AN EVALUATION OF THE EFFICIENCY AND EFFECTIVENESS OF SOME HIGHER EDUCATION INSTITUTIONS IN INDONESIA

by

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ABSTRACT

This thesis postulates that evaluation is an important means to improve the efficiency and effectiveness of an institution of higher education. Three major problems addressed in the thesis are:

- how to assess or evaluate the efficiency and effectiveness of an institution of higher education,
- what variables account for the efficiency and effectiveness of an institution of higher education,
- how to improve the efficiency and effectiveness of an institution of higher education.

To investigate the problems, two kinds of data are collected from six state institutions of higher education in Indonesia. The first kind is the data collected by using questionnaires administered to students, teaching staff and administrators. The second kind is the data collected from the records available at the institutions under study. Data analyses are performed in accordance with the specific questions addressed. These culminate especially in factor analyses, regression and commonality analyses and path analyses.

The following major results are discussed:

- the main dimensions of student educational satisfaction,
- the important variables that account for and help explain student performance,
- the important variables that account for the efficiency and effectiveness of an institution of higher education,
- a set of general criteria with which to evaluate the efficiency and effectiveness of an institution of higher education,
- a parsimonious causal path model for evaluating the efficiency and effectiveness of an institution of higher education.

CERTIFICATE

I certify that the content of this thesis has not been submitted for a higher degree to any other University or Institution.

Agustiar

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CHAPTER 1

THE IMPORTANCE OF ACHIEVING EFFICIENCY AND EFFECTIVENESS IN THE OPERATION OF HIGHER EDUCATION INSTITUTIONS

This study is concerned with an evaluation of the efficiency and effectiveness of some higher education institutions in Indonesia. The results of the study are expected to be useful for the improvement of educational planning in Indonesian higher education especially. In view of previous studies of the performance of higher education institutions, Carlson (1976:1) states: "at the present time very little is known about how colleges and universities do whatever it is that they do. Even less is known about how efficiently and effectively institutions of higher education are performing a variety of activities". Kerr concludes: "the evaluation of higher education is as yet uncharted territory" (1973:143). These two opinions and others seem to indicate that the field to be studied here still lacks a substantial basis.

1.1 THE NEED FOR CONTINUOUS EVALUATION OF HIGHER EDUCATION

Higher education has been expanding over the years and more money is required to meet the rapid growth. Sadlak (1978:213) asserts as follows:

> The expansion of higher education in the 1960s and early 1970s led to some countries doubling and others trebling their student enrolment figures for higher education. It also led to increases in the funds and in the personnel allocated to higher education. Many commentators take the view that the present levels of support are unlikely to be raised further... It is in this context that the problem of efficiency in higher education becomes significant.

In the United States of America, for example, Harris (1972:13) states

that "over a period of almost 100 years, resident degree-credit enrollment rose 27 times as much as the number of institutions and 17 times as much as the number of degrees". With regard to the American higher educational system, Bowen and Douglass (1971:1-2) state as follows:

> There are problems and weaknesses in the American higher educational system of 1970, but it can only be described as a thriving, going concern. Since 1955, enrollments have risen from 2,800,000 to 7,800,000, total expenditures have increased more than fivefold from $4.1 billion to $22.5 billion and cost per student has risen from $929 to $1,865. ...
> But the financial burdens of colleges and universities are still growing. Enrollments are likely to increase from 7,800,000 in 1969-70 to 11,500,000 in 1980-81, and expenditures to double ...
> One approach to solving the problem is to improve the operating efficiency of colleges and universities.

Higher education in Indonesia has also grown rapidly. With respect to this rapid growth, Hayden (1969:496) asserts that "there has been a tremendous growth in institutions and enrolments ... Improvement in quality and efficiency are expected as a later development". Thomas (1973:13) points out that "the first steady growth of institutions did not begin until 1950 when peace prevailed and the Republic could focus its attention on internal development". Tisna Amidjaja and Sapi'e (1980:4) state that "the growth in the number of institutions could be largely explained as a response to the demand generated by the ever increasing number of high school graduates". They compare the situation in 1975 with that in the 1950's as follows:

> (1) The total number of students grows more than twenty five times, in twenty five years.
> (2) The number of public institutions of higher learning, grows more than twenty times.
> (3) The total number of private institutions grows to over more than 200 institutions, which none existed twenty five years ago.

(4) Within this same period, the total number of institutions of higher learning under the various ministeries and the armed forces, increases and diversifies.

Hayden (1969:496) asserts that "in comparison to enrolments, the number of graduates has been very small (in 1959/60 only 1.8 per cent of the total State university enrolment and 1.3 per cent of private and State university enrolment)", while an evaluation of higher education in Indonesia in 1975 shows that "statistical figures in 1975 indicate that the percentage of graduates to total enrolment of higher education institutions is equal to 5%, which is much lower than the target of 15% that is supposed to be fair and could be achieved" (Tisna Amidjaja, 1980:32).

Considering the scarcity of resources that can be used to conduct the operation of an institution of higher education, it is reasonable to say that an evaluation of its efficiency and effectiveness becomes necessary. Lelong (1971:204) states that "it has made unreplaced scholar-executives sensitive to the rumblings about inefficiency in higher education and has caused all executives to consider more deliberately their responsibilities for effective resource use".

With regard to available resources, Coombs and Hallak (1972:51) point out that "in coming years educational systems everywhere will find themselves increasingly squeezed between resource scarcities and rising unit costs". In a similar vein, Lindsay (1979:1-2) asserts "it is apparent that the situation in which the universities must operate for the foreseeable future will be characterised by constraints, possibly increasing in severity, and by strictly limited and probably declining resources". Given the inter-related difficulties of increasing demands and constraints on resources, regularly conducted evaluations become a

sine qua non for institutional administrators. Without these evaluations the two forces could not be balanced in appropriate ways.

Evaluation of higher education institutions has become even more important over the years and many evaluation studies have been considered to be useful for the improvement of certain institutional performances in higher education.

In his editor's introduction, Hunt (1961:ix) states that "it has long been recognized that evaluation, both in a broad sense and in more specialized application, is necessary if the complex processes of higher education are to be administered most efficiently, effectively, and economically", but "most evaluations have been concerned with individual measurement rather than with institutional measurement" (Pace, 1969: 674-675).

With respect to the importance of evaluation in higher education, Kerr (1973:145-146) asserts as follows:

> Higher education is now being assessed more intensely by more people in more countries than ever before.... Education in general, and higher education in particular, is more central to the life of all of a society than ever before and nobody wants to leave it alone, leave it unevaluated, particularly public authorities and students.

Dressel (1976:455) points out that "evaluation is based upon a higher commitment to efficiency and effectiveness in the attainment of specific objectives, which are themselves subject to review and alteration", while Bell (1972:43) asserts that "in an era of close public scrutiny, the American college or university faces the tasks of improving and demonstrating managerial efficiency".

Evaluation of higher education institutions could provide useful information for improving the performance of individuals and institutions. Dressel (1961:389) points out that surveys and studies of higher education

have "the purpose of providing evidence on the adequacy and effectiveness of the operation of a group of institutions". Miller (1979:ix) asserts as follows:

> Evaluation is a valuable means to the end of improving the performance of individuals and institutions. It facilitates progress toward goals and objectives, and it is essential for determining both efficiency and effectiveness. As society demands better-run and higher quality institutions, including colleges and universities, effective institutional administrators need to conduct repeated and continuing assessments and appraisals as part of decision making.

In view of the increasing concern with both the efficiency and the effectiveness of higher education institutions, Gray concludes: "Institutions are being called on to manage their resources more efficiently and at the same time they want, understandably, to conduct the educational process more effectively" (Southern Regional Education Board, 1975:7). This is not to ignore the fact that there are also people who are convinced that the concept of efficiency does not apply to education. Edding recognizes their view when he notes: "There is firmly held conviction among responsible people that the concept of efficiency does not apply to education" (1966:10).

In the light of all of these comments, it becomes very clear that there is great concern across a variety of people - and there has been for some considerable time - to improve both the efficiency and effectiveness of higher education institutions so that the demand for that form of education can be properly met by the available resources. As is shown later, studies of efficiency and effectiveness have not yet led to a thorough understanding of the underlying or background factors contributing to these qualities. The present study is conducted with the aspiration of attempting to clarify the nature of some of these

factors as well as the inter-relationships among them - at least in the Indonesian context.

1.2 THE PROBLEM STATEMENT

The resources that can be used to increase productivity and quality of higher education are scarce. An institution of higher education therefore has to use the limited resources available to increase its efficiency and effectiveness. Coombs (1970:78) states as follows:

> But the important conclusion is this: the central issue that virtually all educational systems now face is how to get bigger and better educational results from the resources already available, how, in other words, to improve their efficiency and productivity.

A single institution of higher education can be viewed as a system, which includes inputs, outputs and processes by which inputs are transformed into outputs. The input-process-output framework can be used in an evaluation of an institution of higher education to identify the main variables contributing to its efficiency and effectiveness and thereby to the improving of its performance. This evaluation can also be useful for the improvement of educational planning which has to give more attention to the efficiency and effectiveness in every aspect of the educational system. Unesco (1970:15) states: "Educational planning must sharpen its concepts and analytical instruments for examining the efficiency and productivity - and ways to improve both - in every aspects of the educational system".

The problem of higher education of concern here is how to evaluate its efficiency and effectiveness and ultimately this is most important for each single institution. Administrators who hold important positions in an institution of higher education, need to know many things

about the performance of their institution. To obtain information about that performance, it is necessary to make an evaluation of its efficiency and effectiveness. It might even be desirable, for example, to have an evaluation model which could be used within an institution to give an "annual check-up" of its efficiency and effectiveness. The basic issues surrounding this aspect can be stated as follows: Is it possible for an administrator to assess the efficiency and effectiveness of an institutior of higher education? How might the administrator evaluate the efficiency and effectiveness of an institution of higher education? This is the formal statement of the first research problem to be investigated in the present study.

There are many variables involved in the operation of an institution of higher education, but not all of these variables are appropriate or useful for evaluating the efficiency and effectiveness of the institution. It is, therefore, necessary to identify which variables contribute most significantly to efficiency and effectiveness. Hence, the second research problem can be stated as follows: What are the variables that account for the efficiency and effectiveness of an institution of higher education?

There are several alternative evaluation approaches available in higher education. Each has its own characteristics and so establishes a different framework for evaluation. In this study, the evaluation strategy adopted has a decision oriented nature. That is, the strategy aims to help the administrator by obtaining and providing useful information to allow a judgment to be made of the efficiency and effectiveness of an institution of higher education. The result of this evaluation is meaningful, if it can be used for the improvement of the

institutional operation. Therefore, the administrator should consider the alternative ways to improve the institutional performance on the basis of information available from research. The third research problem can now be stated as follows: How might the administrator improve the efficiency and effectiveness of an institution of higher education? What alternatives are available to him?

1.3 THE OBJECTIVES OF THE STUDY

The general aim of this study is to obtain a better understanding of the evaluation of the efficiency and effectiveness of an institution of higher education and to develop further the literature cited earlier on which this study has been founded. The more detailed objectives of the study are as follows:

- To develop an evaluation model which could be used to evaluate the efficiency and effectiveness of an institution of higher education. The development of the format through research would help to insure that the main variables are included; therefore, the model is to have an empirical basis for validating its further application. In other words, this study is expected to provide useful information for administrators about a model that could be used in evaluating institutional performance, especially its efficiency and effectiveness.

- To identify the main variables that contribute to the efficiency and effectiveness of an institution of higher education in Indonesia. In assessing the variables for explaining the institutional efficiency and effectiveness, an institution of higher education is viewed as a system and the input-process-output model is used for analysing its performance. The variables that contribute significantly to the efficiency and effectiveness are to be used in developing an evaluation model, while the variables that do not contribute significantly can be ignored and eliminated from the model.

- To identify ways which might lead to an improvement in the efficiency and effectiveness of an institution of higher education. In other words, this study is

expected to show administrators, who hold important positions in an institution of higher education, alternative ways to improve its efficiency and effectiveness.

1.4 THE SIGNIFICANCE OF THE STUDY

The available resources that can be used for increasing the quantity and quality of output of an institution of higher education are scarce. It is, therefore, important to determine that those resources which are available are used efficiently and effectively. It is hoped that this study will identify useful information to be used as feedback for the improvement of educational planning in higher education.

This study should provide administrators with information about criteria with which to evaluate the efficiency and effectiveness of an institution of higher education. The criteria might be used in developing policy on institutional evaluation of higher education, especially in Indonesia.

This study will also provide information about the possibility of assessing the efficiency and effectiveness of an institution of higher education. An input-process-output model of evaluation is developed which could be used to evaluate institutional efficiency and effectiveness in higher education.

The evaluation framework used in this study is decision oriented with the aim of providing useful information for the administrator about the way to improve the efficiency and effectiveness of an institution of higher education.

Finally, this study is expected to add some contributions to the aim of making an institution of higher education more effective and more efficient in its operation.

1.5 SUMMARY

The general aim of this study is to obtain a better insight on evaluation of the efficiency and effectiveness of an institution of higher education. The formal statement of problems to be investigated is as follows:

Problem 1: Is it possible for the administrator to assess the efficiency and effectiveness of an institution of higher education? How might the administrator evaluate the efficiency and effectiveness of an institution of higher education?

Problem 2: What are the variables that account for the efficiency and effectiveness of an institution of higher education?

Problem 3: How might the administrator improve the efficiency and effectiveness of an institution of higher education? What alternatives are available to him?

CHAPTER 2

REVIEW OF RELATED STUDIES

Many articles and books are available related to the theory and practice of evaluating an institution of higher education. Many of these have been helpful for administrators in their attempts to improve institutional performance. The present review is, of course, concerned with such research studies as these. It must however be confined to those studies of efficiency and effectiveness of higher education which concentrate on the aspects identified in Chapter 1 as being of central concern to the present study.

The necessity to distinguish between efficiency and effectiveness has been noted, for example by Norris (1978:2) who asserts that "a failure to distinguish between them goes beyond niceties of language usage. It can lead to misdirected effort and inappropriate attention. Effectiveness is doing the right thing while efficiency is doing the thing right". Such a distinction is also considered necessary by Meeth (1974:77) who states: "A distinction therefore needs to be drawn between efficiency (a measure of the ratio between inputs and outputs) and effectiveness (the achievement of selected goals)". In this chapter, an analysis of previous studies is made to evaluate the measures which have been used to measure efficiency and effectiveness.

2.1 RELATED STUDIES OF THE EFFICIENCY OF HIGHER EDUCATION

The concept of efficiency is related to the measurement of the ratio between inputs and outputs. Studies which have defined efficiency in this way include Coombs, 1969; Bowen and Douglass, 1971; Fincher, 1972; Makmun, 1978; Lindsay, 1979. Administrators and planners seek to achieve

an optimal input-output-ratio. Sometimes it can be achieved, but other times it is not possible.

Efficiency is not always well accepted in education (Woodhall and Blaug, 1965; Edding, 1966; Carter, 1972; Hoos, 1975). There are also people who object to the use of the term 'efficiency' in education. Woodhall and Blaug (1965:484) point out that "some educationists have argued that the economic criteria of productive efficiency are entirely inappropriate to schools and universities for the simple reason that these are not profit-maximizing institutions". Carter (1972:77) asserts as follows:

> Many people in universities object to the use of the words 'efficiency' or 'productivity' in relation to their activities. Sometimes this is for the snobbish reason that the words are appropriate to fitters or dustmen, but not to a learned profession. Some believe, incorrectly, that the words are necessarily related to the pursuit of profit, and universities are not generally profit-making institutions.

The demand for efficiency in the operation of schools has been widely popular since the beginning of the twentieth century and has been well documented by Callahan (1962) who points out that "in the years between 1911 and 1925 educational administrators responded in a variety of ways to the demand for more efficient operation of the schools" (1962:95).

Cost and output ratio

Efficiency can be measured as a ratio between cost and output, and cost per unit becomes a measure of efficiency. Coombs (1969:126) defines "the internal efficiency of the system as the relationship of its output to its inputs ... (and) unit costs (per output) become an important indicator of efficiency".

In discussing the cost per student, Chambers (1965:65) asserts: "Operating expenses per student per year would be perhaps the crudest of

all possible units and likely to produce obviously meaningless or misleading results unless applied in institutions markedly similar to each other in size, purposes, and methods".

Bowen (1972:193) states that "at the institutional level, with the mission and the resources given, the problem of efficiency is to use these resources to achieve the best possible results". It is important, therefore, for administrators in higher education institutions to use the available resources as efficiently as possible, but they cannot ignore the fact that "It is extremely difficult, therefore, to apply meaningful economic principles to questions relating to cost and output" (Cartter, 1969:172). In addition, comparing the cost per student among different kinds of higher education institutions might not indicate the efficiency of their operation. Sheehan (1973:133) states: "The use of cost studies for comparing different kinds and levels of education tells us nothing about efficiency as the goals and activities are different; their main use is in the area of budgeting and finance".

Coombs and Hallak (1972:87) point out that unit cost per student is "a very handy measurement for many purposes, such as comparing costs as between different educational levels, institutions, geographic areas or time periods". However, difficulties in estimating and comparing the efficiency of higher education institutions could also be recognized (Bowen and Douglass, 1971; Carlson, 1976; Sadlak, 1978). Efficiency as the ratio between two variables - cost and output, is difficult to estimate, in the case of education: "units of output are extraordinarily difficult to measure because each variation in cost may result in a qualitatively different output" (Bowen and Douglass, 1971:3).

The problem is, therefore, that the output of an institution of higher education is difficult to measure (Bowen and Douglass, 1971; Layard, 1973; Cootner, 1974; Archibald, 1974; Carlson, 1976). Cootner

(1974:219), for instance, asserts: "The issue in the university is that the educational firm monitors a large number of employees producing a product for which it is difficult to measure either input or output accurately". In addition, Archibald (1974:113) points out that "In the case of universities, the problem is aggravated by the fact that we can aggregate (or disaggregate) by disciplines, institutions, courses, states and so on". Carlson (1976:7) then states: "The result is that any empirical study of higher education production and cost behavior will be limited by the crudeness of the output measures used and the study will be open to criticism on that basis".

One cannot offer a single or easy way to make higher education institutions more efficient in their operation. Carter (1969:332-333) concludes that "improvements in efficiency in higher education will come slowly by experiment and painstaking research, and likely to be swallowed up in providing a better product (or in offsetting the effect of the increase in the value of human knowledge) rather than in providing savings of staff costs".

Maynard (1971) examines some microeconomic phenomena of higher education especially the four-year undergraduate education. He has analysed the differences in per-student costs in relation to differences in the size of institution. He states as follows:

> The conclusions of this study find areas both of agreement and disagreement with the landmark of Russell and Reeves. The major area of agreement is that institutions of higher learning do, indeed, resemble somewhat the firm of classical microeconomics in that long-run unit costs first decline as the scale of output grows from zero, and then become constant for some range. The major area of disagreement concerns the range of institutional sizes over which per-student costs decline.... However, the conclusions of the present study indicate that four-year colleges experience declining per-student costs until 5,363 FTE students enrolled, a number considerably larger than Russell and Reeves's 1,050 students. (1971:116-117)

Bowen and Douglass (1971) report a study of comparative instructional costs for different ways of organizing teaching and learning in a liberal arts college. They assert: "The efficiency problem is to alter favorably the ratio of two variables, cost and quality" (1971:3). This study is confined to undergraduate instruction in a hypothetical small liberal arts college of 1,200 students with the purpose of exploring the possibility of improving educational quality while reducing cost. In the discussion of the results of the study, they state:

> Our main conclusions are that there is ample opportunity within prevailing economic constraints for bold educational experimentation. A corollary is that faculty discussion of educational policy should be more attuned to budgetary considerations than they have been traditionally. The curriculum, the mode of instruction, and the teaching load do make a difference in costs. (1972:92)

It would appear that cost per student or cost per graduate might be a most useful indicator of institutional efficiency. As will be shown later however, such a variable cannot be accepted for this study because of the data unavailability and, to some extent, unreliability, for the faculties studied.

Productivity

Woodhall and Blaug (1965:483) point out that "productivity is usually defined quite simply as output per unit of input" and "there is little confusion about the definition of productivity: outputs of a process are related to inputs and the relationship is taken to indicate productivity" (Toombs, 1973:2). The term is often taken to mean an "efficient use of resources" (Wallhaus, 1975:7).

Blaug (1969) indicates the fallacy of treating productivity as a synonym for efficiency. He states:

> Efficiency can be defined at one point in time, in the context of the existing level of technical knowledge, whereas productivity is almost always measured between two calendar dates. In principle, it is possible to measure absolute productivity at one point in time, but in practice it is easier and usually more relevant to measure changes of productivity over a period of time. Now, it is perfectly conceivable that an activity that is conducted inefficiently at every point in time nevertheless enjoys productivity improvements as time passes. (1969:315-316)

Carlson (1975:39) points out that "two of the most widely used measures of institutional productivity are the student/faculty ratio and the cost per student ratio. Little is known, however, about the efficient and effective levels of these measures". Other writers express the opinion that these variables are perhaps not the best measures of institutional productivity. Woodhall (1972:90), for instance, asserts that: "a crude indicator of productivity of universities is the staff student ratio, but this is misleading, since it does not distinguish between teaching and research, and it makes no allowance for variations in quality".

Woodhall and Blaug (1965) measure productivity trends in British University education between 1938-1962. They assert that "The purpose of productivity measurement is to provide a yardstick of economic efficiency in different time-periods for individual firms within an industry, or for an industry considered as a whole" (1965:483). In the case of education, they state: "Similarly, a study of educational productivity could treat the entire educational system as one industry, or confine itself to examining the productivity of different levels, or even different individual institutions" (1965:484). They conclude that "all the efforts of universities appear to be directed towards decreasing productivity rather than increasing it" (1965:497).

Johnson (1965), in his comment on that study, points out that because changes in quality of education are extremely difficult to measure, the increase in inputs per unit of output could be interpreted as a measure of the increase in quality of the educational product; therefore, the calculation which shows inputs have risen faster than outputs of graduates could be interpreted as finding that the quality of British university education improved rather than productivity in the university education deteriorated.

Toombs (1973) has attempted to examine and interpret the concepts of productivity and efficiency in the ways that are appropriate for higher education. He states in one of his conclusions as follows:

> Ratios such as student-faculty, credit-hour load, cost per student and others are well established indicators in the public domain and would be difficult to replace. In spite of their disturbing inadequacies, they can be used as a point of departure for explaining the full function of a modern university to its new publics. (1973:43)

In view of production and cost behaviour estimation in higher education, Carlson (1976:111) asserts:

> Because of the current state of art in this area, past studies (at best) have provided some insight into the diversity of behavior of production and costs in higher education. These studies, basically by design, have had little predictive power with respect to policy variables.

The average time to produce a graduate or to complete a degree

Efficiency can also be measured in terms of the time used by students in completing an educational cycle - that is, the period from the entrance to an educational program of a certain level until graduation. This measure of efficiency can be expressed in student-years or student-months of study. Berstecher (1972) in analysing the flow of the 1961/1962

cohort through the primary school in Dahomey points out that "the average time and money invested to yield one primary school graduate was as much as 11.44 years, ... In the light of such figures, the growing concern of national educational authorities for improving the economic efficiency of their primary schools is more than justified" (1972:78-79).

Unesco-Bangkok (1967:45-47) presents a summary of a study measuring the efficiency of the school system in Afghanistan using student years to reflect the efficiency of the primary school cycle. The "coefficient of present efficiency" of the 1958/1959 cohort was calculated as follows: the total student years with which the successful completers are required to complete the cycle divided by the total student years offered to the cohort through the cycle. It is found that the coefficient of present efficiency of the cohort is 0.70 which indicates that the school system can be considered as working at a level of 70 per cent of efficiency.

The average time to complete an educational cycle can also be used to indicate the efficiency of an institution of higher education. Loeb and Duff (1974) use average length of time between entrance to the university and receipt of a graduate degree at the University of Illinois, Urbana in comparing performance of the academic departments of the university. They point out that the average length of time for completing a degree can be used "in comparing departments in the efficiency with which they produce degree holders" (1974:326).

In an attempt to measure the educational efficiency of student flow at IKIP Bandung, Makmun (1978) has analysed the 1975 cohort of students through the undergraduate cycle using student years to indicate the educational efficiency of this institution. He points out that "adding up the total number of student-years spent by the cohort ... as inputs, and then dividing them by the total number of completers as the output,

we will obtain the ratio which can be used as an indicator of educational efficiency" (1978:135).

In the present study, the average time to produce a graduate for a degree will be used to measure the efficiency of an institution of higher education. The efficiency measure is then expressed in terms of student-years or student-months of study. The average time to complete a degree is used both to indicate the efficiency with which the institutions sampled produce the graduates and to compare among the institutions and the faculties within those institutions.

2.2 RELATED STUDIES OF THE EFFECTIVENESS OF HIGHER EDUCATION

The concept of effectiveness is related to "the achievement of selected goals" (Meeth, 1974:77). It refers to "an evaluation of the process that has produced the outcomes or results that can be observed" (Fincher, 1972:759). Hence the effectiveness of an institution of higher education can be viewed as the achievement of expected outcomes.

Student satisfaction

Student educational satisfaction is one of the expected outcomes of an institution of higher education that can be used to indicate institutional effectiveness. In the questionnaire for Higher Education Outcome Measures Identification Study reported by Micek and Arney (1974), one of the outcome areas is student satisfaction. Student satisfaction can be viewed as an important measure of institutional effectiveness, but "in addition to student satisfaction, the assessment of other outcomes are critical in judging program effectiveness" (Morstain, 1977:14). Cameron (1978) also used student educational satisfaction as one of the effectiveness dimensions referring to the degree of satisfaction of

students with their educational experience at an institution of higher education.

In a study on how Berkeley doctoral students appraise their academic programs, Heis (1967) presents information about student satisfaction with institution, field of study and major professor. She states:

> The principal complaint against the institution was its size and remoteness ...
> In general students were satisfied with their choice of special field ...
> About three fifths in all fields would select the same person (as major professor, if they were to start their programs over) ... (1967:42)

Pervin (1968) reviews research on performance and satisfaction as a function of the interaction between individual characteristics and environments, and points out that future investigators should consider the interaction between individual and college environment characteristics.

The relationships between university satisfaction expressed by graduating seniors and personality characteristics, academic ability and academic progress in college have been studied by Berdie, Pilapil and Im (1970) at University of Minnesota. They assert: "No sex differences were found and on the basis of these results one can conclude that for this sample the expressed satisfaction of men resembles that of women" (1970:252). Some of the interesting results of this study are as follows:

> The student who expressed the most satisfaction with his curriculum at the time he graduated tended to be the one who spent the least amount of time in college...
> Students with lower grade point average expressed greater satisfaction ...
> Students who had the highest scores on the achievement tests as freshmen tended to be the ones who expressed least satisfaction with the university as graduates ...
> Students with the higher scores on the achievement tests are the ones who several years later expressed the least satisfaction with the instructors. (1970: 256-258)

Berdie, et al. then point out that "to a large extent satisfaction

with the university is associated with certain characteristics of students at the time they enter ... In so far as a chronological sequence is discernable ... at time of graduation, one might infer a causal relationship". (1970:265)

Gluskinos and Wainer (1971) analyse school satisfaction using a principle component analysis and hierarchical cluster analysis. The results of analyses indicate that satisfaction in the university context consists of two major dimensions. The first dimension is related to the amount of impersonality experienced by the individual and the second dimension is related to the intrinsic school characteristics and the more peripheral environmental school characteristics.

The degree of student satisfaction might be different between dropouts and non-dropouts. The students have to fulfil the requirements of the college environment in order to be successful in their studies, while college environment has to meet the needs of students which may lead to student satisfaction. Starr, Betz and Menne (1972:321) point out that "lower satisfaction, coupled with the fact that they were not performing adequately, separated the academic dropouts from the students who remained at the university". A similar finding was presented by Hayes (1974:143) indicating that "dropouts were significantly less satisfied than persisters with the university environment as they perceived it". In the case of graduate student satisfaction, Gregg (1972:483-484) asserts that "the degree of satisfaction experienced by the graduate student may be important not only for his level of performance but also for his remaining in graduate school and attaining his degree objective rather than dropping out before completion".

Astin (1978) presents the analysis of student satisfaction with

college environment using information obtained from students who have been asked to rate their institutions. The student satisfaction covers the student's subjective expreience during the college years and perceptions of the value of the educational experience. The questions and/or satisfaction measures used are as follows:

> How satisfied are you with the following at your college?
> 1. The college's academic program
> 2. The intellectual environment
> 3. Faculty-student relations
> 4. The quality of classroom instruction
> 5. The variety of courses I can take
> 6. Friendships with other students
> 7. The administration
> What is your overall evaluation of your college?
> (1978:166)

He employed stepwise regression analyses using each satisfaction measure as an outcome or dependent variable to assess determinants of satisfaction. Some of the important results presented by Astin (1978: 168-174) are as follows:

> The student's degree of overall satisfaction can be predicted with moderate accuracy (R=.49) ... entering student characteristics account for relatively little of variance (R=.12)....
> Among men, satisfaction is positively associated with good grades in high school, interpersonal self-esteem, and interest in business; it is negatively associated with musical interests....
> Satisfaction with academic reputation of the college is likely to be greater among students with better grades in high school ... Dissatisfaction with reputation is somewhat greater among highly able students, Orientals, students with no religious preference, drinkers, and students with artistic interests....
> Satisfaction with the intellectual environment had small positive relationships with being white, religious, and having high grades in high school....
> Satisfaction with student-faculty relations is less dependent on entering student characteristics (R=.08) than as any other satisfaction measure.

Information about student satisf.:tion can be used "to compare and judge departments and to provide data for departmental faculty to assess

strengths and weaknesses of their departments" (Braskamp, Wise and Hengstler, 1979:494). One interesting result presented by Braskamp, et al. (1979:497) indicates that "student satisfaction with program was not related to sex, grade point average, class status and reason for choosing major". On the other hand, Howard and Maxwell (1980:815) assert as follows: "The data in this investigation revealed a substantial correlation between student satisfaction and expected grades".

Feild and Giles (1980) examine student satisfaction with graduate education to identify major dimensions of graduate student satisfaction and dissatisfaction with the educational programs and experiences in a professional school. They have identified eight factors or dimensions of student satisfaction and assert that "Further inspection of the nature of the eight satisfaction dimensions revealed three general concerns or themes: (a) freedom and independence; (b) relationships with fellow students and professors and (c) academic performance" (1980:72).

Students' academic performance

The student's academic performance is probably the most common measure of effectiveness used in higher education. Lavin (1967:14) points out that in "studies of academic achievement the traditional criterion of performance is the student's grades ... in the overwhelming number of cases, student grades are the sole index of performance", while Reder (1974:208) states: "In the education industry, an output measure often reflects some aspects of student performance".

In view of the studies of academic achievement, Pascarella (1980: 556) points out that "A considerable body of evidence has accumulated to suggest that academic achievement in post-secondary institutions is primarily, but not totally, determined by entering student aptitude or

prior achievement". Some of the results of such studies are presented by Astin (1978) as follows:

> Undergraduate grades can be predicted with modest accuracy (multiple correlations around .55) from admissions information, and the two most potent predictors are the student's high school grade-point average and scores on college admissions tests. Grades almost always carry more weight than tests.... Indeed, some researchers and educators will argue that predicting grade-point averages across different colleges simultaneously makes little sense, since grading systems and academic standards differ so much....
> High school grades are by far the best predictor of college grades; the simple correlation averages around .50. Even if one ignores college characteristics, high school grades are a reasonably accurate predictor of college grades....
> Apparently, regardless of ability and past achievement mature students and students with a high regard for their intellectual capabilities will do better academically in college than younger ...
> Women earn higher grades in college than men ...
> (1978:101-104)

With regard to students' academic performance, one cannot ignore the fact that there are problems of its prediction. Lavin points out two important problems related to the predictors of academic performance as follows: "First, many predictors that have similar labels may, in fact, be measuring different content.... The second difficulty is ... some predictive factors that are defined differently on the conceptual level may not actually be independent of one another" (1967:34).

As indicated by Pascarella, Terenzini and Hibel (1978), much of the research on the prediction of academic performance has concentrated on student characteristics and college environment or institutional environment that explain and contribute to the variance in measures of academic performance. In their study on student-faculty interactional settings and their relationship to predicted academic performance, they assert that "the findings supporting the hypothesized association between

student-faculty informal interaction and academic achievement are suggestive rather than conclusive" (1978:452).

Grade-point average (GPA) has been used as a criterion variable in many studies to indicate the measure of students' academic performance, even though the importnat predictors contributing to the variance of the criterion variable might be different from one study to another. In general, high school grades appear to be the most important and best predictor of students' grade-point average in college (For example, Astin, 1978; Lavin, 1967; Astin, 1971; Scannell, 1960; Holland and Nichols, 1964; Richards, Holland and Lutz, 1967; Sutherland, 1973; Holland and Astin, 1962).

With regard to the predictor of academic performance, Lavin (1967:52) points out that "the one that consistently emerges as the best single predictor is the high school average or high school rank", whereas Scannell (1960:134) asserts as follows: "High school GPA was the best single predictor of college success yielding correlations of .67 and .59 with freshman and four-year GPA, respectively". In addition, Astin (1971:5) states that "Of all the information available about the high school student, his record of academic performance is the best single predictor of how well he will do in college", while Juola (1966:197) points out that "after the student's first term, the best indicator of future attainment in a given area is his previous achievement in that area".

Sex appears to be one of the important variables to explain the variation in students' academic performance (Astin, 1978; Holder, 1970; Lavin, 1967; Jackson, 1955; Abelson, 1952). Holder (1970:169) points out that "with sex and to a lesser extent, social class, playing an influential part in the educational achievement of students at school,

one may well expect this state of affairs to continue at university". In contrast Abelson (1952), in his study on sex differences in predictability of college grades at seven various colleges, states as follows: "Using high school grades as predictor, it was found that there was a significant sex difference (at the 5 per cent level) in the observed standard errors of prediction at four of the seven colleges, and a highly significant overall difference" (1952:644). In addition, some studies indicate that women tend to obtain higher grades than men (Astin, 1978; Jackson, 1955) and to be "more predictable than males in academic performance" (Lavin, 1967:52).

