MKDU courses are two to three credit hours, the MKDK and MKK courses are three to six credits, and the MKPB and MKPBM courses are two to four credit hours. The thesis course is six credits. In the UT academic system, students, with approval from the Dean of their School, can transfer the courses and credits they earned from other universities. The maximum number of credits which can be transferred are limited to 50 percent of the total credits required for the program they are pursuing. A UT student may take up to a maximum of 24 credits a semester. There is no minimum number of credits that students must take in a particular semester.

As was noted earlier, UT programs are divided into diploma and degree programs. The diploma programs lead to an Associate Degree (Diploma 2 Junior High School Teaching Certificate, and the Diploma 3 Taxation Certificate). The degree programs lead to Sarjana I (S1 or the First Degree Level). S1 programs offered by the School of Education (FKIP) are designed for High School

teachers who already have a B.A. diploma (three year program) in the field of education and teaching science. S1 programs offered by the other schools (Economics, Social and Political Sciences, and Physics and Mathematics) are designed for high school graduates.

There are two types of S1 degree programs: (1) the "regular" program (program biasa); and (2) the "honor" program (program utama). The honor program is designed for students with grade point averages (GPA) of 3.0 and above, while the regular program is for those with a GPA of less than 3.0. Students in the honor program are expected to continue their study to the S2 (the Second Degree) level. The total credits required for the typical S1 regular program range from 149 to 151 SKS, while the credit hours required for the S1 honor program is 160 SKS (including the thesis). As a distance education institution, the UT imposes no time limit on program completion. The structure of courses and programs and the required credits (SKS) are summarized in Table 2.4.

The analyses of the UT courses and programs costs and scale economies is based on the academic disciplines as they are represented by the Schools: (1) School of Education; (2) School of Physics and Mathematics; (3) School of Economics; and (4) School of Social and Political Sciences. It is assumed that the nature of the academic disciplines may affect the costs for course development and delivery activities. The language and physics courses offered by the School of Education and the

TABLE: 2.4

THE STRUCTURE OF UT COURSES AND PROGRAMS BY REQUIREMENTS

Programs:	Credit hour requirements (SKS):				
	Fundt'l (MKDU)	Pre-Core (MKDK)	Core (MKK/MKPBM)	Support (MKK)	Total
A. Diploma and Degree (Teaching)					
D2 Associate Degree	6	6	31-32	7-11	40-45
S1 Degree	-	-	29-33	9-15	40-46
B. Diploma and Degree (Non-Teaching)					
D3 Taxation	15	31	59	15	120
S1 Business Adm	17	39	52-57	41-47	149-160
S1 Public Adm	17	45	47-52	40-46	149-160
S1 Development Adm	17	45	47-52	40-46	149-160
S1 Development Econ	15	41	63-66	32-38	151-160
S1 Management	15	42	63-66	31-37	151-160
S1 Applied Stat	15	39	63-67	33-39	150-160
S1 Mathematics	15	39	64-68	32-38	150-160

Source: Universitas Terbuka, **Katalog UT**, Jakarta, 1987

computer courses offered by the School of Social and Political Sciences, for instance, require audio programs, an experiment package (kit), and access to a computer. The number of the planned courses according to type of courses and Schools for the diploma programs and degree programs is shown in Table 2.5.

TABLE: 2.5

NUMBER OF PLANNED COURSES BY TYPES AND PROGRMAS

Schools/ Programs:	Types and Number of Courses: Fundamental (MKDU)	Pre-Core (MKDK)	Core (MKK/MKPBM)	Support (MKK)	Total
EDUCATION (FKIP):					
D2 English	3	3	8	1	16
D2 Bhs. Indonesia	3	3	21	3	30
D2 Science (IPA)	3	3	18	2	26
D2 Mathematics	3	3	17	1	26
D2 Non Formal Educ	-	-	17	3	20
D2 Physical Educ	3	3	18	2	26
D2 Social Studies	3	3	22	3	31
D2 Pancasila (PMP)	3	3	24	3	33
S1 English	-	-	23	2	25
S1 Bhs. Indonesia	-	-	17	2	19
S1 Physics	-	-	20	1	21
S1 Mathematics	-	-	22	1	23
S1 Biology	-	-	22	1	23
S1 Chemistry	-	-	20	1	21
PHYSICS AND MATHEMATICS (FMIPA):					
S1 Applied Stat.	11	23	24	1	59
S1 Mathematics	11	26	20	1	58
ECONOMICS (FEKON):					
S1 Development Econ	11	15	34	1	61
S1 Management	11	15	33	1	60
SOCIAL AND POLITICAL SCIENCES (FISIP):					
D3 Taxation	12	11	49	-	72
S1 Business Admn.	11	15	54	1	81
S1 Public Admn.	11	17	52	1	81
S1 Development Admn	11	17	48	1	77

Source: Universitas Terbuka, **Katalog UT**, Jakarta, 1987

Trends in New Enrollment and Registration

For the purpose of scale economies analysis, it is necessary to distinguish between the trends in new enrollment, registration, and total enrollment. New enrollment refers to the flow of new students (first time registrants) into UT system, while registration level refers to the actual number of students registered in a given semester. Total enrollment refers to the number of students enrolled in the UT system whether or not they are registered in a particular semester.

UT students, as reflected by total enrollment, may be divided into two types: (1) "active" students; and (2) "inactive" students. Active students include new students and the continuing students who are currently registered (defined as registered in the last two years). Inactive students consist of those students who have not registered for the last two years. Students with inactive status must reapply to continue their study program. The 1989 UT data showed that 25,870 of the 152,730 (17%) students were categorized as inactive. In general, since there are substantial number of inactive students, the registration level is less then the total enrollment at any given point in time. The trends in new enrollment and registration of active students are critical because they indicate changing student demand for UT courses and programs as well as changing unit costs for its operational system.

The registration data during the period of 1986 to 1988 is used in this study because it is the most recent data available. While this data is the best available, it should be noted that during this period UT introduced new tuition rates and changes in registration procedures which may have affected student demand for its courses and programs. In 1986 the tuition rate for courses equivalent to 12 semester hours (SKS) increased by 100 percent from Rp 20,000 ($11.10) to Rp 40,000 ($22.20) per semester. In addition, tuition charges were introduced for teachers enrolled in the diploma (teaching) program; prior to 1986, the program had been offered free to teachers. In 1987 the university introduced a new registration system using computerized (optical scanner) registration forms. This was a fully centralized system in which students sent their registration forms to the Central Registrar's Office in Jakarta.

Since the system was new, many students made mistakes in filling out their forms; this resulted in delays in receiving their learning materials. An indication of the intensity of student complaints concerning the new registration process was the number of letters received by the registrar. He received over 10,000 from students. In response to these complaints, UT modified the registration system again in 1988. The 1988 change allowed students to register directly at the UPBJJ offices. The UT also made it possible for students to obtain the learning materials either at the UPBJJ office or from designated bookstores.

This study assumes that these changes in tuition rate and registration policies affected both new enrollments and registration levels. The trends in new enrollments and registration in 1986/87 to 1988/89 are summarized in Tables 2.6 and 2.7. The data in Table 2.6 indicate that in 1987 and 1988 new enrollments in the "teaching" programs declined by 63 percent and 29 percent, respectively. New entrants in the "non-teaching" programs declined by 59 percent in 1987, but in 1988 they increased by 20 percent. Overall, new enrollment decreased by 60 percent in 1987, but increased by 12 percent in 1988. The registration rates during the period shown in Table 2.7 indicate that in 1987 there was an increase of 15 percent in the education programs but a decreased of 33 percent in the following year. The registration rate for the non-teaching programs followed the same pattern. They increased by about six percent in 1987, but decreased by nine percent in 1988. Overall, registration increased by seven percent in 1987, and decreased by 12 percent in 1988.

The reduced enrollment of new students and registrations during this two year period could have been caused by many factors. As already noted the change in the registration system itself may have resulted in fewer new students since the applicants may have been confused by the new computerized registration forms. For the continuing students, the delay in receiving their learning materials (as a result of the mistakes they made in using the computerized forms) may have slowed down their registration rate. Another possible explanation of the decline in

TABLE: 2.6

TRENDS IN NEW ENROLLMENTS 1986/87 TO 1988/89

Programs	1986	1987	1988	Percent Change 1987-86	Percent Change 1988-87
A. Diploma and Degree (Teaching):					
1. D2 Bhs Indonesia	304	248	98	-18	-61
2. D2 English	158	52	17	-67	-67
3. D2 IPA/Physics	174	72	57	-59	-21
4. D2 IPS/Soc Studies	218	103	92	-53	-11
5. D2 Non-Formal	45	14	0	-69	**
6. D2 Math	293	123	98	-82	-20
7. D2 PMP/Pancasila	134	101	37	-25	-63
8. D2 Physical Educ	75	2	0	-97	**
9. S1 Bhs Indonesia	620	150	116	-76	-23
10. S1 English	415	199	177	-52	-11
11. S1 Biology	225	76	63	-66	-17
12. S1 Physics	148	28	47	-81	69
13. S1 Chemistry	169	49	52	-71	6
14. S1 Mathematics	483	121	91	-75	-25
Sub-Total :	(3641)	(1338)	(945)	(-63)	(-29)
B. Diploma and Degree (Non-Teaching):					
1. D3 Taxation	493	219	375	-56	71
2. S1 Public Adm	7183	2561	2670	-64	4
3. S1 Business Adm	1435	630	753	-56	20
4. S1 Development Adm	861	197	325	-77	65
5. S1 Development Econ	2026	826	838	-59	2
6. S1 Management	3430	1662	2523	-52	52
7. S1 Applied Stat	669	310	364	-54	17
8. S1 Mathematics	603	266	248	-56	- 7
Sub-Total :	(16410)	(6771)	(8096)	(-59)	(20)
Total:	(20051)	(8109)	(9041)	(-60)	(12)

Source: BAAK-UT, **Statistik Mahasiswa UT**, Jakarta, 1989

TABLE: 2.7

TRENDS IN REGISTRATION 1986/87 TO 1988/89

Programs	1986	1987	1988	Percent Change 1987-86	Percent Change 1988-87
A. Diploma and Degree (Teaching):					
1. D2 Bhs Indonesia	859	1092	762	27	- 3
2. D2 English	432	417	227	- 3	-46
3. D2 IPA/Physics	748	607	332	-19	-45
4. D2 IPS/Soc Studies	851	813	498	- 4	-39
5. D2 Non-Formal	47	42	27	-11	-36
6. D2 Math	1042	916	520	-12	-43
7. D2 PMP/Pancasila	309	363	330	17	- 9
8. D2 Physical Educ	77	56	29	-27	-48
9. S1 Bhs Indonesia	703	983	952	40	- 3
10. S1 English	1256	1730	1192	38	-31
11. S1 Biology	945	1321	771	40	-42
12. S1 Physics	569	643	403	13	-37
13. S1 Chemistry	734	853	446	15	-48
14. S1 Mathematics	577	708	622	23	-12
Sub-Total :	(9149)	(10544)	(7111)	(15)	(-33)
B. Diploma and Degree (Non-Teaching):					
1. D3 Taxation	532	563	786	8	40
2. S1 Public Adm	26042	29157	26024	12	-11
3. S1 Business Adm	8456	9020	7899	7	-12
4. S1 Development Adm	1042	1099	1191	6	8
5. S1 Development Econ	10927	10796	8548	- 1	-21
6. S1 Management	4227	4409	5645	4	28
7. S1 Applied Stat	771	693	805	-10	16
8. S1 Mathematics	3409	2799	2357	-47	-16
Sub-Total :	(55419)	(58536)	(53445)	(6)	(- 9)
Total:	(64568)	(69081)	(60556)	(7)	(-12)

Source: BAAK-UT, **Statistik Mahasiswa UT**, Jakarta, 1989

enrollment of new students and in registration levels is the increase in the tuition rate, particularly the introduction of tuition charges for the teacher upgrading programs which had been previously offered free of charge. As the tuition rate increased, potential applicants may have found it necessary to postpone or cancel their plans to register at UT. For the continuing students, this condition may have influenced their decision to reduce their course load per semester or per year. A study by Nielsen and Djalil (1989) showed that foregone income, transportation costs and the emotional strain of participation were highly correlated with teachers intention to withdrawal from the UT system.

The trends in fluctuating enrollment and registration levels emphasize the importance of understanding the scale economies of UT courses and programs. The total number of registrations for diploma and degree in the teaching and in the non-teaching programs from 1986 to 1988 was 26,804 and 167,400 respectively and the number of courses produced for the programs was 206 and 236. These figures suggest that the average number of course enrollments in the teaching and the non-teaching programs of 130 and 709 respectively. Thus, due to the relatively small number of enrollments, the unit cost (cost per student) for the teaching programs is higher than for the non-teaching programs. The variability of these unit costs motivated this investigation of the scale economies of UT courses and programs.

Recent Cost Studies of UT Programs

Since 1988, the UT's Center for Research and Community Service in collaboration with the Institute for International Research (IIR) has conducted two separate cost studies of the UT's Teacher Training Programs. The first dealt with the issue of the relationship among the students' private costs, expected benefits, and enrollment decisions as measured by the students' intention to drop out or reduce their course loads. The study collected data from a sample of 311 D2 Science (IPA) and D2 Bahasa Indonesia students (Nielsen and Djalil, 1989). The second study was concerned with the cost-effectiveness of the UT's D2 Mathematics and D2 Bahasa Indonesia programs compared with those provided by the campus based IKIPs and FKIPs (Pusat Penelitian, 1989).

The first study was based on the assumption that students' decisions to withdraw from the program or to reduce their course load are affected by the private costs and their valuation of the benefits of taking the program. The "private" costs were defined to include: (1) the direct costs for tuition, purchasing new modules, and transportation for attending tutorials and examinations; (2) indirect costs, primarily foregone earnings from taking the program; and (3) non-monetary costs, in the form of emotional costs related to the disruption of family life, decline in general well-being and loss of leisure time due to their

involvement with the UT program. The students' expected benefits from the program were measured in terms of improvement in the students' professional abilities.

The study showed that only about six percent of the respondents indicated their intention to drop out from the program. However, 30 percent of them indicated the desire to drop their current courses, and more than 45 percent wanted to reduce their course load. The cost factors that were mentioned by students as reasons for attrition were the cost of new modules (13 percent), tuition (12 percent), and transportation (8 percent). Students' intentions to withdraw from the program also were significantly correlated with non-monetary factors: emotional drain and disruption of family life ($r= .25$, $p<.001$ and $r= .21$, $p<.001$). Transportation costs and foregone income also were significantly correlated with drop-out behavior ($r= .13$, $p<.01$ and .25, $p<.001$). Students' intentions to reduce their course load were similarly significantly correlated with forgone income ($r= .18$, $p<.01$), emotional strain, disruption of family life, decline of general well-being and loss of leisure time (all had coefficients larger than $r= .20$, $p<.001$). The study showed that students' expectations for improved professional abilities were significantly but negatively correlated with students' intention to drop-out of the program.

The significance of this research to the proposed study is that it shows that student direct costs, indirect costs (forgone income), and non-monetary costs (forgone leisure) significantly

affect the enrollment and registration levels of UT teacher training programs. However, it seems that student expectations of improved professional abilities can offset the incentives to drop out. Thus, in this particular instance, maintaining the relevance of the program for students' professional careers is important for exploiting the scale economies of UT courses and programs.

The second cost study conducted by the Center and IIR was a comparison of the "institutional" and "individual" costs for the D2 Mathematics and D2 Bahasa Indonesia programs in the UT system with those of the IKIPs and FKIPs. For the UT, the institutional costs were defined to include the "operational costs" and "fixed costs" for course development and course delivery; while the individual costs were defined as students' direct costs (tuition, modules), indirect costs (foregone income), and non-monetary costs (forgone leisure). For the IKIPs and FKIPs, the institutional costs were defined to include the "operational costs" and "fixed costs" for teaching the courses; while the individual costs again included students' direct costs, indirect costs, and non-monetary costs for taking the courses/program. The institutional costs were grouped into "cycle costs" (costs per graduate), and program "credit hour costs". The cycle costs were based on a two-year program, and the credit costs were based on an 80 semester credit hours requirement for a two-year program.

Four IKIPs and two FKIPs which offered D2 Mathematics and D2 Bahasa Indonesia programs in the academic years 1987/88 and 1988/89 were used as comparison groups for the UT teacher

training program. Comparison of the institutional costs per cycle and per credit (SKS) are summarized in Table 2.8. The study showed that the institutional costs per cycle and per credit (SKS) were significantly lower in the UT teacher training system than in the campus based institutions. The UT's operational cost for D2 Math and D2 Bahasa Indonesia was only 12 to 13 percent of those at IKIPs and FKIPs, where the UT's fixed costs for the two programs were 31 percent and 34 percent of those realized at the campus based institutions.

The result of the analysis of the individual direct costs and indirect costs (foregone income) also favored the UT system. The overall private costs at UT were in the range of 40 percent

TABLE: 2.8

OPERATIONAL COSTS AND FIXED COSTS PER CYCLE AND PER PROGRAM CREDIT AT IKIP, FKIP, AND UT IN 1987/88 and 1988/89 (IN Rp 1000)

Unit Costs:	IKIP and FKIP			UT			Ratio UT/IKIP,FKIP		
	Operation Costs	Fixed Costs	Total	Operation Costs	Fixed Costs	Total	Operation Costs	Fixed Costs	Total
D2 Mathematics:									
Per Cycle	2,738	622	3,359	368	194	562	.13	.31	.17
Per Credit(SKS)	34	8	42	9	5	14	.27	.63	33
D2 Bhs. Indonesia:									
Per Cycle	2,955	571	3,526	359	193	551	.12	.34	.16
Per Credit(SKS)	37	7	44	9	5	14	.24	.71	.32

Source: Adapted from Table 2 and Table 10. Pusat Penelitian, **Studi Prilaku Mengajar dan Biaya**, Jakarta, 1989.

to 50 percent of the costs for taking the same program at an IKIP or FKIP. The major component of the individual costs was the direct cost. The most interesting finding from this study is that the indirect cost for D2 Math students at UT was higher than the income foregone of the IKIPs and FKIPs students. But, for the D2 Bahasa Indonesia program, the IKIPs and FKIPs students had higher income forgone than the UT students. The income foregone of the D2 Math students at UT was almost double that of their peer at IKIPs and FKIPs, while for the D2 Bahasa Indonesia the forgone income figure was only 53 percent. This finding suggests that the D2 Math students in UT system have greater opportunity for multiple teaching jobs than do their peers attending IKIPs and FKIPs, while the reverse is true for D2 Bahasa Indonesia students. Since the study was at the preliminary stage, it did not provide information which explained such contradictory conditions. Individual direct and foregone costs for IKIP, FKIP, and UT students are shown in Table 2.9.

TABLE: 2.9

COMPARISON OF DIRECT AND FOREGONE COSTS
(Data 1987/88 and 1988/89 in 1000 Rupiah)

Program	IKIP, FKIP			UT			Ratio UT/IKIP,FKIP		
	Direct	Fore-gone	Total	Direct	Fore-gone	Total	Direct	Fore-gone	Total
D2 Math	603	48	651	242	86	328	.40	1,80	.50
D2 B.Indonesia	642	85	727	247	45	292	.39	.53	.40

Source: Adapted from Table 6 and Table 13, Pusat Penelitian, **Studi Prilaku Mengajar dan Biaya**, Jakarta, 1989

A lesson to be drawn from these studies is that the up-grading or teaching certification for Secondary School teachers through the UT system was evidently less expensive and possibly more cost-effective than the face-to-face system of the IKIPs and FKIPs. However, the study did not provide the breadth and depth of information on the scale economies of the UT necessary to redesign the UT's operational policies. The purpose of this study is to provide such information.

CHAPTER III

THE CONCEPTUAL FRAMEWORK

In this section the conceptual framework of the study is discussed. The discussion focuses on the theoretical justification for using the cost structure, enrollment, openness, and scale economies of the system as a source of UT policy making. The two topics discussed here are: (1) the cost characteristics of distance university systems; and (2) the relevance of revenue and enrollment minima. The first topic includes the concepts of distance education, the literature on the cost structure, and the concepts of access, equity, and efficiency as applied to distance education systems. The second topic concerns the relationships between scale economies and policies concerning tuition and enrollment for the UT courses and programs.

Cost Characteristics of Distance University Systems

Of the multiple policy issues facing the UT, the evaluation of the scale economies in the provision of courses and programs is among the most important. During these stringent times, the UT planners need to be sensitive to the affect of the variation in enrollment on the unit costs of the UT operations. In determining

the appropriate scale of the UT courses and programs, the planners should take into account the specific characteristics of the distance education system as the justification for defining the UT operational policies. Among these characteristics are: (1) the nature of the cost structure; (2) the target groups and level of enrollment; and (3) the "openness" of the system.

(1) The Nature of UT's Cost Structure.

The cost structure of a distance university (DU) such as UT, is different from those of the campus universities (CU) in two major respects. The first difference is in instructional methodology, and the second difference is in the proportion of the fixed costs relative to the variable costs in the instructional activities. In a CU system, instruction is carried out by faculty members who predominately utilize face-to-face instructional methodologies. The primary source of instruction is the teacher who plans, prepares and then delivers instruction to students in a classroom. In a DU system, instruction is carried out by the institution itself through the use of media technology such as self-instructional modules, radio, audio, or television programs. The students are, however, the proximate initiators of the teaching-learning processes. The main thrust of the DU system is that it changes the production process of education by substituting a range of media for a teacher. In essence it offers a capital intensive instructional technology in education as an alternative

to the traditional labor intensive craft approach (Peters, 1981; Wagner, 1982).

There are three basic conceptual underpinnings of distance education which affect the nature of cost structures of DU systems. They are:

(1) the concept of autonomy and independence (Delling, 1975, 1976; Wedemeyer, 1974; and Moore, 1977);

(2) the concept of industrialization in education (Peters, 1971, 1981);

(3) the concept of interaction and communication (Holmberg, 1986, 1988; Baath, 1982; and Sewart, 1981).

According to the concept of autonomy and independence, the DUs are characterized by operational systems which stress the importance of: (1) self-pacing, individualized, and goal free instructional technology (Dieuzeide, 1970; Cass, 1975; Wedemeyer, 1974); and (2) artificial dialogue between students and the "teacher", the learning institution (Delling, 1975, 1976; Moore, 1977). According to the concept of industrialization in education, the main characteristics of the DUs operational systems are similar to those of the industrial production of goods. It is characterized by rationalization, division of labor, mechanization, assembly line arrangements, mass production, preparatory work, formalization, standardization, functional change and objectification, and concentration and centralization (Peters, 1971, 1981). The main proposition of the interaction and communication concept claims that the operational systems of the DUs are

characterized by the provision of: (1) intensive student services in response to students' need for "guided didactic communication" (Holmberg, 1988); and (2) two-way communication between students and tutors as a means of working through exercises, asking/answering questions, or checking answers to the tests built in into the learning materials. Two-way communication is realized through correspondence, communication by computer networking, telephone, or tutorials (Baath, 1982; Sewart, 1981). In this instance, the UT operational systems and, therefore, the cost structure reflect the institutional commitments to these concepts of the distance education system. However, the UT system does not represent a distinctive application of any one of the concepts but, rather an integrated application of components of each of them.

The second difference in the cost structure of CU and DU systems is in the proportion of variable costs to fixed costs. In a CU where the course delivery is carried out by the teaching staff, teacher salaries are a major component of the instructional costs. This component represents the major variable cost and is related, in the long term, to the number of students. In an open university system (DU) a large proportion of instructional costs are related to course development activities (especially the preparation of the learning materials: self-instructional modules; TV, Radio, and Audio programs). These are the fixed costs, and are not dependent on the number of students enrolled but on the number and the "life" of courses and programs. Thus, development costs can only be justified in economic terms if, at

a later stage, there are a sufficient number of students enrolled in the system to make the investment in development activities worthwhile. At the same time, the DU's direct variable delivery costs (e.g. the tutorial services) are generally lower than those faced by CU systems. This is so, because DUs, such as the UT, provide tutorials for a limited number of courses and on the basis of student requests. A comparative study of the cost structure of the United Kingdom Open University (UKOU) and the British campus universities showed that the ratio of fixed costs to variable costs per student at UKOU was 36,000 to 1, while for the CUs it was only 1,180 to 1 (Laidlaw and Layard, 1974). Thus, the study suggested that the fixed costs aspect of the cost structure significantly affects the scale economies of the DUs.

(2) The Target Groups and Levels of Enrollment.

In the early stage of DU development (predominantly in the initial forms of correspondence learning) adults with occupational, social and family commitments were the original target groups of the distance education institutions. Holmberg (1986) described the rationale of distance education as follows:

> These students wish to educate themselves in their spare time either to improve and update their professional knowledge or to widen their intellectual horizon generally to learn for practical purposes, for instance application of computer technology or a foreign language, or to acquire knowledge and insight for its own sake. To generations that are young when the first correspondence schools and similar distance-education organizations started their work, the opportunities they offered were very often the only chance available to

> compensate the faulty or insufficient early education. Distance education gave -and gives- gifted and hard-working people a possibility to study beside their jobs and may still have a pronounced careerist character. It served and serves mobility educationally, professionally, and socially. (p.16)

In case of the United Kingdom Open University (UKOU), Harris (1987) cited Griffith's (1979) and Arnot's (1983) findings which showed that UKOU has proved advantageous for women since they do not face constant unfavorable comparison with men. Similar observations were made earlier by Landqvist (1948), Glatter and Widell (1971), Gadden (1973), and McIntosh (1976) in European countries such as Norway, Sweden, West Germany, and Great Britain; and by Ansere (1978) in Ghana. These observations further imply that the unit costs of a DU system primarily depended on student use which in turn was determined by the relevance of the courses and programs to students' career development, intellectual and gender aspirations, level of maturity, and commitment to their family living. This means that any DU attempting to increase enrollments (for example, by including the very recent high school graduates as a target group) must take into account the students' interests, gender, levels of maturity, and family commitments as sources of its operational policy considerations.

As indicated earlier the level of enrollment of new students and registrations of active (continuing) students is critical for the scale economies of the UT courses and programs. Specific treatment of level of enrollment for determining the appropriate scale of the UT operational system is based on the following reasons. In campus universities, where the largest part of the student body is comprised of full-time students, the number of

graduates and the progression, repetition, and drop-out rate are commonly used as indicators for evaluating internal efficiency (Chapman and Windham, 1986; Windham, 1988). Thus, the level of the institutional "outputs" as measured in the number of graduates, the progression, repetition and drop-out rate are used to justify the number of "inputs" such as teaching staff, teaching hours, and other teaching facilities. In a distance university system, where the majority of the students are part-time, the number of graduates who earn a degree or diploma may be only a partial criterion for evaluating the internal efficiency of the system. In some instances, those who are taking courses in an open university do so for personal satisfaction and have no intention of earning a degree or certificate. In other instances, students take the courses as part of their program at a campus university (Snowden and Daniel, 1980; Keegan and Rumble, 1982). In both instances, enrollment levels of new students and of the active continuing students are a more appropriate criterion for evaluating the scale economies of the UT system.

(3) The Openness of the UT System.

The third characteristic which is critical to determining the appropriate scale of the UT courses and programs concerns the "openness" of the distance education system. The policies of open admission, flexible registration, use of self-contained textbooks (self-instructional modules) and tutorial services based on student requests, all indicate the "open" nature of the UT in-

structional system (Harris, 1987). Lord Crowther in his 1969 inaugural address as Chancellor of the United Kingdom Open University stated that the open university system implies openness "as to people"; "as to place; "as to method"; and "as to ideas" (Tunstall, 1974). "Open to people" means that the system provides a "second chance" to those otherwise unqualified or unable to attend campus based higher education. The system is, thus, suitable for adults as well as youths who have just graduated from high school. It emphasizes a mass education rather than an elite education orientation. "Open to place" means that the teaching learning process is not constrained by location or classroom arrangement. "Open to method" refers to the use of distance technologies rather than the face-to-face approach of traditional educational systems. "Open to ideas" refers to the innovativeness of the system such as freedom of inquiry, no formal credential requirement for admission, the transferability of the courses and programs, and the self-evaluation system adopted by the UKOU (Rumble and Harry, 1982).

These propositions imply that evaluation of the scale economies of the UT courses and programs must also deal with the question of to what extent the UT system is committed to openness if such openness involves substantial opportunity costs relative to other institutional goals. The UT policy issues regarding the scale economies are closely related to the specific characteristics of the UT operational systems. These characteristics are the cost structure, the target groups and levels of enrollment, and the openness of the system.