Social class or socioeconomic status (SES) might also play an influential part in students' academic achievement. Lavin (1967:43) points out that "students of higher SES perform at higher levels than students of lower SES", but Kohen, Nestel and Karmas (1978) provide different findings. They state as follows:

> Our findings, in contrast with previous studies, provide no evidence of an independent effect of SES on persistence in college, regardless of the year of college attended. It must be emphasized that most of these earlier studies failed to control for other factors that are positively related to SES; consequently, the net effect of SES was generally overstated ... (1978:242)

Age may also have an effect on prediction of academic performance. Astin (1978) points out that mature students will do better academically in college than younger students, whereas Barnett, Holder and Lewis (1968:432) assert as follows: "The age effect resides to some extent in the presence of a relatively larger proportion of better degree results obtained by those in the younger group, but predominantly in a relatively larger proportion of poorer degree results obtained by those in the older group".

Rock, Centra and Linn (1970), in a study of the relationship between characteristics descriptive of college (number of books in the library, library books/student, faculty/student, proportion of faculty with doctorates, full time equivalent and college per student expenditure) and student achievement, found that a high proportion of differences amongst colleges in senior students' academic achievement (output) was predictable from the students' academic aptitude at entrance to college (input). They also pointed out that "of three groups of colleges, the group with higher income per student and larger proportions of faculty with a doctorate tend to do better than two other groups" (1970:120). In other words, college income per student and the proportion of faculty with doctorates distinguished high achieving groups of colleges from low achieving groups.

Munday (1970:105), in a study of factors influencing the predictability of college grades, asserts that "eight variables were found to account for 42 percent of the variance of predictability, which is almost all of its reliable variance". The eight variables are percent of students living under college supervision, ACT composite standard deviation, size of enrolment, ACT composite mean, percent of full time faculty, percent of girls in the student body, institutional control, and percent of faculty with doctorates.

Graduates as output

Number of graduates, indicating the quantity of students graduating from an institution of higher education, can be viewed as one of the important expected outcomes of the institution. It can thus be used as a measure of its effectiveness. Hettich (1971) has reported a study of Canadian universities using graduates as output. He asserts that the

"main interest is in productivity trends, i.e. movements in the ratio of total output to inputs.... No attempt is made to evaluate productivity trends in research activity; the analysis is confined to instruction only" (1971:3). In analysing productivity trends in British university education, Woodhall and Blaug (1965) limit themselves to "what can be readily quantified and measured. In the case of higher education and end-product is simply a degree" (1965:485).

In a study to describe the higher education situation in Indonesia in 1975, the Directorate General of Higher Education, of the Department of Education and Culture, stated that the size of the dropout from a cohort of students through an educational cycle can be used to measure educational efficiency. Since such data were not collected or available, it was estimated by using educational efficiency rates as follows:

a. Educational efficiency rate I

$$\text{AEE I} = \frac{\text{Number of students in the highest grade}}{\text{Total enrolment}}$$

b. Educational efficiency rate II

$$\text{AEE II} = \frac{\text{Number of graduates}}{\text{Number of students in the highest grade}}$$

c. Educational efficiency rate III

$$\text{AEE III} = \frac{\text{Number of graduates}}{\text{Total enrolment}}$$

d. Educational efficiency rate IV

$$\text{AEE IV} = \frac{\text{The average number of graduates in a period}}{\text{The average number of students admitted}}$$

All the measures are expressed in terms of percentages.

(Direktorat Jenderal Pendidikan Tinggi, 1976:75-77)

In view of those measures, it seems more appropriate to use the measures as effectiveness measures rather than efficiency measures. The measures might be used to indicate the achievement of certain specified objectives - that is, as effectiveness measures, but all of them cannot

be used to indicate the efficiency in higher education because of the following reasons.

a. The numerator of the first educational efficiency rate does not represent the output of higher education, since the students in the highest grade have not graduated yet.

b. The divisors of the second and the third educational efficiency rates are not actually the inputs for the number of graduates used as numerators, the inputs are their entrance cohorts.

c. The numerator of the fourth educational efficiency rate is influenced by the size and distribution of the number of graduates over the years during a period, while the divisor is influenced by the size and distribution of the number of students admitted over the years during the period. These in turn will distort the adequacy of using the rate to estimate the efficiency in higher education.

The proportion of graduates to enrolment can be used to indicate productivity of higher education (Tisna Amidjaja and Sapi'e, 1980:22-23). In 1975, the ratio of graduates to student body in the public sector for universities was 0.05, while the ratio for the institutes of higher teacher training (IKIP) was 0.03. Hence, they conclude that "in general the productivity is low" (1980:22).

Thus the proportion of graduates to enrolment has been labelled interchangeably as a measure of productivity or as an educational efficiency rate. It seems more appropriate however to use this variable to indicate effectiveness rather than efficiency. It is related to the expected outcome of an institution of higher education and thus to the fulfilment of its objective. In this role, it must be viewed as a measure of the effectiveness of an institution of higher education.

In the present study, the student educational satisfaction, students' academic performance and graduates as output will be used to indicate and compare the effectiveness of the institutions of higher education taken as the sample and the faculties of those institutions. The effectiveness measures used in this study will be described in more detail in Chapter 4.

It is necessary to note that studies of the efficiency and/or effectiveness in higher education could use either the individual student as the unit of analysis (as is done for example, by Holland and Astin, 1962; Holand and Nichols, 1964; Richards, Holand and Lutz, 1967; Sutherland, 1973; and Field and Giles, 1980) or the institution, faculty or department as the unit of analysis (as is done for example, by Maynard, 1971; Lindsay, 1979; Makmun, 1978; and Loeb and Duff, 1974). In the present study, both student and faculty are used as units of analyses.

2.3 IMPLICATIONS OF THE PREVIOUS RESEARCH TO THE PRESENT STUDY

The previously reviewed studies of the efficiency and effectiveness of higher education presented in this chapter have some important implications for the present study, especially in relation to establishing a point of view or position for an evaluation of the efficiency and effectiveness of some higher education institutions in Indonesia. Some of these implications are merely summaries of decisions previously made in this chapter while others place these decisions in their methodological or contextual setting.

First, it is necessary to distinguish between efficiency and effectiveness in the evaluation of the performance of higher education institutions. The concept of efficiency refers to a measure of the ratio between inputs and outputs. The concept of effectiveness refers to the

achievement of certain objectives which can be expressed in terms of expected outcomes of an institution of higher education.

Second, efficiency can be measured at least in two different ways:

a. as a ratio between costs and output. Unit costs thus become important indicators of efficiency,

b. in terms of the time used by students to complete an educational cycle and the average time invested to produce a graduate of the cycle becomes an indicator of the efficiency. It is necessary to note that the average time invested to produce a graduate has the effect on the average amount of resources or money invested to yield a graduate.

In the present study, the efficiency for individuals is measured in terms of the time used by students to complete a degree, whereas the average time to complete a degree will be used as the measure of the efficiency of an institution of higher education.

Third, the expected outcomes of an institution of higher education are the fulfilment of certain objectives such as students' academic performance, students' satisfaction and proportion of graduates to enrolment. Hence these can be used as measures of effectiveness. In the present study, students' satisfaction, students' academic performance and graduates as outputs of an institution of higher education are also used as the framework to identify several measures of effectiveness in developing a model for evaluating the efficiency and effectiveness of an institution of higher education.

Fourth, the studies of efficiency and effectiveness in higher education can use student and college or faculty as units of analyses. In the present study, both student and faculty will be used as units of analyses, since different bases of analyses could provide different

statistical results.

Fifth, the studies of efficiency and effectiveness in higher education are generally directed towards providing useful information for improving the performance of students and/or institutions of higher education under study. Therefore, in the present study, an evaluation of the efficiency and effectiveness of some higher education institutions in Indonesia is also decision oriented, that is directed towards providing administrators with useful information for judging decision alternatives in order to improve institutional performance.

Although most related studies of efficiency and effectiveness in higher education presented here could be considered to be western oriented in nature, the need to assess and improve institutional efficiency and effectiveness in higher education is important not only in western countries, but in other countries also.

In Indonesia - the country of major concern to the present study - the need to improve efficiency and effectiveness of higher education institutions has been felt by administrators over a number of years. Since higher education in Indonesia is an expensive burden to the people, "it is a moral responsibility for every student to complete his or her study in as short a time as possible according to the specified period" (Direktorat Jenderal Pendidikan Tinggi, 1980:17). Programs for increasing internal and external efficiency are considered to be necessary to increase or improve productivity in higher education (Tisna Amidjaja, 1980:35). Hence the evaluation of higher education is most relevant to the efforts directed towards making higher education institutions in Indonesia more efficient and effective in their operation.

CHAPTER 3

METHODOLOGY

Two kinds of data are collected and used in this study. The first is the data available in the selected institutions of higher education, especially the data that have been recorded at the Registration Office and the Personnel Department. The second kind is the data collected by specially prepared questionnaires.

This chapter discusses the methodology used in this research including the procedure of selecting the samples, the instrument for data collection and the method of data analysis.

3.1 THE PROCEDURE OF SELECTING THE SAMPLES

This study could not aspire to cover all institutions of higher education in Indonesia. Instead it is confined to the investigation of a sample of institutions. Sampling methods are also used to obtain information from the B.A. graduates and from the teaching staff and administrators within institutions of higher education. The methods used and the sample sizes are now described for each sampling procedure.

3.1.1 Selecting the institutions of higher education

The study is confined to investigating the most important kinds of higher education institution in Indonesia - that is, universities and institutes. By taking into account the limited time and resources available to the present investigation, it was decided to select six institutions for intensive study. Those institutions included two universities, two Institutes of Higher Teacher Training (IKIP), and two State Institutes for Islamic Studies (IAIN). This research is therefore

partly in the form of case studies of each of the six institutions of higher education in Indonesia. The institutions of higher education selected for this study are as follows:

1. Sunan Gunung Djati State Institute for Islamic Studies (Institut Agama Islam Negeri Sunan Gunung Djati) in Bandung.
2. Bandung Institute of Higher Teacher Training (Institut Keguruan dan Ilmu Pendidikan Bandung).
3. Padjadjaran University (Universitas Padjadjaran) in Bandung.
4. Sunan Ampel State Institute for Islamic Studies (Institut Agama Islam Negeri Sunan Ampel) in Surabaya.
5. Airlangga University (Universitas Airlangga) in Surabaya.
6. Malang Institute of Higher Teacher Training (Institut Keguruan dan Ilmu Pendidikan Malang).

The field work for the data collection was carried out from January until June 1980.

The institutions selected were restricted to state institutions of higher education in Java because of the following reasons. First, the time and resources available for this study were limited. Second, it is assumed that there is not very much difference between institutions of higher education in Java and the other parts of Indonesia in terms of the problems related to institutional efficiency and effectiveness as posed for this study.

3.1.2 Selecting the sample of students and teaching staff

A sample of 150 students is selected from the list of 1979 B.A. graduates at each of the six institutions of higher education. The B.A. graduates of each institution are stratified by faculty and within each

faculty, B.A. graduates are selected at random by using table of random numbers with probability of selection being proportional to the distribution of B.A. graduates by faculty. This proportional stratified random sampling tends to have somewhat greater precision for the present task than does simple random sampling. Moser and Kalton point out that "stratified random sampling with a uniform sampling fraction tends to have greater precision than random sampling, and it is also generally convenient for practical reasons". (1975:85)

If n is the number of 1979 B.A. graduates of an institution of higher education and n_i is the number of B.A. graduates of the ith faculty (stratum), then the required number of B.A. graduates selected into the sample for the ith stratum (s_i) can be calculated as follows:

$$s_i = \frac{150}{n} \times n_i$$

This formula is used to select the proportional stratified random sample of 1979 B.A. graduates at each of the six institutions of higher education. If the number of 1979 B.A. graduates of an institution of higher education is less than 150, then all graduates, who continued their study and/or whose addresses were available, are taken as the sample.

In a similar way, a sample of 125 faculty members is selected from the list of teaching staff at each of the six institutions of higher education. The teaching staff in each institution are stratified by faculty and within each faculty, faculty members are selected at random by using a table of random numbers with probability of selection again being in proportion to the distribution of teaching staff by faculty. The same kind of procedure as used for students was again used here. That is, if n is the number of faculty members in an institution and n_i

is the number of faculty members of the ith faculty (stratum), then the number selected as the sample for the ith stratum (s_i) can be calculated as follows:

$$s_i = \frac{125}{n} \times n_i$$

This formula is used to select the proportional stratified random sample of faculty members at each of the six institutions of higher education, but if the number of teaching staff is less than 125, then all are taken as the sample.

The samples selected from each of the six institutions of higher education are now described.

IAIN Bandung

Table 3.1 shows the distribution of 1979 B.A. graduates and the teaching staff of Sunan Gunung Djati State Institute for Islamic Studies (IAIN Bandung) by faculty and the samples selected from each of the three faculties. Since the number of 1979 B.A. graduates at this institution is less than 150, then all of the graduates, whose addresses are available, are taken as the sample in this study. The number of faculty members at this institution is less than 125, hence all of them are taken as the sample. From the three faculties, 57 graduates could be contacted, while 75 staff members have been sampled.

IKIP Bandung

Table 3.2 shows the distribution of the 1979 B.A. graduates and the teaching staff of Bandung Institute of Higher Teacher Training (IKIP Bandung) by faculty and the samples taken from them. Sampling was necessary from each faculty here because of the large number of either B.A. graduates or teaching staff.

TABLE 3.1

THE SAMPLE AND DISTRIBUTION OF 1979 B.A. GRADUATES AND THE TEACHING STAFF OF IAIN BANDUNG BY FACULTY

No.	Faculty	Number of B.A. graduates			Number of teaching staff[1]	
		Total (n_i)	Address not available	Selected (s_i)	Total (n_i)	Selected (s_i)
1.	Faculty of Islamic Education (Fakultas Tarbiyah)	38	13	25	40	40
2.	Faculty of Islamic Theology (Fakultas Usuluddin)	14	5	9	18	18
3.	Faculty of Islamic Law (Fakultas Syariah)	26	3	23	17	17
	Summation	n=78	21	s=57	n=75	s=75

Note: 1. The teaching staff who are on leave are not included.

The Faculty of Education, for example, has 212 B.A. graduates (n_i), while the total number of B.A. graduates (n) from IKIP Bandung is 834. Since the sample size to be selected from this institution is 150, then the sample selected from Faculty of Education is equal to $\frac{150}{n} \times n_i = \frac{150}{834} \times 212 = 38.13$, i.e. 38. In analogous ways, the sample size for each faculty can be calculated.

Although IKIP Bandung has six faculties, the Faculty of Teacher Training in Physical Exercise (Fakultas Keguruan Ilmu Keolahragaan) has been excluded from consideration here. There were few graduates (only 11) from this faculty in comparison to the total 1979 B.A. graduates (845 = 834 + 11) from the institution.

The Faculty of Education has 87 full-time faculty members (n_i), while the total number of full-time teaching staff (n) from IKIP Bandung is 523. Since the sample size to be selected from this institution is 125, then the sample size for Faculty of Education is equal to $\frac{125}{n} \times n_i = \frac{125}{523} \times 87 = 20.79$, that is 21. In similar ways, the sample size for each faculty can be calculated. In fact, 126 teaching staff members (1 greater than the sample size to be selected due to the effect of rounding off) have been sampled.

TABLE 3.2

THE SAMPLE AND DISTRIBUTION OF 1979 B.A. GRADUATES AND THE TEACHING STAFF OF IKIP BANDUNG BY FACULTY

No.	Faculty	Number of B.A. graduates		Number of teaching staff	
		Total (n_i)	Selected (s_i)	Total (n_i)	Selected (s_i)
1.	Faculty of Education	212	38	87	21
2.	Faculty of Teacher Training in Social Sciences	190	34	150	36
3.	Faculty of Teacher Training in Arts and Literature	159	29	83	20
4.	Faculty of Teacher Training in Exact Sciences	127	23	80	19
5.	Faculty of Teacher Training in Technology	146	26	74	18
6.	Faculty of Teacher Training in Physical Exercise	-	-	49	12
	Summation	n=834	s=150	n=523	s=126

Padjadjaran University

Padjadjaran University has eleven faculties, but only the six faculties corresponding to the faculties of the other institutions of higher education in the sample have been sampled. These are listed in Table 3.3. The faculties omitted are:

. Faculty of Dentistry (Fakultas Kedokteran Gigi).

. Faculty of Agriculture (Fakultas Pertanian).

. Faculty of Veterinary Medicine (Fakultas Peternakan).

. Faculty of Publicity (Fakultas Publisistik).

. Faculty of Medicine (Fakultas Kedokteran).

Table 3.3 shows the distribution of 1979 B.A. graduates and the teaching staff of Padjadjaran University by faculty and the samples taken from them. Sampling was also necessary from each faculty here because the large number of either B.A. graduates or teaching staff.

TABLE 3.3

THE SAMPLE AND DISTRIBUTION OF 1979 B.A. GRADUATES AND THE TEACHING STAFF OF PADJADJARAN UNIVERSITY BY FACULTY

No.	Faculty	Number of B.A. graduates		Number of teaching staff	
		Total (n_i)	Selected (s_i)	Total (n_i)	Selected (s_i)
1.	Faculty of Law	114	21	73	16
2.	Faculty of Economics	269	50	99	22
3.	Faculty of Exact and Physical Sciences	178	33	173	38
4.	Faculty of Literature	39	7	93	21
5.	Faculty of Social Politics	157	29	99	22
6.	Faculty of Psychology	52	10	29	6
	Summation	n=839	s=150	n=566	n=125

IAIN Surabaya

Table 3.4 shows the distribution of 1979 B.A. graduates and the teaching staff of Sunan Ampel State Institute for Islamic Studies (IAIN Surabaya) by faculty and the samples selected from each of the four faculties. Since the number of 1979 B.A. graduates at this institution is less than 150, then all of the graduates whose addresses are available, are taken as the sample in this study. The number of teaching staff at this institution is less than 125, hence all of them are taken as the sample. From the four faculties, 122 B.A. graduates could be contacted, while 62 staff members have been sampled.

TABLE 3.4

THE SAMPLE AND DISTRIBUTION OF 1979 B.A. GRADUATES AND THE TEACHING STAFF OF IAIN SURABAYA BY FACULTY

No.	Faculty	Number of B.A. graduates			Number of teaching staff[1]	
		Total (n_i)	Address not available	Selected (s_i)	Total (n_i)	Selected (s_i)
1.	Faculty of Islamic Law	33	1	32	22	22
2.	Faculty of Islamic Theology	48	11	37	17	17
3.	Faculty of Islamic Missionary	36	4	32	12	12
4.	Faculty of Islamic Culture	27	6	21	11	11
	Summation	n=144	22	s=122	n=62	n=62

Note: 1. The teaching staff who are on leave are not included.

Airlangga University

Airlangga University has seven faculties, but only the four faculties corresponding to the faculties of the other institutions of higher education in the sample have been sampled. These are listed in Table 3.5. The faculties omitted are:

. Faculty of Medicine (Fakultas Kedokteran).

. Faculty of Dentistry (Fakultas Kedokteran Gigi).

. Faculty of Veterinary Medicine (Fakultas Kedokteran Hewan).

Table 3.5 shows the distribution of 1979 B.A. graduates and the teaching staff of Airlangga University by faculty and the samples taken from them. The Faculty of Social Sciences which is the youngest faculty opened in 1978 has not produced any B.A. graduates yet.

TABLE 3.5

THE SAMPLE AND DISTRIBUTION OF 1979 B.A. GRADUATES AND THE TEACHING STAFF OF AIRLANGGA UNIVERSITY BY FACULTY

No.	Faculty	Number of B.A. graduates		Number of teaching staff	
		Total (n_i)	Selected (s_i)	Total (n_i)	Selected (s_i)
1.	Faculty of Law	142	86	74	46
2.	Faculty of Pharmacy	10	6	42	26
3.	Faculty of Economics	96	58	73	45
4.	Faculty of Social Sciences	-	-	13	8
	Summation	n=248	n=150	n=202	n=125

IKIP Malang

Table 3.6 shows the distribution of 1979 B.A. graduates and the teaching staff of IKIP Malang by faculty and the samples taken from them. IKIP Malang has five faculties and all of them have been sampled.

TABLE 3.6

THE SAMPLE AND DISTRIBUTION OF 1979 B.A. GRADUATES AND THE TEACHING STAFF OF IKIP MALANG BY FACULTY

No.	Faculty	Number of B.A. graduates		Number of teaching staff	
		Total (n_i)	Selected (s_i)	Total (n_i)	Selected (s_i)
1.	Faculty of Education	43	29	48	22
2.	Faculty of Teacher Training in Social Sciences	86	58	59	27
3.	Faculty of Teacher Training in Arts and Literature	42	28	74	34
4.	Faculty of Teacher Training in Exact Sciences	17	11	71	33
5.	Faculty of Teacher Training in Technology	35	24	20	9
	Summation	n=223	s=150	n=272	s=125

Table 3.7 summarises the total samples of 1979 B.A. graduates and the teaching staff selected from the six institutions of higher education. Overall, the number of 1979 B.A. graduates selected as the sample is 779, while the total number of teaching staff selected as the sample is 638.

TABLE 3.7

THE SAMPLE OF 1979 B.A. GRADUATES AND THE TEACHING STAFF SELECTED FROM THE SIX INSTITUTIONS OF HIGHER EDUCATION

No.	Institution	Sample size selected	
		1979 B.A. graduates	Teaching staff
1.	IAIN Bandung	57	75
2.	IKIP Bandung	150	126
3.	Padjadjaran University	150	125
4.	IAIN Surabaya	122	62
5.	Airlangga University	150	125
6.	IKIP Malang	150	125
	Total	779	638

3.1.3 Selecting the sample of administrators

The administrators holding important positions in the six selected institutions are also sampled. Such people include Rectors, the Vice Rectors or Assistant Rectors in Administrative Affairs and Deans. Forty such administrators could be chosen. Their distribution across institutions is reported in Table 3.8.

TABLE 3.8

THE SAMPLE OF ADMINISTRATORS SELECTED FROM SIX INSTITUTIONS OF HIGHER EDUCATION IN INDONESIA

No.	Institution	Sample
1.	IAIN Sunan Gunung Djati Bandung	5
2.	IKIP Bandung	8
3.	Padjadjaran University	8
4.	IAIN Sunan Ampel Surabaya	6
5.	Airlangga University	6
6.	IKIP Malang	7
	Total	40

3.1.4 The final sample result

Questionnaires were distributed to the chosen samples of 1979 B.A. graduates, teaching staff and administrators at the six state institutions of higher education in Indonesia during the period from March to June 1980. Some of the questionnaires for the graduates were distributed during the visit to each institution, especially to those B.A. graduates who were continuing their study to the postgraduate level. For the graduates who were not continuing their study, the questionnaires were sent by mail. Follow-up letters were also sent to those who did not respond within two weeks in order to obtain as close to a maximum return rate as possible. A second follow-up letter was also sent to graduates who did not reply to the first reminder.

TABLE 3.9

THE NUMBER AND PERCENTAGE OF RESPONSES TO THE QUESTIONNAIRES DISTRIBUTED TO 1979 B.A. GRADUATES BY INSTITUTION

No.	Institution	Number of questionnaires distributed	Number of responses	Percentage of responses
1.	IAIN Sunan Gunung Djati	57	42	73.7
2.	IKIP Bandung	150	102	68
3.	Padjadjaran University	150	113	75.3
4.	IAIN Sunan Ampel	122	77	63.1
5.	Airlangga University	150	127	84.7
6.	IKIP Malang	150	108	72
	Total	779	569	73

The final response rate for the graduate questionnaires is reported in Table 3.9. Overall, the response rate is 73% which is acceptably high especially in the Indonesian context.

The questionnaires for teaching staff were distributed during the visit to each of the six institutions of higher education. The response rates are reported in Table 3.10. The overall response rate is 71.8% which is also acceptably high.

The questionnaires for administrators were also distributed during the visit to each of the six institutions of higher education

TABLE 3.10

THE NUMBER AND PERCENTAGE OF RESPONSES TO THE QUESTIONNAIRES DISTRIBUTED TO THE TEACHING STAFF BY INSTITUTION

No.	Institution	Number of questionnaires distributed	Number of responses	Percentage of responses
1.	IAIN Sunan Gunung Djati	75	52	69.3
2.	IKIP Bandung	126	83	65.9
3.	Padjadjaran University	125	88	70.4
4.	IAIN Sunan Ampel	62	51	82.3
5.	Airlangga University	125	102	81.6
6.	IKIP Malang	125	82	65.6
	Total	638	458	71.8

taken as the sample. The response rates to the questionnaire can be seen in Table 3.11. Overall, the response rate is 75% which is acceptably high.

In view of the response rate of the questionnaires, it was decided in June of 1980 not to wait any longer to obtain additional responses. The reasons underlying this decision are as follows:

1. The number of returns is sufficiently large and the response rate has a good distribution by institution.
2. The limited time available for data collection - that is, from January until June 1980.

TABLE 3.11

THE NUMBER AND PERCENTAGE OF RESPONSES TO THE QUESTIONNAIRES DISTRIBUTED TO THE ADMINISTRATORS BY INSTITUTION

No.	Institution	Number of questionnaires distributed	Number of responses	Percentage of responses
1.	IAIN Sunan Gunung Djati	5	4	80
2.	IKIP Bandung	8	7	87.5
3.	Padjadjaran University	8	5	62.5
4.	IAIN Sunan Ampel	6	6	100
5.	Airlangga University	6	3	50
6.	IKIP Malang	7	5	71.4
	Total	40	30	75

3. The need to return to Australia by the end of July 1980.

The response rate for the questionnaires is sufficiently large for each category to permit appropriate analyses to be conducted.

3.2 THE INSTRUMENT FOR DATA COLLECTION

In addition to the data available in the institutions of higher education taken as the sample, some data are collected by using questionnaires. There are two kinds of questionnaires used for data collection, the first is the questionnaire for students and the second is the questionnaire for teaching staff (faculty members) and administrators.

3.2.1 The need for a questionnaire

In view of the kind of data required to evaluate the efficiency and effectiveness of an institution of higher education, it is reasonable that some of the data should be collected by using a questionnaire. Such an approach is fairly common (see Johnstone, 1978). There are two specific reasons motivating the choice of such an instrument here. First, student educational satisfaction will be used to indicate the effectiveness of an institution of higher education. A questionnaire is a most appropriate method with which to collect data on student educational satisfaction. Second, to consider and justify the use of potential measures in the evaluation of institutional efficiency and effectiveness in higher education, it is necessary to have a questionnaire to collect data on the opinions of teaching staff and administrators about the usefulness of potential measures of variables for evaluating the efficiency and effectiveness of an institution of higher education.

The use of a questionnaire has certain advantages. First, with most of its items of the closed type, a more structured pattern of response is achieved. Second, it can be administered to a large number of respondents in a relatively easy way. Third, it is more economical particularly in administration and the coding effort required.

Two questionnaires were specially constructed to collect the needed data for this study. The first questionnaire was distributed to the sample of students who have completed their undergraduate study. It aimed to get information about the degree of their satisfaction with the educational programs and experiences at the institution of higher education they attended. This questionnaire contains a number of rating questions on student educational satisfaction.

The second questionnaire was distributed to the sample of faculty

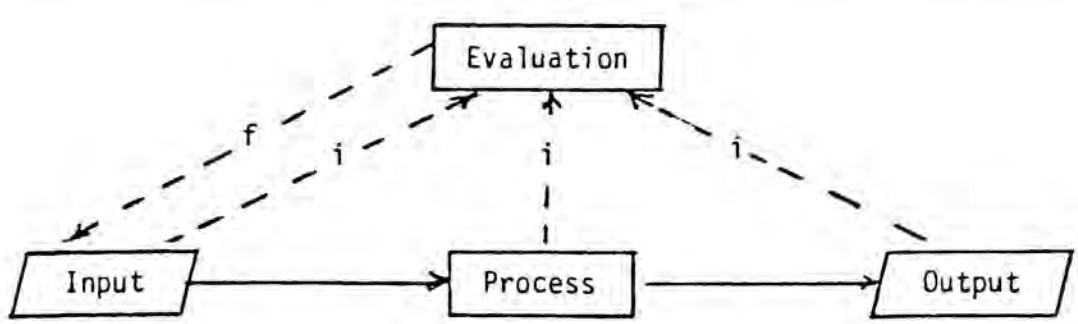
members and the sample of administrators. This questionnaire contains a number of rating questions with the aim of obtaining information about the degree of usefulness of all the variables defined and selected in this study for evaluating the efficiency and effectiveness of an institution of higher education. The list of variables might include input, process and output variables.

3.2.2 The variable selection

In this study, a systems approach is used in a relatively small scope. The reasons for using the systems approach are as follows:

1. The systems approach provides a useful conceptual and analytical framework for decision oriented evaluation - that is, the evaluation which is directed towards providing useful information for decision making made by the administrators who hold important positions in an institution of higher education.
2. Since evaluation of the efficiency and effectiveness of an institution of higher education is decision oriented; then the systems approach is appropriate and useful for the problem to be studied.

The systems model to be used in this study as the framework for evaluating an institution of higher education can be drawn as follows:



f = feedback
i = indicators

FIGURE 3.1 THE SYSTEMS MODEL

The terms used in the systems model are defined as follows:

1. Input is the resource that enters the system. It refers to input variables that are defined as the amount of particular quantity taken by higher education institution.
2. Output is the outcome of the system. It refers to output variables that are defined as the quantities flowing out of higher education institution and either into one of the other systems of society or back into the higher education institution itself.
3. Process (transformation) is the process of changing input into output. It refers to the process variables that are defined as the variables linking input and output variables or the way the input variables are distributed throughout the higher education institution.
4. An indicator can measure an input variable, a process variable or an output variable and can be used for evaluating the efficiency and effectiveness of higher education institution.
5. Evaluation is the process of delineating, obtaining and providing useful information for judging the efficiency and effectiveness of higher education institution.

The definitions of input variable, output variable and process variable presented here are influenced by Johnstone (1977).

Johnstone (1974:29-36) points out seven educational subsystems, that is, pupils, teachers, finance, structure, administration, buildings and equipment. Through the combination of educational subsystems and systems subdivisions (input, process and output), twenty one nominal areas (cells) of an educational system can be identified. He then asserts that six cells are removed because of a lack of educational meaning, i.e. the input and output cells for the structure and

administration subsystems and the output cells for the buildings and equipment subsystems. The same frame of reference for an institution of higher education can also be used for categorizing the variables in this study.

Lindsay (1979) conceptualizes university operation by means of a systems model. He points out that the teaching-learning process and the research process are taken to be the basic university processes under investigation. The inputs are classified into three subsystems: student body, buildings and facilities, and staff. The outputs include student output and staff output. The student output is in terms of resulting additions to stock of knowledge, skills, and attitudes held by students; while the academic staff output is in terms of additions to their stock of knowledge and the publications emanating from university. The gains in knowledge by staff are not included in this study.

In this study, the teaching-learning (educational) process and research process are also taken as basic processes of an institution of higher education; therefore, the outputs are classified into the student output and teaching staff output which are the main outputs of the institution. The financial output will not be included because it is not educationally meaningful, although it could be a meaningful or a worthy subject for a separate study.

The student output refers to the students flowing out of an institution of higher education in terms of quantity and/or quality. These outputs may either complete a standard cycle (i.e. become the graduates) or not complete it (i.e. become the dropouts). The teaching staff output refers to the publications of the teaching staff, but the gains in knowledge by teaching staff will not be included.

The inputs are classified into four major components: students, teaching staff, finance and facility. Students are persons enrolled in an institution of higher education. They are measured in terms of their quantity and quality for the teaching-learning process. Teaching staff are persons in charge of teaching a group of students. Finance includes capital and recurrent expenditure spent by an institution of higher education for its operation. Facility includes buildings and/or equipment available in an institution of higher education for teaching, learning and research activities.

The variables to be used in this study - whether they be input, process or output variables - are selected on the bases of set criteria. The final set of defined and selected variables are therefore expected to be appropriate and useful for evaluating the efficiency and effectiveness of an institution of higher education. The principles used as criteria for variable selection are as follows:

1. the variable can be measured and/or quantified,
2. the variable is related to the efficiency and effectiveness of an institution of higher education,
3. the data would be available for the variable selected in the institution of higher education taken as sample.

The variables to be studied are tabulated in Tables 3.12 to 3.14 under three categories: the input variables, the process variables and the output variables.

Table 3.12 shows the input variables to be studied and the description of each variable. Included are the student input variables (no. 1-10), teaching staff input variables (no. 11-20), finance input variables (no. 21-22) and facility input variables (no. 23-24).

TABLE 3.12
THE INPUT VARIABLES

No.	Variable	Description
1.	GPA on entrance examination.	Indicates the grade point average of student's entrance examination scores.
2.	GPA on high school examination.	Indicates the grade point average of the student's scores on high school examination.
3.	Student's sex.	Indicates whether a student is male or female.
4.	Student's age.	Indicates how old the student is.
5.	Residential origin.	Indicates the place of origin of the student.
6.	Previous high school.	Indicates the kind of high school previously attended by the student.
7.	Number of students registered in an institution of higher education.	Indicates the student body of an institution of higher education.
8.	Number of students registered in undergraduate studies.	Indicates the relative involvement of an institution of higher education in undergraduate studies.
9.	Number of students registered in postgraduate studies.	Indicates the relative involvement of an institution of higher education in postgraduate studies.
10.	Percentage of enrolment who are female.	Indicates the relative involvement of female in an institution of higher education.
11.	Faculty member's teaching experience.	Indicates the number of years a faculty member has teaching experience.
12.	Faculty member's education.	Indicates the highest level of education that a faculty member has completed.
13.	Faculty member's academic rank.	Indicates the academic rank of teaching staff, such as: Professor, Associate Professor and Senior Lecturer.
14.	Teaching load.	Indicates the number of hours in which a faculty member actually teaches every week.
15.	Faculty member's another job.	Indicates a faculty member's time, effort and ability used outside the main job.
16.	Number of faculty members in an institution of higher education.	Indicates the teaching staff involved in an institution of higher education.
17.	Number of faculty who are Professors, Senior Lecturers or Lecturers.	Indicates the balance among teaching staff.
18.	Percentage of faculty with earned doctorate.	Indicates the degree of formal training received by the faculty members.
19.	Percentage of faculty who are Professors, Senior Lecturers and Lecturers.	Indicates the relative degree of the quality of teaching staff.
20.	Percentage of faculty with permanent status (full-time).	Indicates the employment status of the teaching staff.
21.	Total expenditure of an institution of higher education.	Indicates the total amount of money spent by an institution of higher education for the fiscal year.
22.	Instructional expenditure.	Indicates the total amount of money spent for instruction in an institution of higher education.
23.	Number of classrooms.	Indicates the number of classrooms available in an institution of higher education for teaching and learning activities.
24.	Total number of volumes available in the library.	Indicates educational (reading) facilities available for students.

Table 3.13 shows the process variables to be studied and the description of each variable. Included are the variables measure finance or expenditure (no. 1-3), the variables measure time to complete various degrees (no. 4-6) and the variables measuring features of an institution (no. 7-10) especially its facilities.

Table 3.14 shows the output variables to be studied and the description of each variable. Included are the student output variables (no. 1-12) and teaching staff output variables (no. 13-14).

The variables presented in the above tables are included in the questionnaire for teaching staff and administrators. In addition to the variables mentioned above, student educational satisfaction is also useful information related to the effectiveness of an institution of higher education. Hence the questionnaire to measure student educational satisfaction is also prepared for students.

3.2.3 The questionnaire construction

Some of the data needed in this study are obtained by using the two formal questionnaires already mentioned. Appendix A reports the original questionnaires in Indonesian, while Appendix B reports translation of each item into English together with the percentages of responses to each item of the questionnaires.

A tryout was needed in order to ascertain whether any changes were necessary before starting the actual data collection for this study. The tryout was carried out from 15 January 1980 until 5 February 1980 at the Jakarta State Institute for Islamic Studies (IAIN Jakarta) and the Jakarta Institute for Higher Teacher Training (IKIP Jakarta) under the supervision of Dr. J.N. Johnstone. After discussing the results of the tryout with Dr. Johnstone, some new questions were added and some changes

TABLE 3.13

THE PROCESS VARIABLES

No.	Variable	Description
1.	Percentage of total budget of an institution of higher education spent on capital expenditure.	Indicates the relative importance of building program.
2.	Percentage of total expenditure of institution of higher education spent on faculty salaries.	Indicates the proportion of recurrent expenditure already committed for non developmental activity.
3.	Expenditure (cost) per student.	Indicates the investment that the institution of higher education makes in the education of its student.
4.	The average length of time for completing B.A. degree.	Indicates the average of actual length of time needed by students to complete B.A. degree.
5.	The average length of time for completing M.A. degree.	Indicates the average of actual length of time needed by students to complete M.A. degree after getting B.A. degree.
6.	The average length of time for completing Dr. degree.	Indicates the average of actual length of time needed by students to complete doctorate program after getting M.A.
7.	Percentage of administrative officials with M.A. or Dr. degree.	Indicates the relative degree of the quality of administrative staff.
8.	Library books per student.	Indicates the average number of books available in the library per student.
9.	The area per student.	Indicates the square metre area per student available in a class room.
10.	Class size.	Indicates average number of students per class.

TABLE 3.14
THE OUTPUT VARIABLES

No.	Variable	Description
1.	Graduate's GPA.	Indicates the grade point average of a graduate's scores on all the courses needed to complete a degree.
2.	Graduate's GPA on general achievement.	Indicates the grade point average of a graduate's scores on all general courses.
3.	Graduate's GPA on professional achievement.	Indicates the grade point average of a graduate's scores on all professional courses.
4.	Graduate's GPA on major achievement.	Indicates the grade point average of a graduate's scores on all major courses in a department.
5.	Amount of time needed to complete a degree.	Indicates the actual length of time it takes a student to complete a degree.
6.	The mean score in a course.	Indicates the mean of the scores obtained by students in a course.
7.	Number of dropouts as the percentage of their entering class.	Indicates the percentage of students who left an institution before getting a degree.
8.	Completion rate.	Indicates the number of students graduating as the percentage of their entering class.
9.	Number of graduates.	Indicates the main output of an institution of higher education.
10.	Number of B.A. graduates.	Indicates the output of undergraduate programs of an institution of higher education.
11.	Number of M.A. graduates.	Indicates the output of postgraduate programs of an institution of higher education.
12.	Number of doctorate graduates.	Indicates the output of advanced postgraduate program of an institution of higher education.
13.	Number of research projects completed.	Indicates the output of research activities of an institution of higher education.
14.	Number of publications of the faculty.	Indicates the productivity of the faculty in scientific writing.

in wording were made. Then, the final drafts were reproduced and distributed at the six state institutions of higher education in Indonesia nominated as being the sample.

Most of the questions used are closed-end questions - that is, questions with four alternative answers from which the respondent should select or check one. Since there is a tendency for respondents to select the middle response and avoid taking an extreme stand, an even number of choices are made. Allen (1975:54) asserts: "One approach to the central-tendency problem is to use an even number of categories for your questions, thereby forcing the respondent to take one side or the other".

For the questionnaire on student educational satisfaction, for instance, the four alternative answers are disagree strongly, disagree, agree and agree strongly. The respondent should select or check one of the responses that he or she feels appropriate.

The questionnaire on student educational satisfaction

Cameron (1978) has used student educational satisfaction as one of the nine organizational effectiveness dimensions and asked top institutional administrators and academic department heads to respond to questions related to student dissatisfaction, student complaints, and school spirit displayed. Questions no. 1-5 in the questionnaire used in this study for student educational satisfaction are influenced by the dimension and questions used by Cameron. The wording of the questions is adapted to the kind of respondents included in this study.

Micek and Arney (1974) make various descriptive analyses of the data obtained from the Higher Education Outcome Measures Identification Study. This study was conducted by the National Center for Higher Education Management Systems at WICHE (The Western Interstate Commission

for Higher Education). One of the outcome areas asked in the questionnaire for this study is student education satisfaction which is defined as follows: "Information that indicates the satisfaction of students about the knowledge and skills they have acquired and their progress toward their education and occupation career objectives". (1974:58)

This concept is used as the frame of reference in writing the questions no. 6-13 and in taking into consideration the program structure of higher education institutions in Indonesia which consists of general, professional and major courses.

Seven more questions related to teaching staff, research, tuition, administration, classrooms and reading facilities are added. Most of the faculty members responding in the tryout of the questionnaire for teaching staff think that these variables are either useful or very useful in evaluating the efficiency and effectiveness of higher education institution. By including these, all twenty questions used in the questionnaire on student educational satisfaction cover all the components of higher education used as the framework in this study. This questionnaire can be seen in Appendix A.1.

The questionnaire on usefulness of potential measures

This questionnaire is distributed to the sample of teaching staff and administrators of the six state institutions of higher education under investigation in order to get information about the degree of usefulness of potential measures or variables that can be used for evaluating the efficiency and effectiveness of an institution of higher education. The questions for teaching staff and administrators are really the same - the only difference between the questionnaire

distributed to the teaching staff and that distributed to the administrators is the background information.

The questionnaire contains 49 closed-ended questions with four alternative answers - these being not useful, somewhat useful, useful and very useful. The respondent should select or check one of the responses that he or she feels appropriate. The questionnaire can be seen in Appendix A.2.

The 49 questions mentioned above cover all the variables to be studied and described earlier. After the tryout, three open-ended questions were added to allow the respondents to express their suggestions and comments on the evaluation of the efficiency and effectiveness of an institution of higher education, especially on the variables or measures to be used. In fact, all the questions used in the questionnaire comprise all the components of higher education used in this study.

3.3 METHOD OF DATA ANALYSIS

To obtain answers to the research problems, one should analyse the research data and then interpret the results of analysis. Kerlinger (1973:134) points out that analysis means categorizing, ordering, manipulating, and summarizing data to obtain answers to research questions. The purpose of analysis is to reduce data to an intelligible and interpretable form so that the research problems can be studied and tested. Interpretation takes the result of analysis, makes inferences pertinent to research relations studied and draws conclusions about these relations.

The main methods of data analyses to be used in this study are as follows:

1. Descriptive statistical techniques are used in the preliminary analyses of the data with the purpose of describing and summarizing the data obtained from the sample of students, teaching staff and administrators.
2. Factor analyses are used to analyse the students' responses to the questionnaire on student educational satisfaction and the teaching staff responses to the questionnaire on the usefulness of measures for evaluating the efficiency and effectiveness of an institution of higher education. First, the factor analysis of the students' responses leads to the creation of factor scale variables in terms of standardized scores. These can be used for further analyses. Second, the factor analyses employed in analysing the teaching staff responses related to the important factors perceived to be useful by teaching staff lead to a justification of the inclusion of the factors or measures in developing a useful model for evaluating the efficiency and effectiveness of an institution of higher education.
3. Multiple regression analyses are used to analyse the data to identify the important variables that contribute to the efficiency and effectiveness of an institution of higher education. Both multiple regression analysis using student as the unit of analysis and multiple regression analysis using faculty as the unit of analysis are used. The distinction is made so as to conduct the analyses of data properly and to avoid the danger of committing an error called the ecological fallacy - that is, to treat aggregate data as if they are measurements of individual units.

It is necessary to note that B.A. graduate's grade point average for completing the degree (GPBA) as an output variable cannot

be included in regression analyses of the data as a whole, because IKIP Malang uses a different scale of evaluation. Grade point average on high school examination (GPHS) and grade point average on scholastic aptitude test (GPSC) as input variables cannot also be included in regression analyses of data as a whole, because they are not available at some of the institutions selected as the sample. These three variables are only used in regression analyses for each institution where the data are available using student as the unit of analysis.

4. Commonality analysis is also used to examine the relative contribution of each variable or set of variables to the variation of various sets of dependent variables that can be used as measures of efficiency or effectiveness of an institution of higher education.
5. Cohort analysis is used to analyse the student data from the institutions of education under study. This analysis is performed to show the ways of how to measure the institutional efficiency and effectiveness of an institution of higher education.
6. Path analysis is used to study the hypothesized causal relationship between variables in developing a possible model with which to evaluate the efficiency and effectiveness of an institution of higher education. The trial of the model will be undertaken using four faculties in four institutions of higher education taken as part of the sample in this study. The trial is designated to show administrators how useful the model is for evaluating institutional efficiency and effectiveness.

Analysis of variance is also performed in a number of subordinate analyses for each factor scale variable. It allows an estimation as to whether the overall differences among the means are statistically

significant or not. If the overall F ratio is significant, the Scheffé test is used to test the difference between the means of all pairs of institutions and so determine which differences contribute to the overall significance level.

CHAPTER 4

ANALYSIS OF STUDENT DATA

In this chapter, analyses of data are discussed which address those measures of efficiency and effectiveness of an institution of higher education concerned with students. Some of the data used in these analyses have been collected by questionnaires administered to the sample of 1979 B.A. graduates. Other data have been collected from the records available at the various institutions under study.

In the first part of the discussion, attention is focused on the selected measures of efficiency. Efficiency in this context refers to the relationship between inputs and outputs. An ideal value would be established as an optimal input-output ratio. As has been indicated in Chapter 2, efficiency in this study is viewed in terms of the time spent by students in completing an educational cycle. The value computed can be expressed in student-years or student-months of study. Therefore, the average time to complete an educational cycle can be used as a measure of the efficiency of an institution of higher education. Loeb and Duff, for instance, use the average length of time in months for a degree as an index of efficiency. They state: "Average length of time to a degree can be useful in making individual plans and in comparing departments in the efficiency with which they produce degree holders" (Loeb and Duff, 1974:5).

In the second part of the discussion, attention is focused on various measures of effectiveness. The concept of effectiveness refers to the achievement of certain objectives or expected outcomes of an institution. In this study, the expected outcomes of an institution of higher education to be used as measures of effectiveness are expressed

in terms of students' academic performance, students' educational satisfaction, the proportion of graduates to enrolment and the proportion of M.A. graduates to the total number of graduates.

The analysis of the student data presented in this chapter is then directed towards the first research problem stated in Chapter 1, viz.:

> Is it possible for the administrator to assess the efficiency and effectiveness of higher education institution? How might the administrator evaluate the efficiency and effectiveness of an institution of higher education?

Two different samples of students were used to obtain data. The first of these samples is the cohort of 1976 entrants to four of the six institutions which have the data required available and complete. These students could complete their degrees in different academic years such as in 1978 or 1979 or 1980. The cohort thus refers to the groups of students enrolled in a particular academic year and their progress was followed through successive years until they completed the educational cycle and received their degree or discontinued.

The year 1976 was selected because most students of the entering class of 1976 had completed their B.A. degree by 1979 and they were hence most compatible with students in the main sample. Taking a later year for entry for the cohort would have precluded students from graduating up to the data collection period, while an earlier year would have lessened the compatibility between the samples.

The second sample is those students who graduated in 1979. This sample has been described in full in Chapter 3. It is important to point out here however that these B.A. graduates might have first enrolled in different academic years, such as in 1977, 1976 or even earlier. The two samples therefore provide two different viewpoints for examining the

efficiency measure of average completion time and the range of effectiveness measures.

4.1 THE EFFICIENCY MEASURES

4.1.1 The 1976 cohort data

As noted previously, the complete raw data required for conducting the cohort analysis are available only at four of the six institutions of higher education taken as a sample for this study. Hence the analysis of the 1976 cohort of students through the undergraduate cycle is only carried out for these four institutions - namely the State Institute for Islamic Studies (IAIN) in Bandung, the Institute of Higher Teacher Training (IKIP) in Bandung, the State Institute for Islamic Studies (IAIN) in Surabaya and the Institute of Higher Teacher Training (IKIP) Malang.

The flow of the 1976 cohort of students through the undergraduate cycle by faculty at IAIN Bandung, IKIP Bandung, IAIN Surabaya and IKIP Malang is presented in Tables 4.1 to 4.4 respectively. Each table shows the number of students who first enrolled in 1976 by faculty in a particular institution and their progress until they graduated or discontinued. The figures presented for each year are the number of the 1976 cohort of students who enrolled in a particular academic year (t), the number of those students who were promoted into the following academic year (p), the number of repeaters (r) in a particular academic year, the number of dropouts (d) and/or the number of graduates (g) from the undergraduate cycle.

The data in Tables 4.1 to 4.4 allow the calculation of an educational flow coefficient like that used by Makmun (1978:141). This is equal to

TABLE 4.1

FLOW OF THE 1976 COHORT OF STUDENTS THROUGH UNDERGRADUATE CYCLE AT IAIN BANDUNG BY FACULTY

Year/grade / Faculty	1976/I				1977/II				1978/III				1979/III				1980/III			
	t	p	r	d	t	p	r	d	t	g	r	d	t	g	r	d	t	g	r	d
1. Islamic Education	53	48	-	5	48	42	-	6	42	-	42	-	42	7	27	8	27	27	-	-
2. Islamic Theology	42	32	-	10	32	29	-	3	29	-	29	-	29	9	13	7	13	13	-	-
3. Islamic Law	90	74	-	16	74	70	-	4	70	-	70	-	70	24	20	26	20	20	-	-
IAIN Bandung	185	154	-	31	154	141	-	13	141	-	141	-	141	40	60	41	60	60	-	-

TABLE 4.2

FLOW OF THE 1976 COHORT OF STUDENTS THROUGH UNDERGRADUATE CYCLE AT IKIP BANDUNG BY FACULTY

Year/grade / Faculty	1976/I				1977/II				1978/III				1979/III				1980/III			
	t	p	r	d	t	p	r	d	t	g	r	d	t	g	r	d	t	g	r	d
1. Education	528	425	-	103	425	369	-	56	369	12	345	12	345	94	205	46	205	205	-	-
2. Teacher Training in Social Sciences	500	408	-	92	408	378	-	20	378	1	351	26	351	50	256	45	256	88	-	168
3. Teacher Training in Arts and Literature	299	236	-	63	236	205	-	31	205	2	143	60	143	62	59	22	59	25	-	34
4. Teacher Training in Exact Sciences	186	170	-	16	170	163	-	7	163	-	163	-	163	81	82	-	82	10	-	72
5. Teacher Training in Technology	233	220	-	13	220	201	-	19	201	-	201	-	201	14	153	34	153	6	-	147
IKIP Bandung	1746	1459	-	287	1459	1316	-	143	1316	15	1203	98	1203	301	755	147	755	334	-	421

[illegible] STUDENTS THROUGH UNDERGRADUATE CYCLE AT IKIP [illegible]

TABLE 4.3

FLOW OF THE 1976 COHORT OF STUDENTS THROUGH UNDERGRADUATE CYCLE AT IAIN SURABAYA BY FACULTY

Year/grade / Faculty	1976/I				1977/II				1978/III				1979/III				1980/III			
	t	p	r	d	t	p	r	d	t	g	r	d	t	g	r	d	t	g	r	d
1. Islamic Theology	66	47	10	9	47	47	-	-	47	-	41	6	41	23	17	1				
2. Islamic Law	166	138	8	20	138	102	14	22	102	30	62	10	62	26	33	3				
3. Islamic Culture	55	40	-	15	40	33	-	7	33	-	32	1	32	17	15	-				
4. Islamic Missionary	52	41	-	11	41	38	-	3	38	-	35	3	35	19	1	15				
IAIN Surabaya	339	266	18	55	266	220	14	32	220	30	170	20	170	85	66	19				

TABLE 4.4

FLOW OF THE 1976 COHORT OF STUDENTS THROUGH UNDERGRADUATE CYCLE AT IKIP MALANG BY FACULTY

Year/grade / Faculty	1976/I				1977/II				1978/III				1979/III				1980/III			
	t	p	r	d	t	p	r	d	t	g	r	d	t	g	r	d	t	g	r	d
1. Education	127	110	-	17	110	108	-	2	108	41	65	2	65	25	30	10	30	11	-	19
2. Teacher Training in Social Sciences	204	178	-	26	178	175	-	3	175	23	138	14	138	49	75	14	75	6	-	69
3. Teacher Training in Arts and Literature	141	120	-	21	120	119	-	1	119	42	70	7	70	30	27	13	27	7	-	20
4. Teacher Training in Exact Sciences	102	88	-	14	88	87	-	1	87	14	71	2	71	10	54	7	54	6	-	48
5. Teacher Training in Technology	65	58	-	7	58	56	-	2	56	0	56	0	56	6	35	15	35	10	-	25
IKIP Malang	639	554	-	85	554	545	-	9	545	120	400	25	400	120	221	59	221	40	-	181

the number of student-years offered by an institution divided by the number of students graduating and thus being successful completers. This input-output ratio can also be called the "cohort efficiency ratio", but the former term will be used here because of its more general use in the literature.

The number of student-years offered by an institution and actually used by students in their study through the undergraduate cycle (and shown in Tables 4.1 to 4.4) is equivalent to the number of the 1976 cohort of students who enrolled at any time in any academic year (t), while the number of successful completers through the cycle is the total number of graduates (g) from the cohort.

TABLE 4.5

THE NET INPUT-OUTPUT DATA OF THE 1976 COHORT OF STUDENTS THROUGH UNDERGRADUATE CYCLE AT IAIN BANDUNG

Year	Input (t)	Output (g)
1976	185	-
1977	154	-
1978	141	-
1979	141	40
1980	60	60
Total	681	100

Extracting the data from the first 't' columns in Table 4.1 and summarizing them as in Table 4.5 allows the input-output ratio of the undergraduate cycle of IAIN Bandung to be calculated easily:

$$\frac{\text{Number of student years offered}}{\text{Number of graduates}} = \frac{681}{100} = 6.81.$$

This ratio indicates that on the average, about 6.81 student-years have been used to produce a B.A. graduate at this institution, while the ideal ratio is equal to 3, that is, the minimum number of student-years required to complete a B.A. degree in an institution of higher education in Indonesia.

In the same way, the cohort input-output ratio can be computed for each institution by faculty. The results of these computations are presented in Table 4.6. The values for these input-output ratios vary considerably from one institution to another and from one faculty to another. The values range from 5.71 years for the Faculty of Education at IKIP Malang to 50.40 for the Faculty of Teacher Training in Technology at IKIP Bandung. The ideal value however is 3 and this value would be obtained if all the entering classes of a cohort completed an educational cycle in the minimum time required to complete a B.A. degree - that is, three years in this case. The higher the input-output ratio of a faculty or an institution, the less efficient is the faculty or the institution.

4.1.2 The 1979 B.A. graduate data

The measure of the efficiency of an institution of higher education calculated from the sample of 1979 B.A. graduates is the average length of time in months for completing a degree. This measure is also used by Loeb and Duff (1974:325-340) as an index of the efficiency of a graduate student cohort. The shorter the average length of time to complete a degree, the more efficient is that institution.

TABLE 4.6

INPUT-OUTPUT RATIO AND COMPLETION RATE OF THE 1976 COHORT OF STUDENTS THROUGH UNDERGRADUATE CYCLE BY FACULTY

No.	Description	Cohort input-output ratio	Completion rate (%)
1.	IAIN Bandung	6.81	54.05
	1.1 Faculty of Islamic Education	6.24	64.15
	1.2 Faculty of Islamic Theology	6.59	52.38
	1.3 Faculty of Islamic Law	7.36	48.89
2.	IKIP Bandung	9.97	37.23
	2.1 Faculty of Education	6.02	58.90
	2.2 Faculty of Teacher Training in Social Sciences	13.62	27.80
	2.3 Faculty of Teacher Training in Arts and Literature	10.58	29.77
	2.4 Faculty of Teacher Training in Exact Sciences	8.40	48.92
	2.5 Faculty of Teacher Training in Technology	50.40	8.58
3.	IAIN Surabaya	8.65	33.92
	3.1 Faculty of Islamic Theology	8.74	34.85
	3.2 Faculty of Islamic Law	8.36	33.73
	3.3 Faculty of Islamic Culture	9.41	30.91
	3.4 Faculty of Islamic Missionary	8.74	36.54
4.	IKIP Malang	8.42	43.82
	4.1 Faculty of Education	5.71	60.63
	4.2 Faculty of Teacher Training in Social Sciences	9.87	38.24
	4.3 Faculty of Teacher Training in Arts and Literature	6.04	56.03
	4.4 Faculty of Teacher Training in Exact Sciences	13.40	29.41
	4.5 Faculty of Teacher Training in Technology	16.88	24.62
	Total: 4 institutions of higher education	9.18	39.36

The average time to complete a B.A. degree (AVTCDG) in months by faculty is presented in Table 4.7. The values for the average time to complete a B.A. degree range from 38.67 to 56.12 months. The ideal value would be 36 months and achieved when all B.A. graduates in 1979 completed their degree in the minimum time required. The ideal value is seldom achieved amongst the student body in the institutions being investigated here.

An administrator of an institution of higher education can use the average time to complete a degree for comparing the efficiency of the faculties in producing their graduates. At IKIP Malang, for instance, the Faculty of Education has a lower value for the average time to complete a B.A. degree than does the Faculty of Teacher Training in Technology. Hence at this institution, the Faculty of Education is more efficient than the Faculty of Teacher Training in Technology in producing B.A. graduates.

The Faculty of Education at IKIP Malang has a higher value for the average time to complete the B.A. degree than does the Faculty of Education at IKIP Bandung. Therefore the Faculty of Education at IKIP Malang is less efficient in producing B.A. graduates than is the Faculty of Education at IKIP Bandung.

If the data on the average time to complete a B.A. degree for a faculty is available for several consecutive years, the administrator can compare the efficiency of the faculty over the years to determine whether the faculty has become more or less efficient in its production of graduates. This information can be very useful for the administrator especially in deliberating human and financial resources.

The minimum time to complete a B.A. degree is three years or 36 months, but if one looks at the means of the time to complete a B.A.

TABLE 4.7

THE AVERAGE TIME TO COMPLETE THE B.A. DEGREE (AVTCDG), ITS STANDARD DEVIATION (STD) AND COEFFICIENT OF VARIATION (CV) AND THE B.A. GRADUATE EFFICIENCY RATIO (EFRABA) BY FACULTY

No.	Description	AVTCDG	STD	CV	EFRABA
1.	IAIN Bandung	42.26	4.27	10.1	.8519
	1.1 Faculty of Islamic Education	43.28	3.41	7.9	.8318
	1.2 Faculty of Islamic Theology	42.00	8.12	19.3	.8571
	1.3 Faculty of Islamic Law	41.29	2.71	6.6	.8719
2.	IKIP Bandung	44.76	11.29	25.2	.8043
	2.1 Faculty of Education	40.44	5.87	14.5	.8902
	2.2 Faculty of Teacher Training in Social Sciences	45.04	7.19	16.0	.7993
	2.3 Faculty of Teacher Training in Arts and Literature	45.18	14.17	31.4	.7968
	2.4 Faculty of Teacher Training in Exact Sciences	43.15	13.69	31.7	.8343
	2.5 Faculty of Teacher Training in Technology	50.62	12.32	24.3	.7112
3.	Padjadjaran University	44.95	11.45	25.5	.8009
	3.1 Faculty of Law	46.29	14.36	31.0	.7777
	3.2 Faculty of Economics	45.84	10.62	23.2	.7853
	3.3 Faculty of Exact and Physical Sciences	44.56	8.49	19.0	.8079
	3.4 Faculty of Literature	38.67	3.88	10.0	.9310
	3.5 Faculty of Social Politics	46.00	14.44	31.4	.7826
	3.6 Faculty of Psychology	40.90	6.33	15.5	.8802

TABLE 4.7 (CONTINUED)

No.	Description	AVTCDG	STD	CV	EFRABA
4.	IAIN Sunan Ampel Surabaya	41.42	4.11	9.9	.8691
	4.1 Faculty of Islamic Theology	40.45	3.55	8.8	.8900
	4.2 Faculty of Islamic Law	43.14	4.76	11.0	.8345
	4.3 Faculty of Islamic Culture	43.00	4.39	10.2	.8372
	4.4 Faculty of Islamic Missionary	39.11	1.79	4.6	.9205
5.	Airlangga University	48.43	11.75	24.3	.7433
	5.1 Faculty of Law	52.10	12.47	23.9	.6910
	5.2 Faculty of Economics	43.22	8.91	20.6	.8329
	5.3 Faculty of Pharmacy	47.00	7.01	14.9	.7660
6.	IKIP Malang	46.14	9.29	20.1	.7802
	6.1 Faculty of Education	41.25	5.40	13.1	.8727
	6.2 Faculty of Teacher Training in Social Sciences	46.34	8.27	17.8	.7769
	6.3 Faculty of Teacher Training in Arts and Literature	42.94	4.41	10.3	.8384
	6.4 Faculty of Teacher Training in Exact Sciences	45.00	10.56	23.5	.8000
	6.5 Faculty of Teacher Training in Technology	56.12	11.99	21.4	.6415
Total:	6 institutions of higher education	45.24	10.21	22.6	.7958

Note: Values for each institution are calculated for all students in the institution and not by averaging across faculties because faculties have unequal numbers of students in the sample.

degree (AVTCDG) by institution, they range from 41.42 to 48.83 months. These figures reflect the inefficiency of institutional operation of higher education system at undergraduate level.

For example, consider Bandung Institute of Higher Teacher Training (IKIP Bandung) and Malang Institute of Higher Teacher Training (IKIP Malang). As shown in the table, both institutions have similar faculties. The mean and standard deviation of the actual amount of time needed by students to complete the B.A. degree at IKIP Bandung are 44.76 and 11.29 months, whereas at IKIP Malang are 46.14 and 9.29 months respectively. In other words, the average amount of time needed by students to complete B.A. degree is longer at IKIP Malang than at IKIP Bandung, but there is more variation in the amount of time to complete the degree at IKIP Bandung than it is at IKIP Malang.

In order to compare the variation of two or more sets of scores, the measure of variation is expressed as the percentage of the mean or converted to a relative variation called the coefficient of variation (CV). Armore (1967:164) points out that coefficient of variation can be computed as follows: $CV = \frac{\text{standard deviation}}{\text{mean}} \times 100$.

In the same way, the coefficients of variation of the time to complete B.A. degree have been calculated as presented in column 5 Table 4.7. The values of CV range from the lowest (4.6%) at Faculty of Islamic Missionary of IAIN Surabaya through the highest (31.7%) at Faculty of Teacher Training in Exact Sciences of IKIP Bandung.

Then, consider the mean and standard deviation of the time to complete B.A. degree at Faculty of Teacher Training in Arts and Literature. At IKIP Bandung, the mean is 45.18 months and standard deviation is 14.17 months; while at IKIP Malang, the mean and standard deviation are 42.94

and 4.41 months respectively. In other words, the average amount of time to complete B.A. degree at Faculty of Teacher Training in Arts and Literature is longer and has more variation at IKIP Bandung than it is at IKIP Malang. This difference is much clearer if the relative variation for both faculties are taken into account, that is, 31.4% at IKIP Bandung and 10.3% at IKIP Malang.

The efficiency ratio of the undergraduate or B.A. program (EFRABA) by faculty is also presented in Table 4.7. The B.A. graduate efficiency ratio is obtained from the minimum required time to complete a B.A. degree divided by the average length of time to complete the B.A. degree. Since the minimum required time to complete a B.A. degree in the institutions under study is 36 months, the EFRABA is equal to 36 months divided by the average length of time to complete a B.A. degree. Therefore, the highest value of the efficiency ratio is equal to one, when the average length of time to complete a B.A. degree is equal to the minimum required time to complete the degree.

The ratio could have been defined as the inverse, but it was conceptually preferable to have a high value for the measure as indicating higher efficiency. The other measure for the cohort could not be so changed because of its use in previous studies and the destruction of compatibility which would have ensued.

Although conceptually the input-output ratio and the graduate efficiency ratio are analogous and statistically the definition of the latter is the inverse of the former, it has been decided to use the two separate terms in order to make obvious the difference in the definitions used here.

The values of the B.A. graduate efficiency ratio, as shown in Table 4.7, range from .6415 for the Faculty of Teacher Training in

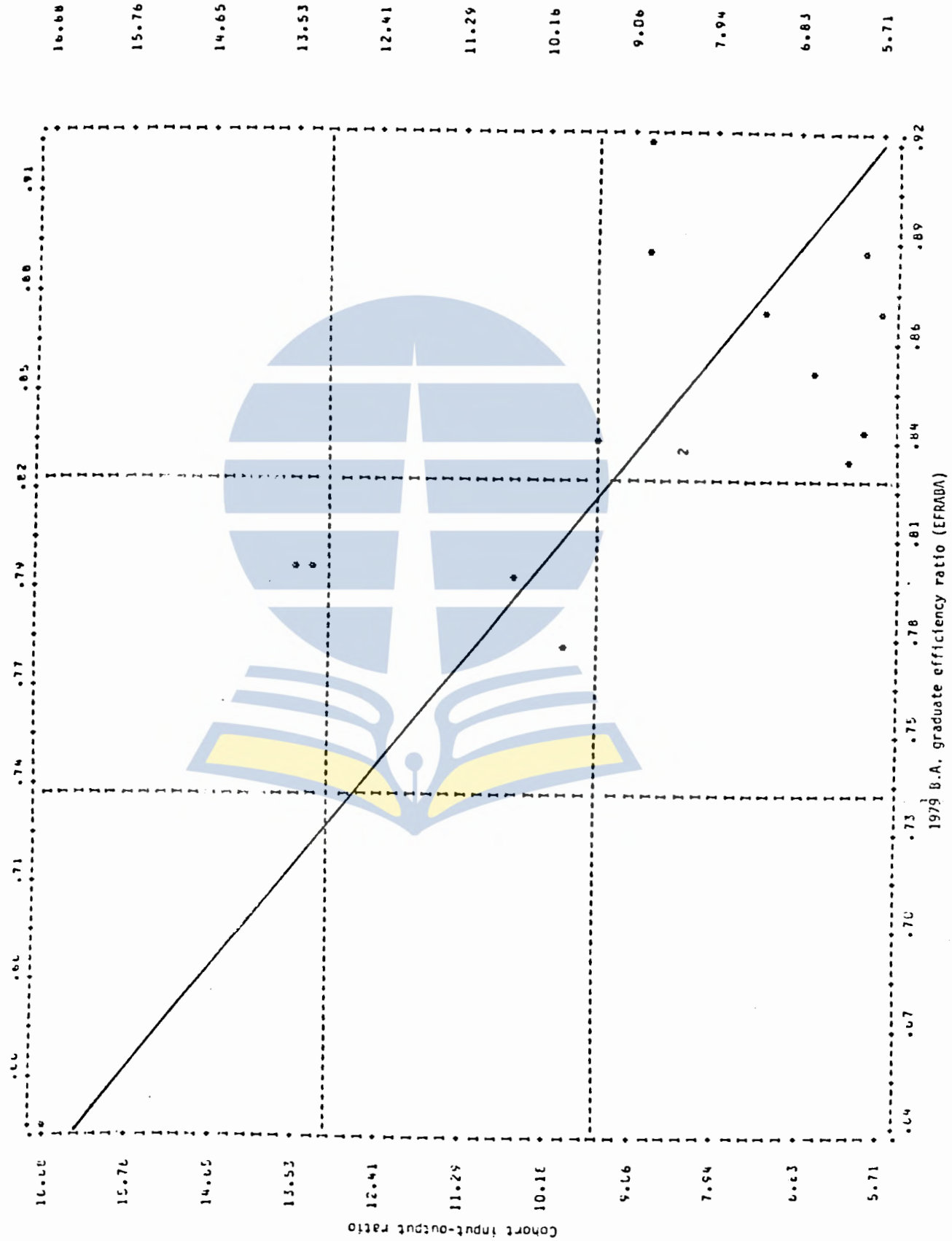
Technology at IKIP Malang to .9310 for the Faculty of Literature at Padjadjaran University, while the efficiency ratio estimated by combining all 26 faculties at the six institutions of higher education is .7958. The higher the B.A. graduate efficiency ratio, the more efficient the faculty is in producing its B.A. graduates.

4.1.3 Interchangeability of the efficiency measures

Alternative forms of the same concept of efficiency have been used for the two samples available to the present study. The extent to which these formulations are interrelated must then be assessed. To do this, a correlation coefficient can be calculated between the 1976 cohort input-output ratio and the 1979 B.A. graduate efficiency ratio across the 17 faculties for which both ratios are available. One of the faculties - that is, Faculty of Teacher Training in Technology at IKIP Bandung, has an extreme value for the input-output ratio which is equal to 50.40 and hence this faculty is excluded from the calculation. This very high value may reflect the small number of successful completers and the large number of dropouts from this faculty. It is admitted that if this faculty is included in the calculation, the correlation coefficient between the two ratios will be slightly lower.

The zero order correlation coefficient between the two ratios across 16 out of the 17 faculties for which both ratios are available is -.78 (significant at .0002 level). This relatively high correlation coefficient provides some empirical support to justify the use of the B.A. graduate efficiency ratio as a measure of the efficiency of an institution of higher education. It is not however high enough to conclude the two measures are completely interchangeable. The difference

FIGURE 4.1 SCATTERGRAM AND REGRESSION LINE FOR 1976 COHORT INPUT-OUTPUT RATIO AND 1979 B.A. GRADUATE EFFICIENCY RATIO



between the two measures is because the repeaters and dropouts which influence the value of the 1976 input-output ratio, are not considered in the 1979 B.A. graduate efficiency ratio.