The Revenue and Enrollment Minima

Another aspect of the framework for this study is based on the concept of revenue and enrollment minima. In the industrial sectors, the optimum level of production is defined by equating the average costs -- average total cost (ATC) and average variable cost (AVC) --, marginal costs (MC), and the price (P) of the product.

There are two underlying assumptions for the notion that an optimum scale of production is defined by equality of ATC, AVC, MC, and P:

(1) Production is at an optimum level when average cost is a minimum, and this occurs where MC equals ATC.[1)]

(2) The first condition for long-term profit maximization in a competitive market is that marginal revenue (MR) equals marginal cost (MC).[2)]

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1) If C is total production cost, C = F + V(Q), where F is total fixed costs and V(Q) is total variable costs. Thus, average fixed cost is F/Q, average variable cost is V(Q)/Q, and average total cost is F/Q + V(Q)/Q, the marginal cost equals dC/dQ = dV(Q)/dQ. It is easy to show that marginal cost (MC) equals average variable costs (AVC) when AVC is a minimum:

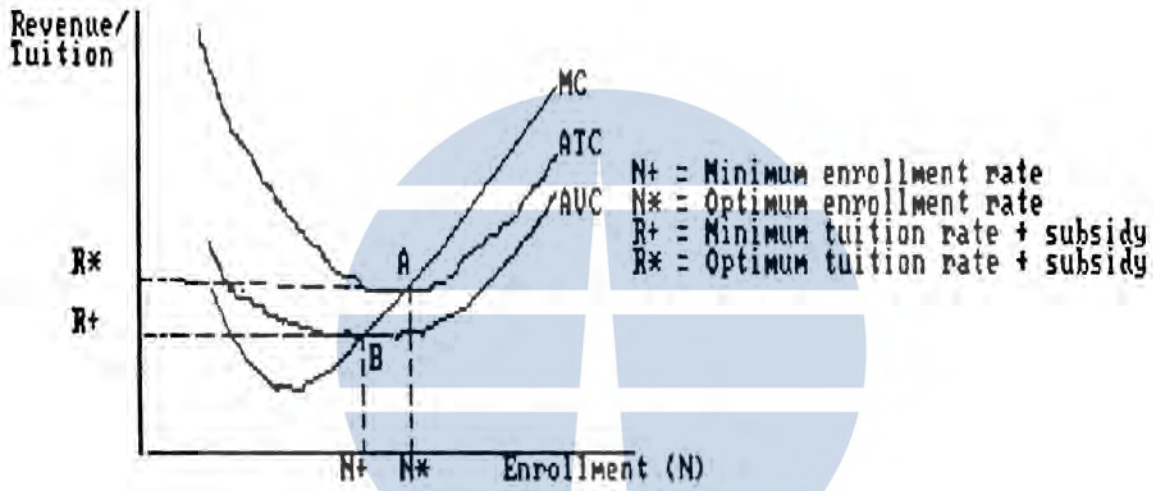
$$\frac{d[V(Q)/Q]}{dQ} = \left(\frac{dV(Q)}{dQ} - \frac{V(Q)}{Q}\right)\frac{1}{Q} = 0$$

which means that dV(Q)/dQ = F/Q + V(Q)/Q, which means that MC = AVC

Geometrically, the relationship between the average cost (AC), average variable cost (AVC) and marginal cost (MC) which implies the revenue and enrollment minima in a production relationship could be depicted in Figure 3.1.

FIGURE: 3.1

The Relationships Between Revenue Enrollment Minima
(Traditional Production Function)



It is also easy to show that MC equals average total cost (ATC) when ATC is at a minimum:

$$\frac{d[F/Q + V(Q)/Q]}{dQ} = \left\{\frac{dV(Q)}{dQ} - \left[\frac{F}{Q^2} + \frac{V(Q)}{Q^2}\right]\right\}\frac{1}{Q} = 0$$

which means that, $dV(Q)/dQ = F/Q + V(Q)/Q$, which means that MC = ATC (see Edwin Mansfield, **Microeconomics: Theory and Application**, 6th ed., WW Norton, New York, 1988: 208-209).

2)

If total revenue, R, is value of quantity of sale Q time price P, or R=QP, the marginal revenue MR = dR/dQ = dQP/dQ which is by definition equals P. Thus, in order to maintain an optimum scale of production means to maintain a production level where ATC = MC = P, which is a break even between the production costs and revenue. Or, at least AVC=MC=P where the revenue covers the variable costs. (see Hal R. Variance, **Microeconomic Analysis**, WW Norton, New York 1984 pp. 79-91).

Applying this traditional production cost analysis to the UT case, the supply curve of the UT courses and programs is the upward sloping part of the marginal cost curve (MC) that lies above the average variable cost curve (AVC). The UT should not operate on those points on the marginal cost curve below the average variable cost since revenue from tuition and subsidy could not even recover the variable costs. At N+, with tuition plus subsidy revenue of R+, the university can barely recover the variable costs, while at N* with tuition plus subsidy revenue of R*, the university maintains a break-even between the total production cost (fixed + variable) and the revenue from student tuition and government subsidy. This revenue minima paradigm also implies enrollment minima. That is, given a fixed tuition level and government subsidy, a minimum level of enrollment is required in order to cover the total production cost.

This concept of revenue and enrollment minima can be used in analyzing the scale economies of the UT courses only if two major considerations are included. First, the UT operation is not based on the principle of profit maximization. UT is a public university which operates on the basis of a cost-constrained maximum utilization principle,[3] and thus, it receives a subsidy from the government. The tuition rate is determined by the government as a function of the subsidy and students' demand through the development and routine budget allocation process.

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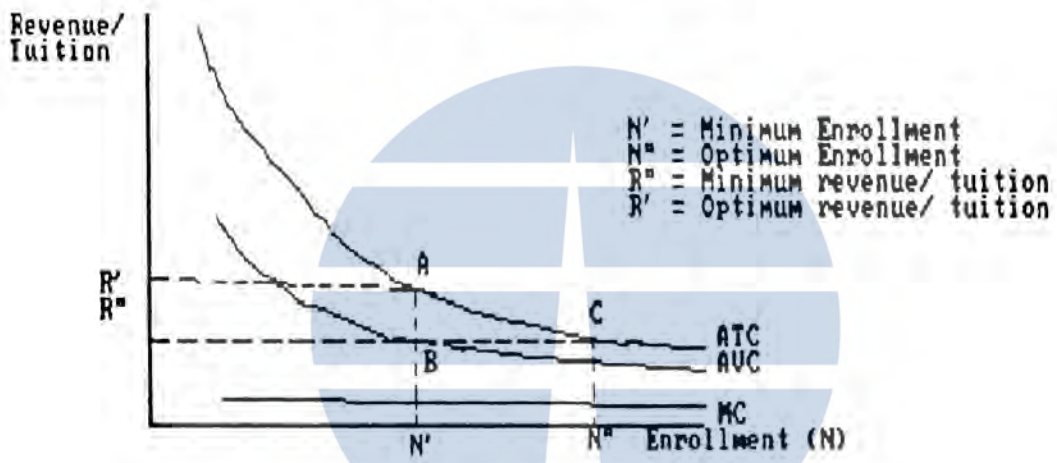
3) That is, utilization is maximized given the nature of costs and level of expected revenue from government and students.

Second, the cost function of UT courses and programs probably does not have the "U-shape" of the traditional average cost function. The cost structure of UT largely consists of the fixed development costs, and the cost functions (average total cost and average variable cost) are probably more of an "L-shape" (as in Figure 3.2). The unit costs per student (ATC and AVC) are high at early stages of enrollment, and diminish rapidly as the number of students enrolled in the programs increase because most costs are fixed and few are variable (i.e., change when the number of students change) (Winkler, 1984). At UT, the marginal cost function is very low, since an increase of one more student (enrollment) at UT will not increase the fixed development costs. It only affects the variable delivery costs (tutorial, examination, registration, and distribution) which are fairly low per student. It is very unlikely that the marginal cost function will increase to cross the average cost (ATC and AVC) from below as it does in the traditional production cost function. The nature of the UT cost structure implies that the internal efficiency in the UT production process can not be defined in the traditional terms of equality between the average cost and the marginal cost functions. It can only be defined in terms of the relationships between the appropriate level of revenue (tuition + subsidy) given the level of enrollment or the appropriate level of enrollment, given the fixed level of tuition and Government subsidy.

The operational policy issues regarding the revenue and enrollment minima of the UT courses and programs can be illus-

trated by Figure 3.2. Given the total and variable costs for producing a UT course or program, the cost per student can be identified as represented by points A and B for enrollment N'. The average total costs at point A indicate that the necessary level of revenue for the course or program is at R'. Only at that

FIGURE: 3.2
The Relationships Between Revenue (Tuition) and Enrollment
For The UT Courses and Programs



level will total revenue equal total cost. However, if UT is not attempting to recover the fixed development costs, the necessary level of tuition is at R"; here total revenue equals total variable cost. If the actual revenue level (from subsidy and tuition) is lower than R', then a change in UT operational policy is required to increase the enrollment level beyond N'(e.g. to N") in order to lower average total cost to the point where it equals average revenue.

Another possible operational policy for exploiting scale

economies in the UT courses and programs is through altering the cost structure. The source of cost structure change may be achieved by altering the nature or use of course offerings (Bottomley, 1972). Cost reductions could be achieved by extending the "life" of the courses and programs or by integrating the single discipline courses with small credit hours of 2 to 3 SKS into a larger "package" of multi-discipline course or syllabi with 4 to 6 SKS (Schumacher, 1983). For instance, the extension of the "life" of the course contents and/or programs' curriculum from five years to ten years will reduce the fixed development cost per unit of time by 50 percent. Also, rather than providing separate small statistical courses for economics, social science, and for behavioral sciences, it would be more economical in terms of the development costs if the courses are provided in the form of a single package of statistical analyses for behavioral and social sciences.

The unit cost per student can be reduced, particularly for the courses with low enrollment levels, by reducing the course offerings from twice to once a year. This would lower costs because the number of tutors and examiners to be hired is not necessarily double although the number of students attending the services increases by 100 percent. This discussion suggests that the nature of scale economies for the UT courses and programs implies the need to examine operational policy issues regarding the revenue and enrollment minima; these considerations will prove to be different from those of the campus university systems.

CHAPTER IV

RESEARCH DESIGN

Drawing on the discussion in the previous chapter, this chapter describes the research design for the study. The main objective of this presentation is to summarize the research strategy to be used in analyzing the scale economies for the UT courses and programs. The discussion here will focus on six topics: (1) research issues; (2) data specification; (3) sources of data; (4) instrumentation and data collection; (5) population and sample; and (6) methods of analysis.

Research Issues

The focus of this study is the policy implications of the scale economies of the UT courses and programs given the varying trend of enrollments. This issue is addressed by three specific questions:

(1) What are the unit costs of the UT courses and programs at various level of enrollment?

(2) What are the determinant cost factors of the UT cost structure?

(3) What alternative operational policies are required to exploit the potential scale economies in the UT operational systems?

Issue #1: What are the unit costs of the UT courses and programs at various level of enrollments?

This question is concerned with defining the average costs per student and per credit for the UT courses and programs. In terms of scale economies, this issue concerns with the unit costs at various levels of enrollment. This is the way of identification of the efficient levels of enrollment for the UT courses and programs. This issue also concerns to what extent the unit costs vary among the UT courses and programs?

Issue #2: What are the determinant cost factors of the UT cost structure?

This question is concerned with the cost components for course development and delivery. How do the expenditures for personnel, building and equipment maintenance, office materials, and travel change as enrollment increases or decreases? How do they differ for the course development and course delivery activities?

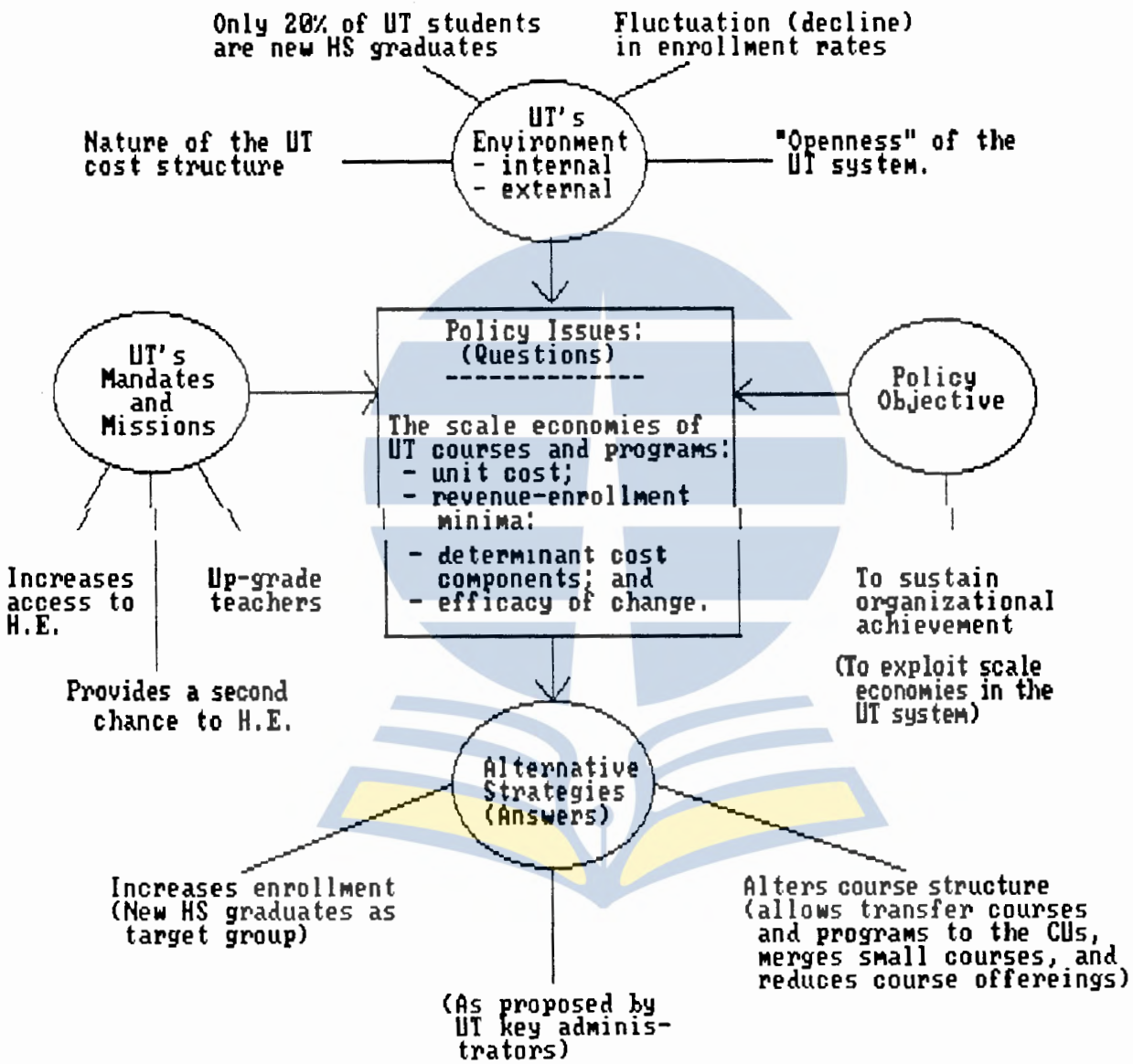
Issue #3: What alternative operational policies are required to exploit the potential scale economies in the UT operational systems?

This question is concerned with identification of alternative operational policies to reduce the unit cost, without affecting program quality or coverage, either by increasing the enrollment rate or by altering the structure of the UT courses. Changes in the operational policies may be required in order to exploit fully the potential scale economies in the UT system, especially in periods when the enrollment is declining. The question also includes the issue of the anticipated problems (constraints) and the opportunities for UT to implement such changes, and how such constraints could be managed.

These four policy questions were analyzed with reference to (1) the UT's environmental conditions; (2) UT's mandates and missions; and (3) the policy objective as summarized in Figure 4.1. The analysis resulted in the recommendation of alternative strategies for policy change.

FIGURE: 4.1

The Contextual Relationships Between the Main Policy Issues, Environment (Conditions), Mandates and Missions, Policy Objective, and Alternative Strategies.



Data Specification

The four interrelated research questions mentioned above determine the nature of data required for the study. The first three issues required quantitative data on: (1) total costs for course development and delivery; (2) cost components (expenditures) for personnel, building and equipment maintenance, office materials, and travel; (3) revenue from student tuition and government subsidy; and (4) enrollment levels. The fourth question required qualitative "policy" data on: (1) the anticipated technical and management problems, and (2) the operational policies which are required in order to maintain scale economies in the UT system.

Data on total costs for course development activities were defined to include expenditures for the Schools and the Media Production Units to produce curriculum (course outline), modules, support learning materials, and the test materials. Data on costs for course delivery activities included expenditures of the Office of Registrar and Computer Center, the Center for Distribution, the Center for Examination Processing, and the UPBJJs for registration and tutorial services, administration of examinations, and distribution of the learning materials to students. The expenditures of the Rectorate Office, the Central Office of Administration, the Center for Research and Public Service, and the Library were considered the overhead costs for course development and delivery activities.

Data on cost components included expenditures for personnel (salary and honorarium), for building and equipment maintenance, office materials, and travel for each of the functional units (schools and centers) within the UT organization. These data, are the same cost data required for the total cost calculation but here are grouped in terms of components of the expenditure instead of by function or activity.

Data on total revenue included the university income from students tuition and fees for the registration materials and examinations. They include the student contributions received by the university through the post offices. Data on revenues from the government subsidy are reported as part of the routine budget and development budget allocations.

Data on enrollments were the number of students registered for the UT courses in a particular semester. Thus, it includes course registration data on the new students as well as on the active continuing students; this reflects the actual students' demand for the UT courses and programs at any point in time.

The policy data were the UT planners' opinions about the alternative operational policies which would improve the scale economies in the UT courses and programs.

Sources of Data

Data on course production costs by function or activity and by component of expenditures, and the UT revenues from student tuition and government subsidy were collected from the Office of Finance. Data on the number of courses and programs produced by the Schools were obtained from the Schools.

Data on registration (course enrollment) levels were obtained from the Office of the Registrar. Data on the number of students taking tutorial services were not available. The data on costs, revenue, and enrollment used for this study were from the period of 1985/86 to 1989/90. The qualitative data about the sources of constraints and opportunities for changing UT operational policies was collected from key UT administrators. They included the Rector, the Vice Rectors, the Deans, and the Heads of the Functional Units/Centers/UPBJJs.

Instrumentation and Data Collection

A set of accounting sheets was developed to collect and record the data on costs, revenue, and student registration. The qualitative policy data from the UT key administrators was collected using a questionnaire.

The data instrument for costs and registration included:

(1) Name of the functional unit.

(2) Year the expenditure occurred.

(3) Distribution of expenditure by cost components.

(4) Number of staff by rank (I to IV) and proportion of salary rate.

(5) Number of courses and programs produced and/or delivered by the Schools.

(6) Number of students registered (and the number of those taking tutorials and examinations).

The data instruments for revenue from student tuition and government subsidy includes information on:

(1) Year of expenditure.

(2) Total revenue by sources (tuition, routine budget, and development budget).

The configuration of these accounting sheets is given in Appendix A-D.

The questionnaire for collecting the policy data includes information about:

(1) The position of the Respondent (Rector, Vice Rector, Dean, or Head of a Unit).

(2) The required policies and the problems related to increasing enrollment.

(3) The required policies and the problems related to reducing the average cost by altering the structure of the UT courses and programs.

This questionnaire is shown in Appendix E.

The method of collecting data on unit costs was the ingredi-

ents approach (Windham, 1988). Each component of the expenditures was collected separately and then aggregated in order to obtain total cost figures for UT course development and course delivery activities. However, the cost data at the course or program level was generated using the aggregate approach. Given the total cost based on the ingredients approach, the cost for a specific course was defined as a proportion of the total cost to the number of credit hours (SKS) equivalent weighted by the course load.

A group of field workers were trained to collect the data. They were drawn from the staff of the Office of Finance who regularly collect data on costs and revenue and the staff from the Office of Registrar who collect data on enrollment. Interviews with the UT key administrators were carried out by the researcher. The source of different types of data collected and the instruments used are as summarized in Table 4.1.

TABLE: 4.1

SPECIFICATION, SOURCES, AND INSTRUMENTS FOR COLLECTING DATA

Data	Sources	Instruments
Costs	Office of Finance	#1 and #2
Enrollment	Office of Registrar/ Computer Center	#3
Course and Program Production	Schools	#4
Operational Policies	UT key administrators (Rector, Vice Rectors, Deans, Heads of Unit/ Center/UPBJJ)	#5

Population and Sample

The target population for the was the 441 courses and the 22 diploma and degree programs offered by UT up to academic year 1988/89 (BAAK-UT, 1989). When designing this study it was assumed that there were differences in unit costs for producing the same type of course for different programs within a school. In practice, however, the cost for producing UT course was based on the number of course credit loads. Thus, production cost for a four-credit course is twice the cost for producing two-credit course, and is one and one-third of cost for producing the three-credit courses. In order to have a comprehensive figures of unit costs the data used for the study were the costs and enrollments from the course population. The distribution of the population of the UT courses by credit load, course requirements, and field of study (schools) are shown in Table 4.2.

The UT courses were grouped into these three categories for the following reasons. First, the total cost for producing the four-credit courses is higher than for the three-credit, or the two-credit courses. But, if the number of students taking the two-credit courses is far below the enrollments for the three-crtedit courses, the unit costs for the three-credit courses could be lower than for the two-credit courses. Similar arguments apply for the classification of UT courses by type of course and school discipline. Thus, each group of UT courses could have different scale economies.

TABLE: 4.2

DISTRIBUTION OF POPULATION OF THE UT COURSES BY CREDIT LOADS, COURSE REQUIREMENTS, AND SCHOOLS

Course Category:	Number of Courses
A. Credit Loads (SKS):	
2 credits (2SKS)	180
3 credits (3SKS)	243
4 credits (4SKS)	17
5 credits (5SKS)	1
B. Type of Course Requirements:	
MKDU Fundamental (MKDU)	12
Pre-Core (MKDK)	65
Core and Supports (MKK/MKPBM)	364
C. Field of Study (Schools):	
Social and Political Sci. (FISIP)	85
Economics (FEKON)	74
Mathematics and Physics (FMIPA)	63
Education (FKIP)	207
D. Total UT	441

Source: Universitas Terbuka, Katalog UT, Jakarta, 1987

Method of Analyses

Each of the research questions under study required an appropriate method of analysis. The three methods of analysis used in the study were: (1) the unit cost analysis; (2) the determinant cost factor analysis; and (3) the operational policy analysis. A brief description of these methods follows.

(1) The Unit Cost Analysis.

The objective of this analysis was to investigate the unit costs (cost per student and cost per credit) for producing the UT courses and programs. Specifically, the analysis was concerned with defining unit costs for various enrollment levels of 250, 500, 1000, 2500, and 5000.

The analysis was based on the following steps. The first step was to define the unit costs based on the actual enrollment levels. These unit costs were simply obtained by dividing the total costs (management + course development + course delivery costs) obtained from the ingredient approach by the number of enrollments and the total course credits.

The second step was to define unit costs at varying enrollment levels. The objective of this analysis was to find out the rate of change in unit costs as the enrollment number changes. The computation was based on two fundamental assumptions: (1) the total fixed development cost does not change with enrollments; and (2) the marginal delivery cost is fairly low so that the average delivery cost can be composed based on the unit costs obtained from the actual (current) enrollments. In this instance, the unit cost per student at the given hypothetical enrollment level is simply the average cost that is derived from the total fixed development cost and the "composite" variable delivery cost for the five levels of enrollment.

(2) The Determinant Cost Factors Analysis.

The objective of this analysis was to investigate the major components of the UT cost structures. Specifically, the analysis was intended to identify the components of expenditures for personnel, building and equipment maintenance, office materials, and travel which are sensitive to changes in enrollments.

This analysis was based on the following steps. First, the components of the cost structures by expenditure were defined. That is, using the ingredients approach the actual aggregate distribution of costs for personnel, building and equipment maintenance, office materials and travel was recorded. Secondly, the expenditures were grouped into three categories: (1) total development costs; (2) total delivery cost; and (3) total overhead management cost. The final step was to convert these figures into percentages of the total cost for the fiscal years 1985/86 through 1989/90.

By comparing the percentage change in the expenditures and the related change in enrollments, the components of expenditure with the largest change were identified. The components of expenditure with the largest change rate were considered the prime determinant factors for scale economies in the UT courses and programs.

(3) The Operational Policy Analysis.

The main objective of this analysis was to investigate the source of constraints and opportunities for changes with the UT operational systems to exploit the potential scale economies in the UT courses and programs when facing a decline in enrollment (registration) rate by introducing changes in the operational policy. The proposed policies are: (1) the inclusion of the new high school graduates as the prime target group for UT enrollment; and (2) the introduction of changes in the structure of the UT courses. The first alternative is proposed based on the basis that, although there are indications of high demand for higher education, less than 20 percent of the UT students are new graduates from high school. While the second alternative is proposed based on the notion of "openness" of the UT system.

Changes in operational systems face resistance both from inside and outside of the organization. Kauffman (1971) identified that the possible sources of constraints include: (1) expensive initial sunk costs; (2) loss of personal or group benefits; (3) it creates instability in the system; (4) "tunnel vision" among the member of the organization; (5) it is against the existing standard operating procedures; and (6) it violates agreement with other educational institutions. Corollary, the potential source of change could be in the forms of: (1) availability of manpower, money, regulation, and technology; (2)

dissatisfaction with the existing system; (3) it has been proposed by the campus universities; (4) there are no sunk costs; (5) it will increase enrollment levels at all universities; and (6) support from the Ministry of Education authorities. Constraints from out side the UT organization could come from the campus universities.

The analysis is conducted based on the UT key administrators' attitudes toward these change proposals. The first part of the analysis is identification of the general mode of the organizational and technical problems faced by the UT system to implement such innovative operational policies. The second part of the analysis focuses on identification of alternative solutions proposed by the UT key administrators for reducing the unit cost of the UT courses and programs. Finally, consideration is given to the major barriers to those potential changes. Thus, the analysis is descriptive in nature as well as inferential. From this analysis, policy makers will better understand the feasibility of the UT system to exploit the potential scale economies in its operations.

CHAPTER: V

UNIT COST ANALYSIS

This analysis defines the estimated cost per student and per credit for UT courses and programs. It also is concerned with the changes in unit costs that result from changes in enrollments. For comparative analysis UT courses are categorized according to credit load, course requirements, and field of study (schools). The types of courses by credit load are: (1) two-credit; (2) three-credit; and (3) four-credit courses. The types of course by course requirements are: (1) fundamental (MKDU); (2) pre-core (MKDK); (3) core (MKK and MKPBM), and (4) support (MKK) courses. The types of course by field of study (schools) are: (1) social and political sciences; (2) economics; (3) mathematics and physics; and (4) education courses. Although comprehensive examinations and the thesis are considered as a special subset of the support courses, costs are not analyzed independently for them since separate development and delivery costs are not specified. Three types of cost analyses are presented in this chapter: (1) the unit cost per course; (2) the unit cost per program; and (3) the scale economies of the UT courses.

The Basic Data and Assumptions.

The basic data used for the analysis were:

(a) The total costs for course development, course delivery, and the overhead management.

(b) The number of credits offered to students.

(c) The level of enrollments for each course for each of the last five years (1985/86 to 1989/90).

Ideally, the cost data required for the analysis are the development cost, the delivery cost, and the overhead management cost for each of the courses offered. However, since the UT budget is formulated at the university level rather than the school level, only aggregated data were available. As a result, the unit cost per course was estimated from the aggregate yearly total costs.

The basic assumption made in estimating unit costs in this study was that the UT course structure has not changed in the last five year period under study. The estimated cost per student is the cost per course divided by the number of students taking the courses during this period. The estimated cost per credit is the cost per student divided by the credit load. For example, the total cost for 180 two-credit courses produced in 1985/86 to 1989/90 was Rp.12,024,092, and the total course enrollments was 382,600 students. The cost per student for a two-credit course is Rp.31,427, and the cost per credit is Rp.15,714. The estimated

unit costs (per course and per credit) could be used as a basis for estimating the UT budget for further development of the UT courses and programs.