Figure 4.1 presents the scattergram of the two ratios. The diagram contains 16 asterisks, each representing one faculty. The horizontal axis (abscissa) has the B.A. graduate efficiency ratio as its scale, while the values of the cohort input-output ratio are marked off on the vertical axis (ordinate). Each asterisk then represents the actual values of both ratios for each faculty.

A regression line is also drawn for the two ratios. It has a negative slope since the correlation coefficient between the two ratios is negative. The regression equation for this line is:

$$Y = 41.50965 - 38.98221 (X)$$

where X is the 1979 B.A. graduate efficiency ratio and Y is the 1976 cohort input-output ratio. The regression line could be used to predict one ratio value from the other.

4.2 THE EFFECTIVENESS MEASURES

4.2.1 The 1976 cohort data

The ratio measuring effectiveness in a cohort analysis is the retention ratio. Unesco discussed this ratio as follows: "Based on cohort data, the percentage of pupils who survive to complete an educational cycle (retention ratio) is computed, or inversely the percentage of pupils who fail to complete the cycle (wastage ratio)" (Unesco-Bangkok, 1976:4). In this study, the retention ratio is called a completion rate to indicate the number of students graduating from an institution of higher education as the percentage of their entering

class. Table 4.1 shows that the entering class of the 1976 cohort of students at IAIN Bandung contained 185 students, while the number of B.A. graduates from that entering class is 100. Hence, the completion rate is $\frac{100}{185} \times 100\% = 54.05\%$. In the same way, the completion rate for each institution by faculty can be computed. The results of these computations are also presented in Table 4.6.

The values for the completion rate in Table 4.6 range from 8.58% for the Faculty of Teacher Training in Technology at IKIP Bandung to 64.15% for the Faculty of Islamic Education at IAIN Bandung, whereas the ideal value is 100% where all the entering classes of a cohort complete an educational cycle successfully. The ideal value for the completion rate is not often achieved, since normally there are some students from the entering class who drop-out.

The Faculty of Teacher Training in Technology at IKIP Bandung has the highest value for the cohort input-output ratio. This would indicate that this faculty is the least efficient one because, on the average, students take a longer time to complete the degree. On the other hand, the completion rate for this faculty is the lowest of all values. Inversely this indicates that this faculty has the highest wastage of the 1976 cohort of students through the undergraduate cycle.

The Faculty of Education at IKIP Malang has the lowest value for the input-output ratio. This indicates that this faculty is the most efficient one. On the other hand, the completion rate for this faculty is relatively high, even though it is not the highest of all values. The faculty which does have the highest completion rate is the Faculty of Islamic Education at IAIN Bandung. This faculty therefore has the lowest wastage of the 1976 cohort of students through the undergraduate cycle.

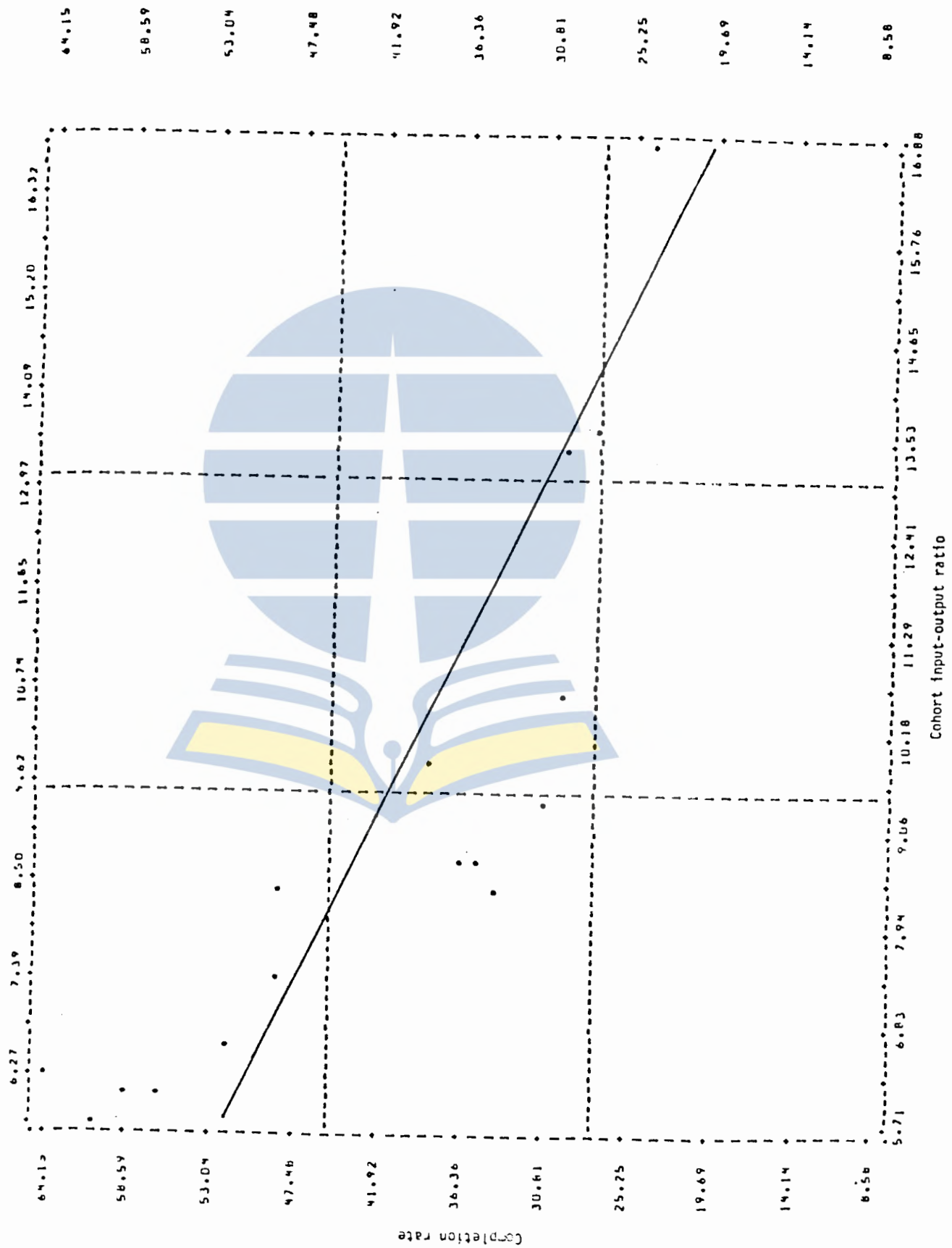
It is necessary to note, that the values of both ratios could change as more years are allowed for the 1976 cohort data to be used in the calculation of the ratios, since some students who were still in the system during the data collection period could obtain their degrees in later years.

The zero order correlation coefficient between the 1976 cohort input-output ratio and the completion rate across 16 out of 17 faculties for which both ratios are available is -.84. Although the correlation coefficient is nigh, the two measures being used are not totally interchangeable. They can give different comment on faculty operation. Because the completion rate is only influenced by the size of an entering class and the total number of successful completers from the entering class, the faculty with the highest completion rate does not necessarily have the lowest input-output ratio. In addition to these two influences, the input-output ratio is also affected by the student-years offered and the distribution of graduates over the academic years through an educational cycle. These in turn affect the average time to complete a degree.

Figure 4.2 presents the scattergram showing the interrelationships between the two ratios. The diagram contains 16 asterisks, each representing one faculty. The horizontal line (abscissa) has the cohort input-output ratio as its variable, while the completion rate is the variable represented by the vertical axis (ordinate). Each asterisk then represents the actual values of both ratios for each faculty.

A regression line is also drawn for the two ratios. It has a negative slope, since the correlation coefficient between the two ratios is negative. The regression equation for this line is:

FIGURE 4.2 SCATTERGRAM AND REGRESSION LINE FOR 1976 COHORT INPUT-OUTPUT RATIO AND COMPLETION RATE



$$Y = 74.26310 - 3.51082 (X)$$

where X is the 1976 cohort input-output ratio and Y is the completion rate. The regression line could be used to predict one ratio scale from the other.

4.2.2 The 1979 B.A. graduate data

The sample of 1979 B.A. graduates provides the major data base for this study. It allows the calculation of the following kinds of effectiveness measures:

. student educational satisfaction,

. students' academic performance,

. proportion of graduates to enrolment,

. proportion of graduates to enrolment in undergraduate program,

. proportion of M.A. graduates to the total number of graduates.

The first of these kinds of measures requires very extensive discussion because of its complex measure and its crucial role in this study. Consideration of student satisfaction is therefore deferred until the following section. The other four effectiveness measures are now discussed.

The students' academic performance as the expected outcome of an institution of higher education is an important measure of its effectiveness. The students' academic performance for the undergraduate cycle is expressed here as the weighted B.A. graduate grade point average, that is, the B.A. graduate's grade point average divided by the highest value of the evaluation scale used in the institution of higher education. IKIP Malang uses scale values between 0 and 4, while the other institutions in the sample use scale values between 0 and 10. Therefore, the denominator used for IKIP Malang is 4 and for the others is 10.

Table 4.8 shows the mean weighted B.A. graduates' grade point average (MWGPBA) by faculty. The values of MWGPBA range from .554 for the Faculty of Teacher Training in Technology at IKIP Malang to .677 for the Faculty of Teacher Training in Arts and Literature at IKIP Bandung. The higher the mean weighted B.A. graduates' grade point average for a faculty, the more effective the undergraduate cycle of the faculty is regarded.

Three other expected outcomes of an institution of higher education will also be used as measures of its effectiveness. They are: the proportion of graduates to enrolment (PRGENR), the proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU) and the proportion of M.A. graduates to the number of graduates (PRMANG).

The ratio of graduates to student body can be used as a measure of productivity (Tisna Amidjaja and Sapi'e, 1980:22-23) and as an important variable in describing higher education in Indonesia (Direktorat Jenderal Pendidikan Tinggi, 1976). Therefore, it is reasonable to include this ratio in the evaluation of effectiveness of faculties and institutions of higher education in Indonesia.

The ratio of graduates to student body which is the same as the proportion of graduates to enrolment (PRGENR) reflects one of the expected outcomes of an institution of higher education. The higher the proportion of graduates to enrolment, the more effective the institution.

Table 4.9 shows the proportion of graduates to enrolment (PRGENR), the proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU) and the proportion of M.A. graduates to the number of graduates (PRMANG) by faculty in 1979. The values of PRGENR in the table range from .0275 for the Faculty of Teacher Training in Exact Sciences at IKIP MALANG to .2277 for the Faculty of Law at Airlangga University. Then the

TABLE 4.8

THE MEAN OF WEIGHTED B.A. GRADUATES' GRADE POINT AVERAGE (MWGPBA) BY FACULTY

No.	Description	MWGPBA
1.	IAIN Bandung	.630
	1.1 Faculty of Islamic Education	.623
	1.2 Faculty of Islamic Theology	.637
	1.3 Faculty of Islamic Law	.633
2.	IKIP Bandung	.659
	2.1 Faculty of Education	.672
	2.2 Faculty of Teacher Training in Social Sciences	.637
	2.3 Faculty of Teacher Training in Arts and Literature	.677
	2.4 Faculty of Teacher Training in Exact Sciences	.664
	2.5 Faculty of Teacher Training in Technology	.651
3.	Padjadjaran University	.624
	3.1 Faculty of Law	.600
	3.2 Faculty of Economics	.628
	3.3 Faculty of Exact and Physical Sciences	.648
	3.4 Faculty of Literature	.667
	3.5 Faculty of Social Politics	.618
	3.6 Faculty of Psychology	.605
4.	IAIN Sunan Ampel Surabaya	.627
	4.1 Faculty of Islamic Theology	.622
	4.2 Faculty of Islamic Law	.639
	4.3 Faculty of Islamic Culture	.624
	4.4 Faculty of Islamic Missionary	.623
5.	Airlangga University	.608
	5.1 Faculty of Law	.601
	5.2 Faculty of Economics	.617
	5.3 Faculty of Pharmacy	.625
6.	IKIP Malang	.570
	6.1 Faculty of Education	.566
	6.2 Faculty of Teacher Training in Social Sciences	.565
	6.3 Faculty of Teacher Training in Arts and Literature	.603
	6.4 Faculty of Teacher Training in Exact Sciences	.579
	6.5 Faculty of Teacher Training in Technology	.554
	Total: 6 institutions of higher education	.618

TABLE 4.9

THE PROPORTION OF GRADUATES TO ENROLMENT (PRGENR), THE PROPORTION OF B.A. GRADUATES TO ENROLMENT IN UNDERGRADUATE PROGRAM (PRBGEU) AND THE PROPORTION OF M.A. GRADUATES TO THE NUMBER OF GRADUATES (PRMANG) BY FACULTY IN 1979

No.	Description	PRGENR	PRBGEU	PRMANG
1.	IAIN Bandung	.1066	.1039	.3800
	1.1 Faculty of Islamic Education	.1476	.1597	.4328
	1.2 Faculty of Islamic Theology	.1013	.0828	.3913
	1.3 Faculty of Islamic Law	.0708	.0693	.3158
2.	IKIP Bandung	.1076	.0885	.2578
	2.1 Faculty of Education	.1115	.0949	.2404
	2.2 Faculty of Teacher Training in Social Sciences	.0935	.0693	.2693
	2.3 Faculty of Teacher Training in Arts and Literature	.1163	.0873	.2933
	2.4 Faculty of Teacher Training in Exact Sciences	.1030	.0954	.1544
	2.5 Faculty of Teacher Training in Technology	.1138	.0954	.3048
3.	Padjadjaran University	.1509	.1573	.3838
	3.1 Faculty of Law	.1159	.1100	.3235
	3.2 Faculty of Economics	.2000	.2360	.4075
	3.3 Faculty of Exact and Physical Sciences	.1558	.1645	.3258
	3.4 Faculty of Literature	.0646	.0405	.4533
	3.5 Faculty of Social Politics	.1728	.1452	.4510
	3.6 Faculty of Psychology	.1965	.2476	.3418

TABLE 4.9 (CONTINUED)

No.	Description	PRGENR	PRBGEU	PRMANG
4.	IAIN Sunan Ampel Surabaya	.1109	.1690	.0717
	4.1 Faculty of Islamic Theology	.1486	.1912	.0769
	4.2 Faculty of Islamic Law	.0431	.0546	.0571
	4.3 Faculty of Islamic Culture	.1402	.2547	.1000
	4.4 Faculty of Islamic Missionary	.1118	.1756	.0525
5.	Airlangga University	.1701	.1666	.3609
	5.1 Faculty of Law	.2277	.2635	.3897
	5.2 Faculty of Economics	.1330	.1814	.1823
	5.3 Faculty of Pharmacy	.1494	.0549	.3077
6.	IKIP Malang	.0672	.0856	.2329
	6.1 Faculty of Education	.0816	.1239	.2833
	6.2 Faculty of Teacher Training in Social Sciences	.0847	.1019	.1810
	6.3 Faculty of Teacher Training in Arts and Literature	.0668	.0597	.3538
	6.4 Faculty of Teacher Training in Exact Sciences	.0275	.0290	.3462
	6.5 Faculty of Teacher Training in Technology	.0756	.1133	.0000
	Total: 6 institutions of higher education	.1174	.1270	.3024

values for the proportion of B.A. graduates to undergraduate enrolment (PRBGEU) range from .0290 for the Faculty of Teacher Training in Exact Sciences at IKIP Malang to .2635 for the Faculty of Law at Airlangga University. Finally, the values for the proportion of M.A. graduates to the number of graduates (PRMANG) range from .0000 for the Faculty of Teacher Training in Technology at IKIP Malang to .8077 for the Faculty of Pharmacy at Airlangga University. In summary therefore, two faculties at IKIP Malang are identified as being least effective by these three measures, while two of the faculties at Airlangga University are identified as being most effective in these respects.

4.2.3 The measure of student satisfaction

The student questionnaire measuring student educational satisfaction consisted of twenty statements. For each statement (or item), students were asked to check the response that they felt most appropriate. There were four possible responses: disagree strongly (DS), disagree (D), agree (A) and agree strongly (AS). In addition, they were also asked about some background information, which can be used for further analysis. Values of 1, 2, 3 and 4 are assigned to the respective responses. If there is no response to an item, 0 is given. Since items numbered 1, 2, 5, 10, 17 and 19 have different or opposite directions, the values assigned to the responses are the reverse of the above so as to maintain the principle of high scores indicating strong agreement to a positive feature - that is, disagree strongly=4, disagree=3, agree=2 and agree strongly=1.

Table B.1 (Appendix B) shows the percentages of students' responses to the questionnaire on student satisfaction by institution. The percentages of students' responses across particular item categories as

presented in this table can be summarized into Table 4.10. Here a summary is presented of the percentages of agreement responses to the questionnaire (i.e. ratings of 3 and 4) by institution. In general, the percentages presented in Table 4.10 indicate that the 1979 B.A. graduates who responded to the questionnaire were agreed to most of the items.

The items obtaining the highest agreement ratings from the respondents can be listed as follows:

- most of the respondents thought that the academic work in their institutions was not a drudgery (Item 1),
- most of the respondents were enthusiastic in their studies (Item 2),
- most of the respondents enjoyed studying in their institutions of higher education (Item 3),
- most of the respondents felt that they got benefit from general education offered to them (Item 6),
- most of the respondents felt that knowledge and skills they obtained from their institutions of higher education were very useful (Item 7),
- most of the respondents felt that competence and skills they obtained from their institutions of higher education were relevant to their occupational career goals (Item 8),
- most of the respondents thought that the educational experience they obtained from their institutions of higher education increased their ability to cope with problems in real life (Item 9),
- most of the respondents thought that the educational experience they obtained from their institutions of higher education was not out of date (Item 10).

Other items have relatively low agreement percentages. In other words, the majority student responses across the item categories for these items indicate disagreement. These items can be listed as follows:

- most of the respondents indicated that they had important complaint regarding their educational experience in their institutions of higher education (Item 4),
- in general, most of the respondents were dissatisfied with their learning experience (Item 5) except at IKIP Malang where most respondents were satisfied,

TABLE 4.10

SUMMARY OF THE PERCENTAGES OF STUDENTS' RESPONSES TO THE QUESTIONNAIRE WHICH ARE OF HIGH RATINGS (3 AND 4) BY INSTITUTION

Item number	IAIN Bandung	IKIP Bandung	Padjadjaran University	IAIN Sunan Ampel	Airlangga University	IKIP Malang	Total: 6 institutions
1.	64.3	76.5	87.6	79.2	81.9	91.7	82.2
2.	78.6	95.1	93.8	76.6	90.5	96.3	90.3
3.	83.3	94.1	94.7	85.7	92.9	97.2	92.6
4.	42.9	25.5	31.8	28.6	37.0	43.5	34.3
5.	9.5	34.3	36.2	27.3	36.2	57.4	36.8
6.	92.8	94.1	95.6	81.8	93.7	95.4	92.8
7.	88.1	94.1	96.4	84.4	96.8	96.3	93.8
8.	88.1	90.2	95.6	79.2	91.3	88.8	89.6
9.	95.2	93.1	92.9	80.5	85.0	83.3	87.9
10.	71.5	85.2	82.3	81.8	75.5	92.6	82.4
11.	45.3	65.7	61.1	36.4	45.6	79.6	57.4
12.	45.2	64.7	61.9	32.5	41	72.2	54.5
13.	23.8	36.3	36.3	22.1	32.2	42.6	33.7
14.	40.5	58.9	55.7	28.6	41.7	72.2	51.4
15.	59.6	59.8	62.9	44.2	50.4	61.1	56.4
16.	47.6	58.8	67.2	41.6	55.1	86.1	61.6
17.	40.5	36.3	33.7	35.1	60.6	53.7	44.6
18.	50.0	53.9	53.9	45.5	53.5	63.9	54.3
19.	33.4	14.6	11.5	36.4	22.8	25.0	22.1
20.	9.6	33.4	33.7	22.1	37.8	56.5	35.3

- most of the respondents indicated that they were not satisfied with their achievement in their institutions of higher education (Item 13),

- most of the respondents were dissatisfied with the high tuition they should pay (Item 17) except at Airlangga University and IKIP Malang where most respondents were satisfied,

- most of the respondents were dissatisfied with most of the classrooms which were generally crowded (Item 19),

- in general, most of the respondents indicated that they were not satisfied with reading materials available at the library of their institutions of higher education (Item 20) except at IKIP Malang where most respondents were satisfied.

It is interesting to note that for some items, most of the students' responses across item categories indicate agreement at some institutions of higher education, while at the other institutions most of the responses indicate disagreement. Overall however the students' responses for these items still indicate general agreement - the percentage of agreement varying between 51% and 62%.

The students' responses for these items can be summarized as follows:

- most of the respondents at IKIP Bandung, Padjadjaran University and IKIP Malang felt that the academic situation in their institutions stimulated most students to attain the best possible performance. On the other hand, most of the respondents at IAIN Bandung, IAIN Sunan Ampel and Airlangga University felt that the academic situation did not stimulate them (Item 11),

- most of the respondents at IKIP Bandung, Padjadjaran University and IKIP Malang felt that the educational program in their institutions was of good quality whereas most of the respondents at IAIN Bandung, IAIN Sunan Ampel and Airlangga University indicated that the educational program in their institution was not of good quality (Item 12),

- most of the respondents at IKIP Bandung, Padjadjaran University and IKIP Malang thought that the teaching staff of their institutions were generally of good quality. On the other hand, most of the respondents at IAIN Bandung, IAIN Sunan Ampel and Airlangga University indicated that the teaching staff of their institutions were generally not of good quality (Item 14),

- most of the respondents at the institutions of higher education taken as the sample with the exception of IAIN Sunan Ampel and Airlangga University felt that most of the teaching staff of their institutions were very kind and helpful to students (Item 15),

- most of the respondents at IKIP Bandung, Padjadjaran University, Airlangga University and IKIP Malang felt proud of the high performance of their institutions in research activities, whereas most of the respondents at IAIN Bandung and IAIN Sunan Ampel Surabaya indicated that they did not feel proud of the performance of their institutions in research activities (Item 16),

- most of the respondents in four of the institutions of higher education - the exception being IAIN Bandung and IAIN Sunan Ampel Surabaya - felt that the administrative functions in their institutions were well managed (Item 18).

Table 4.11 shows a summary of the means of students' responses to each item of the questionnaire by institution. Comparison of the means for each item across institutions also indicates that the 1979 B.A. graduates who responded to the questionnaire were in relatively close agreement on most items. The pattern of students' responses to the questionnaire can be shown clearly by the graphic presentation of the mean values of the responses to each item by institution.

Figure 4.3 shows the graphs of the mean values of students' responses to the questionnaire by institution and each graph, in fact, presents the profile of students' responses to every item for each institution. The horizontal axis (abscissa) has the item, as its scale, while the mean values of students' responses to each item are marked off on the vertical axis (ordinate). A line is drawn at the value of 2.5 - this point indicates the central response point.

The profile of an institution may reflect the strengths and weaknesses of the institution based on the opinions of its 1979 B.A. graduates. The profiles can be described as follows:

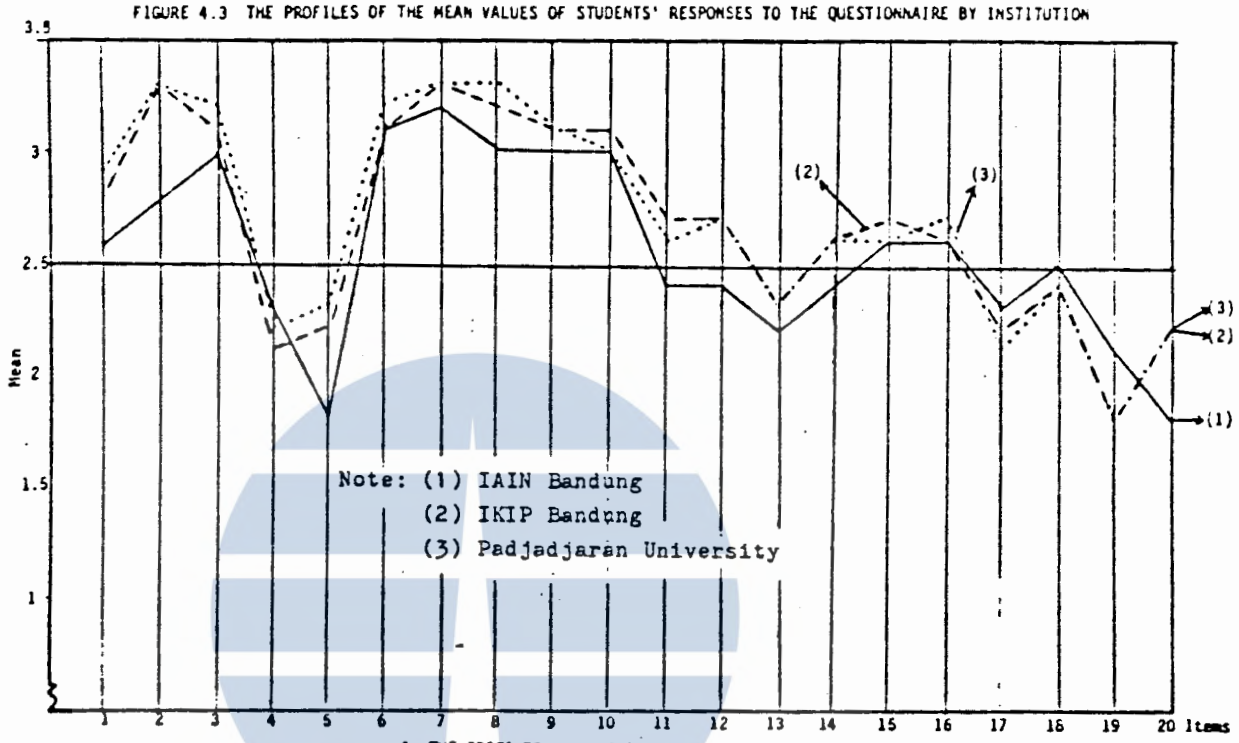
First, it is clear from the profiles in Figure 4.3 that the students' responses to items 1 to 3 and items 6 to 10 have high mean values. These items thus indicate the relative perceived strengths of the institutions of higher education under study. In other words, most

TABLE 4.11

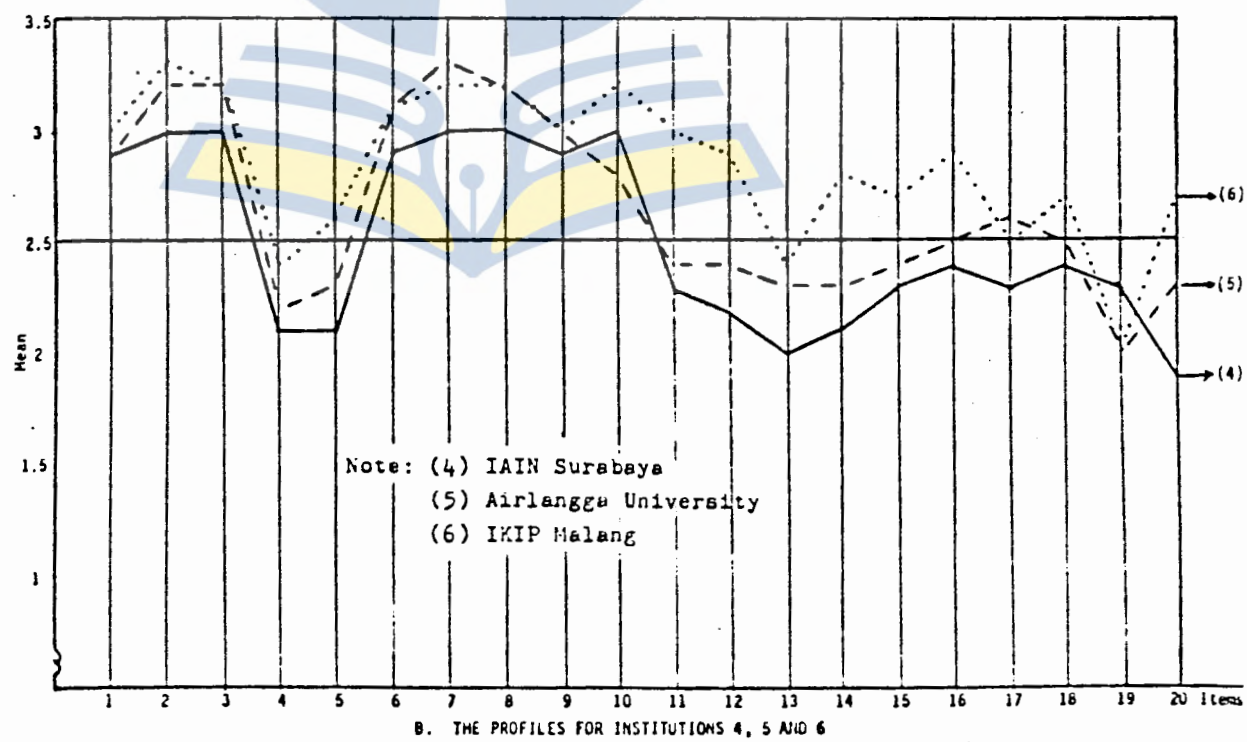
SUMMARY OF THE MEANS OF STUDENT RESPONSES TO THE QUESTIONNAIRE BY INSTITUTION

Item number	IAIN Bandung	IKIP Bandung	Padjadjaran University	IAIN Sunan Ampel	Airlangga University	IKIP Malang	Total: 6 institutions
1.	2.64	2.85	2.94	2.91	2.87	3.02	2.90
2.	2.83	3.26	3.31	2.98	3.25	3.32	3.21
3.	3.00	3.12	3.17	3.00	3.16	3.24	3.14
4.	2.29	2.14	2.23	2.09	2.24	2.38	2.23
5.	1.83	2.22	2.30	2.12	2.31	2.59	2.28
6.	3.12	3.06	3.20	2.94	3.14	3.11	3.10
7.	3.24	3.26	3.34	2.99	3.28	3.25	3.24
8.	3.02	3.18	3.32	2.97	3.19	3.17	3.17
9.	3.02	3.13	3.07	2.91	2.95	2.99	3.01
10.	2.95	3.05	2.97	2.99	2.80	3.21	2.99
11.	2.43	2.67	2.61	2.33	2.43	3.00	2.60
12.	2.36	2.67	2.67	2.25	2.35	2.87	2.56
13.	2.19	2.34	2.33	2.04	2.28	2.40	2.29
14.	2.43	2.56	2.57	2.09	2.34	2.78	2.48
15.	2.55	2.67	2.63	2.34	2.45	2.67	2.56
16.	2.55	2.60	2.68	2.39	2.50	2.89	2.62
17.	2.29	2.16	2.11	2.26	2.62	2.54	2.35
18.	2.48	2.39	2.44	2.39	2.54	2.69	2.50
19.	2.07	1.77	1.77	2.26	1.99	2.03	1.96
20.	1.76	2.15	2.23	1.88	2.27	2.69	2.23

FIGURE 4.3 THE PROFILES OF THE MEAN VALUES OF STUDENTS' RESPONSES TO THE QUESTIONNAIRE BY INSTITUTION



A. THE PROFILES FOR INSTITUTIONS 1, 2 AND 3



B. THE PROFILES FOR INSTITUTIONS 4, 5 AND 6

students at each of the six institutions are generally satisfied with the conditions relevant to these items, which measure students' satisfaction with their study experience and its benefits.

Second, it can be seen from the profiles that the students' responses to items 4, 5, 13 and 19 have low mean values. These values indicate the perceived weaknesses of the institutions. In other words, most students at each of the six institutions are generally dissatisfied with the conditions relevant to these items, which measure students' learning environment. Therefore, administrators of these institutions should pay more attention to improving these conditions to give more satisfaction to their students.

The patterns of distinguishing amongst institutions noted earlier, wherein some institutions have high means or positive items, i.e. high levels of agreement, but others have low means, i.e. disagreement, can be seen clearly in Figure 4.3. The students' responses to items 11 and 14, for instance, have high levels of agreement at IKIP Bandung, Padjadjaran University and IKIP Malang, but disagreement at other institutions.

The description of the profiles indicates that the students' responses to some items of the questionnaire have the same patterns at the six institutions under study, while the responses to some other items have different patterns across institutions. By drawing the profile for each institution of higher education, the administrators will be able to determine the strengths and/or weaknesses of their institutions. They can therefore aim to introduce some improvements so that their institutions might operate more effectively.

It is necessary to note that the relationships between items should be taken into account, because it is possible that several items could be

measuring the same characteristic. Therefore, in addition to the analysis of students' responses to the questionnaire item-by-item, factor analysis is employed to create factor scale variables in terms of standardized scores. These scores can then be used in further analyses.

Computations are performed by using the SPSS (Statistical Package for the Social Sciences) program on the Univac 1100. The correlation coefficients were computed among the 20 items and the resultant matrix was factored by principal factoring with iteration and rotated by using an orthogonal rotation procedure (Varimax) (Nie et al., 1975:485).

Five factors emerged in the initial analysis of the students' responses to the questionnaire with eigen values greater than 1.0. This number of factors was reduced to three for use in further analysis by applying the scree and discontinuity tests. In interpreting the three factors, the highest loadings for a factor are taken into account.

Table 4.12 shows the varimax rotated factor matrix of students' responses to the questionnaire on student educational satisfaction. By examining the factor loadings in the table, the three factors can be interpreted as follows:

Factor 1 has high loadings on students' satisfaction related to academic situation (item 11), educational program (item 12), the quality of teaching staff (item 14), the kindness and helpfulness of teaching staff (item 15), the performance of the institution in research (item 16), administrative functions in their institutions (item 18) and availability of reading materials in the library (item 20). This factor is labelled "satisfaction with the educational environment" because it represents the students' satisfaction with the educational environment of their institutions of higher education.

TABLE 4.12

VARIMAX ROTATED FACTOR MATRIX OF STUDENTS' RESPONSES TO THE QUESTIONNAIRE ON STUDENT EDUCATIONAL SATISFACTION

Item number	Description	Factor		
		Satisfaction with educational environment (1)	Satisfaction with study experience and its benefits (2)	Satisfaction with institutional operation (3)
	Students' satisfaction related to:			
1.	Academic work	.17	.37	.04
2.	Enthusiastic in study	.10	.47	.05
3.	Enjoyment in study	.26	.52	.15
4.	Educational experience	.35	.08	.24
5.	Learning experience	.26	.19	.47
6.	Benefits from general education	.07	.55	.02
7.	Usefulness of knowledge and skills	.19	.65	-.08
8.	Relevance of competence and skills to career goals	.14	.61	-.08
9.	Relevance of educational experience with ability to cope with problem in life	.22	.45	.05
10.	The quality of educational experience	.29	.30	.19
11.	Academic situation	.56	.25	.15

TABLE 4.12 (CONTINUED)

Item number	Description	Factor		
		Satisfaction with educational environment (1)	Satisfaction with study experience and its benefits (2)	Satisfaction with institutional operation (3)
12.	Educational program	.64	.25	.05
13.	Achievement	.32	.15	.38
14.	The quality of teaching staff	.70	.19	.09
15.	The kindness and helpfulness of teaching staff	.56	.21	.06
16.	The performance of their institution in research	.65	.14	.09
17.	Tuition	.09	.00	.44
18.	Administrative functions in their institutions	.45	.18	.15
19.	Crowded classrooms	-.01	-.14	.49
20.	Availability of reading materials in the library	.46	.08	.38

Factor 2 has high loadings on students' satisfaction related to enthusiasm for study (item 2), enjoyment in study (item 3), benefits from general education (item 6), usefulness of knowledge and skills (item 7), relevance of competence and skills to career goals (item 8), and relevance of educational experience with ability to cope with problems in real life (item 9). This factor is labelled "satisfaction with study experience and its benefits" because it represents students' satisfaction with their study experiences and the benefits they perceive from them in the future.

Factor 3 has high loadings on students' satisfaction related to learning experiences (item 5), tuition (item 17) and crowded classrooms (item 19). This factor is labelled "satisfaction with institutional operation".

The three factors together account for 42.3% of the total variance in student satisfaction. The percentages of variance accounted by the three factors are 25.9%, 9.9% and 6.5% respectively.

Three factor scale variables can now be created by including only the highly loaded items from each factor. The factor scale variables have the same names as the three factors and for ease of reference are given mnemonics. The new variables are therefore students' satisfaction with their educational environment (TOT1), students' satisfaction with their study experience and its benefits (TOT2) and students' satisfaction with the institutional operation (TOT3). Computation of standardized scores for TOT1, TOT2 and TOT3 are performed by using a COMPUTE statement in the SPSS program.

The formula for calculating factor scores for each student (Nie et al., 1975:489) is as follows:

$$f_i = fsc_{1i}z_1 + fsc_{2i}z_2 + fsc_{3i}z_3 + \ldots + fsc_{ni}z_n$$

where fsc_{ji} is the factor-score coefficient for variable j and factor i and z_j is the case's standardized value (score) on variable (item) j.

The standardized score of item j can be expressed as z_j = (item j - mean of item j)/standard deviation of item j. The standardized score for each item can then be weighted by the factor score coefficient through multiplication and each component added to form a total factor score. Hence the formulae used for the computations by including factor score coefficient, mean and standard deviation of highly loaded items are as follows:

TOT1 = .15639 x (item 11 - 2.6081)/.7165
+.22333 x (item 12 - 2.5835)/.7025
+.29932 x (item 14 - 2.4798)/.7096
+.14938 x (item 15 - 2.5606)/.6636
+.24313 x (item 16 - 2.6467)/.6500
+.09111 x (item 18 - 2.5343)/.7335
+.09300 x (item 20 - 2.2390)/.8696

TOT2 = .16383 x (item 2 - 3.2144)/.6221
+.17893 x (item 3 - 3.1406)/.5353
+.20430 x (item 6 - 3.1090)/.5091
+.28620 x (item 7 - 3.2496)/.5575
+.24899 x (item 8 - 3.1175)/.6515
+.12708 x (item 9 - 3.0281)/.5622

TOT3 = .26795 x (item 5 - 2.2830)/.7452
+.22893 x (item 17 - 2.3673)/.8203
+.29643 x (item 19 - 1.9666)/.8248

The mean and standard deviation of the computed factor scores are reported by institutions in Table 4.13. The table shows that the

TABLE 4.13

THE MEAN AND STANDARD DEVIATION OF STUDENTS' SATISFACTION BY INSTITUTION

No.	Institution	Students' satisfaction with		
		educational environment (TOT1)	study experience and its benefits (TOT2)	institutional operation (TOT3)
1.	IAIN Bandung	$\bar{x}$ = -.1856 s = .9846	$\bar{x}$ = -.2089 s = .8144	$\bar{x}$ = -.1468 s = .5412
2.	IKIP Bandung	$\bar{x}$ = .0979 s = .8572	$\bar{x}$ = .0255 s = .6867	$\bar{x}$ = -.1375 s = .5561
3.	Padjadjaran University	$\bar{x}$ = .1129 s = .7417	$\bar{x}$ = .2009 s = .7328	$\bar{x}$ = -.1159 s = .4882
4.	IAIN Surabaya	$\bar{x}$ = -.5353 s = 1.0176	$\bar{x}$ = -.3917 s = .9606	$\bar{x}$ = .0156 s = .5288
5.	Airlangga University	$\bar{x}$ = -.2351 s = .7981	$\bar{x}$ = .0660 s = .8637	$\bar{x}$ = .0889 s = .4983
6.	IKIP Malang	$\bar{x}$ = .5198 s = .7571	$\bar{x}$ = .0484 s = .7522	$\bar{x}$ = .1925 s = .6002
	Anova F value	F = 17.672**	F = 5.975**	F = 6.558**

Note: ** = significant at .01 level

students' satisfaction with their educational environment (TOT1), the students' satisfaction with their study experience and its benefits (TOT2) and the students' satisfaction with the institutional operation (TOT3) vary sometimes quite considerably from one institution to another.

For level of students' satisfaction at each institution of higher education, the mean values in Table 4.4 can be described as follows: First, at IAIN Bandung, the students are generally dissatisfied with their educational environment, their study experience and its benefits, and with the institutional operation. Second, at IKIP Bandung and Padjadjaran University, the students are generally satisfied with their educational environment and study experience and its benefits, but dissatisfied with the institutional operation. Third, at IAIN Surabaya, the students are generally dissatisfied with their educational environment, and study experience and its benefits, but are satisfied with the institutional operation. Fourth, at Airlangga University, the students are generally dissatisfied with their educational environment, but satisfied with their study experience and its benefits, and institutional operation. Fifth, at IKIP Malang, the students are generally satisfied with their educational environment, study experience and its benefits and institutional operation.

As measured by the scales, students appear to be most dissatisfied with their educational environment at IAIN Surabaya and Airlangga University while students at IKIP Malang are most satisfied with their educational environment. At IAIN Bandung and IAIN Surabaya, the students are most dissatisfied with their study experience and its benefits, while those at Padjadjaran University are the group most satisfied with their study experience and its benefits. Finally, students at IAIN Bandung, IKIP Bandung and Padjadjaran University are those most dissatisfied with the institutional operation, while those at IKIP Malang are those

satisfied with the institutional operation.

A one way analysis of variance is performed for each factor scale variable to examine whether the overall differences among the means are statistically significant or not. As shown in Table 4.13, there is a significant variation for each variable across the institutions with the F values all being significant beyond the 1% level. To determine which differences contribute to this high significance, the Scheffé test is used to test the difference between the means of all pairs of institutions. Nie et al. (1975:428) point out that the Scheffé test is appropriate for examining all possible linear combinations of group means, even for unequal group sizes. In view of this test, Kirk (1968:90) states: "If the overall F ratio is significant, Scheffé's (1953) S method can be used to make all possible comparisons among means". The test is computed according to the procedure outlined in Kerlinger (1973:240-241).

Table 4.14 supports results of the Scheffé test of the differences between pairs of means of students' satisfaction with their educational environment. It can be seen from the table that:

- IKIP Malang has a significant higher mean students' satisfaction level with their educational environment than the other five institutions,
- IAIN Surabaya has a significant low mean students' satisfaction level with their educational environment than IKIP Malang, IKIP Bandung and Padjadjaran University.

The results of the Scheffé test of the differences between means of students' satisfaction with their study experience and its benefits is reported in Table 4.15. Only four pairs of means are statistically significant at the .05 level. They show that the mean level of students' satisfaction with their study experience and its benefits at IAIN Surabaya (institution 4) is significantly lower than the level of satisfaction experienced by students at IKIP Bandung (institution 2), Padjadjaran

TABLE 4.14

RESULTS OF SCHEFFÉ TEST OF THE DIFFERENCES BETWEEN MEANS OF STUDENTS' SATISFACTION WITH THEIR EDUCATIONAL ENVIRONMENT

Institution	Institution					
	1	2	3	4	5	6
1. IAIN Bandung Mean = -.1856		.2835 NS	.2985 NS	.3497 NS	.0495 NS	.7054 .51*
2. IKIP Bandung Mean = .0979			.0150 NS	.6332 .42*	.3330 NS	.4219 .39*
3. Padjadjaran University Mean = .1129				.6482 .41*	.3480 NS	.4069 .38*
4. IAIN Surabaya Mean = -.5353					.3002 NS	1.0551 .42*
5. Airlangga University Mean = -.2351						.7549 .37*
6. IKIP Malang Mean = .5198						

Note: The top value in each cell reports the difference between the means of the relevant pairs of institutions. The lower value indicates the significance of the difference where:
NS = not significant
* = the value reported is significant at .05 level. This value is computed from $SE_{M_i - M_j} \times S$, where:

$SE_{M_i - M_j}$ = standard error of the difference between means
S = the value for Scheffé
(cf. Kerlinger, 1973:241 and Kirk, 1968:91).

TABLE 4.15

RESULTS OF SCHEFFÉ TEST OF THE DIFFERENCES BETWEEN MEANS OF STUDENTS' SATISFACTION WITH THEIR STUDY EXPERIENCE AND ITS BENEFITS

Institution	Institution					
	1	2	3	4	5	6
1. IAIN Bandung Mean = -.2089		.2344 NS	.4098 NS	.1828 NS	.2749 NS	.2573 NS
2. IKIP Bandung Mean = .0255			.1754 NS	.4172 .40*	.0405 NS	.0229 NS
3. Padjadjaran University Mean = .2009				.5926 .39*	.1349 NS	.1525 NS
4. IAIN Surabaya Mean = -.3917					.4577 .38*	.4401 .40*
5. Airlangga University Mean = .0660						.0176 NS
6. IKIP Malang Mean = .0484						

Note: The top value in each cell reports the difference between the means of the relevant pairs of institutions. The lower value indicates the significance of the difference where:
NS = not significant
* = the value reported is significant at .05 level. This value is also computed from $SE_{M_i - M_j} \times S$.

University (institution 3), Airlangga University (institution 5) and IKIP Malang (institution 6).

Table 4.16 shows the results of Scheffé test of the differences between means of students' satisfaction with the institutional operation. It can be seen from the table that the mean of students' satisfaction with the institutional operation at IKIP Malang (institution 6) is significantly higher at the .05 level than it is at IAIN Bandung (institution 1), IKIP Bandung (institution 2) and Padjadjaran University (institution 3).

The student educational satisfaction as the expected outcome of an institution of higher education is used as one of the measures of effectiveness. Table 4.17 shows the average of students' satisfaction with their educational environment (AVTOT1), the average of students' satisfaction with their study experience and its benefits (AVTOT2) and the average of students' satisfaction with the institutional operation (AVTOT3) by faculty. These composite variables are expressed in standardized scores and will be used as measures of the effectiveness of an institution of higher education.

The values of AVTOT1 range from -.7860 for the Faculty of Islamic Culture at IAIN Surabaya to .6723 for the Faculty of Teacher Training in Arts and Literature at IKIP Malang. The higher the value of AVTOT1 for a faculty, the more satisfied the students of that faculty are with their educational environment.

It is interesting to note, that IAIN Surabaya has negative values for AVTOT1 for all its faculties. On the average therefore the students of this institution appear to be relatively dissatisfied with their educational environment. On the other hand, IKIP Malang has positive values for AVTOT1 for all its faculties. These indicate that, on the

TABLE 4.16

RESULTS OF SCHEFFÉ TEST OF THE DIFFERENCES BETWEEN MEANS OF STUDENTS' SATISFACTION WITH THEIR INSTITUTIONAL OPERATION

Institution	Institution					
	1	2	3	4	5	6
1. IAIN Bandung Mean = -.1468		.0093 NS	.0309 NS	.1624 NS	.2357 NS	3393 .32*
2. IKIP Bandung Mean = -.1375			.0216 NS	.1531 NS	.2264 NS	.3300 .25*
3. Padjadjaran University Mean = -.1159				.1315 NS	.2048 NS	.3084 .24*
4. IAIN Surabaya Mean = .0156					.0773 NS	.1769 NS
5. Airlangga University Mean = .0889						.1036 NS
6. IKIP Malang Mean = .1925						

Note: The top value in each cell reports the difference between the means of the relevant pairs of institutions. The lower value indicates the significance of the difference where:
NS = not significant
* = the value reported is significant at .05 level. This value is also computed from $SE_{M_i - M_j} \times S$.

TABLE 4.17

THE AVERAGE OF STUDENTS' SATISFACTION WITH THEIR EDUCATIONAL ENVIRONMENT (AVTOT1), THEIR STUDY EXPERIENCE AND ITS BENEFITS (AVTOT2) AND INSTITUTIONAL OPERATION (AVTOT3) BY FACULTY

No.	Description	AVTOT1	AVTOT2	AVTOT3
1.	IAIN Bandung	-.1856	-.2089	-.1468
	1.1 Faculty of Islamic Education	.0690	.0471	-.3010
	1.2 Faculty of Islamic Theology	-.0793	.0168	-.0727
	1.3 Faculty of Islamic Law	-.4988	-.5729	-.0140
2.	IKIP Bandung	.0979	.0255	-.1375
	2.1 Faculty of Education	.1180	.2328	-.1878
	2.2 Faculty of Teacher Training in Social Sciences	.4062	.0897	-.0510
	2.3 Faculty of Teacher Training in Arts and Literature	.2084	.0236	.0944
	2.4 Faculty of Teacher Training in Exact Sciences	.0114	.0648	-.2821
	2.5 Faculty of Teacher Training in Technology	-.4694	-.3583	-.3596
3.	Padjadjaran University	.1129	.2009	-.1159
	3.1 Faculty of Law	.1823	.1736	-.0420
	3.2 Faculty of Economics	.1826	.2714	-.1702
	3.3 Faculty of Exact and Physical Sciences	-.0703	-.0542	-.1872
	3.4 Faculty of Literature	.2707	.0288	-.3388
	3.5 Faculty of Social Politics	.1312	.3603	-.0971
	3.6 Faculty of Psychology	-.1192	.0771	.1630
4.	IAIN Sunan Ampel Surabaya	-.5353	-.3917	.0156
	4.1 Faculty of Islamic Theology	-.1561	-.2436	-.0884
	4.2 Faculty of Islamic Law	-.7502	-.1261	-.1695

TABLE 4.17 (CONTINUED)

No.	Description	AVTOT1	AVTOT2	AVTOT3
	4.3 Faculty of Islamic Culture	-.7860	-.4761	.2610
	4.4 Faculty of Islamic Missionary	-.4728	-.7655	.1102
5.	Airlangga University	-.2351	.0660	.0889
	5.1 Faculty of Law	-.1224	.0296	.1563
	5.2 Faculty of Economics	-.4927	.1128	.0096
	5.3 Faculty of Pharmacy	.5151	.1215	-.0725
6.	IKIP Malang	.5198	.0484	.1925
	6.1 Faculty of Education	.4830	.1072	.1803
	6.2 Faculty of Teacher Training in Social Sciences	.5479	.0014	.2169
	6.3 Faculty of Teacher Training in Arts and Literature	.6723	.1874	.3573
	6.4 Faculty of Teacher Training in Exact Sciences	.5156	-.3277	.2666
	6.5 Faculty of Teacher Training in Technology	.3478	.0806	-.0444
	Total: 6 institutions of higher education	.0000	.0000	.0000

average, these students are relatively satisfied with their educational environment.

The values of AVTOT2 range from -.7655 for the Faculty of Islamic Missionary at IAIN Surabaya to .3603 for the Faculty of Social Politics at Padjadjaran University. The higher the value of AVTOT2 for a faculty, the more satisfied the students of the faculty are with their study experience and its benefits. It can be seen in Table 4.17 that IAIN Surabaya again has negative values for AVTOT2 for all its faculties.

These indicate that the students of this institution appear to be relatively dissatisfied with their study experience and its benefits.

The values of AVTOT3 range from -.3596 for the Faculty of Teacher Training in Technology at IKIP Bandung to .3573 for the Faculty of Teacher Training in Arts and Literature at IKIP Malang. The higher the value of AVTOT3 for a faculty, the more satisfied the students of the faculty are with the institutional operation.

There are four faculties that have positive values for all the three measures of student satisfaction, hence the students at the four faculties are generally satisfied with their educational environment, their study experience and its benefits and the institutional operation. These faculties are:

. Faculty of Teacher Training in Arts and Literature at IKIP Bandung,

. Faculty of Education, Faculty of Teacher Training in Social Sciences and Faculty of Teacher Training in Arts and Literature at IKIP Malang.

On the other hand, there are five faculties that have negative values for all the three measures of student satisfaction; therefore, the students at the five faculties are relatively dissatisfied with their educational environment, their study experience and its benefits and the institutional operation. These faculties are:

. Faculty of Islamic Law at IAIN Bandung,

. Faculty of Teacher Training in Technology at IKIP Bandung,

. Faculty of Exact and Physical Sciences at Padjadjaran University,

. Faculty of Islamic Theology and Faculty of Islamic Law at IAIN Surabaya.

4.3 SUMMARY

The analyses of the student data presented in this chapter show that

an administrator can assess the efficiency and effectiveness of an institution of higher education by using data on the cohort of an entering class and/or on the graduates in a given academic year. The experience in collecting the data for this study indicates that it is more convenient to obtain the complete data on the 1979 B.A. graduates than to obtain the data on the 1976 cohort of students throughout their undergraduate cycle. Indeed, the required data for the analysis of the 1976 cohort of students at two of the institutions in the sample for this study are either not available or not complete.

In view of the relative ease of collecting data from graduates in a given academic year and the similarity in comment derived from cohort and graduate data, administrators might be advised to concentrate only on the graduates and to use the opportunity afforded to them to collect other data also, especially those related to educational satisfaction.

Factor analysis of the 1979 B.A. graduates' responses to the questionnaire has identified three dimensions of student educational satisfaction. These dimensions are:

. students' satisfaction with their educational environment,

. students' satisfaction with their study experience and its benefits,

. students' satisfaction with the institutional operation.

CHAPTER 5

THE VARIABLES CONTRIBUTING TO THE EFFICIENCY AND EFFECTIVENESS OF AN INSTITUTION OF HIGHER EDUCATION

5.1 INTRODUCTION

The analyses in this chapter attempt to identify those variables contributing significantly to raising the efficiency and effectiveness of an institution of higher education. These analyses are therefore directed towards the second research problem stated in Chapter 1, namely:

> What are the variables that account for the efficiency and effectiveness of an institution of higher education?

Multiple regression analysis is adopted as the method with which to analyse this problem. It is a technique allowing a researcher to identify the important and meaningful predictors of a dependent variable - here measures of the efficiency or the effectiveness of an institution. To analyse the data properly, it is necessary to distinguish between the multiple regression analysis using student as the unit of analysis and that using faculty as the unit of analysis. This distinction must be made to avoid the danger of using aggregate data as if they are measurements of individual units or to treat grouped data just as individual observations. When this is done, an error called the ecological fallacy is committed. Scheuch (1966:164) states:

> The group fallacy (and, as a special case, the ecological fallacy) results from the difference between units of observation and units of inference. The danger of committing this fallacy is always present when the unit to which the inference refers is smaller than the unit either of observation or of counting.

Multiple regression analysis using student as the unit of analysis

is used to analyse the data on those 1979 B.A. graduates who responded to the questionnaire. Before conducting the analysis, the distribution of variables was examined to check for skewness and make some transformations and/or recoding whenever it was necessary.

The following transformations and/or recoding have been made:

First, age was heavily skewed. Recoding was achieved by changing ages 31 to the highest to equal to 31. There were 15 such cases out of the 569 observations. One case of age was equal to zero due to a no response. It was recoded as 25 - this value being approximately equal to the mean of the distribution. This recoding decreased the skewness from 2.902 to 1.258.

Second, one student with a blank for the actual amount of time required to complete the B.A. degree (TCDG) was recoded as 42 months - this value being approximately equal to the median.

Third, six students with a blank for B.A. graduate's grade point average (GPBA) were recoded as 60, which was equal to the mode and approximately equal to the median.

The consequence of the recoding of extreme values to the mean, median or modal value for later analysis is to reduce, at least slightly, the standard deviations of the respective distributions. The effect of these reductions is to make it slightly more difficult to achieve significant proportions of explained variance. Such a situation is perhaps desirable because greater confidence can be placed in results which do prove to be highly significant.

A different kind of recoding was also required for the two variables measured on a nominal scale. Previous high school was transformed into four dummy variables, namely:

- academic senior high school (PRHS1) which is only Senior High School (SMA),
- vocational senior high school (PRHS2) which includes School for Elementary Teacher Training (SPG), Economics Senior High School (SMEA) and Pharmaceutical Senior High School (Sekolah Menengah Farmasi),
- religious senior high school (PRHS3) which includes School for Elementary Religious Teacher Training (PGA), Religious Senior High School (Madrasah Aliyah), Private School for Elementary Religious Teacher Training (Muallimin or Muallimat) and Preparatory School for State Institute for Islamic Studies (Sekolah Persiapan IAIN),
- the "Other" category which includes Home Economics High School, etc.

The other category variable - residential origin - was transformed into three dummy variables: West Java (REOR1), East Java (REOR2) and the "Other" category.

These dummy variables can now be used as independent variables in a regression analysis. Kerlinger and Pedhazur state as follows:

> The system of 1's and 0's, so-called dummy variables, was used, 1 meaning membership in a given category, or treatment group, and 0 no membership in that category or group. Vectors of 1's and 0's were treated like vectors of continuous measures and used as independent variables in regression equations and calculations. (1973:116)

The number of dummy variables created from a single variable which can be included in a regression equation is equal to the number of categories for the original variable minus one. The exclusion of one of the dummy variables does not result in a loss of information. It becomes the reference category by which the effects of the other dummy variables are judged and interpreted (cf. Kerlinger and Pedhazur, 1973: 117-118 and Nie et al., 1975:374-375).

The stepwise regression program of SPSS (Statistical Package for the Social Sciences) is used for computations of statistics and the

inclusion of independent variables in a regression equation. A 1% increase in the value of R^2 is utilized as the criterion before stopping at any step of the stepwise regression analysis. In other words, the inclusion of an independent variable at any step in the regression equation cannot be tolerated, if it would cause less than a 1% increase in the variance accounted for by the regression equation.

The multiple regression analyses using student as the unit of analysis can be divided into two parts. The first part analyses the data on the total sample of 1979 B.A. graduates. The second part analyses the data at the institutional level - that is, a regression analysis of the data separately for each of the six institutions under study. The number of possible variables to be included in the regression equation is different however because some of the variables are appropriate for use at the institutional level but not at the overall level. B.A. graduates' grade point average, for example, cannot be compared across institutions for the reasons previously outlined in Chapter 3. The list of variables for the multiple regression analyses using student as the unit of analysis is presented in Table 5.1 with the distinction made between the 11 variables used for the total sample and the 14 variables used for the separate institutional analyses. The correlation matrix for the first eight characteristics (i.e. 11 variables) is presented in Appendix C.1.

To analyse the data properly, it is necessary to recalculate the overall multiple regression analysis but use faculty as the unit of analysis. The variables to be included in this regression equation are the characteristics of the faculty. They include aggregated students' characteristics, teaching staff's characteristics and the general characteristics of the faculty. The variables presented in Table 5.1

TABLE 5.1

LIST OF VARIABLES FOR THE MULTIPLE REGRESSION ANALYSES USING STUDENT AS THE UNIT OF ANALYSIS

No.	Characteristics	Code	Focus of analysis	
1.	The actual amount of time to complete a B.A. degree	TCDG	S	I
2.	B.A. graduate's satisfaction with the educational environment	TOT1	S	I
3.	B.A. graduate's satisfaction with his or her study experience and its benefits	TOT2	S	I
4.	B.A. graduate's satisfaction with the institutional operation	TOT3	S	I
5.	B.A. graduate's age	AGE	S	I
6.	B.A. graduate's sex	SEX	S	I
7.	Residential origin of the B.A. graduate (REOR): West Java	REOR1	S	I
	East Java	REOR2	S	I
8.	Previous high school (PRHS):			
	Academic senior high school	PRHS1	S	I
	Vocational senior high school	PRHS2	S	I
	Religious senior high school	PRHS3	S	I
9.	B.A. graduate's grade point average for completing the degree	GPBA	-	I
10.	Grade point average on high school examination	GPHS	-	I
11.	Grade point on scholastic aptitude test	GPSC	-	I

Note: S = the variable is used in analyses of the data on the sample of 1979 B.A. graduates as a whole.
I = the variable is used in analyses for each institution.
Characteristics no. 1-4 and no. 9 are the output variables, while no. 5-8 and no. 10-11 are input variables.

cannot be used in this analysis because of the difference in units of analysis. The list of variables for this new multiple regression analyses is presented in Table 5.2, while the correlation matrix for the variables is presented in Appendix C.2.

5.2 MULTIPLE REGRESSION ANALYSES USING STUDENT AS THE UNIT OF ANALYSIS

5.2.1 Multiple regression analyses of the data on the sample of the 1979 B.A. graduates as a whole

Four dependent variables are used in the regression equations for these analyses. They are the actual amount of time needed to complete a B.A. degree (TCDG), B.A. graduate's satisfaction with the educational environment (TOT1), B.A. graduate's satisfaction with his or her study experience and its benefits (TOT2) and B.A. graduate's satisfaction with the institutional operation (TOT3). These dependent variables are also used interchangeably as independent variables, for example, in one regression analysis TCDG is used as dependent variable, while in another regression it is used as an independent variable.

It should be noted again here that three variables related to students' academic performance (GPBA, GPHS, and GPSC) could not be included in the regression analyses of the data as a whole for the reasons stated in Chapter 3.

Table 5.3 shows selected statistics from the regression of each dependent variable on the input and/or output variables at all six institutions of higher education selected as the sample.

The regression of the actual amount of time to complete a B.A. degree (TCDG) on input and/or output variables brings about the same results, that is, about 18% of total variance is accounted for by the

TABLE 5.2

LIST OF VARIABLES FOR THE MULTIPLE REGRESSION ANALYSES USING FACULTY AS THE UNIT OF ANALYSIS

No.	Variables	Code
1.	The average of students' satisfaction with their educational environment	AVTOT1
2.	The average of students' satisfaction with their study experience and its benefits	AVTOT2
3.	The average of students' satisfaction with the institutional operation	AVTOT3
4.	The average amount of time needed by students to complete a B.A. degree	AVTCDG
5.	The mean of B.A. graduates' age	MNAGE
6.	The mean of teaching staff's age	MTSAGE
7.	The mean of teaching staff's teaching experience	MTSTEX
8.	The mean of teaching staff's teaching load	MTSTLD
9.	The percentage of B.A. graduates who come from academic senior high school	PCGAH
10.	The percentage of B.A. graduates who come from vocational senior high school	PCGVH
11.	The percentage of B.A. graduates who come from religious senior high school	PCGRH
12.	The percentage of B.A. graduates who come from West Java	PCGWJ
13.	The percentage of B.A. graduates who come from East Java	PCGEJ
14.	The percentage of B.A. graduates who are female	PCBAFL
15.	The percentage of teaching staff with a doctorate degree	PCDOFA
16.	The percentage of enrolment who are female	PCENFA
17.	The percentage of faculty members or teaching staff who are lecturers or above	PCFLFA

TABLE 5.2 (CONTINUED)

No.	Variables	Code
18.	The percentage of faculty members or teaching staff with permanent status	PCFPFA
19.	The percentage of teaching staff who do not have other jobs	PCNOAJ
20.	The percentage of teaching staff who are also part-time teaching staff at other institutions of higher education	PCTAJ1
21.	The percentage of teaching staff who are also part-time teachers at secondary school	PCTAJ2
22.	The percentage of teaching staff who are also part-time administrators	PCTAJ3
23.	The percentage of teaching staff who have part-time jobs that are different from the ones previously mentioned	PCTAJ4
24.	The percentage of teaching staff who are female	PCTSFL
25.	The proportion of B.A. graduates to enrolment in undergraduate program	PRBGEU
26.	The proportion of graduates to enrolment	PRGENR
27.	The proportion of M.A. graduates to the total number of graduates	PRMANG
28.	The proportion of the number of administrative officials to the number of full-time faculty members	PRNAFF
29.	The student faculty ratio	SFRFA
30.	The efficiency ratio of B.A. graduates	EFRABA
31.	The mean academic rank of the teaching staff	MACRA
32.	The mean weighted B.A. graduates' grade point average	MWGPBA

Note: Variables no. 1-3, 27 and 32 are output variables.
Variables no. 5-24 and 31 are input variables.
Variables no. 4, 25, 26 and no. 28-30 are process variables.

TABLE 5.3

SELECTED STATISTICS FROM THE REGRESSION OF EACH DEPENDENT VARIABLE ON INPUT AND/OR OUTPUT VARIABLES AT THE SIX INSTITUTIONS

No.	Dependent variables	Independent variables					
		Input variables			Input and/or output variables		
		R^2	Variables	Beta	R^2	Variables	Beta
1.	The amount of time needed by students to complete B.A. degree (TCDG)	.18**	AGE	.40	.18**	AGE	.40
			PRHS1	.14		PRHS1	.14
			SEX	.11		SEX	.11
2.	Students' satisfaction with educational environment (TOT1)	.12**	SEX	.27	.31**	TOT2	.40
			PRHS3	-.24		SEX	.21
			PRHS1	-.16		TOT3	.19
			AGE	.11		PRHS2	.12
						TCDG	.10
3.	Students' satisfaction with their study experience and its benefits (TOT2)	.04**	PRHS3	-.20	.20**	TOT1	.43
						PRHS1	.14
4.	Students' satisfaction with institutional operation (TOT3)	.06**	REOR1	-.22	.11**	TOT1	.25
			SEX	.12		REOR1	-.22

Note: ** = significant at .01 level

three variables selected. Such a value is moderate and it is statistically significant at the .01 level.

The values for the three beta weights are all positive. They indicate that a longer time is needed to complete a B.A. degree by older students, by students who previously came from academic senior high schools and by female students. The beta weights also show that age is the most important variable in the prediction of the amount of time to complete the degree, while the other two variables, although equal in importance to each other, are only about one third to one quarter as influential as age. Perhaps, the longer time to complete a B.A. degree taken by academic senior high school graduates may reflect the lack of required stringency in preparation for continuing their education. No state final examination is now necessary in those schools before university entrance examination.

Four independent variables are included in the regression analysis, when students' satisfaction with their educational environment (TOT1) is used as the dependent variable. The final value of R^2 is .12 and is significant at the .01 level.

The values of the beta weights for sex and age are positive - thus indicating that female students have greater average satisfaction with the educational environment of their institutions than do male students. Also older students are more satisfied with their educational environment than are younger ones. On the other hand, two previous high school variables (PRHS1 and PRHS3) have negative beta weight values. Hence students who previously attended neither a senior academic high school nor a religious senior high school are more satisfied with the educational environment.

The regression of students' satisfaction with their educational environment onto both input and output variable sets, produces a substantial increment in the value of R^2. Now about 31% of the variance in students' satisfaction with their educational environment can be accounted for by students' satisfaction with their study experience and its benefits (TOT2), sex, students' satisfaction with their institutional operation (TOT3), vocational senior high school (PRHS2) and the time needed to complete B.A. degree.

The beta weight values for all five independent variables are positive, which indicate that B.A. graduates who have greater satisfaction with their study experience and its benefits, and with institutional operation also tend to have greater satisfaction with their educational environment. Greater satisfaction is felt by female students, particularly by those who previously attended vocational senior high school and by those who take longer time to complete B.A. degree.

With regard to the regression of students' satisfaction with their study experience and its benefits (TOT2) on input variables, only one variable meets the required criterion. It is, religious senior high school (PRHS3). The value of R^2 is equal to 4% and although it is significant at the .01 level; therefore, it is a very low value for the variance accounted for.

The value of the beta weight is negative, which indicates that those persons who previously attended religious senior high schools before entering higher education institutions are less satisfied with their study experience and its benefits. Perhaps, this is because of the difficulty in finding jobs after they complete their studies although it could be due to the difficulty in understanding and mastering study materials at their institutions of higher education due to the lack of

preparation at previously attended religious senior high school. This tentative explanation needs to be checked by taking into consideration the regression analysis at the institutional level.

The regression of students' satisfaction with their study experience and its benefits (TOT2) on input and output variable sets together results in an R^2 of .20 (significant at the .01 level). This is again a substantial increase over the corresponding values based on input variables only. In other words, about 20% of the variance in students' satisfaction with their study experience and its benefits is accounted for by students' satisfaction with their educational environment (TOT1) and previous attendance at an academic senior high school (PRHS1). As the beta weights of TOT1 and PRHS1 are both positive, the B.A. graduates having greater satisfaction with their educational environment also tend to have greater satisfaction with their study experience and its benefits. Those from academic senior high schools are also more satisfied with their study experience and its benefits. TOT1 is a much more influential variable than is PRHS1.

For the regression of students' satisfaction with institutional operation (TOT3) on input variables, the R^2 is very low with only about 6% of variance in TOT3 accounted for by residential origin of West Java (REOR1) and sex although this proportion is also significant at the .01 level. REOR1 has a negative beta weight - thus indicating that the students who come from West Java are less satisfied with institutional operation. On the other hand, sex has a smaller yet still positive beta weight, hence the female students are more satisfied with institutional operation.

For the regression of students' satisfaction with institutional operation (TOT3) on input and output variables, the R^2 increases to 11%

(also significant at the .01 level). This value for R^2 is still low. TOT1 has a positive beta weight while REOR1 has the negative one, indicating that the B.A. graduates who are more satisfied with their educational environment tend to be more satisfied with institutional operation and not to come from West Java. Both independent variables, TOT1 and REOR1, are about the same in importance.

To ascertain the relative contribution of each of students' characteristics and satisfaction sets of variables to the variance in the amount of time to complete the degree, a commonality analysis is performed. The time to complete a B.A. degree (TCDG) is the dependent variable (Y), while the sets of independent variables are students' characteristics and students' satisfaction.