Another assumption made in this analysis concerned the expenditure data from student tuition (SPP/DPP). These data were available only for the fiscal years 1988/89 through 1990/91. Therefore, the information on tuition (SPP/DPP) during the period of 1985/86 to 1987/88 was estimated by projecting backwards from the data for the period of 1988/89 to 1990/91. It also was assumed that unit costs for course development were affected by the years of experience of managing the UT operations. At the early stage of development, due to the newness of the operational systems the cost for course development (as well as for course delivery and overhead management) might be higher than in the later years. However, since the development costs were assumed fixed for every course credit, the variation of the unit cost throughout the years only reflected the affect of changes in enrollment.

Having made these assumptions, the estimated cost per student and per credit for each of the UT courses was computed accordingly. Table 5.1 summarizes the cost data for the fiscal years 1985/86 to 1989/90. The course enrollments during this period are summarized in Table 5.2, and in greater detail in Appendix F. Table 5.3 summarizes the actual student enrollments per registration period for academic years 1986/87 to 1988/89.

TABLE: 5.1

THE BASIC COST DATA BY UNITS AND SOURCES
(IN RP.000)

UNIT OF ACTIVITY:	SOURCE	FISCAL YEARS: 1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL
1. Course Development	(DIP)	690,326	945,183	768,942	520,139	432,880	3,357,470
	(DIK)	110,622	402,393	443,277	638,613	691,604	2,286,509
	(SPP)	676,362	623,032	562,810	568,775	306,200	2,737,179
	Total DEV:	1,477,310	1,970,608	1,775,029	1,727,527	1,430,684	8,480,978
2. Course Delivery	(DIP)	3,242,760	773,961	-	2,623,510	-	6,640,231
	(DIK)	115,162	390,350	384,676	522,837	551,300	1,964,325
	(SPP)	1,585,505	1,594,667	1,572,385	1,261,620	1,722,820	7,736,997
	Total DEL:	4,943,427	2,758,978	1,957,061	4,407,967	2,274,120	16,341,553
3. Overhead Management	(DIP)	1,155,061	805,120	109,200	2,557,647	998,930	5,625,958
	(DIK)	254,878	583,161	462,354	587,670	610,092	2,498,155
	(SPP)	1,369,963	1,311,967	1,207,795	1,132,368	841,180	5,863,273
	Total MAN:	2,779,902	2,700,248	1,779,349	4,277,685	2,450,202	13,987,386
Total	(DIP)	5,088,147	2,624,264	879,142	5,701,296	1,431,810	15,723,659
	(DIK)	480,662	1,375,904	1,290,307	1,749,120	1,852,996	6,748,989
	(SPP)	3,631,830	3,529,666	3,342,990	2,962,563	2,870,200	16,337,449
UT Grand Total:		9,200,639	7,529,834	5,512,439	10,413,179	6,155,086	38,810,097

Sources of UT budget: DIP: Development Budget; DIK: Routine Budget; SPP: Student Tuition

TABLE: 5.2

THE COURSE ENROLLMENTS FOR ACADEMIC YEARS
1985/86 - 1989/90

COURSE CATEGORY	NUMBER OF COURSES (NX)	TOTAL CREDITS (SKS)	ACADEMIC YEARS: 1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL	AVERAGE
BY CREDIT LOAD:									
2 CREDITS	180	360	104399	107205	91489	40992	38515	382600	76520
3 CREDITS	243	729	175876	206510	199612	88181	81470	751649	150330
4 CREDITS	17	68	11846	11784	10140	3236	3086	40092	8018
BY COURSE REQUIREMENTS:									
FUNDAMENTAL	12	25	56268	44966	44325	23232	21153	189944	37989
PRE-CORE	65	189	113245	108735	83893	34395	32063	272331	74466
CORE & SUPPORT	364	948	122618	171798	175665	76024	71008	617113	123423
BY FIELD OF STUDY (SCHOOLS):									
SOCIAL & POL	85	242	129714	163151	155604	65907	58290	572666	114533
ECONOMICS	74	221	47975	57057	58854	25258	24836	213980	42796
MATH & PHY	63	190	13126	11578	11392	4829	4535	45460	9092
EDUCATION	207	484	45048	48747	33708	14425	15410	157338	31468
TOTAL UT:	441	1162	292131	325499	303883	133651	124224	1179388	235878

TABLE: 5.3

ACTUAL STUDENT ENROLLMENTS BY SCHOOLS
1986/87 TO 1988/89

SCHOOLS	REGISTRATION PERIODS: 86.2	86.3	87.1	87.2	87.3	88.1	88.2	TOTAL	AVERAGE
SOC & POL SCI	15269	20816	9401	12128	18310	18188	17892	112004	37335
ECONOMICS	5969	9185	3550	4536	7119	6953	7250	44562	14854
MATH & PHY	1604	2576	825	976	1691	1532	1630	10834	3611
EDUCATION	3274	5902	2588	3495	4461	3635	3476	26831	8944
TOTAL UT:	26116	38479	16364	21135	31581	30308	30248	194231	64744

Source: BAAK-UT, 1990

The Unit Cost Per Course.

The total costs for the UT courses and programs during the period 1985/86 to 1989/90 was Rp.38.81 billion (US $20.98 million). These costs include total expenditures for the development and delivery of 441 courses carrying a total of 1,162 course credits. The number of student course registrations during this period was 1,179,388. This enrollment figure is entitled "course enrollment", and includes multiple counting because the same student may take more than one course. Thus, the number of individual students registered in the UT system, is less than the course enrollment.

The cost per course (over the five year period) was calculated based on the estimated total cost per credit for each type of UT course. The total cost for a two-credit course was obtained by dividing the total five-year UT budget (Rp.38.81 billion) by the total course credits (1,162) and multiplying the result (Rp.33.4 million) by the course load (2 credits). The product of this calculation is Rp.66.8 million. Since there are 180 two-credit courses offered by the UT system during this period, the total production costs for all of the two-credit courses was Rp.12.02 billion. Table 5.4 provides a summary of the total costs for the UT courses.

The cost per student for each of the UT courses was obtained from dividing the total costs by the number of students taking

TABLE: 5.4

THE ESTIMATED TOTAL COST PER COURSE

COURSE CATEGORY:	NUMB COURSE	CREDIT (SKS) TOT	AVG	FISCAL YEARS: 1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90
A. BY CREDIT LOAD:									
2 CREDITS	180	360	2.00	2850456	2332823	1707812	3226114	1906887	12024092
3 CREDITS	243	729	3.00	5772174	4723966	3458320	6532881	3861445	24348786
4 CREDITS	17	68	4.00	538419	440644	322587	609377	360190	2271217
B. BY COURSE REQUIREMENTS:									
FUNDAMENTAL	12	25	2.08	197948	162002	118598	224036	132423	835006
PRE-CORE	65	189	2.91	1496489	1224732	896602	1693710	1001115	6312648
CORE & SUPPORT	364	948	2.60	7506201	6143100	4497239	8495433	5021468	31663442
C. BY FIELD OF STUDY (SCHOOLS):									
SOCIAL & POL	85	242	2.85	1916140	1568175	1148029	2168666	1281852	8082862
ECONOMICS	74	221	2.97	1749863	1432094	1048407	1980476	1170616	7381456
MATH & PHYSICS	63	190	3.02	1504407	1231212	901345	1702671	1006412	6346049
EDUCATION	207	484	2.34	3832280	3136351	2296059	4337331	2563703	16165724
TOTAL UT:	441	1162	2.63	9200639	7529834	5512439	10413179	6155006	38811097

the course. For instance, given that 382,600 students enrolled for the two-credit courses during the academic years 1985/86 through 1989/90, and the total production costs was Rp.12.02 billion, the estimated cost per student was Rp.31,427, and the average cost per credit was Rp.15,714. Tables 5.5 and 5.6 summarize the results of the computation of the cost per student and per credit for the UT courses.

On average, the cost per student for the UT courses was Rp.32,908. Given that the UT courses have an average of 2.63

TABLE: 5.5

THE ESTIMATED UNIT COST PER STUDENT
(IN RUPIAH)

COURSE CATEGORY:	NUMB COURSE	CREDIT (SKS) TOT	AVG	ACADEMIC YEARS: 1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	STD
A. BY CREDIT LOAD:										
2 CREDITS	180	360	2.00	27303	21760	18667	78701	49510	31427	22512
3 CREDITS	243	729	3.00	32820	22875	17325	74085	47397	32394	20344
4 CREDITS	17	68	4.00	45452	37393	31813	188312	116717	56650	60552
B. BY COURSE REQUIREMENTS:										
FUNDAMENTAL	12	25	2.08	3518	3603	2676	9643	6260	4396	2554
PRE-CORE	65	189	2.91	13215	11263	10687	49243	31223	16954	15108
CORE & SUPPORT	364	948	2.60	61216	35758	25601	111747	70717	51309	30199
C. BY FIELD OF STUDY (SCHOOLS):										
SOCIAL & POL	85	242	2.85	14772	9612	7378	32905	21991	14114	9268
ECONOMICS	74	221	2.97	36474	25099	17814	78410	47134	34496	21204
MATH & PHYSIC	63	190	3.02	114613	106341	79121	352593	221921	139596	101286
EDUCATION	207	484	2.34	85071	64339	68116	300682	166366	102745	89861
TOTAL UT:	441	1162	2.63	31495	23133	18140	77913	49548	32908	21740

TABLE: 5.6

THE ESTIMATED UNIT COST PER CREDIT (SKS)
(IN RUPIAH)

COURSE CATEGORY:	NUMB COURSE	CREDIT (SKS) TOT	AVG	ACADEMIC YEARS: 1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	STD
A. BY CREDIT LOAD:										
2 CREDITS	180	360	2.00	13652	10880	9333	39351	24755	15714	11256
3 CREDITS	243	729	3.00	10940	7625	5775	24695	15799	10798	6781
4 CREDITS	17	68	4.00	11363	9348	7953	47078	29179	14163	15138
B. BY COURSE REQUIREMENTS:										
FUNDAMENTAL	12	25	2.08	1691	1732	1286	4636	3010	2113	1228
PRE-CORE	65	189	2.91	4541	3871	3673	16922	10730	5826	5192
CORE & SUPPORT	364	948	2.60	23545	13753	9847	42980	27199	19734	11615
C. BY FIELD OF STUDY (SCHOOLS):										
SOCIAL & POL	85	242	2.85	5183	3373	2589	11546	7716	4952	3252
ECONOMICS	74	221	2.97	12281	8451	5998	26401	15870	11615	7139
MATH & PHYSICS	63	190	3.02	37951	35212	26199	116753	73484	46224	33538
EDUCATION	207	484	2.34	36355	27495	29109	128496	71097	43908	38402
TOTAL UT:	441	1162	2.63	11975	8796	6897	29625	18839	12512	8266

credits, the estimated cost per credit was Rp.12,512.

As shown in Tables 5.5 and 5.6 both the per student and per credit costs vary widely within and between the groups of course. The unit cost analysis by course load shows that the estimated cost per student for a two-credit course was Rp.31,427. The maximum estimate was Rp.78,701, the minimum estimate was Rp.18,667, with a standard deviation (STD) of 22,512. These figures reflect the variation in the yearly estimates of cost per student within this course category during the five year period under study. The larger the variation (as indicated by the standard deviation), the less precisely the estimated unit cost reflects the actual distribution of costs.

The variation in unit costs between the groups of course was clearly indicated by the variation in the estimated cost per credit (Table 5.6). Despite the fact that the same amount of money was allocated for every single course credit produced by UT, due to the differences in the number of students registered for the UT courses, the cost per credit for the two-credit courses was higher than the cost per credit for the three-credit courses. The cost per credit for the two-credit courses was Rp.15,714, while for the three-credit courses it was Rp.10,789. Similarly, the cost per credit for the core and support courses was almost 239 percent higher than the cost of a one credit pre-core course. Also, the cost of a one credit course in math and physics was almost 833 percent higher than the cost of similar courses in the field of social and political sciences.

The general pattern of unit costs suggests that the most expensive courses were those offered by the School of Mathematics and Physics (FMIPA). The cost per student was Rp.139,596 (US $75.5) and cost per credit was Rp.46,224 (US $25). The least expensive courses were those offered by the School of Social and Political Science (FISIP). The cost per student was Rp. 14,114 (US $7.6), and the cost per credit was Rp.4,952 (US $2.68). Thus, the existing tuition level, which averages Rp.5,000 per course credit, was generally equal to the unit cost for the School of Social and Political Sciences. The current tuition rate was about 50 percent of the cost per credit for economics, nine percent for math and physics, and 10 percent for education courses.

The Improving the Efficiency of Educational Systems Project (IEES, 1986) computed the cost per student for the Indonesian public and private universities as the weighted average of operational costs per student per year for a certain field of study. This unit cost calculation, however, did not take into consideration the number of courses offered by the departments. In comparison to this unit cost, the estimated cost per student by field of study for the UT system, in general, was lower than for the public and private campus university systems. Table 5.7 provides a comparison of cost per student for the campus and distance learning higher education systems.

The figures in Table 5.7 show that the overall cost per student at the UT system was Rp.119,892. The estimated unit costs

TABLE: 5.7

THE ESTIMATED UNIT COSTS FOR UT AND
THE CAMPUS UNIVERSITIES (CU)

Field of Study	Total Costs (5 years)	Average Costs	Average Enrollments	Unit Costs: UT	Public CU*	Private CU*
Social Sciences	8,082,862	1,616,572	37,335	43,299	170,000	266,000
Economics	7,381,456	1,476,291	14,854	99,357	196,000	301,600
Natural Science (Math and Physics)	6,346,049	1,269,210	3,611	351,452	656,000	832,400
Education	16,165,724	3,233,145	8,944	361,501	297,000	236,000
Average (Weighted)	38,811,097	7,762,219	64,744	119,892	280,000	343,800

*) 1984/85 Rupiah. Source: Adapted from IEES (1986), Vol. III, Table 9.27

for the public and private campus universities (CU) were Rp.280,000 and Rp.343,800, respectively. These figures suggest that unit cost at UT is 43 percent of unit cost at the public campus universities and 35 perecent of unit cost at the private campus universities. The unit cost for the field of education in the UT system, however, is higher than for the campus university system. This suggests that the average enrollment levels for the courses and programs offered by the School of Education in the UT system are relatively low when compared to the enrollment levels on the campuses. If this pattern continues, the UT planners may have to invest more in marketing education programs to increase enrollments. The low figure unit costs for the other fields of study suggests that, in the absent of effectiveness data, the UT

system is advantages for these fields of study.

The lessons that the UT planner can draw from these findings are as follows. The variation in unit cost among the courses in the UT system suggests that some courses are more expensive than others. In order to exploit the potential scale economies in the operational system, it may be necessary for UT to consider tuition differentiation by field of study, by type of course, or some combination of field and type of course. Otherwise, the schools with low enrollment will receive disproportional subsidies relative to the schools with higher enrollment. This could lead to a malallocation of resources among the schools in the UT system.

The variation in unit costs by field of study also suggests that the university would have operated more equitably if it had introduced a different tuition rate for each school. Thus, the tuition rate for students taking the programs under the School of Mathematics and Physics might be higher than the tuition rate for the other three schools. To the extent, however, that the differential tuition policy might further reduce enrollment, the level of the government subsidy might need to be maintained or even increased if these programs are considered essential. Alternatively, the school may have to build a closer relationship with industrial sectors willing to subsidize the school or students directly. It seems clear, however, that a flat tuition rate policy has created a potentially inequitable pattern of differential subsidization.

The same situation is implied by the variation in costs per

credit. The variation in cost per credit suggests that UT could have benefited from introducing a tuition differentiation policy by using the number of credits taken by students as a basis of their tuition level. This policy may be more appropriate than a tuition differentiation policy based on the fields of study (schools). Such a policy takes into account the effect of variation in the course credit load. However, a tuition level based on a combination of field of study, degree programs (certification vs. diploma), and the number of credits would be even better. Such a tuition policy takes into account the differences in total production costs due to field of study, the level of degree sought, and the number of course credits taken by the students. By assuming that students' tuition covers 42 percent of the operational costs, the desired flat rate tuition level for the overall UT courses is Rp.5,255. Table 5.8 shows the necessary level of tuition differentiation by field of study (schools) if full tuition financing were desired.

TABLE: 5.8

THE INDICATIVE TUITION LEVELS FOR UT COURSES

FIELD OF STUDY (SCHOOLS)	TUITION PER COURSE CREDIT: (100%)	(42%)
Social and Political Sci. (FISIP)	Rp. 4,952	2,080
Economics (FEKON)	11,615	4,878
Mathematics and Physics (FMIPA)	46,224	19,414
Education (FKIP)	43,908	18,441
UT (flat rate)	Rp. 12,512	5,255

The Unit Cost Per Program.

The cost analyses per student and per credit show that each of the UT courses, either by school or type of course, has a different estimated unit cost. Consequently, despite similar academic requirements introduced by the schools in the UT system, the cost per program will vary. The cost per program is estimated based upon data on: (1) the number of required courses (i.e. the fundamental/MKDU, pre-core/MKDK, core/MKK, and support/MKK and MKPBM) for each type of program; and (2) the cost per credit for the respective courses. Ideally, cost per field of study should be computed by determining the detailed cost per program within each field of study. However, since the cost data for each type of course per field of study was not available, the unit cost for all courses offered for a specific field of study was used for estimating the cost per program. The estimated unit cost for the fundamental courses was used to estimate the unit cost per program across the school because the courses were used for all programs. The unit cost for each of the UT educational programs is summarized in Table 5.9.

Due to the similarity in their academic requirements, the eight Associate Degree programs and the six S-1 Degree programs offered by the School of Education (FKIP) were grouped into two types of programs, namely: (1) the two-year D2-Associate Degree program; and (2) the S-1 or Bachelor Degree program. While the

School of Education does not offer regular and honor programs, as do the other schools, it does provide students with a choice of taking the minimum or maximum academic requirements for their educational program. For the purpose of this analysis, the cost figures provided for each school should be interpreted as the minimum and maximum production costs for the respective programs.

The figures on total cost per program show that the most expensive programs in the UT system are those offered by the School of Mathematics and Physics. The total cost for the regular S1-Degree program was Rp.6,271,935 (US $3,390) and for the honors program was Rp.6,734,175 (US $3,640). The cost per program offered by the School of Mathematics and Physics was about 910 percent of the cost per program offered by the School of Political and Social Sciences, and about 389 percent of the cost per program offered by the School of Economics.

The unit cost for the D2-Associate Degree programs offered by the School of Education ranged between Rp.1,505,550 (US $813) and Rp.1,725,090 (US $932). The unit cost for the S1-Degree program was in the range of Rp.1,756,320 (US $948) and Rp.1,975,860 (US $1,068). These figures are lower than those for the total cost for producing the programs offered by the other schools. The total credit-course (academic) requirements for the S-1 Degree programs offered by the School of Education were only 30 percent of the total course credits required for completing the S-1 Degree program offered by the other schools. Unlike the S1-Degree program for the other schools in the UT system, the S1-Degree

TABLE: 5.9

THE ESTIMATED UNIT COST PER PROGRAM
(IN RUPIAH)

Field of Study/ Programs	Course Credits Requirements: Fund't	Regular	Honors	Unit Costs: Fund't	Special'n	Total Costs: Regular	Honors
Social and Political Sciences (FISIP)							
D3-Taxation	15	120	-	2,113	4,959	551,655	-
S1-Bus. Adm.	17	149	160	2,113	4,959	689,585	739,831
S1-Pub. Adm.	17	149	160	2,113	4,959	689,585	739,831
S1-Dev. Adm.	17	149	160	2,113	4,959	689,585	739,831
Economics (FEKON)							
S1-Dev. Economics	15	151	160	2,113	11,615	1,611,335	1,715,870
S1-Management	15	151	160	2,113	11,615	1,611,335	1,715,870
Mathematics and Physics							
S1-Appl. Stat.	15	150	160	2,113	46,224	6,271,935	6,734,175
S1-Mathematics	15	150	160	2,113	46,224	6,271,935	6,734,175
Education (FKIP)							
D2-Associate	6	40	45	2,113	43,908	1,505,550	1,725,090
S1-Degree	-	40	45	-	43,908	1,756,320	1,975,860

program offered by the School of Education is a continuing degree program for teachers who already have earned the Bachelor Degree (which is a three-year Degree program) from the traditional higher education system. Therefore, with the same total number of course requirements, the total cost for producing the programs will be as high as for producing the programs offered by the

School of Mathematics and Physics Science.

The findings on the cost per program also suggest that the UT system could have operated more equitably by introducing tuition differentiation by type of program. The students taking programs in the field of mathematics and physics perhaps should pay more than those taking the other programs. Put differently, greater subsidy is required for the programs in the field of mathematics and physics because of relatively low level of enrollments. The subsidy could be either directly given to students or the school so that the programs become more attractive to the UT students.

Unit Cost at Varying Levels of Enrollment.

One of the objectives of the unit cost analysis is to investigate the sensitivity of the unit cost (per student and per credit equivalent) to changes in enrollment levels. For this particular purpose a hypothetical unit cost analysis is performed for the UT courses. These hypothetical unit costs were calculated for enrollment levels of 250, 500, 1,000, 2,500, and 5,000. Positive scale economies exist when the unit costs per student can be expected to decline as enrollments increase, assuming the quality of the educational service is unchanged. This assumption is a necessity, particularly regarding the quality of the course delivery activities such as the tutorial services. If the quality of tutorial service deteriorates as a result of an increase in

the number of students demanding the service, the existence of scale economies is at the expense of the quality of the tutorial service. The assumption of constant quality is plausible given the delivery technology of the UT operational systems. Similarly, the gain in scale economies should not be at the expense of the quality of the examination service, or other educational services.

Given the cost data, number of courses offered, and the actual enrollments, the cost structure for the UT courses and programs could be expressed as a cost function:

$$TC = OH + UCxX + UCnN$$

where, TC = Total Costs;
OH = Overhead Management Costs;
UCx = Average Development Cost per course;
X = Number of courses produced and delivered;
UCn = Average Delivery Cost per student;
N = Number of students enrolled;
UCxX = Total development costs;
UCnN = Total delivery costs.

Given this cost function, the scale economies of the UT courses and programs can be measured in terms of unit cost per course or per student. This study, however, is focused on the scale economies in terms of change in student enrollments. Since the courses are not categorized by type of program, it is not

possible to calculate the scale economies of the UT courses by type of program. This analysis, therefore, focuses on the scale economies by type of credit load, type of course requirements, and the field of study (schools) at various levels of enrollment. The basic data used for the analysis are the estimated total costs (fixed development and variable delivery costs) per course.

The hypothetical unit costs at varying enrollment levels were computed based on the following procedures. The first step is to translate total costs into fixed costs and variable costs. Overhead management costs and development costs are considered as the "institutional" fixed costs (Wagner, 1972, 1977; Snowden and Daniel, 1979). This is say that these cost components are not directly depend on the number of enrollments. Delivery costs are considered "variable" since they directly dependent on the number of students enrolled.

The second step is to compute the total course enrollments for each of the hypothetical enrollment levels. For example, suppose that the average course enrollment for each of the 180 two-credit courses is 250 students per five years (or 50 students per year), total course enrollments for these two-credit courses for five years would be 45,000 students. A similar procedure is applied for computing the hypothetical enrollments for the other type of courses. Table 5.10 summarizes the results of the computation for the hypothetical course enrollments.

The third step in the analysis is to compute the unit costs for each of the hypothetical enrollment levels. This computation

TABLE: 5.10

HYPOTHETICAL COURSE ENROLLMENTS

CATEGORY	NUMBER OF COURSES (NX)	TOTAL COSTS (TCx)	ACTUAL ENROLL (ENx)	ESTIMATED UNIT COST (UCx)	FIXED COSTS (FCx)	VAR COSTS (VCx)	HYPOTHETICAL COURSE ENROLLMENTS: 250	500	1000	2500	5000
A. BY CREDIT LOAD:											
2 CREDITS	180	12024092	382600	31427	6959681	5064411	45000	90000	180000	450000	900000
3 CREDITS	243	24348786	751649	32394	14093354	10255432	60750	121500	243000	607500	1215000
4 CREDITS	17	2271217	40092	56650	1314606	956611	4250	8500	17000	42500	85000
B. BY COURSE REQUIREMENTS:											
FUNDAMENTAL	12	835006	189944	4396	483311	351695	3000	6000	12000	30000	60000
PRE-CORE	65	6312648	372331	16954	3653833	2658816	16250	32500	65000	162500	325000
CORE/SUPPORT	364	31663442	617113	51309	18327160	13336282	91000	182000	364000	910000	1820000
C. BY FIELD OF STUDY (SCHOOLS):											
SOCIAL & POL	85	8082862	572666	14114	4678452	3404410	21250	42500	85000	212500	425000
ECONOMICS	74	7381456	213980	34496	4272471	3108986	18500	37000	74000	185000	370000
MATH & PHY	63	6346049	45460	139596	3673165	2672884	15750	31500	63000	157500	315000
EDUCATION	207	16165724	157338	102745	9356905	6808819	51750	103500	207000	517500	1035000
TOTAL UT:	441	38811097	1179388	32908	22464304	16346793	110250	220500	441000	1102500	2205000

is based on two fundamental assumptions: (1) the fixed development and overhead management costs will not vary as enrollment levels change; and (2) the per student variable costs remain constant across levels of enrollment. Granted these assumptions, the "composite" variable cost (VCx') can be computed. For instance, the total fixed costs (FCx) for the two-credit courses is Rp.6.96 million, and the total variable costs (VCx) is Rp.5.06 million. Given the actual course enrollments of 382,600 students

(N), the composite variable costs (VCx') for the two-credit courses is Rp.5.96 million (Rp.5.06 million divided by 382,600 students then multiplied by 45,000 students (N')). The hypothetical unit cost for the two-credit courses at an enrollment level of 250 is Rp.167,986 ((FCx + VCx')/N'). Results of the computation of the hypothetical unit costs are summarized in Table 5.11 and in Figures 5.1, 5.2, 5.3, and 5.4.