The formulas used to calculate the unique and common contribution of two independent variables (Kerlinger and Pedhazur, 1973:298) are as follows:

$$U(1) = R^2_{y.12} - R^2_{y.2}$$

$$U(2) = R^2_{y.12} - R^2_{y.1}$$

$$C(12) = R^2_{y.1} + R^2_{y.2} - R^2_{y.12}$$

where: U(1) = unique contribution of variable 1

U(2) = unique contribution of variable 2

C(12) = commonality of variables 1 and 2

$R^2_{y.1}$ = the proportion of variance in dependent variable y that can be explained by variable or set of variables 1

$R^2_{y.12}$ = the proportion of variance in dependent variable y that can be explained by both variables or both sets of variables 1 and 2.

TABLE 5.4

SUMMARY OF COMMONALITY ANALYSIS USING THE AMOUNT OF TIME TO COMPLETE B.A. DEGREE AS DEPENDENT VARIABLE

Source	Students' characteristics (1)	Students' satisfaction (2)
1. Unique to students' characteristics	.17209	-
2. Unique to students' satisfaction	-	.00622
Common to 1 and 2	.01152	.01152
Σ	.18361	.01774

Table 5.4 shows the summary of the commonality analysis results using the amount of time to complete B.A. degree as the dependent variable. The unique contributions of students' characteristics and students' satisfaction comprise about 17.8% of the variance accounted for, while that explained by the overlap in the two sets of variables accounts for the remaining 1.2%. The unique contribution of students' characteristics to the variance in the amount of time to complete B.A. degree is 17.2%. It is therefore, completely dominant in comparison with the unique contribution of students' satisfaction which is only about .6% of the variance accounted for. In other words, students' characteristics variables are much better predictors for these institutions for the time to complete the B.A. degree than are students' satisfaction variables.

5.2.2 Multiple regression analyses of the data for individual institutions

The same dependent variables are used in multiple regression analyses of the data at the institutional level. By performing these analyses, it is possible to compare the results of the regression of a dependent variable on input and/or output variables amongst the institutions of higher education under study.

Selected statistics from the regression of the actual amount of time needed by students to complete the B.A. degree (TCDG) on input and/or output variables by institution can be seen in Table 5.5. By adding output variables as independent variables, the values of R^2 generally increase for almost all institutions except at Padjadjaran University in Bandung where there is no impact at all and at IAIN Surabaya where the value of R^2 decreases by about 1%. IAIN Surabaya is the only institution where the regression is not significant.

Regression of the time to complete the B.A. degree on input variables by institution brings about the values of R^2 ranging from the lowest of 7% at IAIN Surabaya through to the highest of 41% at Airlangga University. Age emerges consistently and with a high beta weight at all institutions except at IAIN Surabaya. The beta weights for age are all positive and thus indicate that longer time to complete B.A. degree is taken by older students.

Previous high schools (PRHS) appear at all institutions except at Airlangga University, even though the kinds of high schools identified vary from one institution to another. For example, at IKIP Bandung, longer time to complete the B.A. degree is taken by groups of students who previously attended academic senior high school, while at IAIN Surabaya, longer time to complete the B.A. degree is taken by groups of

TABLE 5.5

SELECTED STATISTICS FROM THE REGRESSION OF THE ACTUAL AMOUNT OF TIME NEEDED BY STUDENTS TO COMPLETE THE B.A. DEGREE ON INPUT AND/OR OUTPUT VARIABLES BY INSTITUTION

No.	Institution	Independent variables					
		Input variables			Input and/or output variables		
		R^2	Variables	Beta	R^2	Variables	Beta
1.	IAIN Bandung	.19*	AGE	.37	.29*	AGE	.35
			PRHS1	.23		GPBA	-.29
			PRHS3	.16		TOT2	.14
						PRHS1	.13
2.	IKIP Bandung	.12*	AGE	.33	.19**	AGE	.33
			PRHS1	.19		GPBA	-.21
			SEX	.16		PRHS1	.19
			REOR2	-.12		TOT1	.24
						REOR2	-.18
						TOT2	-.17
						TOT3	-.13
3.	Padjadjaran University	.22**	AGE	.50	.22**	AGE	.50
			PRHS3	-.15		PRHS3	-.15
4.	IAIN Surabaya	.07	PRHS3	.16	.06	PRHS3	.16
			GPHS	.13		GPHS	.16
			REOR2	-.12		GPBA	-.12
			AGE	.11			
5.	Airlangga University	.41**	AGE	.58	.43**	AGE	.59
			SEX	.21		GPBA	-.21
			GPHS	-.16		SEX	.18
6.	IKIP Malang	.25**	AGE	.38	.34**	AGE	.38
			GPHS	-.16		GPBA	-.36
			PRHS3	-.15		TOT1	-.17
						GPSC	.13
						REOR2	-.12

Note: * = significant at .05 level
** = significant at .01 level

students who previously attended religious senior high school. The signs of the PRHS variables also differ.

For the regression of the time to complete the B.A. degree on both input and output variables by institution, the values of R^2 range from the lowest of 6% at IAIN Surabaya through to the highest of 43% at Airlangga University. The beta weights for age are highest and positive, except for IAIN Surabaya - thus indicating that age is a good predictor for the time to complete B.A. degree. Older students tend to take a longer time.

Another variable appearing consistently at all institutions except at Padjadjaran University is B.A. graduate's grade point average (GPBA). The beta weights for GPBA are all negative, which indicates that the students who take less time to complete the B.A. degree tend to have higher B.A. graduate's grade point average.

Other variables appearing as predictors for the time to complete the B.A. degree are previous high schools (PRHS1, PRHS3), residential origin (REOR2), grade point average on high school examination (GPHS) and students' satisfaction (TOT1, TOT2, TOT3), although none of these appears consistently at most of the institutions.

Table 5.6 shows selected statistics from regression of B.A. graduates' satisfaction with educational environment (TOT1) on input and/or output variables by institution. By adding output variables as independent variables, the values of R^2 increase substantially at all six institutions.

The values of R^2 for the regression of B.A. graduates' satisfaction with educational environment on input variables only range from the lowest of 5% at IKIP Malang through to the highest of 34% at Airlangga University. Sex appears consistently at all institutions except at IKIP

TABLE 5.6

SELECTED STATISTICS FROM THE REGRESSION OF B.A. GRADUATES' SATISFACTION WITH EDUCATIONAL ENVIRONMENT ON INPUT AND/OR OUTPUT VARIABLES BY INSTITUTION

No.	Institution	Independent variables: Input variables R^2	Input variables: Variables	Input variables: Beta	Input and/or output variables R^2	Input and/or output variables: Variables	Input and/or output variables: Beta
1.	IAIN Bandung	.18	SEX	.24	.58**	TOT2	.51
			PRHS2	.22		SEX	.20
			PRHS1	.18		TOT3	.30
						PRHS2	.28
						GPBA	-.22
						PRHS1	.15
2.	IKIP Bandung	.20**	SEX	.28	.43**	TOT2	.49
			PRHS1	-.15		SEX	.24
			REOR2	.20		REOR2	.24
			GPHS	-.16		REOR1	.21
			REOR1	.17		TOT3	.17
						TCDG	.14
3.	Padjadjaran University	.09*	REOR1	-.23	.22**	TOT2	.26
			PRHS1	-.15		TOT3	.22
			SEX	-.12		AGE	.15
						REOR1	-.17
						GPBA	.15
						PRHS1	-.15
4.	IAIN Surabaya	.14*	SEX	.29	.51**	TOT2	.60
			AGE	.24		SEX	.37
			PRHS1	.14		GPBA	.20
						AGE	.17
						REOR1	-.12
5.	Airlangga University	.34**	SEX	.59	.47**	SEX	.51
			AGE	.20		TOT3	.25
						AGE	.18
						TOT2	.21
						GPBA	-.12
6.	IKIP Malang	.05	AGE	.22	.33**	TOT2	.40
			GPHS	.13		TOT3	.25
						AGE	.26
						GPHS	.13
						TCDG	-.14

Note: * = significant at .05 level
** = significant at .01 level

Malang and its beta weights are all positive except at Padjadjaran University. The positive beta weights for sex mean that female students are more satisfied with their educational environment, while the negative beta weight means that male students are more satisfied with their educational environment.

Previous academic senior high school (PRHS1) appears in the regression for four of the six institutions. The beta weights for PRHS1 at IAIN Bandung and IAIN Surabaya are positive, which indicate that B.A. graduates who previously attended academic senior high school are more satisfied with their educational environment. On the other hand, the beta weights for PRHS1 at IKIP Bandung and Padjadjaran University are both negatives - thus the B.A. graduates at these institutions who previously attended academic senior high school are less satisfied with their educational environment.

For the regression of B.A. graduates' satisfaction with educational environment on both input and output sets of variables by institution, the values of R^2 range from the lowest (22%) at Padjadjaran University through the highest (58%) at IAIN Bandung. Sex still appears at four of the six institutions with positive beta weights implying that B.A. graduates who are females are more satisfied with their educational environment.

The variable that appears consistently at all institutions is B.A. graduates' satisfaction with their study experience and its benefits (TOT2). Its beta weights are all positive indicating that the B.A. graduates who are most satisfied with their study experience and its benefits tend also to be more satisfied with the educational environment.

Another variable that appears consistently at all institutions except at IAIN Surabaya is B.A. graduates' satisfaction with their

institutional operation (TOT3). The beta weights for TOT3 are all positive - so the B.A. graduates who are more satisfied with their institutional operation also tend to be more satisfied with their educational environment.

Age also appears consistently at four of the institutions (not at IAIN Bandung and IKIP Bandung). The beta weights for age are all positive and indicate that older B.A. graduates are more satisfied with their educational environment than are the younger ones.

Selected statistics from the regression of B.A. graduates' satisfaction with their study experience and its benefits (TOT2) on input and/or output variables are reported in Table 5.7. By adding output variables as independent variables, the values of R^2 increase substantially at all the six institutions.

Regression of B.A. graduates' satisfaction with their study experience and its benefits (TOT2) on input variables produces very low R^2 values ranging from 2% to 11%. Some input variables appear as predictors for TOT2 at particular institutions, but there is no variable identified consistently at most institutions. Only one of the six regressions is significant at the 5% level.

When TOT2 is regressed onto both input and output variables by institution, the values of R^2 range from the lowest (12%) at Padjadjaran University through to the highest (46%) at IAIN Surabaya. TOT1 appears consistently at all institutions with positive and mostly high beta weights. Therefore, B.A. graduates who are more satisfied with their educational environment tend to be more satisfied with their study experience and its benefits.

Other variables appear as predictors for B.A. graduates' satisfaction with their study experience and its benefits by institution, but they are

TABLE 5.7

SELECTED STATISTICS FROM THE REGRESSION OF B.A. GRADUATES' SATISFACTION WITH THEIR STUDY EXPERIENCE AND ITS BENEFITS ON INPUT AND/OR OUTPUT VARIABLES BY INSTITUTION

No.	Institution	Independent variables: Input variables R^2	Variables	Beta	Input and/or output variables R^2	Variables	Beta
1.	IAIN Bandung	.03	SEX	.12	.45**	TOT1	.69
			AGE	-.10		TOT3	-.35
						PRHS2	-.31
						PRHS1	-.26
						PRHS3	-.21
2.	IKIP Bandung	.05	GPHS	-.16	.32**	TOT1	.57
			PRHS2	.14		REOR2	-.25
			PRHS3	.11		REOR1	-.16
						TOT3	-.19
						AGE	.16
						TCDG	-.14
3.	Padjadjaran University	.03	PRHS3	-.12	.12**	TOT1	.32
			REOR1	-.10		TCDG	-.15
						PRHS3	-.14
4.	IAIN Surabaya	.11*	PRHS1	.26	.46**	TOT1	.65
			SEX	-.19		SEX	-.37
			REOR2	-.16		GPBA	.17
						PRHS3	-.19
						REOR2	-.12
						AGE	-.14
5.	Airlangga University	.02	SEX	.15	.13**	TOT1	.33
						GPBA	.17
6.	IKIP Malang	.07	GPHS	-.18	.27**	TOT1	.46
			REOR2	-.16		GPHS	-.20
			PRHS2	-.12		REOR2	-.11
			GPSC	.11		PRHS2	-.11

Note: * = significant at .05 level
** = significant at .01 level

not consistent across most institutions. PRHS3, for example, is selected in only three of the six regression equations. No firm conclusion can then be drawn from this partial pattern.

Table 5.8 shows selected statistics from regression of B.A. graduates' satisfaction with institutional operation (TOT3) on input and/or output variables. By adding output variables as independent variables, the values of R^2 increase at all the institutions.

Regression of B.A. graduates' satisfaction with their institutional operation on input variables, only produces values of R^2 ranging from the lowest of 5% at Airlangga University through to the highest of 19% at IKIP Bandung. Three of the regressions are significant at the 5% level while one is significant at the 1% level. Age is a useful predictor at four of the institutions and has positive beta weights except at IKIP Malang.

The regression of B.A. graduates' satisfaction with institutional operation (TOT3) on input and output variables, produces values of R^2 ranging from the lowest of 16% at Padjadjaran University and IAIN Surabaya through to the highest of 27% at IAIN Bandung. Two of the regressions are significant at the 5% level while the remaining equations are significant at the 1% level. B.A. graduates' satisfaction with their educational environment (TOT1) appears consistently at all institutions except at IKIP Bandung. All beta weights for TOT1 are positive - hence B.A. graduates who are more satisfied with their educational environment also tend to be more satisfied with institutional operation. In addition, age is still identified consistently at most of the institutions.

Selected statistics from the regression of B.A. graduates' grade point average (GPBA) on input and/or output variables by institution

TABLE 5.8

SELECTED STATISTICS FROM THE REGRESSION OF B.A. GRADUATES' SATISFACTION WITH THE INSTITUTIONAL OPERATION ON INPUT AND/OR OUTPUT VARIABLES BY INSTITUTION

No.	Institution	Independent variables: Input variables R^2	Variables	Beta	Input and/or output variables R^2	Variables	Beta
1.	IAIN Bandung	.09	AGE	.20	.27*	TOT2	-.46
			PRHS2	-.20		TOT1	.53
						PRHS2	-.27
						SEX	-.22
2.	IKIP Bandung	.19**	SEX	.31	.22**	SEX	.28
			AGE	.25		AGE	.25
			PRHS1	-.18		PRHS1	-.18
						GPBA	-.18
						GPHS	.12
3.	Padjadjaran University	.08*	REOR1	-.25	.16**	REOR1	-.17
			PRHS2	-.13		TOT1	.23
						GPBA	-.20
						PRHS2	-.16
						AGE	-.11
4.	IAIN Surabaya	.12*	REOR1	-.28	.16*	GPBA	-.14
			REOR2	-.24		REOR1	-.24
			AGE	.19		REOR2	-.20
			PRHS3	.15		PRHS3	.17
						TOT1	.12
						AGE	.12
5.	Airlangga University	.05	SEX	.22	.17**	TOT1	.41
			GPHS	-.11		AGE	-.16
						GPHS	-.15
6.	IKIP Malang	.09*	PRHS3	-.23	.21**	TOT1	.35
			AGE	-.14		PRHS3	-.22
			PRHS1	.15		AGE	-.21
						PRHS1	.12

Note: * = significant at .05 level
** = significant at .01 level

are reported in Table 5.9. By adding output variables as independent variables, the values of R^2 also increase at all the institutions.

The values of R^2 range from the lowest of 2% at Padjadjaran University through to the highest of 32% at IKIP Malang in the regression of GPBA on input variables. Four of the six regressions are significant at the 1% level. Grade point average on high school examination (GPHS) appears consistently at most of the institutions with positive beta weights. Hence B.A. graduates who have a higher grade point average on high school examination tend to have a higher B.A. graduate's grade point average.

Another variable that appears consistently at most institutions is residential origin (REOR2). The beta weight of REOR2 is positive at IAIN Surabaya, but negative at Padjadjaran University, Airlangga University and IKIP Malang. In other words, B.A. graduates who originally come from East Java have higher B.A. graduate's grade point average at IAIN Surabaya, but at Padjadjaran University, Airlangga University and IKIP Malang, B.A. graduates who are originally from East Java tend to have lower grade point average.

The regression of B.A. graduate's grade point average onto input and output variables produces slightly higher values for R^2 ranging from the lowest of 9% at Padjadjaran University through to the highest of 39% at IKIP Malang. All regressions except for one are significant at the 1% level. The variables GPHS and REOR2 are still selected as significant predictors at most of the institutions.

B.A. graduates' satisfaction with their educational environment (TOT1) appears in the regression equations at all institutions except IKIP Bandung. The beta weights of TOT1 are all negative, except at Padjadjaran University. The negative beta weights at IAIN Bandung, IAIN

TABLE 5.9

SELECTED STATISTICS FROM THE REGRESSION OF B.A. GRADUATES' GRADE POINT AVERAGE ON INPUT AND/OR OUTPUT VARIABLES BY INSTITUTION

No.	Institution	Independent variables					
		Input variables			Input and output variables		
		R^2	Variables	Beta	R^2	Variables	Beta
1.	IAIN Bandung	.05	PRHS3	-.25	.28**	TCDG	-.31
			REOR1	.20		TOT1	-.37
						PRHS3	-.24
2.	IKIP Bandung	.17**	GPHS	.33	.22**	GPHS	.31
			SEX	-.20		TOT3	-.17
						TCDG	-.17
						SEX	-.14
3.	Padjadjaran University	.02	REOR2	-.13	.09	TOT3	-.22
						TOT1	.16
						REOR2	-.13
						AGE	-.15
						PRHS3	.11
4.	IAIN Surabaya	.27**	GPHS	.30	.31**	GPHS	.28
			AGE	-.36		AGE	-.27
			SEX	-.16		TOT1	-.29
			REOR2	.13		TOT2	.23
						REOR2	.14
5.	Airlangga University	.14**	GPHS	.28	.22**	TCDG	-.21
			AGE	-.12		GPHS	.26
			REOR2	-.10		TOT2	.18
						TOT1	-.16
						REOR1	.10
6.	IKIP Malang	.32**	GPHS	.38	.39**	TCDG	-.36
			SEX	-.30		GPHS	.32
			AGE	-.20		SEX	-.24
			PRHS1	.31		PRHS1	.14
			REOR2	-.11		TOT1	-.15
			PRHS3	.20		REOR2	-.17
			PRHS2	.19		GPSC	.13

Note: * = significant at .05 level
** = significant at .01 level

Surabaya, Airlangga University and IKIP Malang indicate that B.A. graduates who are less satisfied with the educational environment tend to have higher B.A. graduate's grade point average.

It must be noted that the educational environment does not prevent students from obtaining high grade point averages. Students can do well in their studies though they are less satisfied with their educational environment. The best predictor for B.A. graduate's grade point average may not be students' satisfaction with educational environment, but grade point average on high school examination (GPHS). This claim is supported by the fact that the beta weights for GPHS are all positive and hence the students who have higher grade point average on high school examination tend to have higher B.A. graduate's grade point average. The claim is also similar to the findings of previous studies, and presented in Chapter 2, that high school grade point average is the best predictor for students' grade point average in college.

The actual amount of time needed to complete a B.A. degree (TCDG) appears in the regression equations at all of the institutions except for Padjadjaran University and IAIN Surabaya. The beta weights of TCDG are all negative; therefore, those students who take a shorter time to complete a B.A. degree tend to have a higher B.A. graduate's grade point average.

Commonality analysis is also performed for each institution using the actual time needed to complete a B.A. degree and B.A. graduate's grade point average as dependent variables.

Table 5.10 summarises the commonality analysis using the actual amount of time to complete a B.A. degree as the dependent variable. It is clear that at all institutions, the unique contribution of students' characteristics variables to the variance in the actual amount of time to

TABLE 5.10

SUMMARY OF COMMONALITY ANALYSIS USING THE ACTUAL AMOUNT OF TIME TO COMPLETE B.A. DEGREE AS DEPENDENT VARIABLE BY INSTITUTION

No.	Institution	Unique to		Common to 1 and 2
		Students' characteristics (1)	Students' satisfaction (2)	
1.	IAIN Bandung	.18513	.05864	.00278
2.	IKIP Bandung	.13934	.04034	-.01248
3.	Padjadjaran University	.21210	.01806	.02459
4.	IAIN Surabaya	.07261	.00234	.00165
5.	Airlangga University	.37883	.02260	.03937
6.	IKIP Malang	.28047	.02086	-.00805

complete the B.A. degree is much greater than is the unique contribution of students' satisfaction variables. The commonality of students' characteristics and students' satisfaction variables is very low for each of the institutions.

Table 5.11 shows the summary of commonality analysis using B.A. graduate's grade point average as the dependent variable by institution. The same pattern can be seen in this table - that is, the unique contribution of students' characteristics variables is much greater than is the unique contribution of students' satisfaction variables to the variance in B.A. graduate's grade point average at all institutions except at IAIN Bandung and Padjadjaran University. The commonality of students' characteristics and students' satisfaction variables is also

TABLE 5.11

SUMMARY OF COMMONALITY ANALYSIS USING B.A. GRADUATE'S GRADE POINT AVERAGE AS DEPENDENT VARIABLE BY INSTITUTION

No.	Institution	Unique to		Common to 1 and 2
		Students' characteristics (1)	Students' satisfaction (2)	
1.	IAIN Bandung	.08268	.15671	-.01362
2.	IKIP Bandung	.13711	.02891	.04086
3.	Padjadjaran University	.05431	.06240	-.00862
4.	IAIN Surabaya	.17405	.05407	.09581
5.	Airlangga University	.15426	.05503	-.00554
6.	IKIP Malang	.31813	.00998	.01155

very low except at IAIN Surabaya, where it is about 9.6% of the variance accounted for - higher than that for the satisfaction cluster.

5.3 MULTIPLE REGRESSION ANALYSES USING FACULTY AS THE UNIT OF ANALYSIS

There are seven dependent variables used in the regression equations based on faculty as the unit of analysis. They are:

- the average amount of time needed by students to complete the B.A. degree (AVTCDG),
- the average of students' satisfaction with their educational environment (AVTOT1),
- the average of students' satisfaction with their study experience and its benefits (AVTOT2),
- the average of students' satisfaction with the institutional operation (AVTOT3),

. the proportion of graduates to enrolment (PRGENR),

. the efficiency ratio for the undergraduate or B.A. program (EFRABA),

. the proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU).

The proportion of graduates to enrolment (PRGENR) is obtained from the number of graduates divided by the enrolment in a faculty. The proportion of B.A. graduates to enrolment in the undergraduate program (PRBGEU) is obtained from the number of B.A. graduates divided by the enrolment in undergraduate programs in a faculty. The efficiency ratio of undergraduate or B.A. program (EFRABA) is obtained from the minimum or expected time to complete a B.A. degree divided by the average of actual amount of time to complete the B.A. degree. As the minimum time to complete a B.A. degree in the faculties under study is 36 months, EFRABA is equal to 36 months divided by the average amount of time to complete the B.A. degree in months. It is important to note, that the higher the PRGENR and PRBGEU in a faculty, the more effective the faculty is, while the higher is EFRABA in a faculty, the more efficient is that faculty.

The characteristics of the faculty used as independent variables in the regression analysis are as follows:

First, for students the mean of the B.A. graduates' age (MNAGE), the percentage of enrolment who are female (PCENFA), the percentage of B.A. graduates who are female (PCBAFL), the percentage of B.A. graduates who come from academic senior high school (PCGAH), the percentage of B.A. graduates who come from vocational senior high school (PCGVH), the percentage of B.A. graduates who come from religious senior high school (PCGRH), the percentage of B.A. graduates who come from West Java (PCGWJ), the percentage of B.A. graduates who come from East Java

(PCGEJ), the proportion of B.A. graduates to number of graduates (PRBANG) and the proportion of M.A. graduates to the total number of graduates (PRMANG).

Second, the teaching staff's characteristics are the mean of teaching staff's age (MTSAGE), the percentage of teaching staff who are female (PCTSFL), the mean of teaching staff's teaching experience (MTSTEX), the mean of teaching staff's teaching load (MTSTLD), the percentage of teaching staff who do not have other jobs (PCNOAJ), the percentage of teaching staff who are also part-time teaching staff at other institutions of higher education (PCTAJ1), the percentage of teaching staff who are also part-time teachers at secondary school (PCTAJ2), the percentage of teaching staff who are also part-time administrators (PCTAJ3), the percentage of teaching staff who have part-time jobs that are different from the ones previously mentioned (PCTAJ4), the percentage of teaching staff who have the doctorate degree (PCDOFA), the percentage of teaching staff with permanent status (PCFPFA) and the percentage of faculty members who are lecturers or above (PCFLFA).

Third, the general characteristics of the faculty are the proportion of the number of administrative officials and supporting staff to the number of full-time faculty members (PRNAFF) and the student faculty ratio (SFRFA).

Table 5.12 shows selected statistics for the regression of each dependent variable onto the characteristics of the faculty. The number of faculties included in this analysis is 26. The independent variables presented in the table again account for at least a 1% increase in the R^2 value. This criterion accords with that used previously for the inclusion of an independent variable in a regression equation.

TABLE 5.12

SELECTED STATISTICS FROM THE REGRESSION OF DEPENDENT VARIABLE ON THE CHARACTERISTICS OF FACULTY

No.	Dependent variable	Independent variables: the characteristics of faculty		
		R^2	Variables	Beta
1.	The average amount of time needed by students to complete a B.A. degree (AVTCDG)	.67*	PCTAJ1	-.23
			PCGAH	.53
			MTSAGE	-.34
			MNAGE	.12
			PCBAFL	-.41
			MTSTLD	.63
			PCFPFA	.25
			PCTAJ2	-.20
			PCFLFA	-.31
			PRMANG	.27
			SFRFA	.21
2.	The average of students' satisfaction with educational environment (AVTOT1)	.85**	MTSTLD	.61
			PCBAFL	.41
			PCDOFA	.30
			PCFPFA	.17
			PRMANG	.09
			PCTAJ1	.34
			MTSAGE	-.33
			MTSTEX	.29
			PCNOAJ	.29
			PCENFA	-.27
3.	The average of students' satisfaction with their study experience and its benefits (AVTOT2)	.68**	MTSTEX	.43
			PCFPFA	.43
			PCTSFL	.36
			PCGVH	.44
			PCENFA	-.46
			SFRFA	-.33
			PCFLFA	.22
4.	The average of students' satisfaction with institutional operation (AVTOT3)	.83**	PCGWJ	-.34
			MNAGE	-.48
			PCDOFA	.33
			PCTSFL	.35
			PCTAJ2	-.59
			PCTAJ1	-.30
			MTSTLD	.16
			MTSAGE	-.21
			PCTAJ4	-.24
			PCFPFA	-.15

TABLE 5.12 (CONTINUED)

No.	Dependent variable	Independent variables: the characteristics of faculty		
		R^2	Variables	Beta
5.	The proportion of graduates to enrolment (PRGENR)	.67**	MTSTLD	-.52
			PCGAH	.38
			PCGVH	.43
			SFRFA	-.35
			PCENFA	-.34
			PCTAJ2	-.21
			PRNAFF	.20
6.	The efficiency ratio of undergraduate or B.A. program (EFRABA)	.38	PCTAJ1	.17
			MTSAGE	.34
			PCFPFA	-.43
			MTSTLD	-.48
			PCBAFL	.35
			PCTSFL	-.31
			PCTAJ3	-.15
7.	The proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU)	.60*	MTSTLD	-.35
			PCTAJ3	.26
			PCGAH	.32
			PCTAJ1	-.22
			PCTAJ2	-.42
			PCTSFL	-.18
			PCFLFA	-.16
			SFRFA	-.19
			PCBAFL	-.20

Note: * = significant at .05 level
** = significant at .01 level

The regression of the average amount of time needed by students to complete their B.A. degree (AVTCDG) on the characteristics of the faculty results in an R^2 value of 67% which is significant at the .05 level.

The variables PCTAJ1 and PCTAJ2 have negative beta weights and hence the faculties with larger percentages of their teaching staff who have part-time teaching jobs tend to have shorter average amounts of time for their students to complete the B.A. degree. This seems to indicate that the wider the teaching experience of the teaching staff, the better

the effect on the average amount of time to complete the degree.

Faculties with higher means of teaching staff's age (MTSAGE), larger percentages of faculty members who are lecturers or above (PCFLFA), lower means of faculty members' teaching load (MTSTLD) and smaller student faculty ratios (SFRFA) tend to have shorter averages for the amount of time to complete the degree.

The faculties with lower means of B.A. graduates' age (MNAGE) and higher percentages of the graduates who are female (PCBAFL) also tend to have shorter averages for the amount of time to complete the degree. On the other hand, the faculties with larger percentages of B.A. graduates who come from academic senior high schools (PCGAH), larger percentages of faculty members with permanent status (PCFPFA) and larger proportions of M.A. graduates to total enrolment (PRMANG) tend to have longer averages for the amount of time to complete the degree.

Generally these results are fairly expected. The unexpected results for the variables PCGAH, PCFPFA and PRMANG can however be explained as follows:

First, the positive beta weight for PCGAH - indicating that the faculties with larger percentages of B.A. graduates from academic senior high schools tend to have longer average amounts of time to complete the B.A. degree - may reflect the lack of stringent preparation of students at academic senior high school. As noted previously, no state final examination is now necessary before university entrance examination. The same finding was identified in the regression analysis using individual student as unit of analysis.

Second, the positive beta weight for PRMANG indicates that those faculties with higher proportions of M.A. graduates to the total number of graduates tend to have students taking longer average amounts of time

to complete the B.A. degree (AVTCDG). This is an unusual finding from an educational viewpoint. A statistical reason for it can however be identified. The zero order correlation between the variables is very small - that is, only .047. Hence the variable has probably been selected into the regression equation with a moderately high (.27) beta weight because it is acting as a suppressor variable for another variable already selected in the equation (cf. Darlington, 1968:163-165).

Third, the positive beta weight for PCFPFA indicates that the faculties with larger percentages of faculty members or teaching staff with permanent status tend to have longer average amounts of time to complete the B.A. degree. This may reflect an ineffective and inefficient use of human resources (teaching staff) in the operation of the faculty.

The regression of the average of students' satisfaction with their educational environment (AVTOT1) on the characteristics of the faculty has a very high value for R^2 - that is, .85. This value is significant at the .01 level. Hence about 85% of the variance in the dependent variable is accounted for by the ten independent variables selected into the regression equation.

The faculties with higher means of teaching staff's teaching load (MTSTLD), higher percentages of teaching staff with doctorate degree (PCDOFA), higher percentages of faculty members with permanent status (PCFPFA), higher means of teaching staff's teaching experience (MTSTEX), higher percentages of teaching staff who do not have other part-time jobs (PCNOAJ), higher percentages of teaching staff who are also part-time teaching staff at other institutions of higher education (PCTAJ1) and lower means of teaching staff's age (MTSAGE) tend to have higher average levels of students' satisfaction with their educational

environment.

With regard to the students' characteristics, the faculties with larger percentages of B.A. graduates who are female (PCBAFL), larger proportions of M.A. graduates to the total number of graduates (PRMANG) and lower percentages of enrolment who are female (PCENFA) also tend to have higher average levels of students' satisfaction with their educational environment.

It should be noted that the beta weight for the percentage of the enrolment who are female (PCENFA) is negative, while the beta weight for the percentage of B.A. graduates who are female (PCBAFL) is positive. The beta weights may imply that in general, the faculties with lower percentages of enrolment who are female (PCENFA) tend to have higher average levels of students' satisfaction with their educational environment; but the longer the female students study at a faculty, they become well adjusted and more satisfied with their educational environment. It is therefore conceivable that the faculties with larger percentages of B.A. graduates who are female tend to have higher average level of students' satisfaction with their educational environment.

The regression of average students' satisfaction with their study experience and its benefits (AVTOT2) on the characteristics of faculty results in an R^2 value of 68%. This value is significant at the .01 level.

The faculties with higher means of teaching staff's teaching experience (MTSTEX), higher percentages of faculty members with permanent status (PCFPFA), higher percentages of teaching staff who are female (PCTSFL), higher percentages of faculty members who are lecturers or above (PCFLFA) and smaller student faculty ratios (SFRFA) tend to have higher average levels of students' satisfaction with their study

experience and its benefits.

With respect to students' characteristics, the faculties with higher percentages of B.A. graduates who come from vocational senior high schools (PCGVH) and smaller percentages of enrolment who are female (PCENFA) tend to have higher average levels of students' satisfaction with their study experience and its benefits.

The regression of the average of students' satisfaction with the institutional operation (AVTOT3) on the characteristics of the faculty has a very high value of R^2 - that is, 83%. This value is significant at the .01 level.

The faculties with higher percentages of teaching staff with doctorate degrees (PCDOFA), higher percentages of teaching staff who are female (PCTSFL), higher means of teaching staff's teaching load (MTSTLD), lower percentages of teaching staff who have other part-time jobs (PCTAJ1, PCTAJ2 and PCTAJ4) and lower percentages of faculty members with permanent status (PCFPFA) tend to have higher average levels of students' satisfaction with the institutional operation.

With regard to students' characteristics, the faculties with lower means of B.A. graduates' age (MNAGE) and smaller percentages of students who come from West Java (PCGWJ) tend to have higher average levels of students' satisfaction with the institutional operation.

MTSAGE has a negative beta weight indicating that the faculties with lower means of teaching staff's age tend to have higher average levels of students' satisfaction with the institutional operation. This may imply younger staff are introducing new methods into institutional operational procedures. The negative beta weight for PCFPFA indicates that the faculties with lower percentages of teaching staff with permanent status (PCFPFA) tend to have higher average levels of students'

satisfaction with the institutional operation. The zero order correlation between the two variables is however very small - only -.048. Hence this is probably another example of a suppressor variable as explained before.

The regression of the proportion of graduates to enrolment (PRGENR) on the characteristics of the faculty has a high value of R^2 - that is, 67%. This value is significant at the .01 level.

The beta weights for the independent variables indicate that the faculties with lower means of teaching staff's teaching load (MTSTLD), smaller student faculty ratios (SFRFA), smaller percentages of teaching staff who have part-time teaching jobs at secondary schools (PCTAJ2) and larger proportions of the number of administrative officials and supporting staff to the number of full-time faculty members (PRNAFF) tend to have larger proportions of graduates to total enrolment.

With respect to students' characteristics, the faculties with larger percentages of B.A. graduates who come from academic senior high schools and vocational senior high schools (PCGAH and PCGVH) and smaller percentages of enrolment who are female (PCENFA) tend to have larger proportions of graduates to enrolment.

The regression of the efficiency ratio of B.A. graduates (EFRABA) on the characteristics of faculty results in a rather low R^2 value (38%). The beta weights for the independent variables indicate that the faculties with larger percentages of teaching staff who have part-time teaching jobs at other institutions of higher education (PCTAJ1), higher means of teaching staff's age (MTSAGE), smaller percentages of faculty members with permanent status (PCFPFA), lower means of teaching staff's teaching load (MTSTLD), lower percentages of teaching staff who are female (PCTSFL) and lower percentages of teaching staff who are also

part-time administrators (PCTAJ3) tend to have higher efficiency ratios of undergraduate programs. Then, with regard to students' characteristics, the faculties with larger percentages of B.A. graduates who are female (PCBAFL) tend to have higher efficiency ratios in their undergraduate programs.