Figure 5.4 shows that positive scale economies do exist for the UT courses. The unit costs for the overall UT courses decreased rapidly as enrollment levels increased from 250 to 2500, that is from Rp.217,618 to Rp.34,236. Every marginal increase in enrollments (from 250 to 500, 500 to 1,000, and 1,000 to 2,500) was associated with a marginal decrease of about 50 percent of the unit cost. The further reduction in unit cost above an enrollment level of 2500 would declined to about 30 percent because the average fixed costs are already at a low level. Thus, the analysis demonstrates the familiar pattern of diminishing returns to scale beyond a hypothetical point. The actual level of course enrollment for the overall UT courses was 1,179,388 students. This enrollment level was associated with an average of the hypothetical course enrollment levels between 2,500 to 5,000 for each of the 441 UT courses. As shown by the shape of the hypothetical unit cost in Figure 5.4, at this level of course enrollment, the UT system is operating at an efficient level. The graph suggests that beyond an enrollment level of 2,500 students, the reduction in unit cost will be marginal. The trade-off between

TABLE: 5.11

HYPOTHETICAL UNIT COSTS OF THE UT COURSES

CATEGORY	NUMBER OF COURSES (NX)	TOTAL COSTS (TCx)	ACTUAL ENROLL (ENx)	ESTIMATED UNIT COST (UCx)	FIXED COSTS (FCx)	VAR COSTS (VCx)	HYPOTHETICAL UNIT COSTS: 250	500	1000	2500	5000
A.BY CREDIT LOAD:											
2 CREDITS	180	12024092	382600	31427	6959681	5064411	167896	90567	51902	28703	20970
3 CREDITS	243	24348786	751649	32394	14093354	10255432	245633	129639	71641	36843	25243
4 CREDITS	17	2271217	40092	56650	1314606	956611	333180	178520	101190	54792	39326
B. BY COURSE REQUIREMENTS:											
FUNDAMENTAL	12	835006	189944	4396	483311	351695	162955	82403	42128	17962	9907
PRE-CORE	65	6312648	372331	16954	3653833	2658816	231992	119567	63354	29626	18384
CORE/SUPPORT	364	31663442	617113	51309	18327160	13336282	223008	122309	71960	41750	31681
C. BY FIELD OF STUDY (SCHOOLS):											
SOCIAL & POL	85	8082862	572666	14114	4678452	3404410	226107	116026	60985	27961	16953
ECONOMICS	74	7381456	213980	34496	4272471	3108986	245474	130002	72265	37624	26077
MATH & PHY	63	6346049	45460	139596	3673165	2672884	292013	175405	117101	82118	70457
EDUCATION	207	16165724	157338	102745	9356905	6808819	224085	133680	88478	61356	52316
TOTAL UT:	441	38811097	1179388	32908	22464304	16346793	217618	115739	64800	34236	24048

FIGURE: 5.1

HYPOTHETICAL UNIT COSTS BY CREDIT LOAD

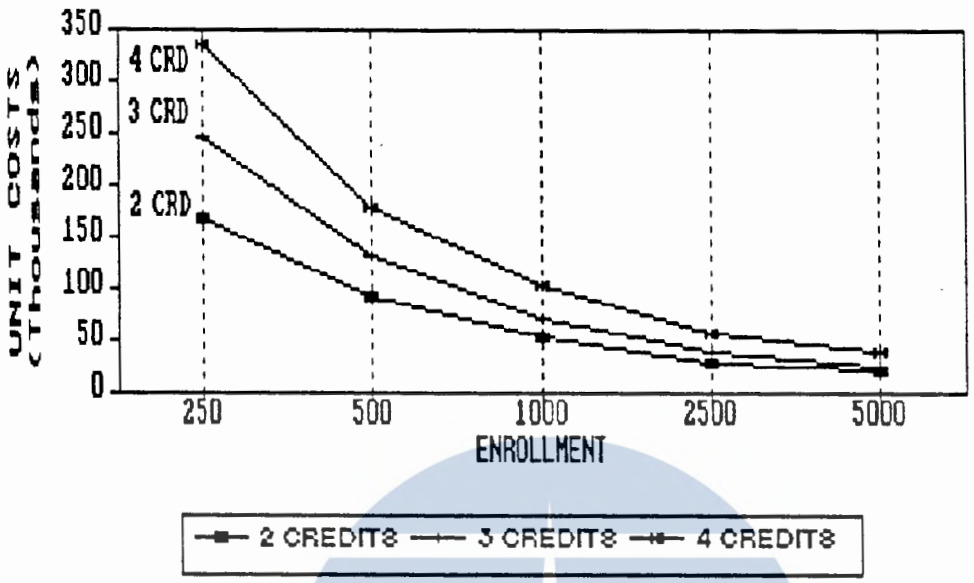


FIGURE: 5.2

HYPOTHETICAL UNIT COSTS BY COURSE REQUIREMENTS

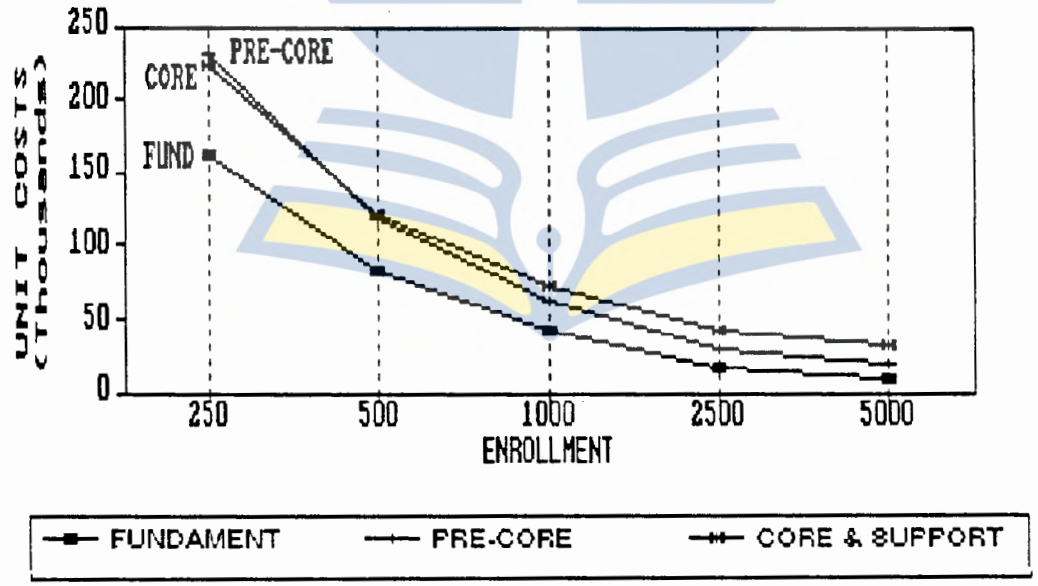


FIGURE: 5.3

HYPOTHETICAL UNIT COSTS BY FIELD OF STUDY

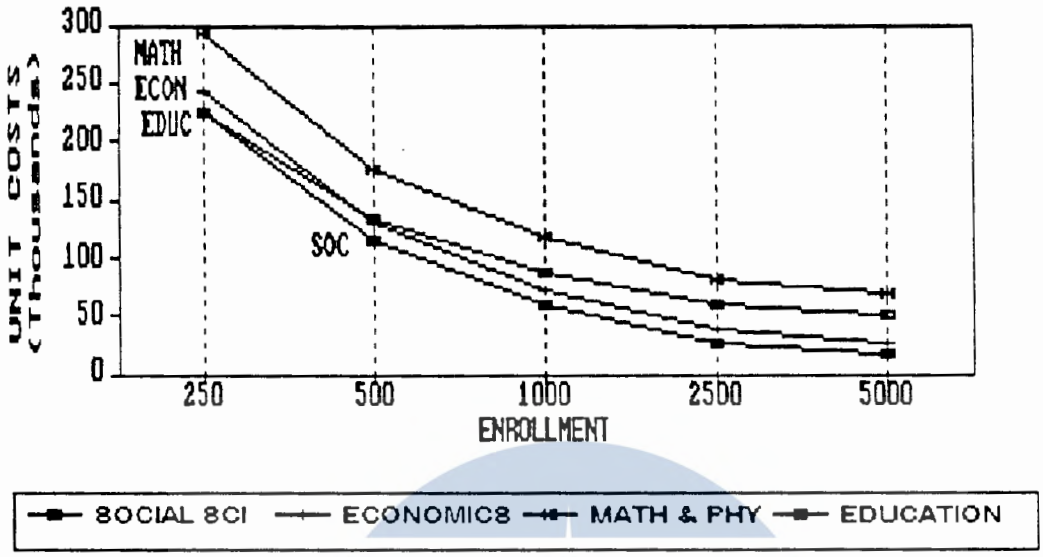
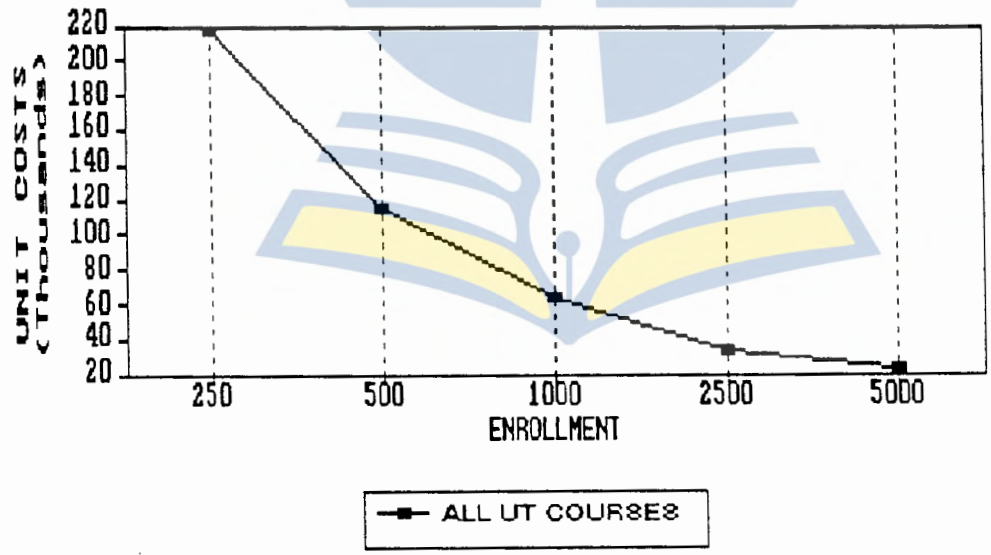


FIGURE: 5.4

HYPOTHETICAL UNIT COSTS FOR ALL COURSES



the costs to increase the enrollment and the benefits (reduction of unit cost) is minimal.

As shown by Figure 5.1 the declines in unit cost for the two-credit courses is not as rapid as for the three-credit and four-credit courses. The unit cost for the three-credit courses even converges with the unit cost for the two-credit courses at the 5,000 level of enrollment. It means that, despite the fact that the three-credit courses have higher total production costs; beyond this enrollment level the two types of course will have approximately the same unit costs. The four-credit courses seem to have the same scale economies as do the three-credit course.

The actual level of enrollment for the UT courses by credit load suggests that only the three-credit courses are at an efficient level. The total course enrollment of 751,649 is in the range of the hypothetical enrollment levels between 2,500 to 5,000 per course. The enrollment levels of the two-credit and four-credit courses are in the range of the hypothetical enrollment between 1,000 to 2,500. These levels of enrollment are sub-optimum.

The analysis by type of course requirements is summarized in Figure 5.2. The figure shows that the core and support courses (MKK/MKPBM) persistently have higher unit costs than the pre-core (MKDK) and the fundamental (MKDU) courses. The pre-core course, however, shows a slightly more rapid change in unit cost compared with the other two types of courses. At enrollment levels beyond 500, unit costs for the pre-core courses are lower than for the

core courses. The figures for actual course enrollments suggests that both the fundamental and the pre-core courses are at an efficient level. The average enrollment level for the two types of courses is beyond 5,000 students per course. The enrollment level for the core and support courses, however, is less efficient. The average enrollment is less than 2,500 students per course.

Figure 5.3 summarizes the scale economies of the UT courses by field of study. The figure shows that the courses and programs offered by the School of Social and Political Sciences always have the lowest unit costs at all hypothetical enrollment levels. The graph suggests beyond enrollment level 500 the unit cost of the economics courses is lower than the unit cost for the education courses.

The data on actual course enrollment indicates that only the courses offered by the School of Social and Political Sciences and the School of Economics have attained efficient enrollment level. The average course enrollment is higher than 5,000 per course. The average level of enrollment for the courses offered by the School of Mathematics and Physics and the School of Education are lower than 1,000 students. This level of enrollment is inadequate to capture the benefits of the scale economies.

The policy implication of the scale economies of the UT courses and programs are as follows. The acceptable level of course enrollment for the UT courses is in the range of 1,000 to 2,500. Beyond these levels the reduction in unit cost is margin-

al, and may not be compatible with the extra investment required for achieving that level of enrollment. The trade-off between the costs to increase enrollment and the reduction in the unit cost is greatest at enrollment levels between 1,000 to 2,500. Enrollments below 500, however, imply that UT is not operating at an efficient level. For instance, a very steep reduction in unit cost as enrollment increases from 250 to 500 suggests that UT could gain substantial cost savings at these levels of enrollment. An enrollment level of less than 250 is very expensive. The cost per student at this enrollment level would be more than Rp.200,000.

The fact that the total course enrollments for the UT courses during the academic years 1985/86 through 1989/90 was 1,179,388 students suggests that the UT system has operated at an efficient level overall. However, enrollment levels for the two-credit, the four-credit, the core and support courses, the mathematics and physics schools, and the education courses are not as large as would be desirable in terms of unit costs. This suggests that a change in operational policy may be required in order to increase the enrollment level for these two types of courses. Resource allocation among the UT operational activities may have to be adjusted given trends in enrollments. For instance, expenditures allocated for management, course development, and course delivery activities should be adjusted as enrollment decreases or increases. The next chapter discusses the relationships between changes in the expenditures and enrollments.

CHAPTER: VI

THE COST STRUCTURE ANALYSIS

This analysis is concerned with the identification of components of the UT cost structure which are sensitive to the changes in student enrollment. They are the expenditures for personnel salary and honorarium, building equipment and maintenance, office materials, travel, and miscellaneous expenses. These expenditures are the actual cost components of the UT cost structure. The topics of analysis will cover: (1) the basic data and assumptions; (2) the general patterns of the cost structure; and (3) the determinant cost factors.

The main method of analysis is to compare the percentage changes in the expenditures with the changes in enrollments. The components of the expenditure with the largest percentage changes will be considered as the cost factors which are sensitive to scale economies in the UT operational systems. Knowledge of these cost factors is critical to planners in particular when faced with decline in enrollments. A comparison was made with the cost structure of the campus universities.

The Basic Data and Assumptions.

The basic data used for the analysis were:

(a) The total expenditures for personnel salary and honorarium, building equipment and maintenance, office materials, travel, and miscellaneous.

(b) Total enrollments for the last five academic years from 1985/86 to 1989/90.

For policy analysis purposes the expenditures data were grouped according to the cost structure of the distance teaching university, namely: (1) overhead management; (2) course development; and (3) course delivery. The data were derived from the UT expenditure documents in the forms of the development budget (Daftar Isian Proyek/DIP), the routine budget (Daftar Isian Kegiatan/DIK), and the revenue from students' tuition (Sumbangan Pembinaan Pendidikan/ Dana Penyelenggaraan Pendidikan- SPP/DPP). The distribution of the expenditures for the fiscal years 1985/86 through 1989/90 are summarized in Table 6.1.

This analysis was shown in Table 6.1 based on two fundamental assumptions:

(a) The level of expenditures are reflections of the UT financing policies required by the cost structure of the UT courses and programs.

(b) The UT revenues (budgets) and the expenditures were made based on the estimated enrollments.

TABLE: 6.1

THE COST STRUCTURE OF UT BY ACTIVITY AND COMPONENT

ACTIVITY/ COMPONENT:	FISCAL YEARS (RP 1000): 1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL
A. MANAGEMENT						
SALARY AND HONORARIUM	1006296	731110	772405	751537	798222	4059570
EQUIPMENT AND MAINTENANCE	643985	1307360	467847	2249244	1203105	5871541
OFFICE MATERIALS	242765	100379	70453	360833	70371	844801
TRAVEL	360487	325130	264692	378849	147683	1476841
MISCELLANEOUS	526369	236269	203952	537222	230901	1734713
TOTAL MANAG. COSTS:	2778902	2700248	1779349	4277685	2450282	13987466
B. COURSE DEVELOPMENT:						
SALARY AND HONORARIUM	594398	1324217	417780	816482	482692	3635569
EQUIPMENT AND MAINTENANCE	41217	216445	693240	349949	354559	1655410
OFFICE MATERIALS	431803	264159	363304	222054	223029	1504349
TRAVEL	85850	60062	82577	56995	50426	335910
MISCELLANEOUS	324042	105725	218128	281857	319978	1249730
TOTAL DEV. COSTS:	1477310	1970608	1775029	1727337	1430684	8380968
C. COURSE DELIVERY:						
SALARY AND HONORARIUM	2129539	1622443	1316496	1113431	1524304	7706213
EQUIPMENT AND MAINTENANCE	1419353	573506	200764	2229567	135161	4558351
OFFICE MATERIALS	358622	330589	272822	358806	466134	1786973
TRAVEL	330020	149995	91128	123462	91397	786002
MISCELLANEOUS	705893	82445	75851	582701	57124	1504014
TOTAL DEL. COSTS:	4943427	2758978	1957061	4407967	2274120	16341553
D. ALL COMPONENTS:						
SALARY AND HONORARIUM	3730233	3677770	2506681	2681450	2805218	15401352
EQUIPMENT AND MAINTENANCE	2104555	2097311	1361851	4828760	1692825	12085302
OFFICE MATERIALS	1033190	695127	706579	941693	759534	4136123
TRAVEL	776357	535187	438397	559306	289506	2598753
MISCELLANEOUS	1556304	424439	497931	1401780	608003	4488457
TOTAL COSTS:	9200639	7429834	5511439	10412989	6155086	38709987
TOTAL ENROLLMENT:	292131	325499	303883	133651	124224	1179388

The first assumption refers to the UT commitments on the number and quality of the UT courses and programs. The larger the number of courses to be produced and the better the quality of course delivery sytem, the higher the requirement on the expenditures. More staff and equipment will be needed for supporting the course development and course delivery activities. The second assumption refers to the conditions in which the expenditures may have to be readjusted when the enrollment level increases or decreases significantly. When enrollment increases, more personnel, space for tutorials and examinations, office materials, and travel for monitoring are required.

General Patterns of the Cost Structure.

In practice, the UT cost structure is realized in the forms of expenditures for personnel salary and honorarium, building equipment and maintenance, office materials, travel, and miscellaneous. Adjustments on these expenditures may have to be made when the number of courses to be offered, or the number of students enrolled for the courses increases. Similarly, adjustments should be made if the number of courses to be produced and delivered and/or the number of enrollments decrease dramatically. The components of the expenditures which reflect the three components of the UT cost structure (overhead management, course development, and course delivery) are also represented by the structure

of functional units in the UT organization. However, since the cost data were not available by functional unit, the analysis was was focused on patterns of expenditure by activity and component. Table 6.2 summarizes the proportions of resources allocated for the UT during the fiscal years 1985/86 to 1989/90 by type of activity and component of expenditure. These figures were derived directly from the data shown in Table 6.1. Figures under the "Fiscal Years (%)" indicate proportion of the expenditure across the fiscal years. For instance, the highest expenditure on personnel salary and honorarium during the fiscal years 1985/86 through 1989/90 occurred in 1986/87. Figures under the "Total" column indicate the proportion of the total expenditures across the cost components. For instance, the largest component of expenditures for the course development activity was for the personnel salary and honorarium (i.e. 43.4%). Similarly, in terms of activity, the largest expenditure was for the course delivery activity (i.e. 42.2%).

The data in Table 6.2 show that, in terms of expenditures by activity, the largest component of UT expenditure was devoted to the course delivery activity. Rp.16.3 billion or 42.2 percent of the UT total budget was attributed to this activity. The second largest expenditure was devoted to the overhead management activity. Almost Rp.14 billion, which represents 36 percent of the total UT budget, was allocated for this activity. The remaining 21.7 percent of the UT budget was spent for supporting the course delivery activity. The large allocation for the fixed components

TABLE: 6.2

PROPORTION OF EXPENDITURES BY COMPONENTS AND ACTIVITIES

ACTIVITY/ COMPONENT:	FISCAL YEARS (%): 1985/86	1986/87	1987/88	1989/89	1989/90	TOTAL
A. MANAGEMENT						
SALARY AND HONORARIUM	24.8	18.0	19.0	18.5	19.7	29.0
EQUIPMENT AND MAINTENANCE	11.0	22.3	8.0	38.3	20.5	42.0
OFFICE MATERIALS	28.7	11.9	8.3	42.7	8.3	6.0
TRAVEL	24.4	22.0	17.9	25.7	10.0	10.6
MISCELLANEOUS	30.3	13.6	11.8	31.0	13.3	12.4
TOTAL MANAG. COSTS:	19.9	19.3	12.7	30.6	17.5	36.1
B. COURSE DEVELOPMENT:						
SALARY AND HONORARIUM	16.3	36.4	11.5	22.5	13.3	43.4
EQUIPMENT AND MAINTENANCE	2.5	13.1	41.9	21.1	21.4	19.8
OFFICE MATERIALS	28.7	17.6	24.2	14.8	14.8	17.9
TRAVEL	25.6	17.9	24.6	17.0	15.0	4.0
MISCELLANEOUS	25.9	8.5	17.5	22.6	25.6	14.9
TOTAL DEV. COSTS:	17.6	23.5	21.2	20.6	17.1	21.7
B. COURSE DELIVERY:						
SALARY AND HONORARIUM	27.6	21.1	17.1	14.4	19.8	47.2
EQUIPMENT AND MAINTENANCE	31.1	12.6	4.4	48.9	3.0	27.9
OFFICE MATERIALS	20.1	18.5	15.3	20.1	26.1	10.9
TRAVEL	42.0	19.1	11.6	15.7	11.6	4.8
MISCELLANEOUS	46.9	5.5	5.0	38.7	3.8	9.2
TOTAL DEL. COSTS:	30.3	16.9	12.0	27.0	13.9	42.2
D. ALL COMPONENTS:						
SALARY AND HONORARIUM	24.2	23.9	16.3	17.4	18.2	39.8
EQUIPMENT AND MAINTENANCE	17.4	17.4	11.3	40.0	14.0	31.2
OFFICE MATERIALS	25.0	16.8	17.1	22.8	18.4	10.7
TRAVEL	29.9	20.6	16.9	21.5	11.1	6.7
MISCELLANEOUS	34.7	9.5	11.1	31.2	13.5	11.6
TOTAL COSTS:	23.8	19.2	14.2	26.9	15.9	100.0
TOTAL ENROLLMENT:	24.8	27.6	25.8	11.3	10.5	100.0

of cost (the overhead management and course development) was a major justification for the earlier attention addressed to scale economies.

In terms of components of the expenditures, the largest allocation (39.8%) was for personnel salaries and honoraria. The second largest (31.2%) of the expenditures was for building equipment and maintenance. The remaining 29 percent was allocated for office materials, travel, and miscellaneous.

At the activity level (overhead management, course development, and course delivery), the largest component of expenditures supporting the course development activity is for personnel salaries and honoraria. About 43 percent of the expenditure was on this cost component. The second largest expenditure was on building equipment and maintenance. The largest expenditures supporting course delivery were also for personnel salaries and honoraria. More than 47 percent of the expenditure was on this cost category. The pattern of expenditures supporting these two activities suggests that the UT course development and delivery system is a labor intensive one.

The pattern of expenditures supporting the management activities shows that these activities were heavily related to the procurement of building equipment and maintenance. Forty-four percent of the expenditure for management activity was related to building equipment and maintenance. This partly is a reflection of the UT planners' efforts to computerize the management activity. The expenditures on office materials, travel, and miscellane-

ous which usually characterize overhead management costs represents only 29 percent of the total here.

The fact that the largest component of the UT expenditures were on personnel salaries again suggests that the existing operational system is a labor intensive one. Compared to the patterns of expenditure at the campus universities, however, the UT operational system actually is relatively less labor intensive. Table 6.3 provides a comparison on the pattern of expenditures between the UT and the campus universities.

TABLE: 6.3

THE DISTRIBUTION OF EXPENDITURES
AT UT AND THE CAMPUS UNIVERSITIES.

COST COMPONENTS:	UT	CAMPUS UNIVERSITY: PUBLIC	PRIVATE
Salary	39.8%	81.7%	66.1%
Materials	10.7	14.5	16.1
Maintenance	31.2	3.3	7.0
Travel	6.7	0.5	10.8
Miscellaneous	11.6	n.a.	n.a.

Source: IEES, 1986. Adapted from Table 9.25 and Table 9.26

The policy implication of the patterns of expenditure in the UT cost structure are as follows. In order for UT to be able to exploit the potential scale economies in the operational systems,

UT should maintain a course delivery system that is less dependent on the availability of personnel. More funds should be allocated for purchasing the distance teaching equipment to support the course delivery activity. Investment in technology will make the UT operational (delivery) systems less dependent on the need for tutors, and therefore, will reduce expenditures for personnel salary and honorarium. With this investment strategy UT system will become more of a capital intensive educational system. For example, more intensive use of two-way radio communication (which is now being experimented by UT for nine remote locations in the region) could substitute the face-to-face tutorial services. Sumilarly, the use of video recording of face-to-face tutorial services could be attractive for students who have access to this facility. Despite the possibility of psychological disadvantage to students the use of these technological means could be efficent given the open nature of UT delivery system.

The Determinant Cost Factors.

The identification of the determinant cost factors in the UT operational system is based on the general patterns of percentage changes in the expenditure components and enrollments. For analytical purposes the percentage changes in expenditures and enrollments are grouped into three categories. A 20 percent or less change (increase or decrease) in expenditures or enrollments

is considered a "minor" change. A 21 percent to 50 percent change is considered a "substantial" change, while a change of more than 50 percent is considered a "major" change.

The three components of the UT cost structure remain (1) overhead management, (2) course development, and (3) course delivery. Institutional management includes all the services required to support implementation of course development and course delivery (planning, budgeting, supervision, and control). These services are not be directly affected by the levels or changes in enrollments.

Course development activities include the production of curriculum, textbooks, and the supplementary learning materials. These activities depend on the number of courses and programs to be developed and delivered, and the life of the curriculum. Since these activities do not directly relate to number of students, the number of enrollments are not the basis for determining the budget level of these activities.

The course delivery activity is the student related activity. It includes the provision of registration, learning materials, tutorial, and examination services. The expenditures supporting these activities, therefore, are directly affected by number of students.

Table 6.4 summarizes the proportional changes in the UT expenditures by components and activities. These figures show the percentage increase or decrease of the total expenditure for each of the UT cost components under study. For comparative purposes

TABLE: 6.4

PERCENTAGE CHANGES IN EXPENDITURES BY ACTIVITIES

ACTIVITY/ COMPONENT:	% CHANGE IN FISCAL YEARS: 1987-86	1988-87	1989-88	1990-89	AVERAGE
A. MANAGEMENT					
SALARY AND HONORARIUM	-27.3	5.6	-2.7	6.2	-4.5
EQUIPMENT AND MAINTENANCE	103.0	-64.2	380.8	-46.5	93.3
OFFICE MATERIALS	-58.7	-29.8	412.2	-80.5	60.8
TRAVEL	-9.8	-18.6	43.1	-61.0	-11.6
MISCELLANEOUS	-55.1	-13.7	163.4	-57.0	9.4
TOTAL MANAG. COSTS:	-2.9	-34.1	140.4	-42.7	15.2
B. COURSE DEVELOPMENT:					
SALARY AND HONORARIUM	122.8	-68.5	95.4	-40.9	27.2
EQUIPMENT AND MAINTENANCE	425.1	220.3	-49.5	1.3	149.3
OFFICE MATERIALS	-38.8	37.5	-38.9	0.4	-9.9
TRAVEL	-30.0	37.5	-31.0	-11.5	-8.8
MISCELLANEOUS	-67.4	106.3	29.2	13.5	20.4
TOTAL DEV. COSTS:	33.4	-9.9	-2.7	-17.2	0.9
C. COURSE DELIVERY:					
SALARY AND HONORARIUM	-23.8	-18.9	-15.4	36.9	-5.3
EQUIPMENT AND MAINTENANCE	-59.6	-65.0	1010.5	-93.9	198.0
OFFICE MATERIALS	-7.8	-17.5	31.5	29.9	9.0
TRAVEL	-54.5	-39.2	35.5	-26.0	-21.1
MISCELLANEOUS	-88.3	-8.0	668.2	-90.2	120.4
TOTAL DEL. COSTS:	-44.2	-29.1	125.2	-48.4	0.9
D. ALL COMPONENTS:					
SALARY AND HONORARIUM	-1.4	-31.8	7.0	4.6	-5.4
EQUIPMENT AND MAINTENANCE	-0.3	-35.1	254.6	-64.9	38.6
OFFICE MATERIALS	-32.7	1.6	33.3	-19.3	-4.3
TRAVEL	-31.1	-18.1	27.6	-48.2	-17.5
MISCELLANEOUS	-72.7	17.3	181.5	-56.6	17.4
TOTAL COSTS:	-19.2	-25.8	88.9	-40.9	0.7
TOTAL ENROLLMENT:	11.4	-6.6	-56.0	-7.1	-14.6

FIGURE: 6.1

PERCENTAGE CHANGES IN EXPENDITURES AND ENROLLMENTS
(ALL ACTIVITIES)

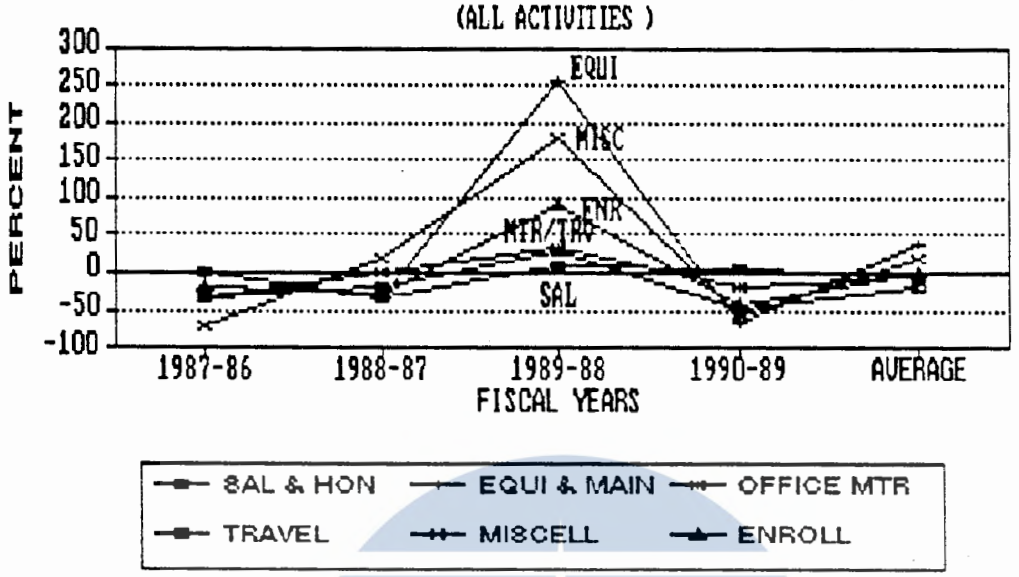
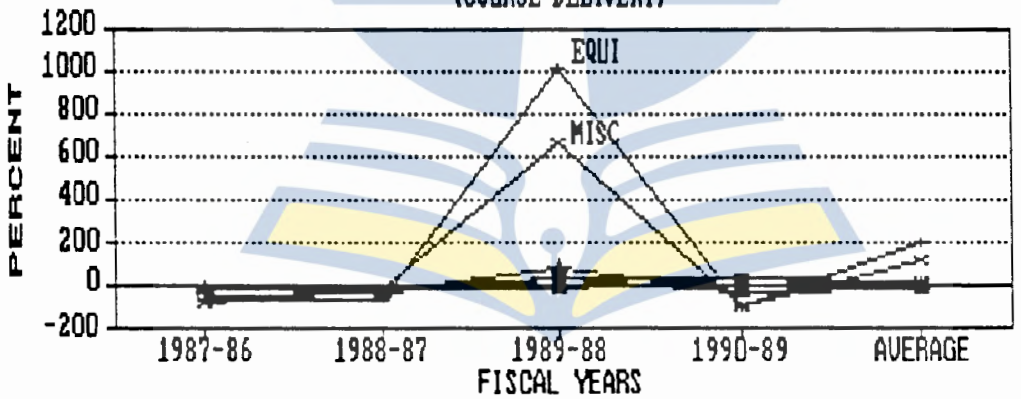


FIGURE: 6.2

PERCENTAGE CHANGES IN EXPENDITURES
(COURSE DELIVERY)



data on the percentage changes in enrollment levels is provided at the bottom of the Table. Figure 6.1 illustrates the relationships between the percentage changes in enrollments and expenditure categories for the overall UT budget. Figure 6.2 describes the relationships between the changes in enrollment and expenditure categories for the course delivery.

Using the three change categories ("minor", "substantial", and "major") as defined earlier, the relationships between the changes in expenditure categories and in enrollments can be interpreted as follows. On average, a minor decrease in enrollment does not cause a substantial change in overall UT expenditures either in terms of budget categories or activities. In terms of yearly expenditures, however, changes in enrollment are associated with substantial changes in expenditures.

In the fiscal year 1986/87 a minor increase in enrollments was followed by both a substantial decrease in expenditures supporting course delivery, and a substantial increase in expenditures related to course development. In the fiscal year 1988/89, however, despite a major decrease in enrollment the expenditures supporting the delivery and management activities increased. The most consistent changes in trends occurred in the fiscal years 1987/88 and 1989/90. Regardless of the magnitude of the changes, a minor decrease in enrollments was associated with minor or substantial decrease in the expenditures. In the fiscal year 1987/88, a 6.6 percent decrease in enrollment was associated with 25.8 percent decrease in expenditure. Similarly, in the fiscal year 1989/90, a 7.1 percent decrease in enrollment was associated

with 40.9 percent decrease in expenditure.

Given the change patterns illustrated in Figure 6.1, it appears that the level of enrollment has not operated as a major determinant of the expenditures supporting the three components of the UT cost structure. The lack of such linkage is a surprising finding and will require further study by UT planners. One possible explanation for the findings of no direct linkage between changes in enrollment and in expenditures is the time lag between the institutional environment and institutional adjustment. The adjustment in number of staff could not as quickly as the change in enrollments. The nature of the civil service suggests that necessary adjustments lag two or three years afterward.

The effect of enrollments on the change in the components of expenditures supporting the course delivery can be summarized as follows. On average, a small decrease in enrollment was followed by a major increase in expenditure on building equipment and maintenance, and miscellaneous. The magnitude of the changes may mean that when enrollments declined proportionally more resources are devoted to the provision of equipment and miscellaneous activities designed to halt enrollment declines. This relationship occurred particularly in the fiscal year 1988/89. The enrollment level decreased by 56 percent from the previous level, and the expenditures on building equipment and maintenance, and miscellaneous increased by 1,010 and 668 percent, respectively. The expenditures on personnel salary, office materials, and travel were relatively stable. This suggests that the level of

enrollment may not be the determinant factor for these later cost components of the UT cost structure.

As indicated by the overall figures in Table 6.4 and Figure 6.1, it seems that there were no special pattern of relationships between changes in enrollments and expenditure by activity categories (overhead management, course development and course delivery). Enrollment levels, however, could become the determinant factor for the allocation of expenditures by component categories particularly for building equipment and maintenance, and miscellaneous. The overall changes in the UT expenditures may reflect a long-range UT strategy to deal with the fluctuation in enrollments. Since the UT system is relatively young, the resource allocation policy could be influenced more by the government determination to develop the operational systems rather than levels and changes in enrollments. The UT strategy to deal with the enrollment issues is discussed in the next chapter.

CHAPTER: VII

THE OPERATIONAL POLICY ANALYSIS

The analysis presented in this chapter is concerned with the sources of opportunities and constraints for governing the UT policy. Two alternative operational policies were proposed as part of this study to UT administrators:

(1) To increase enrollments by taking the new high school graduates as the prime target group for the UT systems.

(2) To reduce the unit cost by altering the UT cost structure.

Seven hypothetical constraints and six hypothetical opportunities for change (adapted from Kaufman (1971)) in UT operational systems were introduced to the UT administrators. These hypothetical constraints and opportunities for change come from within as well as outside of the UT organization. In addition, specific alternative operational policies suggested by the UT administrators themselves were also studied.

Kaufman (1971) suggests that the sunk costs of the initial investments, potential loss of benefits, mental blinders, and tunnel vision among the members of the organization act as constraints to changing institutional policies. The organization may have to compensate those who will lose benefits as a result of

such changes. For example, the organization may have to give special salary compensation to those who lose their positions or seniority from merging of their units. The source of constraints from outside the UT organization could come from the campus universities. The campus universities may consider UT as a rival and fear that changes will improve UT's relative position as a choice for high school graduates.

The seven hypothetical constraints for changes are:

1. Change represents expensive initial costs (sunk costs).
2. Change results in loss of personal or group benefits.
3. Change creates instability in the existing system.
4. No one expects change.
5. The existing system is the best alternative.
6. The change violates standard operating procedures in distance education system.
7. The change violates the agreement made with other universities.

The six hypothetical opportunities for changes are:

1. There are available resources from: (1) manpower, (2) finance, (3) law and regulation, and (4) technology and skills.
2. Dissatisfaction with the existing operational system.
3. It has been proposed by the campus universities.
4. There are no sunk costs.
5. All universities will increase their enrollment rates.
6. Support from the Ministry of Education authorities.

Survey data were analyzed by tabulating the frequency with which UT administrators agreed or disagreed with the hypothetical constraints and opportunities for change in the UT operational systems. The responses given by the UT administrators at the central office and the regional offices were compared. In this way, strategic planning regarding alternative operational policy, which reflects "consensus" among the UT administrators at the central office in Jakarta and the regional offices (UPBJJ), could be proposed.

The Basic Data and Assumptions.

The basic data used for the analysis were obtained from sixteen administrators at the Jakarta central office and twenty-two administrators at the UT regional offices. The respondents at the UT central office were the Rector, Vice Rectors, School Deans, and Heads of the functional units. The respondents at the regional offices were the Heads of the office. The data from the regional office represented 69 percent of this group of respondents. The method of data collection was a survey designed for this study (see Appendix E).

Two basic assumptions were made for the policy analysis. The first assumption is that any form of change in organization will face constraints either from inside or outside of the organization (Kaufman, 1971). In the case of the UT organization, the administrators both at the central office and the regional offices were the best source of information on the constraints and opportunities for changes in the UT operational systems. The second assumption is that the administrators at the UT central office have a different set of responsibilities from the administrators at the regional offices. These differences in responsibilities could lead to different perceptions of the constraints and opportunities for change in the UT operational systems. The administrators at the UT central office are concerned primarily with the development of the system; the administrators at the

regional offices are concerned more with the implementation of the system, given the facilities available in the region. Thus, information from both sides could be complementary or, perhaps, conflicting.

New High School Graduates as the Prime Target.

Since its inception the government has intended the UT to serve the new high school graduates who were not eligible or able to attend campus institutions. However, despite the high demand for higher education places, particularly for the public universities' places, less than 20 percent of the UT students are new graduates (Setijadi, 1989). It would appear that the UT system is not sufficiently attractive for the new high school graduates. Given the low enrollment figures, this study raised the issue of targeting marketing efforts on this pool.

Holmberg (1986) showed that the distance university systems (DUs) in general satisfy the demands of adults who already have jobs (career), and of housewives. This implies that special efforts will have to be made to attract new high school graduates to distance learning systems. For instance, strong student support programs such as tutorials, social events, and extra-curricular activities which are popular with students in the campus university systems (Holmberg, 1977; Baath, 1982; and Sewart, 1981) may have to be introduced.

Another explanation for the need of strong student support programs is the academic background of new high school graduates who are likely to enroll for UT programs. Those who finally enroll for UT programs often are less able (in terms of academic achievement) than those who pass the campus university entrance test. This group of UT students, therefore, needs more support from the UT system. Without the support program, these students may either drop out early from the UT system or never become interested in the UT programs. Thus, provision of intensive student support programs in the UT system could attract more students because they would have a place to go for help, and could meet their friends to discuss and overcome any feelings of helplessness, lack of confidence, loneliness, and "homelessness" that might occur (Pannen, 1990). As the UT system becomes more attractive, enrollment levels of new high school graduates may increase and the unit costs for the UT courses and programs could decrease. However, since these programs could increase the recurrent costs, a cost-efficiency analysis with respect to gains in enrollments as well as the quality of the UT educational service should be made. In this instance, given the nature of the UT students, efficiency and quality considerations for the UT courses and programs may not necessarily mean lower unit costs. The political pressures on government to meet the demands of high school graduates for some form of higher education could result in significant political support for this change at the UT.

Table 7.1 summarizes the UT administrators' responses on the

TABLE: 7.1

THE UT ADMINISTRATORS RESPONSE ON THE FEASIBILITY TO
PROVIDE INTENSIVE STUDENT SUPPORTS TO INCREASE ENROLLMENTS
OF THE NEW HIGH SCHOOL GRADUATES AT THE UT SYSTEM

SOURCE OF CONSTRAINTS OPPORTUNITIES FOR CHANGE:	UT		UPBJJ		Total:	
	AGREE	DISAGREE	AGREE	DISAGREE	AGREE	DISAGREE
A. SOURCE OF CONSTRAINTS:						
1. Expensive initial costs (sunk costs)	0.50	0.50	0.48	0.52	0.49	0.51
2. Loss of personal or group benefits.	0.06	0.94	0.45	0.55	0.29	0.71
3. Creates instability in the existing system.	0.13	0.88	0.32	0.68	0.24	0.76
4. Simply impossible because no one expecting any change in the existing system.	0.06	0.94	0.27	0.73	0.18	0.82
5. The existing system is the best alternative.	0.19	0.81	0.23	0.77	0.21	0.79
6. It is against the standard operating procedures in distance education system.	0.13	0.87	0.27	0.73	0.22	0.78
7. It violates the agreement made with other universities.	0.06	0.94	0.27	0.73	0.18	0.82
B. SOURCE OF OPPORTUNITIES:						
1. There are available resources from: (1) manpower;	0.79	0.21	0.90	0.10	0.86	0.14
(2) finance;	0.67	0.33	0.73	0.27	0.71	0.29
(3) law and regulation;	0.86	0.14	0.82	0.18	0.83	0.17
(4) technology and skills.	0.96	0.04	0.82	0.18	0.89	0.11
2. Dissatisfaction with the existing operational system.	0.64	0.36	0.73	0.27	0.69	0.31
3. It has been proposed by the campus universities	0.21	0.79	0.65	0.35	0.47	0.53
4. There are no sunk costs	0.40	0.60	0.41	0.59	0.41	0.59
5. All universities will increase their enrollment rates	0.40	0.60	0.86	0.14	0.67	0.33
6. Support from the Ministry of Education authorities.	0.62	0.38	0.95	0.05	0.81	0.19

source of constraints and opportunities for the UT to provide intensive student support services to attract the new high school graduates. The data shows a marked split in opinion among the administrators regarding the sunk cost as the source of constraints. This suggests that the issue of initial costs for providing the intensive student support service is a critical factor. They overwhelmingly disagreed that the loss of personal or group benefits, instability, or mental blinders are among the constraints. They also did not agree that the existing operational system is the best. Providing intensive student support services was not viewed as contrary to the standard procedures of the distance education systems. Thus, in terms of these organizational factors, policy change in student services appears feasible. Independent learning in distance education systems does not mean that students must be isolated. Provision of intensive student services to attract the new high school graduates would not violate agreements with the campus universities because the UT system specifically was created to provide a second chance to the high school graduates already in the labor market. There are large numbers of high school students who are ineligible for the public campus universities and who cannot afford the private universities. Two main constraints on focusing on the new high school graduates were suggested by the administrators. UT suffers from a lack of experience in marketing to high schools and there are a lack of learning facilities at the regional offices (UPBJJ).

Not surprisingly, the information on the opportunities for change actually is the mirror image of that for the constraints. The data shows that the administrators are confident that the provision of intensive student support programs is feasible. The UT has strong resources in terms of (1) manpower; (2) finance; (3) law and regulation; and (4) technology and skills. They agreed that the existing operational system does not meet the need for intensive student support programs. They also agreed that strong support from the Ministry of Education and Culture (MOEC) is necessary for the UT to introduce the change. This support is important because the implementation of the policy may require additional budget for the UT system. Their response on the sunk cost issue is compatible with their response to it as a constraint. About 40 percent of the administrators at the central office and the regional office (UPBJJ) agreed that there will be no sunk cost for providing the student support services. This is true because UT could use the university rooms and facilities in the region during weekends. However, UT would incur the recurrent costs for personnel services.

The UT administrators at the central office and the UPBJJ, however, did not agree on two issues. Seventy-nine percent of the central office administrators disagreed, while 65 percent of the heads of the UPBJJ agreed that the campus university had proposed that UT should provide intensive student support programs in order to increase enrollment of new high school graduates. Since the heads of the UPBJJ are seconded from the campus university in

each region, it may reflect the campus university support for the UT to implement the intensive student support programs in their region. Besides, the implementation of this policy would increase the role of the UPBJJ in the UT operational systems. The second issue in which the two groups of administrators were not in agreement is concerned with the effect of the intensive student service policy on enrollments. Sixty percent of administrators at the central office disagreed, while 86 percent of the administrators at the UPBJJ agreed, that the policy could result in increases of enrollments for both campus universities and UT. The favorable response from the heads of the UPBJJ offices may also reflect their expectation of improvement in their role in the UT organization from implementation of the policy.

The UT administrators suggest other opportunities to increase enrollments of new high school graduates. These are: (1) the emergence of private tutorial service centers called the "UT campuses"; (2) the transferability of the course credits earned from campus universities (CUs) to the UT programs; and (3) the opportunity such intensive student services provide for UT students to have social programs similar to those available for the campus university students. The emergence of private tutorial agencies is helping the UT system because UT was not allowed to provide tuition-paid tutorial services. Tutorial services are provided twice for limited courses in each semester. The administrators at the UPBJJ office suggested two other opportunities: (1) the feasibility of UT providing tutorial services trough

correspondence and telephone lines provided by the government satellite Palapa; and (2) opening the UT system to all age groups. The opportunities gained from the Palapa satellite, however, appear feasible only for students who can afford the use of these facilities. The open nature of the UT system for all ages obviously implies potential scale economies if sufficient student demand can be realized.

In order to increase enrollment levels for the new and continuing UT students, the UT administrators suggested the following strategies:

1. Intensive promotion activities by involving the high school principals, student association organizations (OSIS), the Chief of Educational Office (Ka Kanwil DEPDIKBUD), and using media (radio, TV, news paper and magazines) for introducing UT courses and programs.

2. Provision of new and "tailor-made" certification programs such as for business, management, and computer courses.

3. Provision of more student services for socialization, intensive tutorials (campus-like UT), and orientation to the UT programs (open house) by the UPBJJ.

4. Obtain more support and autonomy from the Ministry of Education and Culture to promote UT.

5. More efficient delivery services (fixed schedule for examination, publication of examination results, and the distribution of registration forms).

6. UPBJJ should have better physical building and learning facilities independent from the campus university as "home" for the UT students.

7. Intensive use of TV educational programs as media of course offering particularly for students in the Eastern part of the country.

Although many of these suggested strategies are self-explanatory, some of them deserve special consideration from the policy

implementation perspective. In order for the high school principals, and the Chief of the Educational Offices in the regions to become formally involved in promoting the UT courses and programs, special consent from the Ministry of Education And Culture may be required. Introducing new programs requires authorization from the Directorate General of Higher Education. Provision of independent buildings and learning facilities at the regional offices (UPBJJ) requires an increased budget for the UT system. Intensive use of TV as media for the UT programs could be sustainable if there are low transmission costs. This requires the TV programs to be financed by private TV stations or highly subsidized by the government. Alternatively, provision of the audio and video cassette programs may be a more affordable alternative. Thus, in terms of implementation policy, these suggestions should become part of the UT long-range strategic institutional planning.

The policy implication of introducing the intensive student support programs as a strategy to increase enrollment of new high school graduates are as follows. In order for UT programs to be more marketable to the new high school graduates UT should provide student service programs similar to those available for campus students. The most critical factors for the implementation of this operational policy pertain to the recurrent costs and its effects on enrollment for the campus universities. The sunk cost could be low if UT uses the facilities available at the campus university which hosts the UPBJJ in the region. Unless the recur-

rent costs (honorarium for tutors and rents for rooms) are financed by the student, the implementation of the intensive student service programs could change the structure of UT costs. Besides, the campus universities in the region may fear the programs will discourage enrollments at their university. Therefore, a cost-benefit analysis on the student support programs and a survey of its effects on the potential market loss for the campus universities is required. In addition, a survey on the opinion among the third party administrators at the campus universities and at the Directorate General of High Education (DGHE) is also necessary. Their responses could provide indications of the intensity of their support or resistance for UT to implement this policy. This suggests that a new long-range strategic planning is required for implementing the UT administrators' suggestion. The planning should include the organizational mechanisms to involve the high schools, the Office of Education, and the campus universities in the region, and planners at the DGHE in promoting the UT courses and programs. Alternatively, UT may subcontract the student support programs to the private tutorial agencies.

Altering the Structure of the UT Courses.

A second alternative to reduce unit costs is to alter the structure of the courses (Bottomley, 1972). Three strategic

operational policies that may reduce the unit costs of the UT courses and programs were introduced in this study.

These are:

(1) To allow transfer of the UT courses to the CU programs.

(2) To merge the single discipline courses with low credit course loads (such as the 2 SKS courses) into broader multi-discipline, multi-user courses with larger credit course loads (e.g. 4 to 6 sks courses).

(3) To reduce the frequency of course offerings for the courses with low enrollment levels from twice to once a year.

These alternatives were proposed based on the notion of the openness (Tunstall, 1974) and the industrial nature (Peters, 1981) of the distance education systems. Besides, the nature of the cost structure of the open university system is characterized by a large proportion of fixed development costs but relatively low variable delivery costs (Wagner, 1974; Laidlaw and Layard, 1975; Rumble, 1981). As was discussed in Chapter III, the notion of openness and industrial education give extensive flexibility to the UT course delivery system. The unique cost structure implies that the alteration of the structure of the courses could change the composition of the UT's costs. A smaller ratio of variable costs for course delivery relative to the fixed costs for course development could reduce significantly the cost per student when enrollment increases. Thus, by exploiting the open nature of the course delivery systems and altering the cost

structure of the course development systems, UT could better exploit the potential scale economies in its operational systems. The UT administrators were asked to give their opinion on the source of constraints and opportunities for change regarding these three strategic operational policies.

(3.1.) Transferability of the UT courses for the CU Programs.

The first alternative strategy is to increase enrollment by allowing the campus university students to take courses at the UT system and transfer these course credits for the academic requirements at their campus university. This policy is useful for students at the campus university who temporarily cannot continue their study full time, and want to maintain their status at the campus university. In this way the campus university will not lose their students, and the UT could increase its enrollment level. Provided with this enrollment flexibility, both the UT and campus university systems could become more attractive to students. Table 7.2 summarizes the UT administrators' responses on the constraints and opportunities for UT to implement this policy.

The data shows that both groups of the UT administrators agreed that none of the seven factors (sunk cost, personal or group benefits, instability in the system, mental blinders, standard operations, and agreement on UT mission) introduced in the study are perceived as constraints to the implementation of the policy which allows transfer of the UT courses for the CU

TABLE: 7.2

THE ADMINISTRATORS RESPONSE ON THE FEASIBILITY TO REDUCE UNIT COST BY ALLOWING TRANSFER OF THE COURSE CREDITS EARNED AT THE UT FOR ACADEMIC REQUIREMENT AT THE CAMPUS UNIVERSITY

SOURCE OF CONSTRAINTS OPPORTUNITIES FOR CHANGE:	UT		UPBJJ		Total:	
	AGREE	DISAGREE	AGREE	DISAGREE	AGREE	DISAGREE
A. SOURCE OF CONSTRAINTS:						
1. Expensive initial costs (sunk costs)	0.19	0.81	0.30	0.70	0.25	0.75
2. Loss of personal or group benefits.	0.25	0.75	0.50	0.50	0.39	0.61
3. Creates instability in the existing system.	0.19	0.81	0.35	0.65	0.28	0.72
4. Simply impossible because no one expecting any change in the existing system.	0.13	0.88	0.19	0.81	0.16	0.84
5. The existing system is the best alternative.	0.19	0.81	0.19	0.81	0.19	0.81
6. It is against the standard operating procedures in distance education system.	0.19	0.81	0.24	0.76	0.22	0.78
7. It violates the agreement made with other universities.	0.06	0.94	0.24	0.76	0.16	0.84
B. SOURCE OF OPPORTUNITIES:						
1. There are available resources from: (1) manpower;	0.93	0.07	0.95	0.05	0.95	0.05
(2) finance;	0.79	0.21	0.71	0.29	0.74	0.26
(3) law and regulation;	0.67	0.33	0.80	0.20	0.74	0.26
(4) technology/skills.	0.87	0.13	0.75	0.25	0.80	0.20
2. Dissatisfaction with the existing operational system.	0.63	0.38	0.65	0.35	0.64	0.36
3. It has been proposed by the campus universities	0.20	0.80	0.55	0.45	0.40	0.60
4. There are no sunk costs	0.63	0.38	0.30	0.70	0.44	0.56
5. All universities will increase their enrollment rate	0.53	0.47	0.61	0.39	0.57	0.43
6. Support from the Ministry of Education authorities	0.64	0.36	0.95	0.05	0.82	0.18

programs. Instead, they suggested three other possible constraints for the UT: (1) lack of academic transfer procedures; (2) it is against the CU academic "tradition"; and (3) the examination system at the CUs requires a minimum attendance rate.

The data on opportunities suggests that UT has the capability to implement the course transfer policy. The administrators believed that UT has sufficient resources from manpower, finance, law and regulation, and skill and technology to implement such a policy. They agreed that the existing system could not meet the need for allowing students to transfer their courses from UT to their university. Support from the Ministry of Education and Culture is important for UT to implement this policy. They also agreed that the transferability of the UT courses for the CU programs will increase enrollment levels for both university systems. They were not in agreement, however, on the issue of initial sunk cost. Sixty-three percent of UT administrators at the central office agreed, but 70 percent of the administrators at the UPBJJ disagreed that the transfer policy will have sunk cost. They also are in disagreement on whether the transfer policy has ever been proposed by the campus university planners. These disagreements may reflect their different perspectives concerning the impact of the two policies on their jobs. The favorable response from the heads of the UPBJJ could reflect the campus universities' political support for the policy.

The UT administrators suggested two factors that increase the opportunity for the UT to introduce the transfer policy between

the UT and the CU courses and programs. First, such a policy would enable the unaccredited private campus universities to improve their academic status. By allowing students to take the UT courses as part of their academic requirements, the quality of instruction would be improved, at least to the level of UT academic standards. Secondly, there is high demand from students. Despite a lack of official data, the number of students attending the unaccredited universities in Indonesia is estimated to be relatively large.

The policy implications are as follows. The UT planners will find strong support from the UT administrators both at the central office and at the UPBJJ offices to introduce the policy of transferring UT course credit to CU programs. Since UT will be the primary party that gains benefits from the policy, the UT planner may have to take the initiative in establishing agreements on the academic transfer procedures with the CU planners. The UT can expect to gain strong support from the unaccredited private universities. Through this policy, UT could help these private universities to improve the quality of their instructional system, which in turn regains their academic status. Furthermore, UT planners should also identify the sunk cost for implementing transfer of the UT courses to the campus programs. This includes the justification of reduction in revenue from a possible special tuition rate that could be charge to students who are taking the "transfer program" at the UT.

(3.2.) Merging the UT Courses.

The second strategic operational policy that UT could pursue in order to reduce the unit cost is to merge the courses with small credit course loads into a broader "package" of multi-discipline courses with four to six credit course loads. Since the academic year 1985/86, the Rector of UT has brought this issue several times to the staff meetings and urged the school Deans to combine the two-credit courses into four-credit or six-credit courses. But, the schools have been unable or unwilling to implement the policy.

Earlier in this study it was shown that the two-credit course load has high unit costs. Figure 5.1 (Chapter V) shows that the reduction in unit costs that would result from an increase in enrollments is smaller for the two-credit courses than for the three-credit and the four-credit courses. The differences in unit costs between the two-credit and the three-credit course is marginal at the enrollment level of 2,500. The unit costs are the same at the enrollment level of 5,000.

Table 7.3 summarizes the UT administrators responses on the source of constraints and the opportunities for the UT to combine courses with small credit loads into broader courses bearing larger credit loads. The data on source of constraints shows that both administrators at the central office and the regional (UPBJJ) offices were concerned about the sunk cost. Fifty percent

TABLE: 7.3

THE UT ADMINISTRATORS RESPONSE ON THE SOURCE OF CONSTRAINTS AND OPPORTUNITIES FOR UT TO MERGE THE SMALL COURSES INTO A PACKAGE OF MULTI DISCIPLINES COURSES

SOURCE OF CONSTRAINTS AND OPPORTUNITIES FOR CHANGE:	UT		UPBJJ		Total:	
	AGREE	DISAGREE	AGREE	DISAGREE	AGREE	DISAGREE
A. SOURCE OF CONSTRAINTS:						
1. Expensive sunk (initial) costs.	0.50	0.50	0.67	0.33	0.59	0.41
2. Loss of personal or group benefits	0.25	0.75	0.50	0.50	0.39	0.61
3. Creates instability in the existing system.	0.19	0.81	0.64	0.36	0.45	0.55
4. Simply impossible because no one expecting any change in the existing system.	0.06	0.94	0.33	0.67	0.22	0.78
5. The existing system is the best alternative.	0.19	0.81	0.24	0.76	0.22	0.78
6. It is against the standard operating procedures in distance education system.	0.06	0.94	0.14	0.86	0.15	0.85
7. It violates the agreement made with other universities.	0.13	0.88	0.24	0.76	0.19	0.81
B. OPPORTUNITIES FOR CHANGE:						
1. There are available resources from: (1) manpower;	0.94	0.06	0.85	0.15	0.89	0.11
(2) finance;	0.73	0.27	0.70	0.30	0.71	0.29
(3) law and regulation;	0.88	0.13	0.85	0.15	0.86	0.14
(4) technology and skills.	0.88	0.13	0.85	0.15	0.86	0.14
2. Dissatisfaction with the existing operational system.	0.73	0.27	0.53	0.47	0.62	0.38
3. It has been proposed by the campus universities	0.17	0.83	0.63	0.37	0.45	0.55
4. There are no sunk costs	0.50	0.50	0.17	0.83	0.32	0.68
5. All universities will increase their enrollment rates	0.50	0.50	0.63	0.37	0.58	0.42
6. Support from the Ministry of Education authorities	0.75	0.25	0.95	0.05	0.87	0.13

of administrators at the central office and 67 percent of those at the UPBJJ offices agreed that this factor may be a constraint. They indicated that: (1) a four to six-course credit load will be too heavy for some students; (2) when combining the courses there will be topics that could not be covered equally well; and (3) there is a lack of manpower to produce the modules and a lack of consensus among the schools about combining their courses.