PCTAJ1 has positive beta weight; therefore, the faculties with larger percentages of teaching staff who have part-time teaching jobs at other institutions of higher education (PCTAJ1) tend to have higher efficiency ratios of B.A. graduates, which may indicate that the wider the teaching experience of the teaching staff, the better its effect would be on the efficiency ratio of undergraduate program.

The regression of the proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU) on the characteristics of the faculty has a high value of R^2 - that is, 60%. This value is significant at the .05 level.

The beta weights for the independent variables indicate that faculties with lower means of teaching staff's teaching load (MTSTLD), higher percentages of teaching staff who have other jobs as administrators (PCTAJ3), lower percentages of teaching staff who have part-time teaching jobs (PCTAJ1 and PCTAJ2), lower percentages of teaching staff who are female (PCTSFL), lower percentages of faculty members who are lecturers or above (PCFLFA) and smaller student faculty ratios (SFRFA) tend to have larger proportions of B.A. graduates to undergraduate enrolment.

With respect to students' characteristics, the faculties with larger percentages of B.A. graduates who come from academic senior high schools (PCGAH) and smaller percentages of B.A. graduates who are female (PCBAFL) tend to have larger proportions of B.A. graduates to undergraduate enrolment.

Table 5.13 shows selected statistics from regression of the dependent variables on input and/or output variables at the level of faculty. This analysis is similar to the one presented in Table 5.3, but the units of analyses are different. In Table 5.3 the unit of analysis is the individual (student), while in Table 5.13 the unit of analysis is the faculty.

The regression of the average amount of time needed by students to complete the B.A. degree (AVTCDG) on input variables results in an R^2 value which is equal to 26%. This rather low value is produced by a combination of variables measuring the percentage of B.A. graduates who come from academic senior high school (PCGAH), the percentage of B.A. graduates who are female (PCBAFL) and the mean of B.A. graduates' age (MNAGE). The values of the beta weights are positive for PCGAH and MNAGE, thus indicating that the larger the percentage of B.A. graduates from academic senior high schools and the higher the mean of B.A. graduates' age in a faculty, the longer the average amount of time to complete the B.A. degree. On the other hand, PCBAFL has a negative beta weight, hence the larger the percentage of B.A. graduates who are female, the shorter is the average amount of time to complete the B.A. degree.

Then, the regression of the average amount of time to complete the B.A. degree onto input and output variables results in a rise in the R^2 value to 40%.

The beta weights for the independent variables indicate that the faculties with larger percentages of B.A. graduates who come from academic senior high schools (PCGAH), higher averages of students' satisfaction with their educational environment (AVTOT1), higher means of B.A. graduates' age (MNAGE) and higher averages of students' satisfaction with the institutional operation (AVTOT3) tend to have longer averages for the

TABLE 5.13

SELECTED STATISTICS FROM THE REGRESSION OF DEPENDENT VARIABLE ON INPUT AND/OR OUTPUT VARIABLES AT THE LEVEL OF FACULTY

No.	Dependent variable	Independent variables: Input variables R^2	Variables	Beta	Input and/or output variables R^2	Variables	Beta
1.	The average amount of time needed by students to complete B.A. degree (AVTCDG)	.26	PCGAH	.45	.40	PCGAH	.41
			PCBAFL	-.29		PCBAFL	-.51
			MNAGE	.25		AVTOT1	.47
						MNAGE	.32
						AVTOT3	.14
						PCGVH	-.17
2.	The average of students' satisfaction with educational environment (AVTOT1)	.48**	PCBAFL	.43	.67**	PCBAFL	.53
			PCGVH	.36		AVTOT2	.41
			PCGAH	.12		AVTCDG	.26
						PCGAH	-.19
						AVTOT3	.15
						PCGVH	.15
3.	The average of students' satisfaction with their experience and its benefits (AVTOT2)	.41*	PCGRH	-.49	.49**	AVTOT1	.45
			PCGEJ	-.21		PCGRH	-.33
			PCGVH	.22		AVTOT3	-.24
			MNAGE	-.12			
4.	The average of students' satisfaction with institutional operation (AVTOT3)	.55**	PCGWJ	-.59	.63**	PCGWJ	-.60
			MNAGE	-.41		MNAGE	-.36
			PCGVH	.20		PCGVH	.43
						AVTOT2	-.26
						AVTOT1	.41
						PCBAFL	-.30
						PCGAH	.60
						PCGRH	.55

Note: * = significant at .05 level
** = significant at .01 level

amount of time to complete the B.A. degree. In contrast, the faculties with higher percentages of B.A. graduates who are female (PCBAFL) and higher percentages of B.A. graduates from vocational senior high schools (PCGVH) tend to have shorter averages for the amount of time to complete the B.A. degree.

The regression of the average of students' satisfaction with their educational environment (AVTOT1) on input variables has a value of R^2 which is equal to .48. This value is significant at the .01 level. Hence about 48% of the variance in AVTOT1 is accounted for by PCBAFL, PCVGH and PCGAH. The beta weights are all positive which indicate that the faculties with higher percentages of B.A. graduates who are female (PCBAFL), higher percentages of B.A. graduates who come from vocational and academic senior high schools (PCGVH and PCGAH) tend to have higher average levels of students' satisfaction with their educational environment.

The regression of the average of students' satisfaction with their educational environment on input and output variables results in a high value of R^2 - that is, .67. This value is significant at the .01 level. Therefore, about 67% of the variance in AVTOT1 is accounted for by PCBAFL, AVTOT2, AVTCDG, PCGAH, AVTOT3 and PCGVH. The beta weights for these independent variables are all positive, except for PCGAH, hence the faculties with higher percentages of B.A. graduates who are female (PCBAFL), higher averages of students' satisfaction with their study experience and its benefits (AVTOT2), higher averages of the amount of time to complete the B.A. degree (AVTCDG), higher averages of students' satisfaction with the institutional operation (AVTOT3) and higher percentages of B.A. graduates who come from vocational senior high schools (PCGVH) tend to have higher average levels of students' satisfaction with

educational environment.

The regression of the average of students' satisfaction with their study experience and its benefits results in an R^2 value of .41 which is significant at the .05 level. Therefore, about 41% of the variance in the average of students' satisfaction with their study experience and its benefits (AVTOT2) is accounted for by PCGRH, PCGEJ, PCGVH and MNAGE. The beta weights for the independent variables are all negative, except for PCGVH, which indicate that the faculties with lower percentages of B.A. graduates who come from religious senior high schools (PCGRH) and from East Java (PCGEJ) and lower means of B.A. graduates' age (MNAGE) and higher percentages of B.A. graduates who come from vocational senior high schools (PCGVH) tend to have higher average levels of students' satisfaction with their study experience and its benefits.

The regression of the average of students' satisfaction with their study experience and its benefits (AVTOT2) on input and output variables has a value of R^2 which is equal to .49 and significant at the .01 level. Hence about 49% of the variance in AVTOT2 is accounted for by AVTOT1, PCGRH and AVTOT3. The beta weights for these independent variables are negative except for AVTOT1, thus the faculties with higher average levels of students' satisfaction with their educational environment (AVTOT1), lower average levels of students' satisfaction with the institutional operation (AVTOT3) and lower percentages of B.A. graduates who come from religious senior high schools (PCGRH) tend to have higher average levels of students' satisfaction with their study experience and its benefits.

The regression of the average of students' satisfaction with the institutional operation (AVTOT3) on input variables results in an R^2 value of .55. This value is significant at the .01 level. Hence about 55% of the variance of AVTOT3 is accounted for by PCGWJ, MNAGE and PCGVH.

The beta weights for the independent variables are negative except for PCGVH, which indicate that the faculties with lower percentages of B.A. graduates who come from West Java (PCGWJ), lower means of B.A. graduates' age (MNAGE) and higher percentages of B.A. graduates who come from vocational senior high schools (PCGVH) tend to have higher average levels of students' satisfaction with the institutional operation.

The regression of the average of students' satisfaction with the institutional operation (AVTOT3) on input and output variables has a high value of R^2 - that is, .63. This value is significant at the .01 level. Four of the independent variables have negative beta weights indicating that the faculties with lower percentages of B.A. graduates who come from West Java (PCGWJ), lower means of B.A. graduates' age (MNAGE), lower average levels of students' satisfaction with their study experience and its benefits (AVTOT2) and lower percentages of B.A. graduates who are female (PCBAFL) tend to have higher average levels of students' satisfaction with the institutional operation. The other four independent variables have positive beta weights which indicate that the faculties with larger percentages of B.A. graduates who come from vocational senior high schools (PCGVH), academic senior high schools (PCGAH), religious senior high schools (PCGRH) and higher average levels of students' satisfaction with their study experience and its benefits (AVTOT2) tend to have higher average levels of students' satisfaction with the institutional operation.

Commonality analysis is used to determine the relative contribution of each set of variables to the variance in the dependent variable. The commonality analysis is performed by using the average amount of time to complete the B.A. degree (AVTCDG) as the dependent variable, while the independent variable sets are the students' characteristics variables and

the students' satisfaction variables. The formulas used to calculate the unique and common contribution of the two sets of independent variables are the same as those used in the previous section of this chapter.

TABLE 5.14

SUMMARY OF COMMONALITY ANALYSIS USING THE AVERAGE AMOUNT OF TIME TO COMPLETE THE B.A. DEGREE AS DEPENDENT VARIABLE

Source	Students' characteristics (1)	Students' satisfaction (2)
1. Unique to students' characteristics	.35152	-
2. Unique to students' satisfaction	-	.13813
Common to 1 and 2	-.08693	-.08693
Σ	.26459	.05120

Table 5.14 shows the summary of commonality analysis using the average amount of time to complete the B.A. degree as the dependent variable. The unique contributions of students' characteristics and students' satisfaction comprise about 48.96% of the variance accounted for, while the commonality of the variables suppresses this total by about 8.7%.

The unique contribution of students' characteristics to the average amount of time needed by students to complete the B.A. degree is 35.15%. It is much more dominant in comparison with the unique contribution of students' satisfaction which is only 13.81% of the variance accounted for.

Therefore, students' characteristics variables are better predictors of the average amount of time to complete the B.A. degree. This result has the same pattern as the result obtained from the commonality analysis of the amount of time to complete the B.A. degree using individual student as the unit of analysis which is presented in Table 5.4.

Table 5.15 shows the summary of the commonality analyses for various dependent variables with the characteristics of the faculty as independent variables (including students' characteristics of the faculty, teaching staff's characteristics of the faculty and general characteristics of the faculty). In other words, the commonality analyses are performed with three independent variable sets and the formulas used to calculate unique and common contributions of the three independent variable sets follow guidance given by Kerlinger and Pedhazur (1973: 299-303).

The results of the commonality analyses presented in Table 5.15 indicate that the teaching staff's characteristics of the faculty show the largest relative contributions to the variance of the dependent variables. These contributions range from 21.60% to 52.36% of the variance accounted for.

For four of the dependent variables, the students' characteristics of the faculty are moderate in their unique contributions to the variance of the dependent variables. These dependent variables are the average amount of time needed by students to complete the B.A. degree (AVTCDG), the average of students' satisfaction with their study experience and its benefits (AVTOT2), the average of students' satisfaction with the institutional operation (AVTOT3) and the proportion of graduates to enrolment (PRGENR). For the other three dependent variables - that is, the average of students' satisfaction with their educational environment

TABLE 5.15

SUMMARY OF COMMONALITY ANALYSES FOR VARIOUS DEPENDENT VARIABLES WITH THE CHARACTERISTICS OF THE FACULTY

No.	Dependent variable	Unique to			Common to			
		Students' characteristics of the faculty (1)	Teaching staff's characteristics of the faculty (2)	General characteristics of the faculty (3)	1 and 2	1 and 3	2 and 3	1, 2 and 3
1.	AVTCDG	.27921	.39905	.01531	-.02783	.02793	.00056	-.01297
2.	AVTOT1	.05862	.21602	.02063	.35355	-.00810	.16474	.07740
3.	AVTOT2	.14870	.52363	.05966	.00537	-.04884	.00804	.06631
4.	AVTOT3	.19980	.28306	.01079	.34448	.04898	.00920	-.03699
5.	PRGENR	.20368	.22395	.08782	-.05452	.05420	.15881	.01081
6.	EFRABA	.05650	.35766	.00000	-.00997	.00762	.01166	-.01928
7.	PRBGEU	.08107	.43857	.02158	.09445	-.00384	-.01182	.00319

(AVTOT1), the efficiency ratio of B.A. graduates (EFRABA) and the proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU), the unique contributions of the students' characteristics are relatively low. Therefore, teaching staff's characteristics of the faculty are better predictors of these dependent variables than are students' characteristics.

The unique contributions of the general characteristics of the faculty to the variance in the dependent variables are relatively the lowest. Hence they are relatively less important predictors for the dependent variables in comparison to teaching staff's and students' characteristics of the faculty.

The commonalities of the independent variables are generally low, except for the average of students' satisfaction with their educational environment (AVTOT1) and the average of students' satisfaction with the institutional operation (AVTOT3) where the commonalities of 1 and 2 are relatively high, indicating that the correlations between students' and teaching staffs' characteristics account for the relatively large proportion of variance in AVTOT1 and AVTOT3. In addition, the commonalities of teaching staff's characteristics and general characteristics of the faculty account for about 16% of the variance in the average of students' satisfaction with their educational environment (AVTOT1) and the proportion of graduates to enrolment (PRGENR).

5.4 SUMMARY

The multiple regression analyses of the data using firstly student and then faculty as the unit of analysis have been presented in this chapter. Both bases for analyses provide administrators with useful information for judging decision alternatives.

The multiple regression using student as the unit of analysis provides results indicating the important variables that account for and help explain students' performance. This information can be used by administrators for individual advising of students to improve performance. Such advising could relate to the efficient use of their study time and giving guidance to the students in their study in an institution of higher education taking into consideration the students' characteristics such as previous high school, grade point average on high school examination and student's age.

The multiple regression using faculty as the unit of analysis provides results indicating the important variables that account for the efficiency and effectiveness of an institution of higher education. This information can be used by administrators to evaluate and improve the performance of an institution. Therefore it is reasonable and appropriate to use these results in developing a model for evaluating the efficiency and effectiveness of an institution of higher education. Such a model will be presented in Chapter 7.

The multiple regression analyses using student as the unit of analysis on the sample of 1979 B.A. graduates as a whole indicate that some students' characteristics - namely students' age, sex and previous high school - appear to be important predictors of the amount of time to complete a B.A. degree and of the students' satisfaction with their educational environment. Previous high school is also an important predictor of students' satisfaction with their study experience and its benefits, whereas student's sex and residential origin are important predictors of students' satisfaction with the institutional operation. A commonality analysis of the data indicates that the unique contribution of students' characteristics variables to the variance of the time to

complete the B.A. degree is relatively high. However both the unique contribution of students' satisfaction variables and the commonality of the two sets of variables are very low.

The multiple regression analyses of the data using student as the unit of analysis for each institution show that student's age and sex are consistently important predictors of the amount of time to complete the B.A. degree and the students' satisfaction with their educational environment. The student's sex is also an important predictor of the students' satisfaction with the institutional operation. Grade point average on high school examination is an important predictor for a B.A. graduate's grade point average in obtaining the degree. The commonality analysis of the data for each institution also indicates that the unique contribution of students' characteristics variables to the variance in the amount of time to complete the B.A. degree is relatively high, but the unique contribution of students' satisfaction variables is generally low. The commonality of the two sets of variables is also generally low.

The multiple regression analyses of the data using faculty as the unit of analysis shows that some of the aggregated characteristics of the faculty appear to be important predictors of various measures of efficiency and effectiveness of an institution of higher education used as dependent variables. The results of the commonality analysis indicate: first, teaching staff's characteristics of the faculty show the largest relative contributions to the variance of the dependent variables. Second, the students' characteristics of the faculty are generally moderate in their unique contributions to the variance of the dependent variables. Third, the unique contributions of the general characteristics of the faculty are relatively low and therefore are less important predictors of the dependent variables.

CHAPTER 6

ANALYSIS OF STAFF DATA

The staff at each of the six institutions under study were asked questions to determine what measures they considered to be useful for the evaluation of institutional efficiency and effectiveness in higher education. The questionnaires were administered to samples of both teaching staff and administrators.

Data on the staff perception as to possible measures for evaluating institutional performance in higher education are considered essential, because the teaching and administrative staff are the persons who are actually involved in the process of transforming inputs into the outputs of an institution of higher education. A questionnaire approach would give a chance to identify one set of evaluation criteria derived from items that are conceptually related to each other. These criteria would provide useful information for developing a sound policy on the evaluation of higher education especially in Indonesia.

6.1 DESCRIPTIVE ANALYSIS OF THE TEACHING STAFF RESPONSES

The teaching staff sample were asked to express their opinions about the degree of usefulness of possible variables or measures which can be used to evaluate the efficiency and effectiveness of an institution of higher education. As noted in Chapter 3, the questionnaire consisted of 49 statements and for each statement, respondents were asked to check that one of the four responses available they felt to be appropriate. The values assigned to the responses are as follows: not useful=1, somewhat useful=2, useful=3 and very useful=4.

In addition, respondents were also asked for their suggestions and comments on the potential measures or variables for evaluating the efficiency and effectiveness of an institution of higher education. Then, they were asked for some background information, which can be used for further analysis.

Table B.2 (Appendix B) reports the percentages of teaching staff responses to the questionnaire on the usefulness of measures by institution. These percentages of responses by item and by institution can be summarized as in Table 6.1 to show a summary of the percentages of high "perceived usefulness" responses (i.e. ratings of 3 and 4). In general, most of the teaching staff consider that most of the variables presented to them are useful or very useful. The exceptions to this pattern are item 3 (student's sex), item 4 (student's age), item 5 (the place of origin of the student), item 22 (the percentage of enrolment who are female) and item 32 (the percentage of administrative officials with M.A. or doctorate degree).

The variables which are rated by most of the teaching staff as somewhat useful or not useful across institutions are the place of origin of the student (item 5) and the percentage of enrolment who are female (item 22); then there are three other variables which are rated as useful or very useful by most of the teaching staff at some institutions of higher education, but are rated as somewhat useful or not useful at other institutions, that is, student's sex (item 3), student's age (item 4) and the percentage of administrative officials with M.A. or Dr. degree (item 32).

The teaching staff responses for the last three variables mentioned above can be described as follows:

1. Most of the respondents at the institutions of higher education taken

TABLE 6.1

SUMMARY OF THE PERCENTAGES OF TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE WHICH ARE OF HIGH RATINGS (3 AND 4) BY INSTITUTION

Item number	IAIN Bandung	IKIP Bandung	Padja-djaran Univ.	IAIN Sunan Ampel	Air-langga Univ.	IKIP Malang	Total: 6 institutions
1.	88.5	94.0	88.7	88.2	89.2	81.7	88.4
2.	86.6	77.1	73.9	82.3	62.7	71.9	74.0
3.	53.9	48.2	30.7	47.1	22.6	30.5	36.5
4.	73.1	48.2	52.3	56.8	36.2	35.4	47.8
5.	40.4	33.7	34.1	21.6	19.6	31.7	29.7
6.	78.8	77.1	59.1	76.5	52.9	68.3	66.8
7.	86.6	74.7	84.1	80.4	76.4	74.4	78.8
8.	90.4	92.8	85.3	86.3	77.4	74.4	83.7
9.	94.3	92.8	87.5	86.3	79.4	79.3	85.8
10.	96.2	97.6	96.6	98.0	94.1	93.9	95.8
11.	94.2	96.4	96.6	100	98.0	93.9	96.5
12.	88.5	72.3	84.1	90.2	81.4	69.5	80.0
13.	98.1	95.2	94.3	94.1	96.0	98.8	96.0
14.	65.4	67.5	78.4	60.7	71.6	70.7	70.1
15.	92.3	92.8	94.3	90.2	95.1	95.1	93.7
16.	100	89.2	95.5	52.9	90.1	90.3	92.0
17.	92.3	94.0	93.2	90.2	91.2	95.1	92.8
18.	98.1	97.6	94.3	90.2	95.1	96.3	95.4
19.	100	94.0	97.8	88.2	93.1	96.4	94.9
20.	98.1	96.4	95.5	94.1	98.0	97.6	96.8
21.	94.2	89.2	87.5	90.2	90.2	93.9	90.6
22.	30.8	28.9	34.1	45.1	19.6	24.4	29.1
23.	86.5	80.7	88.7	88.2	82.3	86.6	85.2

TABLE 6.1 (CONTINUED)

Item number	IAIN Bandung	IKIP Bandung	Padja-djaran Univ.	IAIN Sunan Ampel	Air-langga Univ.	IKIP Malang	Total: 6 institutions
24.	92.3	88.0	85.2	84.3	88.2	81.7	86.5
25.	98.1	95.2	93.2	92.2	95.1	96.3	95.0
26.	92.3	89.2	87.5	74.6	81.4	79.3	84.1
27.	90.4	83.1	89.8	78.4	87.3	80.5	85.2
28.	84.6	85.6	76.2	68.6	67.7	84.2	77.5
29.	96.2	95.2	93.2	90.2	89.2	90.2	92.2
30.	92.3	89.2	92.1	84.3	90.2	92.7	90.4
31.	84.7	77.1	81.9	66.6	74.5	87.8	79.0
32.	57.7	45.8	52.3	56.9	45.1	45.1	49.4
33.	92.4	88.0	95.5	80.4	94.1	92.7	91.3
34.	82.7	88.0	88.6	60.7	82.3	87.8	83.2
35.	84.7	91.6	92.1	68.6	93.1	97.6	89.7
36.	90.4	85.5	89.7	92.2	89.2	87.8	88.9
37.	82.7	77.1	76.1	68.5	71.6	74.4	64.9
38.	92.3	92.8	89.8	94.1	90.2	87.8	90.8
39.	98.1	91.6	93.2	98.0	92.2	89.1	93.0
40.	92.3	88.0	92.0	82.4	94.2	92.7	90.9
41.	92.3	83.2	73.9	86.3	84.3	76.8	81.8
42.	73.1	85.6	81.8	64.7	74.6	80.4	77.8
43.	88.5	86.8	92.1	76.5	91.1	86.6	87.8
44.	92.4	91.6	95.4	92.1	92.1	90.3	92.3
45.	90.4	90.4	92.0	92.1	86.3	86.6	89.3
46.	94.3	92.8	96.6	86.2	91.1	93.9	92.9
47.	88.5	77.5	90.9	72.6	80.4	86.6	83.4
48.	92.3	81.6	90.9	86.3	88.2	90.2	90.0
49.	94.3	86.8	93.2	80.4	95.1	91.5	90.8

as sample with the exception of IAIN Bandung rated the student's sex as somewhat useful or not useful for evaluating the efficiency and effectiveness of an institution of higher education.

2. Most of respondents at IAIN Bandung, Padjadjaran University and IAIN Sunan Ampel rated the student's age as useful or very useful; but on the other hand, most of the respondents at IKIP Bandung, Airlangga University and IKIP Malang rated it as somewhat useful or not useful. This pattern of responses will also apply to describe the variable or item 32.

The characteristics of the teaching staff responses indicate that the teaching staff who responded to the questionnaire were in relatively close agreement on most items or variables. This information can also be seen in Table 6.2 that shows the summary of the mean scores of teaching staff responses to the questionnaire by institution. The pattern established in the percentages of teaching staff responses to the questionnaire is confirmed when the mean score across item categories by item and by institution is taken into consideration.

In view of the mean score for each item across institutions, it can be concluded that most of the teaching staff were in relatively close agreement on their responses to most of the items. Most values of the mean scores are relatively high, which indicate that most of the teaching staff responses across item categories are of high ratings with the exception of item 3 (student's sex), item 4 (student's age), item 5 (the place of origin of the student), item 22 (the percentage of enrolment who are female), and item 32 (the percentage of administrative officials with M.A. or Dr. degree). This is the same as the result obtained when the percentages of teaching staff responses to the questionnaire were taken into account such as presented in Table 6.1.

TABLE 6.2

SUMMARY OF THE MEANS OF TEACHING STAFF RESPONSES

TO THE QUESTIONNAIRE BY INSTITUTION

Item number	IAIN Bandung	IKIP Bandung	Padja-djaran Univ.	IAIN Sunan Ampel	Air-langga Univ.	IKIP Malang	Total: 6 institutions
1.	3.37	3.40	3.28	3.16	3.17	3.06	3.23
2.	3.23	3.00	2.96	3.14	2.66	2.88	2.93
3.	2.37	2.24	1.85	2.24	1.76	1.82	2.00
4.	2.73	2.31	2.28	2.47	2.15	2.13	2.30
5.	2.06	2.06	1.97	1.71	1.64	1.95	1.89
6.	3.10	2.98	2.66	3.00	2.47	2.71	2.77
7.	3.14	2.98	3.06	2.98	2.95	2.98	3.00
8.	3.21	3.23	3.06	3.02	2.96	2.92	3.06
9.	3.27	3.22	3.18	3.06	3.04	3.05	3.13
10.	3.67	3.57	3.69	3.65	3.58	3.54	3.61
11.	3.62	3.46	3.66	3.63	3.64	3.51	3.58
12.	3.27	2.90	3.09	3.18	3.04	2.96	3.05
13.	3.48	3.52	3.43	3.33	3.48	3.67	3.50
14.	2.60	2.86	2.83	2.61	2.92	2.96	2.83
15.	3.42	3.45	3.53	3.35	3.50	3.55	3.46
16.	3.64	3.40	3.48	3.41	3.38	3.23	3.41
17.	3.58	3.59	3.58	3.53	3.32	3.55	3.51
18.	3.69	3.60	3.59	3.55	3.44	3.60	3.57
19.	3.60	3.53	3.73	3.33	3.59	3.56	3.57
20.	3.71	3.68	3.77	3.84	3.75	3.73	3.74
21.	3.42	3.29	3.22	3.29	3.19	3.32	3.27
22.	1.90	2.00	1.88	2.24	1.76	1.83	1.91
23.	3.27	3.10	3.39	3.22	3.27	3.28	3.26
24.	3.25	3.17	3.26	3.18	3.27	3.15	3.21

TABLE 6.2 (CONTINUED)

Item number	IAIN Bandung	IKIP Bandung	Padja-djaran Univ.	IAIN Sunan Ampel	Air-langga Univ.	IKIP Malang	Total: 6 institutions
25.	3.50	3.47	3.50	3.55	3.55	3.59	3.53
26.	3.27	3.28	3.31	2.94	3.17	3.12	3.19
27.	3.23	3.27	3.40	3.04	3.20	3.04	3.21
28.	3.06	3.18	3.02	2.80	2.87	3.21	3.03
29.	3.40	3.41	3.39	3.22	3.23	3.35	3.33
30.	3.37	3.35	3.35	3.12	3.26	3.40	3.31
31.	3.14	3.08	3.09	2.75	2.95	3.26	3.06
32.	2.60	2.39	2.46	2.47	2.34	2.46	2.44
33.	3.50	3.43	3.63	3.35	3.55	3.58	3.52
34.	3.23	3.27	3.51	2.69	3.22	3.23	3.23
35.	3.17	3.35	3.49	2.73	3.49	3.38	3.32
36.	3.37	3.19	3.22	3.18	3.14	3.29	3.22
37.	3.02	2.90	2.80	2.71	2.78	2.84	2.83
38.	3.48	3.42	3.32	3.33	3.22	3.31	3.33
39.	3.56	3.35	3.50	3.51	3.32	3.38	3.42
40.	3.44	3.27	3.43	3.12	3.28	3.44	3.33
41.	3.27	3.04	2.92	3.06	3.05	3.01	3.04
42.	2.83	3.07	3.17	2.59	2.95	3.20	3.00
43.	3.21	3.24	3.47	2.90	3.29	3.39	3.28
44.	3.19	3.40	3.46	3.22	3.21	3.31	3.31
45.	3.21	3.31	3.27	3.18	3.05	3.26	3.21
46.	3.31	3.36	3.51	3.18	3.18	3.35	3.32
47.	3.10	3.07	3.36	2.84	3.05	3.29	3.14
48.	3.31	3.39	3.39	3.20	3.16	3.34	3.30
49.	3.44	3.30	3.43	3.04	3.14	3.50	3.37

The teaching staff responses to the three open ended questions have also been analysed. There are no clear or consistent patterns in their recommendations on the possible additional measures. Since there is no consistency on the ranking of the three most important measures to be used in evaluating the efficiency and effectiveness of an institution of higher education in Indonesia, the results of this analysis are of no real use for the central issues addressed in the analyses here and they are therefore not reported.

In general, all the items with low overall means of teaching staff responses to their questionnaire have the mean values less than 2.5 - that is, the central response point, except for items 4 and 32, whereas the mean values at IAIN Bandung are greater than 2.5. These indicate that item 4 (student's age) and item 32 (percentage of administrative officials with M.A. or Dr. degree) are considered to be useful and important for evaluating the institutional efficiency and effectiveness by most of the teaching staff at IAIN Bandung.

6.2 DESCRIPTIVE ANALYSIS OF THE ADMINISTRATORS' RESPONSES

The sample of administrators, described in Chapter 3, were also asked to express their opinions about the degree of usefulness of variables or measures for evaluating the efficiency and effectiveness of an institution of higher education. The statements and questions within their questionnaire were the same as those within the questionnaire for the teaching staff - the only difference being in the background information asked.

Table B.3 (Appendix B) shows the percentage of administrators' responses to the questionnaire at the six institutions of higher education under study for the 30 respondents. The mean, standard deviation and

skewness values of the responses to each item can also be seen in this table.

The percentages of administrators' responses to the questionnaire across item categories as presented in Table B.3 indicate that the responses to most items are generally of high ratings (3 and 4) with the exception of item 3 (student's sex), item 4 (student's age), item 5 (the place of origin of the student), item 22 (the percentage of enrolment who are female) and item 32 (the percentage of administrative officials with M.A. or doctorate degree). This pattern of responses is exactly the same as that for the teaching staff responses to their questionnaire.

Table 6.3 shows the percentage of teaching staff and administrators who rate each item or variable as being useful or very useful. There is a distinct similarity between the teaching staff and administrators' response patterns. In other words, they are in relatively close agreement on their perceptions about the degree of usefulness of possible measures for evaluating the efficiency and effectiveness of an institution of higher education.

Teaching staff and administrators' ratings vary most on item 14 (faculty member's another job) and item 28 (expenditure per student). The administrators who rated these items as useful or very useful were 13.3% and 10.8% more than the teaching staff did respectively, but the general patterns of responses to these items are still the same - that is, most of the teaching staff and administrators rated these two items as useful or very useful.

All the administrators in the sample are in the highest level of agreement - that is, with 100% of high ratings, on item 10 (faculty member's teaching experience), item 11 (the highest level of education that a faculty member has completed), item 12 (faculty member's academic

TABLE 6.3

THE PERCENTAGES OF TEACHING STAFF AND ADMINISTRATORS WHO RATE THE ITEM AS USEFUL OR VERY USEFUL

Item number	Teaching staff	Administ-rators	Item number	Teaching staff	Administ-rators
1.	88.4	90.0	26	84.1	90.0
2.	74.0	76.8	27	85.2	76.6
3.	36.5	40.0	28	77.5	88.3
4.	47.8	40.0	29	92.2	93.4
5.	29.7	26.6	30	90.4	96.7
6.	66.8	73.3	31	79.0	73.3
7.	78.8	80.1	32	49.4	46.7
8.	83.7	83.3	33	91.3	93.3
9.	85.8	86.7	34	83.2	90.0
10.	95.8	100	35	89.7	90.0
11.	96.5	100	36	88.9	83.4
12.	80.0	100	37	64.9	73.4
13.	96.0	100	38	90.8	86.7
14.	70.1	83.4	39	93.0	93.4
15.	93.7	100	40	90.9	93.3
16.	92.0	93.3	41	81.8	80.0
17.	92.8	96.7	42	77.8	83.4
18.	95.4	93.3	43	87.8	90.0
19.	94.9	100	44	92.3	90.0
20.	96.8	93.3	45	89.3	93.4
21.	90.6	93.3	46	92.9	96.7
22.	29.1	23.3	47	83.4	90.0
23.	85.2	86.7	48	90.0	90.0
24.	86.5	86.7	49	90.8	90.0
25.	95.0	96.7			

rank), item 13 (faculty member's teaching load), item 15 (number of teaching staff in an institution of higher education, and item 19 (the faculty with earned doctorate); while the maximum percentage of teaching staff responses with high ratings is 96.8% for item 20 (total number of volumes available in the library). On the other hand, the lowest percentages of teaching staff and administrators' responses with high ratings are for item 22 - these being 29.1% and 23.3% respectively.

6.3 FACTOR ANALYSIS OF TEACHING STAFF RESPONSES

The high degree of agreement across teaching staff responses as to which measures were useful for evaluation of the efficiency and effectiveness of an institution of higher education has led to a need to identify whether any patterns underlie the responses. To effect such an identification, factor analyses are performed on the 49 items in the teaching staff questionnaire.

As noted in Chapter 3, the first 35 items in the questionnaire have been designed to measure inputs and processes, while the remaining 14 items measure outputs. It is therefore desirable to perform three factor analyses - for all 49 items, for the 35 input and process items and for the 14 output items. A comparison of the resulting factor matrices allows an estimate of whether the identified factors are stable or not.

Before conducting the factor analyses, the distribution of responses was examined to check for skewness and to make certain transformations and/or recoding as necessary. There were no problems related to skewness with any of the items. All skewness measures were within acceptable limits.

The following transformations and/or recoding have been made to clear

the data:

First, 40 out of the 49 items of the questionnaire had a blank or no response. There were between one to six such non-responses to each item from the 458 cases. Such small numbers do not pose distributional problems and hence these blank or no responses were recoded with the mode of each item response.

Second, the background information of the teaching staff had one case where a person's age had not been reported. This was recoded to 40 years - equal to the mode and approximately equal to the mean and median.

Third, the academic rank of the teaching staff (ACRA) was regrouped and coded into 1 for senior teaching staff, 2 for junior teaching staff and 3 for not fully qualified teaching staff. Senior teaching staff covered the ranks of professor, senior lecturer and lecturer; junior teaching staff covered associate lecturer (lektor madya), junior lecturer (lektor muda) and assistant lecturer (asisten ahli). The not fully qualified teaching staff covered middle assistant lecturer (asisten ahli madya), assistant and junior assistant.