The UT administrators, however, disagreed that the factors such as loss of personal benefit, instability in the system, mental blinders, and tunnel vision among the members of the organization, the standard operating procedure of distance education system, or the agreement with the campus universities (CUs) were constraints. Thus, the UT administrators consider the academic factors and sunk cost rather than the organizational factors as constraints for UT to combine the small courses into packages of multi-discipline or multi-user courses bearing larger credit loads.

As shown in Table 7.3 the data on opportunities for changes suggests that UT has sufficient resources from manpower, finance, law and regulation, and technology and skills to change the small courses into a broader multi-discipline and/or multi-user courses. Similar to their responses on the constraints, 68 percent of them indicated that sunk costs will prevent the UT from having the opportunity to combine the small courses into courses with larger credit. A majority (83%) of administrators at the central office disagree that the campus universities (CUs) ever

suggested that UT merge the small courses into packages of courses with large credit load. On the other hand, 63 percent of the heads of the UPBJJ agreed that the campus universities had suggested this policy. The responses from the heads of UPBJJ offices may reflect their actual preferences about the reduction in the number of UT courses. This expectation is acceptable because the policy would make their jobs as the heads of the UPBJJ offices easier. The fewer courses offered to students, the fewer tutors to be hired and room proctors needed for conducting examinations.

The administrators were not really sure that introducing broader multi-discipline courses could increase enrollments. They indicated that strong support from the Ministry of Education and Culture is needed in order to change the course credit load. The UT administrators at the central office suggested that merging the UT courses will reduce the management burden, and could simplify the course transfer procedure. The administrators at the UPBJJ believed that multi-discipline and multi-user courses imply an efficient and meaningful teaching-learning process.

The policy implications are as follows. By tradition individual schools have academic autonomy to design the curriculum including the course credit load for classes. In order for UT to be able to merge the small courses into broader multi-discipline or multi-user courses, the UT planners need to assure the school Deans about the trade-off between the sunk costs invested in the small courses and the potential scale economies obtained from

broader multi-discipline or multi-user courses. The benefits of the policy could be expressed in terms of savings in course management costs as well as in terms of efficiency in the teaching-learning process. Similarly, the planner should provide the Deans with appropriate incentives for re-designing the new courses, and include the cost of these incentives into the cost-benefit analysis.

Since courses with a larger credit load (for example, four to six credits) may increase students' academic burdens, the planners should develop criteria for determining the maximum academic loads that students can take in a semester. It is also important for the UT planners to explore the availability of manpower to produce such multi-discipline and multi-user courses (as well as the tutorial services), particularly at the regional level. The responses among the UPBJJ administrators on combining the small courses into courses bearing larger credits deserve serious attention from the UT planners. This alternative operational policy could increase efficiency in course delivery activities at the regional levels.

(3.3.) Reducing the Frequency of Course Offerings.

The third strategy to reduce unit cost is by reducing the frequency of course offerings. This strategy is appropriate particularly for the courses with extremely low enrollment levels. For instance, a particular course may be taken by only 100 stu-

dents per semester. The cost per student for producing the examination materials will be very high because total fixed cost for producing material for 100 students would be the same as for 200 students. If the course were offered once a year instead of twice, the total enrollment for the course will be 200 students instead of 100 students. Thus, the UT could save 50 percent of the examination costs for this particular course by reducing the frequency of examinations from twice to once a year. Table 7.4 summarizes the UT administrators responses on this policy alternative.

The data on constraints shows that both groups of administrators disagreed that sunk cost could become a constraint for UT to implement the policy. The resistance for change in frequency of course offerings could come from the UT administrators at the central office as well as the UPBJJ offices. They considered that the policy could imply loss of personal and group benefits among members of the UT organization, and that it could create instability in the UT operational systems. In sum, they considered the existing system the best alternative.

The UT administrators at the central office also stressed that reduction of course offerings could result in longer time requirements for students to finish their studies. The administrators at the UPBJJ offices thought that the policy would discourage enrollments. They also thought that it would be difficult to decide which courses should be offered. These responses provide further indication that the UT administrators could not

TABLE: 7.4

THE UT ADMINISTRATORS RESPONSE ON THE SOURCE OF CONSTRAINTS AND OPPORTUNITIES TO REDUCE FREQUENCY OF COURSE OFFERING

SOURCE OF CONSTRAINTS AND OPPORTUNITIES FOR CHANGE:	UT		UPBJJ		Total:	
	AGREE	DISAGREE	AGREE	DISAGREE	AGREE	DISAGREE
A. SOURCE OF CONSTRAINTS:						
1. Expensive initial costs (sunk costs)	0.31	0.69	0.24	0.76	0.26	0.74
2. Loss of personal or group benefits.	0.67	0.33	0.57	0.43	0.61	0.39
3. Creates instability in the existing system.	0.67	0.33	0.52	0.48	0.58	0.42
4. Simply impossible because no one expecting any change in the existing system.	0.53	0.47	0.19	0.81	0.33	0.67
5. The existing system is the best alternative.	0.63	0.38	0.33	0.67	0.46	0.54
6. It is against the standard operating procedures in distance education system.	0.25	0.75	0.19	0.81	0.22	0.78
7. It violates the agreement made with other universities.	0.14	0.86	0.14	0.86	0.14	0.86
B. OPPORTUNITIES FOR CHANGE:						
1. There are available resources from (1) manpower;	0.85	0.15	0.95	0.05	0.91	0.09
(2) finance;	0.80	0.20	0.76	0.24	0.77	0.23
(3) law and regulation;	0.69	0.31	0.85	0.15	0.78	0.22
(4) technology and skills	0.79	0.21	0.86	0.14	0.83	0.17
2. Dissatisfaction with the existing operating system.	0.40	0.60	0.71	0.29	0.58	0.42
3. It has been proposed by the campus universities	0.08	0.92	0.48	0.52	0.33	0.67
4. There are no sunk costs	0.53	0.47	0.52	0.48	0.53	0.47
5. All universities will increase their enrollment rate	0.60	0.40	0.62	0.38	0.61	0.39
6. Support from the Ministry of Education authorities	0.31	0.69	0.85	0.15	0.64	0.36

support reducing the frequency of course offerings.

Despite their strong agreement on five sources of constraints (sunk cost, personal and group benefit, instability in the system, standard operating procedures, and agreement on the UT mission) the two groups of administrators were in disagreement on the issues of mental blinders among members of the UT organization, and dissatisfaction with the existing system. Fifty-three percent of administrators at the central office agreed, while 81 percent of the administrators at the regional offices (UPBJJ) disagreed that mental blinders would be a constraint for the UT to reduce the frequency of course offering. Sixty-three percent of the administrators at the central office were not satisfied, while 67 percent of the UPBJJ administrators were satisfied with the existing system. In other words, the administrators at the central office do not support the policy to reduce the frequency of course offering, while the administrators at the regional (UPBJJ) offices are supporting the policy. One of the possible explanations for this disagreement resides in the different sets of responsibilities between the two groups of administrators. The administrator at the central office, particularly the school Deans, would fear losing their present autonomy in designing the curriculum. On the other hand, as the frequency of course offering decreased, the number of tutors and examinations also would decrease. Thus, the administrative burden at the UPBJJ offices would decrease.

The administrators' responses on the opportunities for policy

change in frequency of course offerings were consistent with their responses on the source of constraints. The two groups of administrators disagreed that such a policy had ever been suggested by the campus university. Thus, they believed that the policy is solely for UT interests, and may have no negative effects on enrollment levels at the campus universities. Since UT should maintain academic autonomy, the UT administrators disagreed that implementation of this policy requires special consent from the Ministry of Education and Culture.

The administrators from the UPBJJ offices suggested two other reasons for the UT to reduce the frequency of course offerings. First, the lack of qualified tutors in the regions and second, the strong support from their staff. Reduction of course offerings could reduce the need for tutors at the regional level.

If UT seriously considers reducing the frequency of course offerings as an appropriate solution to small enrollments, the foremost support should come from the school Deans. In order to gain their support, the UT planners should involve them in the assessment of the scale economies of the small courses they presently offer to students. In this way the school Deans will come to understand the economic value of the policy, and at the same time the schools will maintain their maximum academic autonomy. The Deans are the main actors who make the decisions on which courses and when to offer the courses to students.

The reduction of frequency of course offering could prolong the period of student study. This problem could be overcome by as-

signing academic advisors to help the students to prepare their academic programs. Besides, UT should provide a fixed schedule for the courses so that students can plan their program effectively. Students should be informed of any change in the schedule at least one year before it becomes effective.

A strong disagreement between the administrators at the central office and the UPBJJ offices regarding the change in frequency of course offerings deserves serious consideration by the UT planners. The favorable responses of the administrators at the UPBJJ office suggest their support for such a policy. Their strong endorsement for the policy is understandable because they are the group of administrators who benefit most from the policy. The policy will ease their job of finding tutors and organizing examinations. Thus, in terms of implementation of the policy at the regional office, UT has strong opportunities to exploit the scale economies by reducing the frequency of course offerings.

(3.4.) Alternative Policies Suggested by UT Administrators.

The administrators were also asked to provide suggestions on alternative policies to reduce the unit costs of the UT courses and programs. Table 7.5 summarizes their suggestions. From the table it is clear that the UT administrators are aware of alternative strategies for reducing the unit costs besides the three options analyzed in this study. Their suggestions cover a wide range of policies including conducting regular cost analysis

TABLE: 7.5

SUMMARY OF THE UT ADMINISTRATORS SUGGESTIONS ON ALTERNATIVE POLICIES TO REDUCE THE UNIT COST

SUGGESTED POLICIES:	RESPONDENTS: UT	UPBJJ
1. Conduct regular study on cost-benefit of the UT courses and programs.	x	
2. Develop more efficient course production (printing) for advance courses by applying the principle of "small-scale" technology rather than the large scale technology (e.g. to use copy machine or reshograph).	x	
3. Use the existing course for certification short term programs and seminar courses needed by the industrial sectors as well as other public (government) organizations.	x	x
4. Provide study guide for the existing marketed textbooks instead of developing the modules, particularly for the advance level courses where only small number of students are taking the courses. (However, the corollary problem is that there are very view textbooks available in Bahasa Indonesia).	x	
5. Allows students to sell and/or the used textbooks (modules) which should be available at the bookstore, UPBJJ and the UT central office.	x	
6. Provide more facilities for the UPBJJ so that they are capable to produce tests and to mark them.		x

(as part of cost-benefit analysis) of the existing UT courses and programs, maximum utilization of the UT courses for short term certification programs, and reusing the UT textbooks or modules.

The policy implications of their recommendation are straight forward. It is expected that UT will conduct regular assessments on the unit costs of the UT courses and programs. The results of the assessment could be used as guidance for making policy regarding the scale economies of the UT systems. The application of the "small scale" technology instead of "large scale" technology

principle for producing the advanced courses is among the methods to deal with the high unit cost resulting from extremely low enrollments level.

The small scale technology principle refers to the idea that the unit cost for producing a small quantity of products is lower for some technologies than for others. For instance, the unit cost of producing 100 textbooks by photocopying is lower than unit cost of producing the same quantity of textbooks using the printing machine. The use of the printing machine is subject to the large scale technology principle, in which low unit cost can only be maintained if a large quantity is produced.

The policy on selling used textbooks also is a method to reduce the costs, and to keep the price of textbooks low so that it will not become a major financial constraint for students. That is to say, unit costs for the UT courses should be neutral in terms of the student's decision to enroll given the price of the textbooks. The administrators' suggestion on the use of study guides instead of the modules also provides an alternative means by which the UT can overcome the problem of finding the qualified module writers for the advanced courses. Since producing study guides is much simpler than writing the self-instructional modules, this policy also implies a "small scale" technology in the production of textbooks for the advanced courses, as well as a way of maintaining the quality of the instruction. Finally, their suggestion on providing more facilities for the UPBJJ to produce the test materials and to mark them is an example of using decentralized management to increase efficiency in the examination

systems. Under the present examination system, all assignments and examinations are produced and processed at the central office. Often, the production of the assignment materials and the sending of examination results are behind schedule. Delays in processing of the examinations cause delays in student decisions about subsequent course enrollment. By taking into account all of these suggestions, UT should be able to exploit the potential scale economies in its operational systems.

Alternative Operational Policies.

This study was also designed to collect the UT administrators' views on additional alternative operational policies in order to exploit the potential scale economies in the UT system. Table 7.6 summarizes their suggestions. The suggestions covered a wide range of policies regarding the structure, process and outputs of the UT organization.

The administrators' responses show that both central and regional administrators are concerned with the need for decentralizing the decision making process. They recommend changes in the UT organizational structure by integrating the small temporary units into the formal functional unit and allowing the UPBJJ offices to adjust their operational systems to the local needs including conducting tuition tutorial services. Despite the novelty of a decentralized management system, the administrators' proposal may face two major constraints. First, a change in UT

TABLE: 7.6

SUMMARY OF ADMINISTRATORS SUGGESTION ON ALTERNATIVE POLICIES TO EXPLOIT SCALE ECONOMIES IN THE UT OPERATIONAL SYSTEMS

ALTERNATIVE POLICIES	RESPONDENTS: UT	UPBJJ
A. ORGANIZATIONAL STRUCTURE:		
1. Improve managerial skills (training on decision making) to reduce staffs and unnecessary small units at the UT central office;	x	
2. More decentralize decision making both at the UT central office and at the UPBJJ.	x	x
3. Allows UPBJJ to modify the operational system best suit to local constraints and resources (e.g. to support UPBJJ to organize their own "private" intensive tutorial service for the students).	x	x
4. Integrate all temporary units into the UT formal organizational structure.	x	
5. Change the organizational structure of UT and the UPBJJ	x	x
B. ORGANIZATIONAL PROCESS:		
1. UT staffs must work more efficient (productive), and the size of UT staff must be reduced.	x	x
2. Develop better computerizing data information system (MIS) to support the UT strategic planning activities.	x	x
3. Eliminate unnecessary expenditure such as for wisuda.	x	
4. Beside to increase new enrollments of the HS graduates there should be a strong effort to make the existing UT students to register regularly.		x
5. Employing more efficient means of communication with students because the existing information systems for registration and examination are expensive.	x	
6. Reduce unimportance seminars and meetings.	x	
7. Better planning of UT activities and manpower (career) development program.	x	
8. Omit the TV and educational programs because very small number of students utilize the facilities.		x
C. ORGANIZATIONAL OUTPUTS:		
1. Sub-contracting UT operations to the more efficient private organizations (e.g. tutorial services, course production, printing and distributing the textbooks/modules.	x	x
2. UT should provide more intensive tuition tutorial service (the campus-like instruction) organized by the UPBJJ so that UT could control the quality of the service.	x	x
3. Improve the quality of modules (in terms of content and appearance/ lay out)	x	
4. UT should provide shorter certification programs such as the D1-Diploma which has civil effects to the diploma holders.	x	x
5. Develops good relationships with other government agencies in the region including the KOPERTIS so that UT students could utilize their learning facilities.		x

structure requires a Presidential decree. Since the issuance of a Presidential decree involves a long organizational process, such change could not be implemented immediately. Second, the UT organization covers all regions of the country. In order to decentralize the management system to function productively, it should be supported with a distributed communication networks. The development of such a communication (and data) network also will take time. This suggests that the implementation of a decentralized management system for UT will be feasible only when there is a high commitment from the UT planners at the Ministerial level.

The administrators' suggestion on alternative operational policies regarding the UT organizational process pertains to the organizational productivity, size of the staff, and the need for better management information systems. They suggest that the average productivity of the UT staff is low because of excessive personnel, and the division of personnel into too many small units in the UT organization. There are about 10 small units; some of these could be integrated into the functional units as defined in the formal UT structures. These include: Photography, Studio/Audio, Student Service (BINMAWA), Module Documentation, Monitoring the UPBJJ, Campus Development, Staff Development, and System Development. Integrating these units into the main functional units in the UT organization could result in a more efficient management. It could save manpower for supervision and save money for personnel salaries if the integration could reduce the number of staff. Therefore, it is understandable if both adminis-

trators at the central office and the UPBJJ offices considered the existing organizational processes to have important effects on the scale economies of the UT operational systems.

The administrators also suggested that the UT organizational processes require a computerized management information system (MIS) with a distributed data processing system. Such systems will enable the administrators at the UPBJJ offices to have direct access to the UT data base at the central office; this is necessary in making decisions at the regional level. This management policy will improve the communication between the central office and the 32 UPBJJ offices as well as the efficiency in the UT organizational processes. Such management policy could affect the scale economies in the UT courses and programs if the improvement in policy making at the UPBJJ enables the administrators to provide better service to students, which in the long-run could improve enrollment levels. Again, since the development of a distributed data processing systems (DDPS) will require additional budget for UT, it should become part of the UT long-range strategic planning.

The UT administrators also indicated that sub-contracting UT operations to private agencies is desirable in order to increase efficiency in the organizational outputs. For instance, the UT could provide support to private agencies (including private universities) to organize the tuition tutorial services for the UT students. UT could sub-contract the production, printing, and the distribution of the modules to the professional private agencies rather than creating a production unit in the UT organi-

zation. To some extent, similar policies have been implemented by the UT since the early stages of its development. Thus, the appeals made by the administrators are concerned primarily with the rate of implementation of such policies.

Two important alternative operational policies suggested by the UT administrators deserve special attention from the UT planners. First, the administrators suggest that the UPBJJ should be provided with sufficient facilities to organize "campus-like" tuition tutorials so that UT could control the quality of the service. Second, UT should offer the D-1 (Associate Degree-1) certification programs which have promotional effects for the holders. The implementation of the first suggestion is feasible if the extra tuition is affordable by the students. Such an extra charge is allowed by the government if it is to cover the "practice" costs. The maximum fee is 100 percent of the tuition rate, and has to be managed by the government treasury offices. Thus, the implementation of this policy requires consent from the Ministry of Education and Culture and the Ministry of Finance. The suggestion to introduce short certification programs would imply further scale economies in the UT system as long as it utilizes the already developed courses. The provision of a variety of "tailor-made" short certification programs could reduce the attrition rate, and maintain low unit costs per graduate as long as it did not change the cost structure of the UT courses and programs. Thus, implementation of such a policy will enable the UT to exploit the potential scale in its operational systems.

CHAPTER: VIII

SUMMARY AND RECOMMENDATIONS

This Chapter provides summary of the findings and recommendations derived from the study. To some extent subsequent policy implications have been made regarding the findings. It is important, however, to summarize the findings into practical conclusions and strategic policy recommendations. The flow of the discussion will follow the three basic issues raised in this study. These are (1) the unit costs; (2) the determinant cost factors; and (3) the alternative operational policies for the UT courses and programs.

Summary

Issue #1: What are the unit costs of the UT courses and programs?

The estimated unit costs of the UT courses are Rp.32,908 (US $17.79) per student, and Rp.12,512 (US $6.76) per credit. In terms of field of study (schools), the most expensive courses are those offered by the School of Mathematics and Physics (FMIPA)

and the School of Education. The least expensive courses are those offered by the School of Social and Political Sciences. The most expensive courses by type of course requirements are the Core and Support Courses (MKK/MKPBM), while the least expensive courses are the Fundamental courses (MKDU). Despite high costs per student, the cost per credit for the three-credit courses is lower than for the two-credit courses. In terms of the overall operational costs, the cost per student at the UT system is lower than the cost per student at the campus university systems.

As the unit costs vary by types of course (credit load, course requirements, and fields of study), so did unit costs by type of program. The most expensive programs are offered by the School of Mathematics and Physics (FMIPA). The least expensive programs are the S1-Degree programs offered by the School of Social and Political Sciences (FISIP). Since the number of credit courses required for the S1-Degree program in Education is smaller, the unit cost is also lower than the unit cost for the other S1-Degree programs. The S1-Degree program in education is a continuing program for those having the B.A. degree earned from the traditional higher education system.

The unit cost analysis based on hypothetical future enrollments shows positive scale economies in the UT courses. The UT courses are very expensive if the enrollment levels are lower than 250 per course for a five year period. At this enrollment level the cost per student exceeds Rp.200,000. The unit cost for the UT course declines rapidly for enrollment levels between 250

to 1,000, and becomes relatively stable at the enrollment levels above 5,000. The least costly level of enrollment for the UT course is in the range between 1,000 to 2,500. The current level of enrollment for the Social and Political Sciences courses and the Economics courses are at this level. Enrollment levels for the Mathematics and Physics, and the Education courses are not sufficient to capture the scale economies in the UT operational system.

Issue #2: What are the determinant cost factors in the UT cost structure?

The largest cost components in the UT cost structure were expenditures on personnel salary and honorarium for the course delivery and course development activities. In terms of activity, the largest cost component was devoted to the course delivery activities. Thus, the patterns of the UT cost structure suggest a labor intensive course delivery system.

The change in patterns in the expenditures and enrollments suggested that enrollment levels had not become the determinant factor for the UT's cost level. The changes in cost structures (as reflected by the changes in expenditures) could be a reflection of the UT planners' long-range strategy to develop the UT systems. Also, it could be due to the effect of a time lag between enrollment changes and the financing policy.

Issue #3: What are the alternative operational policies for exploiting the potential scale economies in the UT courses and programs?

The four alternative policies introduced in the study were: (1) providing intensive student service programs; (2) transfer of UT courses for campus programs; (3) combining small courses into broader multi-discipline or multi-user courses bearing larger credit load; and (4) reducing the frequency of course offerings for courses with low enrollment.

The provision of intensive student support programs primarily is aimed at attracting new high school graduates. In order to implement this policy, the following are necessary: (1) intensive marketing programs to high schools which involve the high school principals, and the Chief of Educational Office in the region; (2) providing facilities to the UPBJJs to provide tuition tutorial services, and (3) supporting the private "UT Campus" agencies to provide tuition tutorial services. The main constraint for the UT to implement this policy could be the variable costs. This policy could change the cost structure of the UT courses toward high variable delivery costs relative to fixed development and management costs. The administrators, however, are confident that UT has the opportunities for change from manpower, finance, law and regulation, and technology and skills.

Introducing an academic policy that allows transfer of the

UT courses to the campus university programs may not face resistance from inside the UT organization. The source of constraints could be related to the CUs themselves because they may consider that the academic transfer policy will reduce enrollments. Since the implementation of the policy could improve the academic credibility of the unaccredited private universities, the UT should obtain strong support from this group. In order to implement this policy, UT may have to take the initiative in establishing the course transfer procedures primarily with the unaccredited private universities. The transfer procedures should also include the provision of separate student record systems for the campus students who are participating this "joint" program. A special tuition rate could be established so that the joint program will not discourage enrollments.

Merging the small courses into a broader package of multi-user or multi-discipline courses may face resistance from the School Deans. They were concerned about the sunk cost of the initial investment for the small courses as well as the costs for re-designing the curriculum. They also are worried that students' loads will be too heavy. Besides, there will be some topics that could not be treated jointly. On the other hand, the administrators indicated that the policy will reduce the number of courses to be managed, simplify the course transfer procedure, and it also implies an efficient and meaningful teaching-learning process. The administrators are confident that UT has good opportunities to implement the policy from manpower, finance, law and

regulation, and technology and skills. These responses suggest that in order to become a successful policy, strong involvement from the school Deans at the planning stage is necessary.

The feasibility for UT to reduce the frequency of course offerings as a method to reduce the unit costs is meager. The administrators at the central office believed that the policy will result in significant loss of personal and group benefits so that it could create instability in the system. They considered the existing system to be the best. Also by tradition, each school claims maximum academic autonomy including the right to design their curriculum. Students will take a longer time to finish their programs and, therefore, could increase their educational costs. The administrators at the UPBJJ offices believe that it would be difficult to choose which courses are to be offered. The policy could decrease enrollment rate, and they were not sure that staff at the central office will seriously support the policy. The administrators, however, were confident that UT has good opportunities to implement the policy in terms of resources from manpower, finance, law and regulation, and technology and skills. Thus, in order to implement this policy, UT planners will have to convince the administrators both at the central office and the UPBJJ offices that it is necessary.

The alternative policies to reduce unit costs per student suggested by the UT administrators are concerned with: (1) the application of the "small scale" technology principle for producing the advanced courses; (2) the provision of short-term certi-

fication programs and seminars for the industrial sectors; (3) the use of standard textbooks accompanied with study guides instead of the self-instructional modules; (4) allowing use of used modules instead of buying new ones; (5) allowing the UPBJJ to produce and mark the tests. Implementation of these policies is feasible as long as they will not change the cost structure of the UT courses and programs. The decentralizing of test production and marking could raise the issue of test security. If the security of the test materials is violated the credibility of the UT system could diminish.

The UT administrators expressed the need for an organizational structure which allows decentralizing of the policy making process both at the central office and UPBJJ. They ask that the UPBJJ be allowed to modify the operational system to adapt it to local constraints and resources, including the organization of their own tuition tutorial services. Unless the tuition tutorial service is financially self supported, it will be difficult for UT to implement this policy. In addition, to change the UT organizational structure requires a Presidential decree. The implication of this suggestion is that UT should obtain a strong commitment from the planners at the Ministerial level.

The administrators indicated that average productivity of the existing staff is low because of excessive staff and too many small units in the UT central office. Reduction in the number of staff and integration of the small temporary units into the functional units could improve the efficiency in organizational

process at the central office. Low productivity could also be a result of slow organizational processes. The UT organizational processes (the operational systems: management, course development, and course delivery) require a management information system (MIS) which enables each of the functional units and UPBJJ offices to have direct access to the data base at the UT central office. In other words, UT management should be supported with a distributed data processing system (DDPS). Such data base system could improve the communication and policy making process at the central office and the UPBJJ particularly the administrative service to students. The policy implication of this management policy is that UT must develop a long-range management information system planning including the data processing networks system.

Sub-contracting of UT operations such as printing textbooks, distribution, and the tutorial service to the private market might also improve the efficiency of the UT organizational outputs. This is true for a large scale productions; small scale productions are best handled by the UT production unit. The policy implication of this policy is that UT should develop the scale criteria for sub-contracting the operations to private agencies. Alternative policies for improving the UT organizational outputs could be through the provision of intensive tuition tutorial service by the UPBJJ, and the provision of short-term certification programs which have civil service effects. Thus, the diploma earned should have a direct effect on salary in-

creases or on opportunities for promotion. The D1-Associate Degree programs for upgrading Junior Secondary School teachers are an example of such short-term programs that have a civil service effect. Again, the provision of tuition tutorial services by the UPBJJ and of the short-term certification programs are feasible if the services and the programs will not increase unit costs of the UT courses and programs.

Recommendations

The recommendations of this study focus on strategic management policies for exploiting the potential scale economies in the UT operational systems. The recommendations are organized under the three basic policy issues raised in the study. These are: (1) the management of the courses with high unit costs; (2) the identification of the determinant cost factors; and (3) the management of changes in the operational systems. These policy recommendations were designed as part of the UT strategic management policies. They are presented in terms of short-term, medium-term, and long-term strategies. The short-term policy refers to the yearly planning, the medium-term policy refers to the two to five years planning, and the long-term policy refers to the five to ten years planning activities. These planning activities are formulated in terms of strategic policies in the senses that the planning activities could include the redefinition of the UT

missions and mandates, the emergence of new services and programs, and introduction of innovations in the UT operational systems.

Recommendation #1: Managing the courses with high unit costs.

The two types of UT courses that have high unit costs are: (1) the Math and Physics courses and; (2) the Education courses. The unit costs of these courses could be lowered by increasing the enrollment levels and altering the course structure. The short-term strategy would be to avoid a further decrease in enrollments of the continuing students. Surveys of students' motivation to withdraw from their program are necessary. If their motivation to withdraw is because of high transportation and forgone income, and emotional stress (Neilsen and Djalil, 1989), UT may have to provide more tutorial and examination centers closer to students' residence. Marketing surveys of high school students about their expectations from the UT system could be very helpful for understanding the students' perspectives on UT programs.

The medium-term strategy could be aiming at attracting more students to enroll in these two fields of study. The transferability of the Math and Physics and the Education courses for the campus universities (CUs) programs is among the alternatives that UT may be able to introduce. Another alternative is to use the

existing courses for short-term certification programs which are highly demanded by the industrial sectors. Example of these programs are: the D2-Associate Degree programs in the field of Industrial-Chemistry, Computer Programming, Architectures, and the D1-Associate Degree programs for the Junior Secondary School teachers. Marketing surveys of private and public companies employees as well as of senior high school students are among the strategic activities to achieve this objective.

The long-term strategy could be related to altering the course structure for the Math and Physics and Education programs. For example, integrating student programs with internship programs at the work place could encourage more students to enroll in these two fields of study. Students taking Math and Physics may participate in internship programs at the industrial sectors relevant to their programs. Similarly, students taking the education programs could participate in internship programs in primary and secondary schools near their residence. Since the internship programs are a form of employment, students should receive payments sufficient to pay their tuition. Another advantage of the internship programs is that the UT graduates will be more adaptable to the world of work, which in turn could increase their employment opportunities. The implication of this planning strategy is that UT should build a good relationship with private companies in the industrial sectors and the Office of Education (KANWIL DEPDIKBUD) in the region. A study on the organizational as well as technical requirements from these companies and the Office of Education is necessary.

Recommendation #2: Managing the determinant cost factors for the course delivery activity.

This study shows that the expenditure on personnel salary and honorarium is the largest cost component in the UT cost structure, particularly for the course delivery activities. It suggests that the UT operational systems are heavily engaged in labor intensive operations. A labor intensive course delivery system could result in reduced scale economies in the UT operational system. The marginal costs could increase as enrollments increase. In order for UT to benefit from the potential scale economies inherent in the distance education systems, the UT planners may pursue the following strategies.

The short-term activity is to avoid further increases in expenditures on personnel salary and honorarium, particularly for supporting the course delivery activities. Thus, UT should avoid further recruitment of staff for delivery activities. The medium-term strategy aims at reducing the unit costs in term of expenditures for personnel salary and honorarium. This objective could be achieved through reduction of the staff and automation of course delivery activities. Reduction of the staff could be achieved by allowing the staff to transfer to other government institutions. Alternatively, staff could be transferred from the central office to the regional offices which employed substantial numbers of part-time staff seconded from the university in the region.

The long-term strategy is to alter the composition of the total fixed costs and variable costs. Scale economies in the UT system could be improved if the delivery system is not highly dependent upon the availability of manpower. Thus, the proportion of fixed costs should be larger than the variable costs. This objective could be achieved through intensive investment on educational technology for supporting the course delivery activity. Face-to-face tutorial services should be limited and substituted by the use of two-way radio communication and audio and video programs. Thus, the existing nine tutorial programs using the two-way radio communication should be extended to other regions particularly for students at the eastern part of the country. The development of video programs containing recording of actual face-to-face tutorial events could be attractive for students who have access to this facilities. They can share the facility with their friends if the cost is beyond their individual financial ability. The use of satellite for TV programs (including for tutorial) is expensive, and therefore has to be utilized efficiently. The biweekly UT-TV educational programs should be used as media for providing reference for students on the availability of the tutorial programs using the two-way radio communication in the regions and the video tutorial programs. To some extent these programs have been provided by the UT system. Since UT has a limited budget, the production of audio and video tutorial programs could be sub-contracted to the private market. This study proposes that such programs should become the main

component of the UT long-range strategic planning regarding the course delivery system. For further development, studies on the cost-effectiveness of these programs for individual learning as well as group learning are also necessary.

Recommendation #3: Managing changes in the operational policy.

The UT system is still in the development stage so that changes in its operational system are inevitable. Four alternative operational policies for exploiting the potential scale economies in the UT system have been introduced to the UT administrators. These are: (1) provision of intensive student support programs to attract new high school graduates; (2) allowing transfer of the UT courses for the campus universities (CUs) programs; (3) merging the courses with small credit loads into broader package of multi-user courses with larger credit loads; and (4) reducing the course offering from twice to once a year.

This study shows that UT administrators at the central office in some issue are in agreement with their companion at the regional office, but not on other issues. For example, the administrators at the central office did not support the policy to combine the small courses into a broader package of multi-discipline or multi-user courses. Similarly, the two groups are in disagreement regarding the change in policy about frequency of course offerings. Their disagreement could be due to the differ-

ent sets of responsibilities and roles in the UT system. The implementation of merging the small courses and reduction of course offerings are perceived by the School Deans as a reduction of the school's autonomy, while the administrators at the UPBJJ perceived the changes as opportunities to increase their role in the UT organization. Thus, these findings show the complexity of the problem for UT to introduce changes in the operational system.

One among the alternative strategies to introduce change in the organization is to apply the Lewin's (1951) basic change model: unfreezing, movement, and refreezing. Lippit, Watson, and Westley (1958) revised Lewin's model and introduced the diagnosis phase prior to the unfreezing phase. The diagnosis involves three separate tasks: identifying the problem, isolating its primary causes, and coming up with an appropriate and effective solution. The six places to search for problems, their causes, and solutions when a change is needed are: purposes or missions, structure, relationships, rewards, support systems, and leadership in the organization (Weisbord, 1978).The unfreezing is the process of getting an organization ready for change. It is a process of reducing the source of constraints and improving the opportunities for change. Three main objectives of the unfreezing process are: (1) selling the results of diagnosis to the top management staff; (2) enhancing the understanding on the implementation of the change plans of the operational staff; and (3) preparing for the consequences. The movement phase includes the actual imple-

mentation of the change plans. At this stage, the external change agents (consultants) may be required to implement the changes. The refreezing is the process of institutionalizing the new changes into organizational habits through training, ceremonies, and other forms of cultural events.

In line with this change model, the management of change in the UT operational systems in terms of short-term, medium-term, and long-term strategic planning activities could be as follows. The short-term strategy are the diagnosing and unfreezing of the existing UT operational systems. The diagnosis activities include the identification of the scale economies of the UT courses and program (such as this study). The identification of the potential sunk costs and the individuals or groups who will lose their position as a result of the introduction of the new operational systems should be done in this stage of the change plans. The unfreezing activities include selling the result of the diagnosis to the UT management and staff, and helping them understand the risks resulting from further toleration of the existing operational systems. For example, the question about the trade-off between the sunk cost and the costs for re-designing the curriculum and the cost savings from reduction of the number of required tutors and examination materials as result of changes in the policy to combine the small courses into a broader multi-discipline or multi-user courses should be answered at that stage.

The medium-term strategy is moving from the existing opera-

tional systems toward the desirable operational systems. For example, to change the marketing target to new high school graduates, to change the frequency of course offerings from twice to once a year, to change the data processing system, or to change the structure of UT organization. The UT Yearly National Coordination Meeting (Rapat Koordinasi National/ RAKORNAS-UT) could be the most efficient forum for discussing the need for changes in the UT operational systems. At this stage, a steering committee which represents executives from the central and regional offices should be appointed to prepare the master plan (two to five year plan) for UT system. The master plan should provide the detailed activities to implement the changes. Sub-committees on the development of the UT management information system, course development system, and course delivery system are also necessary. Each sub-committee should work independently under the coordination of the UT steering committee and present their progress at the yearly RAKORNAS-UT coordinating meeting. These committees are the main users of findings from UT institutional research (such as this cost analysis). Any change in the master plan (as proposed by the sub-committees) should become a main topic of discussion in the National meetings.

The long-term strategy is aimed at refreezing the new operational systems through institutional process. These activities include the making of the Ministerial Decree and/or the Presidential Decree on UT organization functions and structure, continuous evaluation and monitoring of implementation of the new

system, and building the organizational culture through education, training, and ceremonies. Writing articles on UT for national news papers, magazines, and for other mass media; Rector and other UT executive leaders addresses on occasions of national ceremonial events; and staff training on functions and missions of UT are among the activities aimed at refreezing the UT system. It is a long-term activity because it could include redefinition of the UT mission. This is a long-term educational process for the entire members of the UT organization, the planners at the Ministerial level, as well as the community at large. In all, it is a process of acculturation of the UT system.

Concluding Remarks

The policy recommendations discussed above do not necessarily exhaust all of the possible alternatives for exploiting the scale economies in the UT system. Also, the recommendations should not be considered as separate entities. They should be considered as an integrated strategic management policies package. It is hoped that the findings and recommendations gained from this study will enhance the UT planners insight about the intricacy of the policy implications of the scale economies of the UT courses and programs. It also is expected that this study can provide a basis for further research on the cost-effectiveness of the UT system.

It should be understood that this study was not intended to answer all policy issues regarding the scale economies of the UT operational systems. The following implementation issues regarding the recommendations proposed by study are also important to be answered.

Among these issues are:

(1) A large component of Government subsidy from routine budget is in the form of personnel salary. How could UT minimize the effects of this budget allocation on the scale economies in the course delivery?

(2) If the UT courses are transferable for the CU programs, what tuition policy is required in order to implement such a policy? How much does it reduce the unit cost?

(3) What strategy should the UT pursue if the Ministry of Education does not support any change in the UT operational policy?

Thus, continuous identification of the scale economies is a necessary condition for further development of the UT courses and programs. The assessments of constraints and opportunities for UT to introduce changes in the operational systems should be considered as an integral part of the strategic policy to capture the potential scale economies in the UT system. It is with this management strategy that UT may be able to maintain an efficient operational system.

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Appendix A

Instrument for Collecting Data on Costs
(Respondent: Head of Office of Finance)

Units: _____ Year : _____

Cost Components:	Expenditure in Rp.1000:
1. Personnels Salary (number)	
Rank I ( )	Rp._____
II ( )	_____
III ( )	_____
IV ( )	_____
Total: ( )	Rp._____
2. Building and Equipment Maintenance	Rp._____
3. Office materials	Rp._____
4. Travel	Rp._____
5. Unclassified	Rp._____
Total:	Rp.

Note:

1. The units are: (1) Rectorate Office; (2) Office of Registrar; (3) Office of Central Administration; (4) School of Education; (5) School of Economics; (6) School of Social and Political Sciences; (7) School of Mathematics and Physical Science; (8) Center for Research and Public Service; (9) Computer Center; (10) Media Production Unit; (10) Center for Distribution; (11) Center for Examination Processing; (12) Library; and (13) UPBJJ offices.

2. The fiscal years are 1985/86 to 1989/90.

Appendix B

Instrument for Collecting Data on Revenue
(Respondent: Head of the Office of Finance)

	Fiscal Years:				
	1984/85	1985/86	1986/87	1987/88	1988/89
Source of Income (Rp.1000):					
1. Routine Budget	Rp.				
2. Development Budget	Rp.				
3. Students Tuition/Fees	Rp.				
Total:	Rp.				

Appendix C

Instrument for Collecting Data on Enrollment Rate

(Respondent: Head of Registrar Office)

	Credit Hours (SKS)	Enrollment Rate for Academic Years: 1985/86	1986/87	1987/88	1988/89	1989/90	Total
A. Courses:							
1. MKDU 4101							
2.							
3.							
.							
.							
441							
B. Programs:							
1. D2 English							
2. D2. Bhs. Indonesia							
.							
.							
.							
22.							
C. Schools:							
1. Education	____	____	____	____	____	____	____
2. Economics							
3. Math & Physics							
4. Soc-pol Sci.							
D. Total UT:	____	____	____	____	____	____	____

Note: There are 441 courses, 22 programs, and 4 schools.

Appendix D

Instrument for Collecting Data on Year of Production and "User" of the Courses

(Respondent: School's Dean)

---

*	Produced in Academic Years:					
User(s)	1985/86	1986/87	1987/88	1988/89	1989/90	Total
Courses:						
1. MKDU 4101	____	____	____	____	____	____
2.						
3.						
.						
.						
.						

441.

---

*) There are 23 "users" of the courses: 0 = all programs; 1 = D2 English program; , ... , and 22 = S1 Devel. Administration program.

Appendix E

Questionnaire for Collecting Policy Data
(Respondent: Rector, Vice-Rectors, Deans, Head of the Units)

Introduction.

For the last three years (1986 to 1988), we observed a significant fluctuation (declining and a title increase) of enrollments for the UT courses and programs. This situation raises question on scale economies in the IOU operational systems. Among alternative policies to maintain scale economies in the IOU courses and programs are: (1) to increase revenue by including the newly high school graduates as the prime target group for the UT system; and (2) to reduce the unit cost per student by altering the structure of the UT courses and programs (Bottomley, 1972).

The first alternative is proposed because evidently only less than 20% of the UT students are those newly graduated from high school. Although there are indication of high demand for higher education (Setijadi, 1989), it seems that the UT system does not attractive enough for this group of population. The literature (Holmberg, 1986) showed that the distance university (DU) systems generally satisfied adults which already had jobs (career), or housewives. This means that the inclusion of the newly high school graduate as the prime target group for the UT systems requires innovative operational policies, which are suitable to students' development stage. Such policies include the provision of intensive student support programs: tutorial, socialization, and extra-curricular services which are familiar to the campus university (CU) students (Holmberg, 1977; Baath, 1982; and Sewart, 1981). In this way the UT system could help the students to overcome their feeling of being helpless, inconfident, loneliness, and "homeless" (Pannen, 1990).

The second policy is proposed based on the notion of the "openness" of the UT system, as to people, to method, to place, and to ideas (Tunstall, 1974), as well as the nature of the educational technology which is similar to the industrial production system (Peters, 1981). Besides, the nature of cost structure in distance education system is characterized with large amount of fixed development costs but relatively low variable delivery costs per student (Wagner, 1974; Laidlaw and Layard, 1975; Rumble, 1981). Given the openness and the cost structure of the system, the alteration of the course structure will significantly affect the scale economies of the UT operational systems. Among innovative policies to reduce the unit cost by altering the structure of the UT courses are: (1) allowing transfer of the UT courses to the CU programs; (2) merging of the small (single) discipline course into a package of multi-discipline courses; and (3) reducing the frequency of course offering from twice to once a year.

A change in the operational systems obviously will face resistances as well as supports both from inside and out-side of the UT organization. The following lists indicates some of the organizational and non-organizational factors commonly become the sources of constraint and opportunity to implement change in the UT operational systems. Please indicate your opinion and provide some suggestions on alternative policies to sustain scale economies in the UT courses and programs.

****

Policy #1: To increase revenue by including the new high school graduates as a prime target group for the UT system.

Strategy: To provide intensive student support services which are familiar to the CU students.

****

A. Source of Constraints:	Agree	Disagree:
1. Expensive initial costs (sunk costs)	___	___
2. Loss of personal or group benefits.	___	___
3. Creates instability in the existing system.	___	___
4. Simply impossible because no one expecting any change in the existing system.	___	___
5. The existing system is the best alternative.	___	___
6. It is against the standard operating procedures in distance education system.	___	___
7. It violates the agreement made with other universities.	___	___
8. Other (specify):_____ _____	___	___

B. Opportunities for Change:	Agree	Disagree
1. There are available resources from:		
(1) manpower:	___	___
(2) finance:	___	___
(3) law and regulation:	___	___
(4) technology and skills:	___	___
2. Dissatisfaction with the existing operating system.	___	___
3. It has been proposed by the campus universities	___	___
4. There are no sunk costs	___	___
5. All universities will increase their enrollment rates	___	___
6. Support from the Ministry of Education authorities	___	___
7. Others (specify) :_____ _____	___	___

C. Suggestions: Alternative strategies to increase the UT enrollments:

****
* *
* Policy #2: To reduce the unit cost per student by altering the *
* structure of the UT courses and programs. *
* *
* Strategies: (2.1) transferability of the UT courses/program for the CU *
* CU program(s); *
* (2.2) introduction of multi-disciplinary courses; *
* (2.3) reduction of course offering. *
* *
****

++++++++++
+ +
+ Strategy #2.1: Transferability of the UT course for the CU programs. +
+ +
++++++++++

A. Source of Constraints:	Agree	Disagree:
1. Expensive initial costs (sunk costs)	___	___
2. Loss of personal or group benefits.	___	___
3. Creates instability in the existing system.	___	___
4. Simply impossible because no one expecting any change in the existing system.	___	___
5. The existing system is the best alternative.	___	___
6. It is against the standard operating procedures in distance education system.	___	___
7. It violates the agreement made with other universities.	___	___

8. Others: (specify):_____ ___ ___
_____

B. Opportunities for Change:	Agree	Disagree
1. There are available resources from:		
(1) manpower:	___	___
(2) finance:	___	___
(3) law and regulation:	___	___
(4) technology and skills:	___	___
2. Dissatisfaction with the existing operating system.	___	___
3. It has been proposed by the campus universities	___	___
4. There are no sunk costs	___	___
5. All universities will increase their enrollment rates	___	___
6. Support from the Ministry of Education authorities	___	___
7. Others (specify) :_____	___	___
_____		

Strategy #2.2: Introduction of multi-disciplinary courses.

A. Source of Constraints:	Agree	Disagree:
1. Expensive sunk (initial) costs.	___	___
2. Loss of personal or group benefits.	___	___
3. Creates instability in the existing system.	___	___
4. Simply impossible because no one expecting any change in the existing system.	___	___
5. The existing system is the best alternative.	___	___
6. It is against the standard operating procedures in distance education system.	___	___
7. It violates the agreement made with other universities.	___	___
8. Others: (specify):_____	___	___
_____		

B. Opportunities for Change:	Agree	Disagree
1. There are available resources from:		
(1) manpower:	___	___
(2) finance:	___	___
(3) law and regulation:	___	___
(4) technology and skills:	___	___

2. Dissatisfaction with the existing operating system.	___	___
3. It has been proposed by the campus universities	___	___
4. There are no sunk costs	___	___
5. All universities will increase their enrollment rates	___	___
6. Support from the Ministry of Education authorities	___	___
7. Others (specify) :_____ _____	___	___

Strategy #2.3: Reduction of selected of course offerings from twice to once a year.

A. Source of Constraints:	Agree	Disagree:
1. Expensive initial costs (sunk costs)	___	___
2. Loss of personal or group benefits.	___	___
3. Creates instability in the existing system.	___	___
4. Simply impossible because no one expecting any change in the existing system.	___	___
5. The existing system is the best alternative.	___	___
6. It is against the standard operating procedures in distance education system.	___	___
7. It violates the agreement made with other universities.	___	___
8. Others: (specify):_____ _____	___	___

B. Opportunities for Change:	Agree	Disagree
1. There are available resources from:		
(1) manpower:	___	___
(2) finance:	___	___
(3) law and regulation:	___	___
(4) technology and skills:	___	___
2. Dissatisfaction with the existing operating system.	___	___
3. It has been proposed by the campus universities	___	___
4. There are no sunk costs	___	___
5. All universities will	___	___

increase their enrollment rates		
6. Support from the Ministry of Education authorities	___	___
7. Others (specify) :_____	___	___
_____		

C. Suggestions: Alternative strategies to reduce the unit cost of the UT courses and programs:

D. Other suggestions on alternative operational policies to sustain scale economies in the UT system.

Thanks you for your participation in this study.
Ibrahim Musa

APPENDIX: F

NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
1	MKDU4101	MKDU	2	11896	7177	8647	5007	3833	36560	7312
2	MKDU4102	MKDU	2	10633	4150	3756	1872	2368	22779	4556
3	MKDU4103	MKDU	2	874	588	650	326	276	2714	543
4	MKDU4104	MKDU	2	4033	6935	6292	3454	2581	23295	4659
5	MKDU4105	MKDU	2	7404	6439	6408	3361	3478	27090	5418
6	MKDU4106	MKDU	2	8394	5892	6612	3603	3662	28163	5633
7	MKDU4107	MKDU	3	4794	5025	3827	1707	2001	17354	3471
8	MKDU4201	MKDU	2	6635	7208	6616	3112	2409	25980	5196
9	MKDU4202	MKDU	2	860	921	784	458	329	3352	670
10	MKDU4203	MKDU	2	519	449	526	227	152	1873	375
11	MKDU4204	MKDU	2	161	143	134	69	36	543	109
12	MKDU4205	MKDU	2	65	39	73	36	28	241	48
	TOTAL MKDU:		25	56268	44966	44325	23232	21153	189944	37989
	AVERAGE:		2	4689	3747	3694	1936	1763	15829	3166
	STD:		0	4094	2932	3018	1653	1449	12640	2528
	MAX:		3	11896	7208	8647	5007	3833	36560	7312
	MIN:		2	65	39	73	36	28	241	48
13	ADNE4110	MKDK	3	5300	4589	3546	1282	1198	15915	3183
14	ADNE4111	MKDK	3	5193	5337	2718	917	867	15032	3006
15	ADNE4130	MKDK	3	3588	8141	4447	1727	1686	19589	3918
16	ADNE4210	MKDK	2	2491	3260	2045	646	503	8945	1789
17	ADNE4211	MKDK	2	5975	4928	2625	863	822	15213	3043
18	ADNE4212	MKDK	4	0	0	0	15	161	176	35
19	ADNE4213	MKDK	3	630	9813	4833	1290	1101	17767	3553
20	ADNE4214	MKDK	3	8596	4975	4064	1907	2224	21766	4353
21	ADNE4215	MKDK	3	6089	4548	3252	1115	1130	16134	3227
22	ADNE4216	MKDK	3	9598	5343	3266	1009	769	19985	3997
23	ADNE4217	MKDK	3	2	0	608	1509	1526	3645	729
24	ADNE4218	MKDK	3	3784	4545	2631	828	763	12551	2510
25	ADNE4221	MKDK	2	322	2278	2382	718	601	6301	1260
26	ADNE4230	MKDK	2	2862	1627	1251	472	359	6571	1314
27	ADNE4310	MKDK	3	3492	4236	2855	908	753	12244	2449
28	ADNE4330	MKDK	4	9871	3272	2373	829	870	17215	3443
29	ADNE4331	MKDK	3	0	0	4402	1630	1419	7451	1490
30	ADNE4332	MKDK	3	2889	5370	5634	3145	2220	19258	3852
	TOTAL MKDK-FISIP:		52	70682	72362	52932	20810	18972	235758	47152
	AVERAGE:		3	3927	4020	2941	1156	1054	13098	2620
31	ADNE4333	MKK	3	4159	4862	2768	687	563	13039	2608
32	ADNE4334	MKK	3	13	982	866	281	243	2385	477
33	ADNE4335	MKK	3	186	0	895	2799	2923	6803	1361
34	ADNE4410	MKK	3	12	0	5416	1965	1784	9177	1835
35	ADNE4430	MKK	2	447	1542	1143	348	264	3744	749
36	ADNE4431	MKK	3	34	5678	5046	1179	955	12892	2578
37	ADNE4433	MKK	3	0	175	1006	406	352	1939	388

APPENDIX: F

NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
38	ADNE4435	MKK	3	2	125	1180	427	451	2185	437
39	ADNE4436	MKK	3	1	0	0	79	413	493	99
40	ADNE4438	MKK	5	10	0	2642	1242	1153	5047	1009
41	ADNE4440	MKK	3	7	0	1104	405	416	1932	386
42	ADNE4442	MKK	3	0	4	635	1435	1154	3228	646
43	ADNE4500	MKK	3	1020	1061	479	179	120	2859	572
44	ADNE4510	MKK	3	0	0	0	1	8	9	2
45	ADNE4531	MKK	2	6	514	432	184	155	1291	258
46	ADNE4532	MKK	2	7	358	1919	741	865	3890	778
47	ADNE4533	MKK	3	0	0	77	179	231	487	97
48	ADNE4534	MKK	3	3	0	4135	1584	1149	6871	1374
49	ADNE4535	MKK	3	27	0	119	507	710	1363	273
50	ADNI4110	MKK	3	0	0	662	2042	2013	4717	943
51	ADNI4130	MKK	3	5707	4158	4653	2742	1962	19222	3844
52	ADNI4210	MKK	3	1224	894	1096	609	524	4347	869
53	ADNI4211	MKK	2	42	3271	2554	653	616	7136	1427
54	ADNI4230	MKK	3	4702	4116	2079	584	524	12005	2401
55	ADNI4310	MKK	3	12	5196	4706	1114	823	11851	2370
56	ADNI4330	MKK	3	375	7148	4337	1142	867	13869	2774
57	ADNI4331	MKK	3	2	0	11	35	63	111	22
58	ADNI4332	MKK	3	2983	1343	919	271	216	5732	1146
59	ADNI4333	MKK	3	19	1775	1405	438	378	4015	803
60	ADNI4335	MKK	3	32	0	1292	429	382	2135	427
61	ADNI4410	MKK	3	0	0	1	13	22	36	7
62	ADNI4431	MKK	3	3	0	33	83	111	230	46
63	ADNI4432	MKK	3	0	100	1268	729	904	3001	600
64	ADNI4433	MKK	3	1	0	1413	517	470	2401	480
65	ADNI4435	MKK	3	1	0	10	53	88	152	30
66	ADNI4500	MKK	2	0	0	12	19	30	61	12
67	ADNI4510	MKK	3	0	0	295	827	1013	2135	427
68	ADNI4530	MKK	3	6189	4828	3540	1103	837	16487	3299
69	ADNI4531	MKK	4	42	3119	2568	805	661	7195	1439
70	ADNI4532	MKK	3	3	0	4632	1734	1152	7521	1504
71	ADNI4534	MKK	2	8	20	216	113	112	469	94
72	ADNI4535	MKK	3	7695	5348	2878	847	721	17489	3498
73	ADNI4538	MKK	2	12	1	2445	1089	1023	4570	914
74	ADPE4210	MKK	2	2439	2406	1519	463	338	7165	1433
75	ADPE4211	MKK	4	13	2455	2351	647	549	6015	1203
76	ADPE4330	MKK	3	6491	5487	3506	935	693	17112	3422
77	ADPE4332	MKK	2	4	0	4	17	52	77	15
78	ADPE4433	MKK	3	5657	3934	2099	702	676	13068	2614
79	ADPE4435	MKK	2	399	932	461	144	94	2030	406
80	ADPE4437	MKK	3	158	1104	852	291	97	2502	500
81	ADPE4438	MKK	2	0	0	25	42	25	92	18
82	ADPE4532	MKK	4	10	1697	1317	326	207	3557	711
83	ADPE4533	MKK	2	6	23	99	38	33	199	40
84	PAJA3131	MKK	3	178	5897	3613	1047	876	11611	2322
85	PAJA3230	MKK	4	0	12	43	22	25	102	20

APPENDIX: F

NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
86	PAJA3231	MKK	2	4573	4316	2186	667	603	12345	2469
87	PAJA3232	MKK	2	0	0	0	1	11	12	2
88	PAJA3233	MKK	3	1142	1155	742	252	270	3561	712
89	PAJA3235	MKK	2	0	0	241	193	179	613	123
90	PAJA3333	MKK	2	6	896	783	212	135	2032	406
91	PAJA3335	MKK	3	0	57	468	144	130	799	160
92	PAJA3336	MKK	3	3	0	582	1595	1602	3782	756
93	PAJA3337	MKK	2	738	2836	2431	741	640	7386	1477
94	PAJA3338	MKK	3	2229	963	777	233	206	4408	882
95	PAJA3339	MKK	3	0	0	686	1942	950	3578	716
96	PAJA3345	MKK	3	0	1	4134	1546	1215	6896	1379
97	PAJA3430	MKK	3	0	0	866	278	291	1435	287
	TOTAL MKK-FISIP:		190	59032	90789	102672	45097	39318	336908	67382
	AVERAGE:		3	868	1335	1510	663	578	4955	991
	TOTAL FISIP:		242	128714	163151	155604	65907	58290	572666	114533
	AVERAGE:		3	1526	1919	1831	775	686	6737	1347
	STD:		1	2533	2361	1586	682	591	6183	1237
	MAX:		5	9871	9913	5634	3145	2923	21766	4353
	MIN:		2	0	0	0	1	8	9	2
98	EKON4110	MKDK	3	48	0	0	0	0	48	10
99	EKON4111	MKDK	3	1235	2617	1600	662	672	6786	1357
100	EKON4112	MKDK	3	2223	2332	1855	730	930	8070	1614
101	EKON4113	MKDK	3	2520	2631	2011	759	680	8601	1720
102	EKON4210	MKDK	3	1436	1201	1201	637	483	4958	992
103	EKON4211	MKDK	2	16	747	670	288	284	2005	401
104	EKON4212	MKDK	3	3744	1391	1206	534	558	7433	1487
105	EKON4213	MKDK	3	0	0	120	94	85	299	60
106	EKON4214	MKDK	3	3843	1870	1262	522	656	8153	1631
107	EKON4215	MKDK	3	169	1949	1188	401	342	4049	810
108	EKON4216	MKDK	3	3076	3541	4317	2372	2183	15489	3098
109	EKON4218	MKDK	3	18	41	338	161	176	734	147
110	EKON4219	MKDK	3	2493	769	441	156	127	3986	797
111	EKON4231	MKDK	3	21	267	570	261	214	1333	267
112	EKON4310	MKDK	3	310	1401	648	202	191	2752	550
113	EKON4330	MKDK	3	2451	1268	1006	393	362	5480	1096
114	EKON4331	MKDK	3	6303	3547	1678	689	806	13023	2605
115	EKON4332	MKDK	3	2161	1790	2916	1667	1544	10078	2016
	TOTAL MKDK FEKON:		53	32067	27362	23027	10528	10293	103277	20655
	AVERAGE:		3	1782	1520	1279	585	572	5738	1148
116	EKON4333	MKK	3	4	0	1186	398	365	1953	391
117	EKON4334	MKK	3	4439	1021	670	207	199	6536	1307
118	EKON4335	MKK	3	2251	1526	1054	301	215	5347	1069
119	EKON4336	MKK	3	0	0	0	24	163	187	37

APPENDIX: F

NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
120	EKON4337	MKK	3	225	3180	1311	424	376	5516	1103
121	EKON4430	MKK	3	7	486	578	243	223	1537	307
122	EKON4431	MKK	3	42	404	1075	323	337	2181	436
123	EKON4432	MKK	3	174	3886	2811	876	810	8557	1711
124	EKON4433	MKK	3	944	2096	979	319	263	4601	920
125	EKON4434	MKK	3	0	0	84	96	84	264	53
126	EKON4435	MKK	3	10	1405	990	346	310	3061	612
127	EKON4436	MKK	3	1	89	217	129	120	556	111
128	EKON4437	MKK	3	7	1981	932	278	262	3460	692
129	EKON4438	MKK	3	1	0	58	160	337	556	111
130	EKON4439	MKK	3	4102	1420	689	206	156	6573	1315
131	EKON4440	MKK	3	2	0	158	104	100	364	73
132	EKON4441	MKK	3	11	2196	990	309	293	3799	760
133	EKON4500	MKK	3	1	0	135	109	134	379	76
134	EKON4510	MKK	3	0	123	478	176	169	946	189
135	EKON4530	MKK	3	0	586	1477	607	618	3288	658
136	EKON4533	MKK	3	5	495	1381	448	427	2756	551
137	EKON4534	MKK	3	0	30	351	155	218	754	151
138	EKON4535	MKK	3	1	0	522	701	553	1777	355
139	EKON4536	MKK	3	0	0	196	109	118	423	85
140	EKON4537	MKK	3	1	590	1341	357	290	2579	516
141	EKON4538	MKK	3	0	0	33	86	137	256	51
142	EKON4539	MKK	3	0	0	374	476	428	1278	256
143	MANA4110	MKK	3	0	0	14	55	70	139	28
144	MANA4210	MKK	3	1182	1505	539	176	162	3564	713
145	MANA4211	MKK	3	0	217	1445	504	652	2818	564
146	MANA4231	MKK	3	2006	524	248	100	106	2984	597
147	MANA4232	MKK	3	2	0	0	26	227	255	51
148	MANA4313	MKK	3	6	0	1366	471	388	2231	446
149	MANA4331	MKK	3	0	0	0	7	70	77	15
150	MANA4332	MKK	3	9	1477	1130	343	354	3313	663
151	MANA4333	MKK	3	0	9	98	59	43	209	42
152	MANA4334	MKK	3	4	0	447	546	449	1446	289
153	MANA4335	MKK	3	0	0	190	116	107	413	83
154	MANA4336	MKK	3	0	0	12	48	92	152	30
155	MANA4337	MKK	3	2	60	136	90	65	353	71
156	MANA4430	MKK	3	0	0	422	563	514	1499	300
157	MANA4431	MKK	3	1	0	283	178	225	687	137
158	MANA4432	MKK	3	4	0	938	325	295	1562	312
159	MANA4433	MKK	3	0	0	32	81	128	241	48
160	MANA4434	MKK	3	237	1264	979	362	301	3143	629
161	MANA4435	MKK	3	1	0	0	9	70	80	16
162	MANA4436	MKK	3	1	0	1372	482	363	2218	444
163	MANA4437	MKK	3	0	0	0	5	86	91	18
164	MANA4438	MKK	3	3	0	1316	434	371	2124	425
165	MANA4439	MKK	3	1	0	39	106	122	268	54
166	MANA4440	MKK	3	208	2149	905	259	299	3820	764
167	MANA4441	MKK	3	2	0	37	128	163	330	66

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NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
168	MANA4442	MKK	3	2	416	926	314	341	1999	400
169	MANA4531	MKK	3	8	530	1356	369	297	2560	512
170	MANA4532	MKK	3	1	0	1241	486	369	2097	419
171	MANA4534	MKK	3	0	30	286	121	109	546	109
	TOTAL MKK-FEKON:		168	15908	29695	35827	14730	14543	110703	22141
	AVERAGE:		3	284	530	640	263	260	1977	395
	TOTAL FEKON:		221	47975	57057	58854	25258	24836	213980	42796
	AVERAGE:		3	648	771	795	341	336	2892	578
	STD:		0	1309	1024	766	354	328	3122	624
	MAX:		3	6303	3886	4317	2372	2183	15489	3098
	MIN:		2	0	0	0	0	0	48	10
172	MATK4110	MKDK	3	4	413	375	97	83	972	194
173	MATK4111	MKDK	3	1240	254	165	57	41	1757	351
174	MATK4112	MKDK	4	0	100	158	60	55	373	75
175	MATK4113	MKDK	3	0	194	185	59	67	505	101
176	MATK4211	MKDK	2	1	5	91	55	56	208	42
177	MATK4212	MKDK	3	1031	442	302	128	102	2005	401
178	MATK4213	MKDK	3	367	433	218	70	64	1152	230
179	MATK4215	MKDK	4	435	334	412	205	179	1565	313
180	MATK4216	MKDK	3	0	109	101	49	49	308	62
181	MATK4310	MKDK	3	491	473	321	122	102	1509	302
182	MATK4312	MKDK	3	227	298	413	202	174	1314	263
183	MATK4314	MKDK	3	1340	453	210	74	63	2140	428
184	MATK4330	MKDK	3	10	401	211	58	64	744	149
185	MATK4331	MKDK	3	690	516	462	250	219	2137	427
186	MATK4332	MKDK	3	714	234	175	87	74	1284	257
187	MATK4333	MKDK	3	71	242	254	88	94	749	150
188	MATK4431	MKDK	3	5	0	5	33	25	68	14
189	MATK4432	MKDK	3	586	368	376	192	161	1683	337
190	MATK4434	MKDK	3	0	72	142	60	59	333	67
191	MATK4531	MKDK	3	146	227	212	80	100	765	153
192	STAT4110	MKDK	3	237	145	145	55	51	633	127
193	STAT4111	MKDK	3	707	123	152	39	53	1074	215
194	STAT4112	MKDK	3	314	434	196	61	41	1046	209
195	STAT4113	MKDK	2	545	180	174	58	82	1039	208
196	STAT4210	MKDK	3	0	0	0	2	20	22	4
197	STAT4211	MKDK	3	193	268	156	63	61	741	148
	TOTAL MKDK-FMIPA:		78	9354	6718	5611	2304	2139	26126	5225
	AVERAGE:		3	360	258	216	89	82	1005	201
198	STAT4212	MKK	3	1092	472	208	67	59	1898	380
199	STAT4213	MKK	3	0	0	110	128	134	372	74
200	STAT4214	MKK	3	1	0	4	18	18	41	8
201	STAT4215	MKK	3	0	0	150	75	80	305	61

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NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
202	STAT4230	MKK	3	299	220	236	83	102	940	188
203	STAT4231	MKK	3	2	23	340	117	74	556	111
204	STAT4310	MKK	3	0	0	0	5	23	28	6
205	STAT4311	MKK	3	0	0	278	110	98	486	97
206	STAT4312	MKK	3	0	0	10	14	6	30	6
207	STAT4330	MKK	3	1	230	338	83	71	723	145
208	STAT4331	MKK	3	894	548	312	96	85	1935	387
209	STAT4332	MKK	3	0	23	0	0	0	23	5
210	STAT4333	MKK	3	2	0	42	184	183	411	82
211	STAT4334	MKK	3	0	72	161	70	68	371	74
212	STAT4335	MKK	3	245	502	269	88	57	1161	232
213	STAT4410	MKK	3	0	59	234	119	105	517	103
214	STAT4430	MKK	3	2	61	92	53	27	235	47
215	STAT4431	MKK	3	1	0	100	115	110	326	65
216	STAT4432	MKK	3	1	0	298	95	75	469	94
217	STAT4433	MKK	3	0	199	293	91	102	685	137
218	STAT4434	MKK	3	0	0	3	18	17	38	8
219	STAT4435	MKK	3	0	0	168	74	106	348	70
220	STAT4436	MKK	3	0	0	0	2	10	12	2
221	STAT4437	MKK	4	5	0	0	5	43	53	11
222	STAT4438	MKK	3	587	558	330	97	84	1656	331
223	STAT4510	MKK	3	3	0	0	0	0	3	1
224	STAT4530	MKK	3	421	609	369	68	72	1539	308
225	STAT4531	MKK	3	2	0	8	33	32	75	15
226	STAT4532	MKK	3	17	576	393	117	109	1212	242
227	STAT4533	MKK	3	0	0	135	140	133	408	82
228	STAT4535	MKK	3	0	0	0	2	23	25	5
229	FISA4110	MKK	3	0	0	35	27	8	70	14
230	FISA4310	MKK	3	4	290	319	102	73	788	158
231	KIMA4110	MKK	3	3	59	257	117	98	534	107
232	KIMA4111	MKK	3	190	311	185	62	69	817	163
233	KIMA4310	MKK	3	0	0	21	13	16	50	10
234	BIOL4310	MKK	3	0	48	83	37	26	194	39
	TOTAL MKK-FMIPA		112	3772	4860	5781	2525	2396	19334	3867
	AVERAGE:		3	102	131	156	68	65	523	105
	TOTAL FMIPA:		190	13126	11578	11392	4829	4535	45460	9092
	AVERAGE:		3	208	184	181	77	72	722	144
	STD:		0	341	194	129	53	46	618	124
	MAX:		4	1340	609	462	250	219	2140	428
	MIN:		2	0	0	0	0	0	3	1
235	DKEP2210	MKDK	2	375	755	818	278	236	2462	492
236	DKEP2211	MKDK	2	245	721	687	196	182	2031	406
237	DKEP2212	MKDK	2	522	817	818	279	241	2677	535
	TOTAL MKDK-FKIP:		6	1142	2293	2323	753	659	7170	1434

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No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
	AVERAGE:		2	381	764	774	251	220	2390	478
238	PBIO4430	MKK	2	91	324	132	61	38	646	129
239	PBIO4431	MKK	2	132	351	167	65	198	913	183
240	PBIO4432	MKK	2	0	4	18	1	3	26	5
241	PBIO4433	MKK	3	497	190	100	36	121	944	189
242	PBIO4434	MKK	2	73	271	307	81	69	801	160
243	PBIO4435	MKK	2	154	219	239	78	103	793	159
244	PBIO4436	MKK	2	80	170	186	37	36	509	102
245	PBIO4437	MKK	2	154	176	163	65	76	634	127
246	PBIO4438	MKK	2	379	253	211	64	194	1101	220
247	PBIO4439	MKK	2	554	330	223	78	91	1276	255
248	PBIO4440	MKK	2	0	0	11	6	1	18	4
249	PBIO4441	MKK	2	874	1238	602	212	206	3132	626
250	PBIO4442	MKK	2	648	213	164	141	140	1306	261
251	PBIO4443	MKK	2	4	582	227	119	92	1024	205
252	PBIO4470	MKK	2	3	50	35	15	11	114	23
253	PBIO4500	MKK	2	0	201	161	108	93	563	113
254	PFIS4430	MKK	3	611	236	173	150	160	1330	266
255	PFIS4431	MKK	2	130	406	277	57	62	932	186
256	PFIS4432	MKK	2	0	6	6	0	0	12	2
257	PFIS4433	MKK	3	7	139	130	85	58	419	84
258	PFIS4434	MKK	3	76	408	201	103	91	879	176
259	PFIS4435	MKK	3	234	238	100	31	44	647	129
260	PFIS4436	MKK	3	0	12	24	9	2	47	9
261	PFIS4437	MKK	3	63	141	146	52	62	464	93
262	PFIS4438	MKK	2	163	154	73	20	20	430	86
263	PFIS4439	MKK	2	104	195	171	83	67	620	124
264	PFIS4470	MKK	3	31	22	10	3	5	71	14
265	PFIS4500	MKK	2	340	166	131	68	56	761	152
266	PINA2230	MKK	2	50	73	52	20	14	209	42
267	PINA2231	MKK	2	139	81	132	18	17	387	77
268	PINA2232	MKK	3	1	11	19	3	7	41	8
269	PINA2233	MKK	2	664	387	216	63	76	1406	281
270	PINA2234	MKK	2	114	142	58	19	14	347	69
271	PINA2235	MKK	2	45	343	236	99	224	947	189
272	PINA2236	MKK	3	0	9	9	1	0	19	4
273	PINA2238	MKK	2	794	764	290	113	222	2183	437
274	PINA2240	MKK	2	209	158	60	19	20	466	93
275	PINA2241	MKK	2	81	370	210	87	205	953	191
276	PINA2242	MKK	2	1	26	5	2	1	35	7
277	PINA2270	MKK	2	33	355	272	71	210	941	188
278	PINA2272	MKK	2	383	385	328	215	186	1497	299
279	PINA4430	MKK	2	224	272	156	33	62	747	149
280	PINA4431	MKK	2	1	361	240	150	143	895	179
281	PINA4432	MKK	2	28	504	208	129	135	1004	201
282	PINA4433	MKK	2	269	235	210	130	148	992	198
283	PINA4434	MKK	4	0	0	350	94	82	526	105

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No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
284	PINA4436	MKK	3	169	273	182	57	62	743	149
285	PINA4437	MKK	2	338	344	181	124	122	1109	222
286	PINA4438	MKK	2	114	244	204	101	81	744	149
287	PINA4440	MKK	3	619	126	141	88	98	1072	214
288	PINA4441	MKK	2	306	134	126	57	98	721	144
289	PINA4442	MKK	3	15	530	250	171	162	1128	226
290	PINA4443	MKK	2	7	117	139	29	23	315	63
291	PINA4470	MKK	2	74	568	270	113	104	1129	226
292	PINA4471	MKK	2	227	161	135	54	96	673	135
293	PING2230	MKK	2	174	82	120	24	15	415	83
294	PING2231	MKK	2	101	127	62	20	29	339	68
295	PING2232	MKK	2	211	121	100	37	36	505	101
296	PING2233	MKK	2	160	178	176	63	107	684	137
297	PING2234	MKK	2	243	537	221	107	95	1203	241
298	PING2235	MKK	2	0	146	275	62	88	571	114
299	PING2236	MKK	2	143	223	79	37	32	514	103
300	PING2237	MKK	2	631	267	167	52	53	1170	234
301	PING2238	MKK	2	254	100	48	15	14	431	86
302	PING2239	MKK	2	3	569	219	121	103	1015	203
303	PING2240	MKK	2	37	79	53	15	9	193	39
304	PING2271	MKK	2	782	214	92	37	56	1181	236
305	PING2272	MKK	2	666	616	383	177	26	1868	374
306	PING4430	MKK	2	8	281	132	40	37	498	100
307	PING4431	MKK	2	317	247	172	46	32	814	163
308	PING4432	MKK	3	449	325	134	50	45	1003	201
309	PING4433	MKK	2	227	372	294	193	179	1265	253
310	PING4434	MKK	2	463	527	403	195	125	1713	343
311	PING4435	MKK	2	344	283	268	152	112	1159	232
312	PING4436	MKK	2	676	250	175	61	50	1212	242
313	PING4437	MKK	2	123	446	427	280	226	1502	300
314	PING4438	MKK	2	384	170	185	55	53	847	169
315	PING4441	MKK	2	497	511	350	191	158	1707	341
316	PING4442	MKK	2	463	234	100	32	42	871	174
317	PING4443	MKK	2	237	278	309	176	182	1182	236
318	PING4444	MKK	3	7	329	280	123	106	845	169
319	PING4445	MKK	2	7	151	194	65	37	454	91
320	PING4446	MKK	2	29	102	67	27	18	243	49
321	PING4447	MKK	2	504	412	216	104	110	1346	269
322	PING4448	MKK	2	287	224	144	62	72	789	158
323	PING4449	MKK	2	376	498	316	161	138	1489	298
324	PING4470	MKK	3	603	1241	519	187	172	2722	544
325	PING4471	MKK	2	0	0	7	35	164	206	41
326	PING4500	MKK	2	222	154	63	22	26	487	97
327	PIPA2230	MKK	2	1	69	101	36	23	230	46
328	PIPA2231	MKK	2	5	86	143	40	35	309	62
329	PIPA2232	MKK	2	521	400	225	59	85	1290	258
330	PIPA2233	MKK	2	481	272	296	212	184	1445	289
331	PIPA2234	MKK	3	122	323	289	75	98	907	181

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No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
332	PIPA2235	MKK	2	2	117	140	42	34	335	67
333	PIPA2236	MKK	3	103	170	137	56	48	514	103
334	PIPA2237	MKK	3	649	401	368	151	167	1736	347
335	PIPA2238	MKK	2	0	3	40	20	21	84	17
336	PIPA2239	MKK	2	0	1	52	15	15	83	17
337	PIPA2270	MKK	3	39	331	91	38	33	532	106
338	PIPA2271	MKK	2	418	400	270	151	110	1349	270
339	PIPA2272	MKK	2	12	292	113	33	43	493	99
340	PIPA2273	MKK	3	7	368	218	136	141	870	174
341	PIPA4430	MKK	2	96	158	122	101	98	575	115
342	PIPA4431	MKK	2	151	85	74	33	67	410	82
343	PIPA4432	MKK	2	89	124	49	15	16	293	59
344	PIPA4433	MKK	2	483	260	139	110	97	1089	218
345	PIPA4434	MKK	3	453	170	91	43	47	804	161
346	PIPS2230	MKK	3	460	223	98	33	51	865	173
347	PIPS2231	MKK	2	49	144	104	38	116	451	90
348	PIPS2232	MKK	2	92	146	121	50	59	468	94
349	PIPS2233	MKK	2	394	132	98	23	35	682	136
350	PIPS2234	MKK	2	44	281	173	122	103	723	145
351	PIPS2235	MKK	2	241	151	88	23	33	536	107
352	PIPS2236	MKK	3	67	485	140	45	54	791	158
353	PIPS2237	MKK	2	26	54	18	1	9	108	22
354	PIPS2238	MKK	3	43	13	3	2	1	62	12
355	PIPS2239	MKK	2	23	13	7	3	0	46	9
356	PIPS2270	MKK	3	38	14	3	1	0	56	11
357	PIPS2271	MKK	2	41	751	355	87	69	1303	261
358	PIPS2272	MKK	3	35	17	6	4	2	64	13
359	PKIM4430	MKK	3	808	538	270	86	73	1775	355
360	PKIM4431	MKK	3	1	14	9	2	0	26	5
361	PKIM4432	MKK	3	806	580	410	141	150	2087	417
362	PKIM4433	MKK	3	26	16	5	1	1	49	10
363	PKIM4434	MKK	2	197	182	147	130	52	708	142
364	PKIM4435	MKK	3	30	17	2	2	3	54	11
365	PKIM4436	MKK	3	52	112	129	63	61	417	83
366	PKIM4437	MKK	3	1	16	10	0	2	29	6
367	PKIM4438	MKK	2	616	170	102	43	35	966	193
368	PKIM4439	MKK	3	0	8	4	1	0	13	3
369	PKIM4470	MKK	2	184	231	137	48	52	652	130
370	PKIM4500	MKK	3	27	18	15	6	3	69	14
371	PLUS2230	MKK	2	11	187	174	78	115	565	113
372	PLUS2231	MKK	2	0	4	11	5	3	23	5
373	PLUS2232	MKK	2	195	396	273	85	76	1025	205
374	PLUS2233	MKK	2	548	494	255	85	105	1487	297
375	PLUS2234	MKK	3	272	95	89	90	97	643	129
376	PLUS2235	MKK	3	545	182	180	142	149	1198	240
377	PLUS2236	MKK	3	183	65	69	35	74	426	85
378	PLUS2237	MKK	2	422	160	115	65	58	820	164
379	PLUS2238	MKK	3	164	106	118	47	49	484	97

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No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
380	PLUS2239	MKK	2	535	177	144	135	136	1127	225
381	PLUS2240	MKK	2	497	157	104	36	120	914	183
382	PLUS2241	MKK	3	149	175	143	120	95	682	136
383	PLUS2242	MKK	2	75	69	38	10	5	197	39
384	PLUS2243	MKK	3	424	136	160	66	67	853	171
385	PLUS2244	MKK	3	282	132	120	105	96	735	147
386	PLUS2245	MKK	2	308	110	57	27	30	532	106
387	PLUS2246	MKK	2	211	402	369	131	159	1272	254
388	PLUS2271	MKK	2	21	346	207	145	142	861	172
389	PLUS2272	MKK	3	61	186	171	89	116	623	125
390	PLUS2273	MKK	2	489	425	280	204	185	1583	317
391	PMAT2230	MKK	2	699	493	285	127	170	1774	355
392	PMAT2231	MKK	2	392	175	116	56	63	802	160
393	PMAT2232	MKK	2	7	12	7	5	1	32	6
394	PMAT2233	MKK	2	1	17	11	1	2	32	6
395	PMAT2234	MKK	3	12	209	112	98	93	524	105
396	PMAT2235	MKK	2	397	419	198	70	78	1162	232
397	PMAT2236	MKK	3	123	104	92	41	118	478	96
398	PMAT2237	MKK	2	199	217	136	57	59	668	134
399	PMAT2238	MKK	3	1	15	12	2	5	35	7
400	PMAT2239	MKK	2	388	108	161	52	64	773	155
401	PMAT2270	MKK	2	186	164	168	82	118	718	144
402	PMAT2271	MKK	2	29	58	47	11	11	156	31
403	PMAT2272	MKK	2	436	665	224	62	68	1455	291
404	PMAT4430	MKK	2	20	243	203	65	61	592	118
405	PMAT4431	MKK	2	3	200	198	64	65	530	106
406	PMAT4432	MKK	3	155	84	128	81	59	507	101
407	PMAT4433	MKK	3	1200	529	290	97	73	2189	438
408	PMAT4434	MKK	2	33	702	329	133	185	1382	276
409	PMAT4435	MKK	4	0	22	15	2	3	42	8
410	PMAT4436	MKK	2	640	201	138	70	111	1160	232
411	PMAT4437	MKK	2	392	199	111	40	114	856	171
412	PMAT4438	MKK	3	831	548	308	163	159	2009	402
413	PMAT4439	MKPBM	2	18	216	161	39	55	489	98
414	PMAT4440	MKPBM	2	51	72	46	78	12	259	52
415	PMAT4441	MKPBM	4	0	31	64	28	28	151	30
416	PMAT4442	MKPBM	3	0	89	398	97	112	696	139
417	PMAT4443	MKPBM	2	19	9	12	5	3	48	10
418	PMAT4444	MKPBM	2	47	251	206	64	107	675	135
419	PMAT4446	MKPBM	2	22	632	318	138	105	1215	243
420	PMAT4470	MKPBM	2	19	183	171	38	35	446	89
421	PORK2230	MKPBM	2	760	328	185	99	152	1524	305
422	PORK2231	MKPBM	2	10	214	134	42	32	432	86
423	PORK2232	MKPBM	2	3	88	59	26	28	204	41
424	PORK2233	MKPBM	2	91	96	44	73	10	314	63
425	PORK2234	MKPBM	4	590	197	113	56	61	1017	203
426	PORK2235	MKPBM	2	20	40	75	25	16	176	35
427	PORK2236	MKPBM	2	370	586	406	130	99	1591	318

APPENDIX: F

NUMBER OF STUDENTS ENROLLED

No.	CODE	TYPE	SKS	1985/86	1986/87	1987/88	1988/89	1989/90	TOTAL 86-90	AVERAGE 86-90
428	PORK2237	MKPBM	4	397	93	54	38	40	622	124
429	PORK2238	MKPBM	2	239	141	22	3	3	408	82
430	PORK2270	MKPBM	3	1	10	4	1	1	17	3
431	PORK2271	MKPBM	4	19	13	11	2	1	46	9
432	PPMP2230	MKPBM	2	84	194	164	61	99	602	120
433	PPMP2231	MKPBM	3	0	0	7	2	2	11	2
434	PPMP2232	MKPBM	2	518	195	97	27	40	877	175
435	PPMP2233	MKPBM	2	2	5	5	1	0	13	3
436	PPMP2234	MKPBM	2	21	65	101	16	22	225	45
437	PPMP2235	MKPBM	2	171	140	53	20	29	413	83
438	PPMP2236	MKPBM	4	463	242	105	47	55	912	182
439	PPMP2237	MKPBM	4	1	197	206	55	66	525	105
440	PPMP2238	MKPBM	2	566	322	179	59	99	1225	245
441	PPMP2239	MKPBM	3	0	99	390	90	98	677	135
	TOTAL MKK/MKPBM-FKI		478	43906	46454	31385	13672	14751	150168	30034
	AVERAGE:		2	215	228	154	67	72	736	147
	TOTAL FKIP:		484	45048	48747	33708	14425	15410	157338	31468
	AVERAGE:		2	218	235	163	70	74	760	152
	STD:		1	239	208	133	58	60	574	115
	MAX:		4	1200	1241	818	280	241	3132	626
	MIN:		2	0	0	2	0	0	11	2
	TOTAL UT:		1162	292131	325499	303883	133651	124224	1179388	235878
	AVERAGE:		3	662	738	689	303	282	2674	535
	STD:		1	1653	1479	1228	579	512	4871	974
	MAX:		5	11896	9913	8647	5007	3833	36560	7312
	MIN:		2	0	0	0	0	0	3	1

GLOSSARY

BAAK	Biro Administrasi Akademik dan Kemahaisiswaan (The Office of Registrar).
BAPPENAS	Badan Perencanaan Pembangunan Nasional (The National Bureau for Planning and Development).
DI	Diploma I (Associate Degree Level I).
D2	Diploma II (Associate Degree Level II).
D3	Diploma III (Associate Degree Level III).
FEKON	Fakultas Ekonomi (School of Economics).
FISIP	Fakultas Ilmu Sosial dan Ilmu Politik (School of Social and Political Sciences).
FMIPA	Fakultas Matematik dan Ilmu Pengetahuan Alam (School of Mathematics and Physics).
FKIP	Fakultas Keguruan dan Ilmu Pendidikan (School of Education within the University System).
IKIP	Institute Keguruan dan Ilmu Pendidikan (The Post-Secondary Teacher Training College).
KANWIL-DEPDIKBUD	Kantor Wilayah Departement Pendidikan dan Kebudayaan (Office of Education in the region).
KOPERTIS	Koordinator Perguruan Tinggi Swasta (Coordinating Body for Private Universities).
MKDU	Mata Kuliah Dasar Umum (Fundamental courses).
MKDK	Mata Kuliah Dasar Keahlian (Pre-Core Courses).
MKK	Mata Kuliah Keahlian (Core and Area Concentration Courses).
MKPB	Mata Kuliah Pilihan Bebas (Elective Courses from MKK).
MKPBM	Mata Kuliah Praktek Belajar Mengajar (Teaching Practicum Courses).
S1	Sarjana 1 (First Degree Level).
SKS	Satuan Kredit Semester (Semester Credit Hours).
SPP/DPP	Sumbangan Pembinaan Pendidikan/Dana Pembinaan Pendidikan (Student Tuition).
UPBJJ	Unit Program Belajar Jarak Jauh (The UT Regional Office).
UT	Universitas Terbuka (the Indonesian Open University).