Fourth, three teaching staff did not respond to the question about faculty member's education while three other teaching staff responded in the "other" category. They were all classified into the lowest category equivalent to B.A. degree. Therefore, the code for faculty member's education becomes 1 for the B.A. degree, 2 for the M.A. degree and 3 for the doctorate degree.

Fifth, ten teaching staff out of 458 in the sample did not respond to the question for teaching experience. They were recoded to ten (years) which was equal to the median and approximately equal to the mean for the distribution of responses to that question.

Sixth, twelve teaching staff out of 458 in the sample did not respond to the question about teaching load. They were recoded to six (teaching hours) which was approximately equal to the median, while the teaching staff who had teaching loads from 22 through 40 teaching hours (7 cases out of 458) were recoded to 22.

Seventh, the kind of another job engaged in by the teaching staff was transformed into dummy variables. They were part-time teaching staff at another institution of higher education (KAJB1), part-time teacher at senior high school (KAJB2), part-time administrator at either the same or another institution (KAJB3), other part-time jobs which are different from the ones mentioned above (KAJB4) and no other job at all or no response as the "other" category.

6.3.1 Factor analysis of all 49 items

In the first factor analysis based on all 49 items, 12 factors had eigen values greater than 1.0. The number of factors to be rotated were reduced to seven by using the scree test and only the highest loadings for a factor are taken into account in the interpretation of the factor.

Table 6.4 shows the varimax rotated factor matrix of teaching staff's ratings of the questionnaire on the usefulness of various potential measures for evaluating the efficiency and effectiveness of an institution of higher education. By examining the factor loadings in the table, the seven factors can be interpreted as follows:

Factor 1 has high loadings on teaching staff's or faculty member's teaching load (item 13), total expenditure of an institution of higher education (item 17), instructional expenditure (item 18), number of classrooms (item 19), total number of volumes available in the library (item 20), number of administrative officials and supporting staff (item

TABLE 6.4

VARIMAX ROTATED FACTOR MATRIX OF TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE ON THE USEFULNESS OF POTENTIAL MEASURES FOR EVALUATING THE EFFICIENCY AND EFFECTIVENESS OF AN INSTITUTION OF HIGHER EDUCATION

Item number	Description	Factor						
		1	2	3	4	5	6	7
	Teaching staff opinion on the usefulness of:							
1.	GPA on entrance examination	.10	.13	-.00	.34	.17	.17	.11
2.	GPA on high school examination	.13	.04	-.02	.33	.16	.25	.02
3.	Student's sex	-.00	-.00	.01	.07	-.01	.80	.09
4.	Student's age	.04	-.03	.10	.11	.04	.62	.12
5.	Residential origin	.03	.10	.02	.09	.02	.65	.06
6.	Previous high school	.05	.08	.05	.12	.13	.46	.07
7.	Number of students registered in an institution	.13	.17	.10	-.00	.14	.17	.60
8.	Number of students registered in under-graduate studies	.08	.20	.18	.06	.07	.22	.80
9.	Number of students registered in post-graduate studies	.09	.23	.14	.07	.07	.17	.80
10.	Faculty member's teaching experience	.21	.06	-.01	.18	.36	.00	.25
11.	Faculty member's education	.11	.13	.03	.14	.48	.04	.18
12.	Faculty member's academic rank	.06	.14	-.02	.23	.42	.18	.12
13.	Teaching load	.41	.07	.11	.15	.15	.01	.29
14.	Faculty member's another job	.21	-.01	.22	.12	-.05	.07	.18
15.	Number of faculty members in an institution	.38	.03	.16	.00	.26	-.02	.30
16.	Number of faculty who are Professors, Senior Lecturers or Lecturers	.22	.09	.01	.03	.62	.14	.09

TABLE 6.4 (CONTINUED)

Item number	Description	Factor						
		1	2	3	4	5	6	7
17.	Total expenditure of an institution of higher education	.58	.12	.12	.01	.16	.10	.09
18.	Instructional expenditure	.54	.13	.10	.09	.26	.05	.07
19.	Number of classrooms	.64	.19	.03	.15	.13	-.02	.03
20.	Total number of volumes available in the library	.54	.11	-.04	.21	.19	-.11	-.02
21.	Number of administrative officials and supporting staff	.50	.01	.04	.08	.16	.10	.15
22.	The percentage of enrolment who are female	.11	.01	.10	.04	.11	.64	.08
23.	The percentage of faculty with earned doctorate	.20	.12	.17	.07	.69	.06	-.05
24.	The percentage of faculty who are Professors, Senior Lecturers and Lecturers	.12	.10	.16	.11	.75	.06	-.01
25.	The percentage of faculty with permanent status (full-time)	.39	-.02	.20	.16	.26	.04	.09
26.	The percentage of total budget of an institution spent on capital expenditure	.53	.14	.21	.03	.10	.22	.05
27.	The percentage of total expenditure of an institution spent on faculty salaries	.51	-.01	.17	.09	.13	.13	.02
28.	Expenditure per student	.35	.11	.47	.05	-.04	.08	.06
29.	The average of actual length of time for completing B.A. degree	.17	.09	.74	.14	.07	-.01	.18
30.	The average of actual length of time for completing M.A. degree	.16	.09	.76	.13	.10	.00	.16
31.	The average of actual length of time for completing Dr. degree	.15	.08	.63	.06	.13	.15	.05

TABLE 6.4 (CONTINUED)

Item number	Description	Factor						
		1	2	3	4	5	6	7
32.	The percentage of administrative officials with M.A. or Dr. degree	.19	.09	.31	.19	.11	.23	-.00
33.	Library books per student	.52	.09	.17	.35	.04	-.02	-.03
34.	The square metre area per student in a classroom	.58	.09	.22	.17	-.02	.05	-.01
35.	Class size	.53	.18	.19	.14	-.04	.01	.05
36.	Graduate's GPA	.14	.15	.29	.57	.09	.07	.06
37.	Graduate's GPA on general achievement	.14	.11	.21	.58	.13	.21	-.02
38.	Graduate's GPA on professional achievement	.22	.12	.09	.72	.05	.08	.06
39.	Graduate's GPA on major achievement	.21	.08	.09	.71	.11	-.00	.05
40.	Actual amount of time needed to complete a degree	.15	.28	.49	.14	.09	.09	.04
41.	The mean score in a course	.13	.17	.26	.54	.11	.17	.03
42.	The percentage of dropouts	.16	.36	.38	.17	.03	.00	.09
43.	Completion rate	.17	.47	.35	.21	.15	-.09	.10
44.	Number of graduates	.14	.87	.07	.14	.09	.06	.21
45.	Number of B.A. graduates	.16	.78	.09	.17	.08	.07	.25
46.	Number of M.A. graduates	.13	.86	.10	.18	.13	.06	.18
47.	Number of doctorate graduates	.11	.60	.20	.08	.29	.08	.03
48.	Number of research projects completed	.18	.41	.21	.04	.36	.09	-.01
49.	Number of publications of the faculty	.22	.26	.28	.13	.24	.02	-.03

21), the percentage of total budget of an institution spent on capital expenditure (item 26), the percentage of total expenditure of an institution spent on faculty salaries (item 27), library books per student available in the library (item 33), the square metre area per student in a classroom (item 34) and class size (item 35). This factor can be labelled "the usefulness of the size of an institution". It represents the perception of respondents that the size of an institution of higher education is an important criterion with which to evaluate an institution.

Factor 2 has high loadings on completion rate (item 43), number of graduates (item 44), number of B.A. graduates (item 45), number of M.A. graduates (item 46), number of doctorate graduates (item 47) and number of research projects completed (item 48). This factor can be labelled "the usefulness of output quantity considerations". It represents the perception of respondents that the quantity of the output of an institution of higher education is an important criterion with which to evaluate an institution.

Factor 3 has high loadings on expenditure per student (item 28), the average of actual length of time for completing B.A. degree (item 29), the average of actual length of time for completing M.A. degree (item 30), the average of actual length of time for completing doctorate degree (item 31), and the actual amount of time needed by a student to complete a degree (item 40). This factor can be labelled "the usefulness of student's success in completing a degree in reasonable time". It represents the perception of respondents that the time for a student to achieve success in study is an important criterion for evaluating an institution of higher education.

Factor 4 has high loadings on graduate's GPA (item 36), graduate's

GPA on general achievement (item 37), graduate's GPA on professional achievement (item 38), graduate's GPA on major achievement (item 39) and the mean score in a course (item 41). This factor can be labelled "the usefulness of students' academic performance" because it represents the students' qualitative achievement level in their study at an institution of higher education.

Factor 5 has high loadings on teaching staff's or faculty member's education (item 11), faculty member's academic rank (item 12), number of faculty members who are lecturers or above (item 16), the percentage of faculty with earned doctorate (item 23) and the percentage of faculty who are lecturers or above (item 24). This factor can be labelled "the usefulness of the quality of teaching staff". It represents the perception of respondents that the teaching staff quality is an important criterion with which to evaluate an institution of higher education.

Factor 6 has high loadings on student's sex (item 3), student's age (item 4), residential origin or the place of origin of the student (item 5), previous high school attended by the student (item 6) and the percentage of enrolment who are female (item 22). This factor can be labelled "the usefulness of students' characteristics". It represents the perception of respondents that the characteristics of students at an institution of higher education should be considered as being important criteria with which to evaluate an institution.

Factor 7 has high loadings on the number of students registered in an institution (item 7), number of students registered in undergraduate studies (item 8) and number of students registered in postgraduate studies (item 9). This factor can be labelled "the usefulness of the total enrolment". It represents the perception of respondents that the total enrolment is an important criterion for evaluating an institution

of higher education.

All seven factors have low loadings (<.30) on faculty member's another job (item 14) and on number of publications of the faculty (item 49). It is conceivable that the teaching staff did not think that a faculty member's other job is useful for evaluating the efficiency and effectiveness of an institution of higher education. Perhaps this is because most of the teaching staff who responded to the questionnaire also have other jobs. In fact, 241 out of the 458 respondents said that they had other jobs. With regard to the lack of perceived importance of the number of publications of the faculty members, this may reflect the fact that few teaching staff have many publications while there are many staff who do not have any publications at all.

6.3.2 Factor analysis of the 35 input and process items

Table 6.5 reports the varimax rotated factor matrix of the input and process measures of teaching staff responses to the questionnaire. In the first factor analysis of the 35 items related to the input and process variables, nine factors emerged with eigen values greater than 1.0. This number of factors was reduced to five factors by using the scree test. The five factors can be interpreted as follows:

Factor 1 has high loadings on teaching staff's teaching load (item 13), total expenditure of an institution of higher education (item 17), instructional expenditure (item 18), number of classrooms (item 19), total number of volumes available in the library (item 20), number of administrative officials and supporting staff (item 21), the percentage of faculty with permanent status (item 25), the percentage of total budget of an institution spent on capital expenditure (item 26), the percentage of total expenditure of an institution spent on faculty

TABLE 6.5

VARIMAX ROTATED FACTOR MATRIX OF THE INPUT AND PROCESS MEASURES OF TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE

Item number	Description	Factor				
		1	2	3	4	5
	Teaching staff opinion on the usefulness of:					
1.	GPA on entrance examination	.16	.23	.22	.05	.09
2.	GPA on high school examination	.17	.21	.31	.03	-.01
3.	Student's sex	-.01	-.01	.80	.00	.10
4.	Student's age	.04	.04	.63	.09	.12
5.	Residential origin	.04	.04	.67	.01	.08
6.	Previous high school	.06	.15	.49	.08	.06
7.	Number of students registered in an institution	.13	.18	.16	.09	.63
8.	Number of students registered in undergraduate studies	.09	.11	.20	.17	.86
9.	Number of students registered in postgraduate studies	.11	.12	.14	.11	.88
10.	Faculty member's teaching experience	.22	.41	.04	.03	.19
11.	Faculty member's education	.12	.52	.06	.05	.15
12.	Faculty member's academic rank	.09	.47	.20	.02	.10
13.	Teaching load	.42	.20	.04	.12	.25
14.	Faculty member's another job	.23	-.02	.10	.19	.17
15.	Number of faculty members in an institution	.35	.28	-.02	.15	.27
16.	Number of faculty who are Professors, Senior Lecturers or Lecturers	.19	.64	.13	-.01	.07
17.	Total expenditure of an institution of higher education	.55	.20	.10	.10	.09
18.	Instructional expenditure	.52	.29	.07	.10	.07

TABLE 6.5 (CONTINUED)

Item number	Description	Factor				
		1	2	3	4	5
19.	Number of classrooms	.67	.19	.00	.03	.04
20.	Total number of volumes available in the library	.56	.24	-.07	.03	-.02
21.	Number of administrative officials and supporting staff	.48	.20	.11	.04	.12
22.	The percentage of enrolment who are female	.10	.12	.62	.08	.09
23.	The percentage of faculty with earned doctorate	.20	.67	.06	.14	-.02
24.	The percentage of faculty who are Professors, Senior Lecturers and Lecturers	.12	.76	.06	.13	-.02
25.	The percentage of faculty with permanent status	.40	.30	.06	.18	.06
26.	The percentage of total budget of an institution spent on capital expenditure	.53	.11	.20	.16	.10
27.	The percentage of total expenditure of an institution spent on faculty salaries	.50	.12	.11	.16	.05
28.	Expenditure per student	.39	-.03	.09	.42	.10
29.	The average of actual length of time for completing B.A. degree	.21	.11	.03	.83	.14
30.	The average of actual length of time for completing M.A. degree	.18	.15	.04	.88	.10
31.	The average of actual length of time for completing Dr. degree	.20	.11	.15	.55	.10
32.	The percentage of administrative officials with M.A. or Dr. degree	.24	.13	.24	.28	.03
33.	Library books per student	.59	.10	.04	.16	-.01
34.	The square metre area per student in a classroom	.64	.01	.07	.16	.02
35.	Class size	.59	.01	.04	.14	.09

salaries (item 27), library books per student available in the library (item 33), the square metre area per student in a classroom (item 34) and class size (item 35). This factor is similar to factor 1 in Table 6.4 which has been labelled "the usefulness of the size of an institution".

Factor 2 has high loadings on faculty member's teaching experience (item 10), faculty member's education (item 11), faculty member's academic rank (item 12), number of faculty who are lecturers or above (item 16), the percentage of faculty with earned doctorate (item 23) and the percentage of faculty who are lecturers or above (item 24). This factor is similar to factor 5 in Table 6.4 which has been labelled "the usefulness of the quality of teaching staff".

Factor 3 has high loadings on student's sex (item 3), student's age (item 4), residential origin or the place of origin of the student (item 5), previous high school attended by the student (item 6) and the percentage of enrolment who are female (item 22). This factor is similar to factor 6 in Table 6.4 which has been labelled "the usefulness of students' characteristics".

Factor 4 has high loadings on expenditure per student (item 28), the average of actual length of time for completing B.A. degree (item 29), the average of actual length of time for completing M.A. degree (item 30) and the average of actual length of time for completing doctorate degree (item 31). This factor is similar to factor 3 in Table 6.4 which has been labelled "the usefulness of students' success in completing a degree in reasonable time".

Factor 5 has high loadings on the number of students registered in an institution (item 7), number of students registered in undergraduate studies (item 8) and number of students registered in postgraduate studies (item 9). This factor is similar to factor 7 in Table 6.4 which has been

labelled "the usefulness of the total enrolment".

6.3.3 Factor analysis of the 14 output items

In the first factor analysis of the 14 items related to the output variables, three factors emerged with eigen values greater than 1.0. The number of factors was reduced to two by applying the scree test but the rotation showed that the two factors were highly correlated (.58). Hence an oblique rotation procedure (oblimin) was also used. The oblique rotation lowered the correlation between the two factors (.50), but the pattern of factor loadings for both rotation procedures was still the same.

Table 6.6 reports the oblique factor structure matrix of the output measures of teaching staff responses to the questionnaire. By examining the factor loadings in the table, the two factors can be interpreted as follows:

Factor 1 has high loadings on the actual amount of time to complete a degree (item 40), the percentage of dropouts (item 42), completion rate (item 43), number of graduates (item 44), number of B.A. graduates (item 45), number of M.A. graduates (item 46), number of doctorate graduates (item 47), number of research projects completed (item 48) and number of publications of the faculty (item 49). This factor is similar to factor 2 in Table 6.4 which has been labelled "the usefulness of the output quantity considerations".

Factor 2 has high loadings on graduate's GPA (item 36), graduate's GPA on general achievement (item 37), graduate's GPA on professional achievement (item 38), graduate's GPA on major achievement (item 39) and the mean score in a course (item 41). This factor is similar to factor 4 in Table 6.4 which has been labelled "the usefulness of

TABLE 6.6

OBLIQUE FACTOR STRUCTURE MATRIX OF THE OUTPUT MEASURES OF TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE

Item number	Description	Factor	
		1	2
	Teaching staff opinion on the usefulness of:		
36.	Graduate's GPA	.40	.69
37.	Graduate's GPA on general achievement	.33	.69
38.	Graduate's GPA on professional achievement	.35	.75
39.	Graduate's GPA on major achievement	.32	.72
40.	Actual amount of time needed to complete a degree	.46	.38
41.	The mean score in a course	.40	.67
42.	The percentage of dropouts	.51	.39
43.	Completion rate	.62	.41
44.	Number of graduates	.90	.33
45.	Number of B.A. graduates	.83	.34
46.	Number of M.A. graduates	.90	.36
47.	Number of Dr. graduates	.68	.33
48.	Number of research projects completed	.54	.30
49.	Number of publications of the faculty	.42	.35

students' academic performance".

In view of the factors identified from factor analyses based on all 49 items and on 35 item and 14 item subsets, it appears that the seven factors are very stable. There is therefore no reason to perform subsequent factor analyses separately. In other words, further use of

the factor analysis results will be based on all 49 items analysed together.

6.3.4 Factor scale variables

Seven factor scale variables can now be created by including those items highly loaded on each factor. The general formula used for calculating a factor score for each case is analogous to the one used for calculating the factor scores for each case of the students' responses to the questionnaire. The complete formulas used to compute factor scores for each of the seven factors are presented in Appendix D.

Table 6.7 reports the mean and standard deviation of factor scale variable scores of teaching staff responses to the questionnaire by institution, which indicate that the teaching staff's perception on the usefulness of the size of an institution (TOTST1), the usefulness of output quantity considerations (TOTST2), the usefulness of students' success in completing a degree in reasonable time (TOTST3), the usefulness of students' academic performance (TOTST4), the usefulness of the quality of teaching staff (TOTST5), the usefulness of students' characteristics (TOTST6) and the usefulness of the total enrolment (TOTST7) vary from one institution to another.

At IAIN Bandung, teaching staff perceive that the two most important criteria for evaluating an institution are the students' academic performance (TOTST4) and students' characteristics (TOTST6). They also consider that the total enrolment (TOTST7) is fairly important.

At IKIP Bandung, teaching staff perceive that the two important criteria for evaluating the efficiency and effectiveness of an institution are students' characteristics (TOTST6) and the total enrolment (TOTST7), but they consider that the quality of teaching staff (TOTST5) is not

TABLE 6.7

THE MEAN AND STANDARD DEVIATION OF FACTOR SCALE VARIABLES OF TEACHING STAFF'S RESPONSES TO THE QUESTIONNAIRE BY INSTITUTION

No.	Institution	TOTST1	TOTST2	TOTST3	TOTST4	TOTST5	TOTST6	TOTST7
1.	IAIN Bandung	$\bar{x}$= .0461	$\bar{x}$= .0231	$\bar{x}$=.0899	$\bar{x}$= .2565	$\bar{x}$= .1095	$\bar{x}$= .3176	$\bar{x}$= .1797
		s= .9291	s= .8462	s= .7966	s= .7237	s= .6565	s= .8059	s= .7916
2.	IKIP Bandung	$\bar{x}$= .0265	$\bar{x}$= .0874	$\bar{x}$= .0560	$\bar{x}$= .0094	$\bar{x}$=-.1215	$\bar{x}$= .1809	$\bar{x}$= .1381
		s= .9542	s=1.1110	s= .8534	s=1.0133	s= .8104	s= .7779	s= .8324
3.	Padjadjaran University	$\bar{x}$= .2120	$\bar{x}$= .2471	$\bar{x}$= .1046	$\bar{x}$=-.0011	$\bar{x}$= .1191	$\bar{x}$=-.0556	$\bar{x}$= .0241
		s= .9720	s=1.0641	s= .7790	s= .9245	s= .9020	s= .9072	s= .8999
4.	IAIN Surabaya	$\bar{x}$=-.3809	$\bar{x}$=-.2437	$\bar{x}$=-.2950	$\bar{x}$= .0042	$\bar{x}$=-.0114	$\bar{x}$= .1816	$\bar{x}$=-.0768
		s=1.0787	s=1.0578	s= .8337	s= .7258	s= .7828	s= .7940	s= .8663
5.	Airlangga University	$\bar{x}$=-.0596	$\bar{x}$=-.1937	$\bar{x}$=-.1417	$\bar{x}$=-.1365	$\bar{x}$=-.0348	$\bar{x}$= .2548	$\bar{x}$=-.0900
		s= .8910	s=1.0519	s= .8262	s= .7829	s= .8202	s= .7323	s= .9120
6.	IKIP Malang	$\bar{x}$= .0276	$\bar{x}$= .0242	$\bar{x}$= .1337	$\bar{x}$=-.0037	$\bar{x}$=-.1103	$\bar{x}$=-.1208	$\bar{x}$=-.1201
		s= .8834	s=1.0963	s= .8569	s=1.0350	s= .8464	s= .8707	s=1.0786
	Anova F value	F=2.684*	F=2.333*	F=2.816*	F=1.33[illegible]	F=1.260	F=5.318**	F=1.355

Note: * = significant at .05 level
** = significant at .01 level

useful for such an evaluation.

At Padjadjaran University, teaching staff perceive that the two most important criteria for evaluating an institution are the size of an institution (TOTST1) and output quantity considerations (TOTST2). They also consider that students' success in completing a degree in reasonable time (TOTST3) and the quality of teaching staff (TOTST5) are fairly important.

At IAIN Surabaya, teaching staff perceive that an important criterion for evaluating an institution is students' characteristics (TOTST6), but they consider that the size of institution (TOTST1), output quantity considerations (TOTST2) and students' success in completing a degree in reasonable time (TOTST3) are not important for the evaluation of an institution.

At Airlangga University, teaching staff perceive that output quantity considerations (TOTST2), students' success in completing a degree in reasonable time (TOTST3), students' academic performance (TOTST4) and students' characteristics (TOTST6) are not important for evaluating an institution of higher education.

At IKIP Malang, teaching staff perceive that an important criterion for evaluating an institution of higher education is students' success in completing a degree (TOTST3), but they consider that the quality of the teaching staff (TOTST5), students' characteristics (TOTST6) and the total enrolment (TOTST7) are not important criteria for the evaluation of an institution.

Considerable variation is evident in the teaching staff opinions of the relative usefulness of the seven factors for evaluating an institution of higher education. To examine whether the differences between means for the variables across the institutions are statistically significant or not, a one way analysis of variance is performed for each

factor scale variable. The F values in Table 6.7 show that the overall differences among the means for TOTST1 (F=2.684), TOTST2 (F=2.333) and TOTST3 (F=2.816) are significant at .05 level, while that for TOTST6 (F=5.318) is significant at .01 level.

A Scheffé test was performed on each of the factor scale variables to identify those institutions which were most dissimilar from each other. The test was performed only for the four scales for which a significant F value was obtained from the analysis of variance.

Table 6.8 shows the results of the Scheffé test of the differences between pairs of means for the usefulness of the size of an institution (TOTST1). The difference between the means of teaching staff opinion on the usefulness of the size of an institution between Padjadjaran University and IAIN Surabaya is the only comparison significant at the .05 level.

Table 6.9 shows the results of the Scheffé test of the differences between pairs of means of teaching staff on the usefulness of students' characteristics (TOTST6). Only two pairs of means are statistically significant at .05 level - those being the differences between the mean of Airlangga University and the means of IAIN Bandung and IKIP Bandung.

Significant Anova results were also obtained for the usefulness of output quantity considerations (TOTST2) and the usefulness of students' success in completing a degree in reasonable time (TOTST3), but the Scheffé results indicated that no pairs of means to be significantly different. These results are unusual, but are attributed here to greater within group variances than overall variances. For example, for teaching staff opinion on the usefulness of output quantity considerations (TOTST2), the mean sum of squares is 1.1091 while the overall standard deviation is 1.0608. This difference is thus tending to distort a clear

TABLE 6.8

RESULTS OF SCHEFFÉ TEST OF THE DIFFERENCES BETWEEN MEANS OF TEACHING STAFF OPINION ON THE USEFULNESS OF THE SIZE OF AN INSTITUTION (TOTST1)

Institution	Institution					
	1	2	3	4	5	6
1. IAIN Bandung Mean = .0461		.0196 NS	.1659 NS	.4270 NS	.1057 NS	.0185 NS
2. IKIP Bandung Mean = .0265			.1855 NS	.4074 NS	.0861 NS	.0011 NS
3. Padjadjaran University Mean = .2120				.5929 .56*	.2716 NS	.1844 NS
4. IAIN Surabaya Mean = -.3809					.3213 NS	.4065 NS
5. Airlangga University Mean = -.0596						.0872 NS
6. IKIP Malang Mean = .0276						

Note: The top value in each cell reports the difference between the means of the relevant pairs of institutions. The lower value indicates the significance of the difference where:
NS = not significant
* = the value reported is significant at .05 level. This value is computed from $SE_{M_i - M_j} \times S$, where:

$SE_{M_i - M_j}$ = standard error of the difference between means
S = the value for Scheffé
(cf. Kerlinger, 1973:241 and Kirk, 1968:91)

TABLE 6.9

RESULTS OF SCHEFFÉ TEST OF THE DIFFERENCES BETWEEN MEANS OF TEACHING STAFF OPINION ON THE USEFULNESS OF STUDENTS' CHARACTERISTICS (TOTST6)

Institution	Institution					
	1	2	3	4	5	6
1. IAIN Bandung Mean = .3176		.1367 NS	.3732 NS	.1360 NS	.5724 .46*	.4384 NS
2. IKIP Bandung Mean = .1809			.2365 NS	.0007 NS	.4357 .40*	.3017 NS
3. Padjadjaran University Mean = -.0556				.2372 NS	.1992 NS	.0652 NS
4. IAIN Surabaya Mean = .1816					.4354 NS	.3024 NS
5. Airlangga University Mean =-.2548						.3756 NS
6. IKIP Malang Mean =-.1208						

Note: The top value in each cell reports the difference between the means of the relevant pairs of institutions. The lower value indicates the significance of the difference where:
NS = not significant
* = the value reported is significant at .05 level. This value is also computed from $SE_{M_i - M_j} \times S$.

pattern in the Scheffé results. By inspection of institutional means in Table 6.7 it would appear that Padjadjaran University (institution 3) differs from IAIN Surabaya (institution 4) and possibly also from Airlangga University (institution 5). The application of an LSD (Less significant difference) multiple range test, which is slightly less stringent than the Scheffé test supports this observation.

6.3.5 Application of the criteria to the sample institutions

It is possible that the teaching staff may have responded to the questionnaire based on the best characteristics they perceived about their own institutions. In other words, it is important to know whether teaching staff responses are strongly influenced by the situation in their institutions. To do this, the average standardized scores of factor scales were calculated by substituting the available data at each institution for each item in the formula used to compute factor scores as presented in Appendix D and dividing the resulting standardized score for each factor by the number of items included in the calculation of the score for the factor.

Table 6.10 reports the average standardized scores of factor scale variables calculated from the available data by institution. The comparison between these scores and the ones presented in Table 6.7 indicates that the teaching staff opinion on the usefulness of the factor scale variables in evaluating the efficiency and effectiveness of an institution of higher education is not necessarily influenced by the conditions of their institutions.

IAIN Bandung, for instance, has low performance measures on the output quantity considerations (TOTST2) and the total enrolment (TOTST7). The teaching staff at this institution perceive that output quantity

TABLE 6.10

THE AVERAGE STANDARDIZED SCORES OF FACTOR SCALE VARIABLES CALCULATED FROM THE AVAILABLE DATA BY INSTITUTION

No.	Institution	TOTST1	TOTST2	TOTST3	TOTST4	TOTST5	TOTST6	TOTST7
1.	IAIN Bandung	-.2877	-.9197	.1784	.3299	-.5030	-.5217	-.8560
2.	IKIP Bandung	-.0446	.7841	-.3823	1.3401	.5270	.4147	.6186
3.	Padjadjaran University	.8160	1.3957	.0231	.1531	-.0450	.0677	1.2940
4.	IAIN Surabaya	-.6287	-.4677	.3183	.2585	-1.3473	-.3431	-.6263
5.	Airlangga University	.3917	.0304	.2246	-.3844	.2040	.1224	-.1016
6.	IKIP Malang	-.2477	-.8206	-.3622	-1.6871	1.2144	.3012	-.3286

considerations (TOTST2) is not an important criterion or measure for evaluating the efficiency and effectiveness of an institution of higher education. They do however consider total enrolment (TOTST7) is fairly important. This institution is also strong in students' academic performance (TOTST4) while its teaching staff have nominated that criterion as being one of the most important and useful measures.

IKIP Bandung is very strong in output quantity considerations (TOTST2) and students' academic performance (TOTST4), although its teaching staff perceive that these measures are only somewhat important and useful. Airlangga University has a high rating on the size of institution criterion (TOTST1), but its teaching staff perceive that this factor scale variable is not an important and useful measure. Finally, IKIP Malang is very strong in the quality of teaching staff criterion (TOTST5), but its teaching staff perceive that this measure is not important for evaluating efficiency and effectiveness.

Although many congruences do exist, the above discrepancies between perceived ratings and actual situation, allow one to conclude that teaching staff are not being strongly influenced by their situation when responding to questions concerning what characteristics are possessed by a "good" institution of higher education.

6.4 SUMMARY

Factor analysis of the teaching staff rating of the questionnaire on the usefulness of various potential measures for evaluating the efficiency and effectiveness of an institution of higher education identifies seven factors as being important and useful criteria for institutional evaluation. These criteria are:

- the usefulness of the size of an institution (TOTST1),
- the usefulness of output quantity considerations (TOTST2),
- the usefulness of students' success in completing a degree in reasonable time (TOTST3),
- the usefulness of students' academic performance (TOTST4),
- the usefulness of the quality of teaching staff (TOTST5),
- the usefulness of students' characteristics (TOTST6),
- the usefulness of the total enrolment (TOTST7).

The teaching staff perception of the importance of these factors varies from one institution to another. The comparison between teaching staff perception on the usefulness of the factor scale variables and the average standardized scores for the variables calculated from the available data by institution indicates that the conditions of an institution do not necessarily have any direct impact on teaching staff opinion of the importance or usefulness of the factors as criteria for evaluating the efficiency and effectiveness of an institution of higher education.

CHAPTER 7

A MODEL FOR EVALUATING AN INSTITUTION OF HIGHER EDUCATION IN INDONESIA

This chapter is concerned with developing a possible model with which to evaluate the efficiency and effectiveness of an institution of higher education. Discussion is therefore directed towards the third research problem stated in Chapter 1:

> How might the administrator improve the efficiency and effectiveness of an institution of higher education? What alternatives are available to him?

A theoretical model is initially proposed partly on the basis of assumed relationships and partly from empirical evidence presented in previous chapters. This model contains the variables collected in this study which are assumed to be the most useful for an educational administrator and ones which provide him with useful information for judging among decision alternatives to improve institutional performance, especially its efficiency and effectiveness. After eliminating certain causal relationships from the model, the most significant paths are estimated so as to form the parsimonious path model.

A test of the evaluation model using four faculties in four of the higher education institutions taken as part of the sample in this study is then undertaken. This test is an attempt to show administrators how useful the model is for evaluating the efficiency and effectiveness of an institution of higher education.

The test is made of the model in part to validate it and as well as to demonstrate how the model might be used by administrators in their own faculties. On the basis of the information obtained from using the

model for evaluating a faculty in an institution of higher education, an administrator can decide the best alternative way to improve the efficiency and effectiveness of that faculty after taking into consideration the conditions of the institution.

7.1 THE DEVELOPMENT OF AN EVALUATION MODEL

The evaluation of the efficiency and effectiveness of an institution of higher education is decision oriented - that is, it provides useful information for decision making directed towards improving institutional performance. The decision oriented evaluation is based on the definition of educational evaluation formulated by Stufflebeam as "the process of delineating, obtaining, and providing useful information for judging decision alternatives" (1971:40).

The evaluation model hypothesized here incorporates causal relationships between selected input, process and output variables previously used in the multiple regression analyses using faculty as the unit of analysis. A causal path model is adopted because it is possible by using such a model to trace forward from the remotest cause(s) to the dependent variable or tracing backwards from the dependent variable taken as an effect to the antecedent cause(s). This potential information is very useful for an administrator in judging decision alternatives which might improve efficiency and effectiveness.

The basic model

The basic path diagram postulated for the evaluation model is presented in Figure 7.1. Each variable is contained in a box. The paths leading from each box to at least one other box are represented by single-headed arrows which connect a hypothesized cause (tail) to a

hypothesized effect (head). Turner and Stevens point out: "In causal regression systems the arrows of the path diagrams indicate passage of time" (1971:79). In fact, the path diagram is "a useful device for displaying graphically the pattern of causal relations among a set of variables" (Kerlinger and Pedhazur, 1973:307-308).

The relationships incorporated in the model are derived from one of three sources. Some have a logical basis in that one variable is known to cause or at least directly affect another. Other relationships are based on the results of previous studies. These were discussed at least in part in the general discussion in Chapter 2. Yet other relationships have been identified from the empirical evidence reported in previous analysis chapters. A thorough review of the correlation matrices and regression results reported earlier prompted some of the relationships to be incorporated explicitly in the model here.

The causal model presented here is a recursive model. This means that "the causal flow is unidirectional. Stated differently, it means that at a given point in time a variable cannot be both a cause and an effect of another variable" (Kerlinger and Pedhazur, 1973:308). Anderson (1978:81) states as follows:

> A causal model is recursive if all the causal links are one way. That is, such models involve a priori assumptions that no reciprocal links are involved, nor is there indirect feedback in which a variable that appears at one point in the causal sequence directly or indirectly affects a variable that appears earlier in the sequence.

In Figure 7.1, each path has a number written beside it. This value is the zero order correlation coefficient for the two variables involved with that path. The hypothesized causal relationships among input, process and output variables shown in the path diagram are those

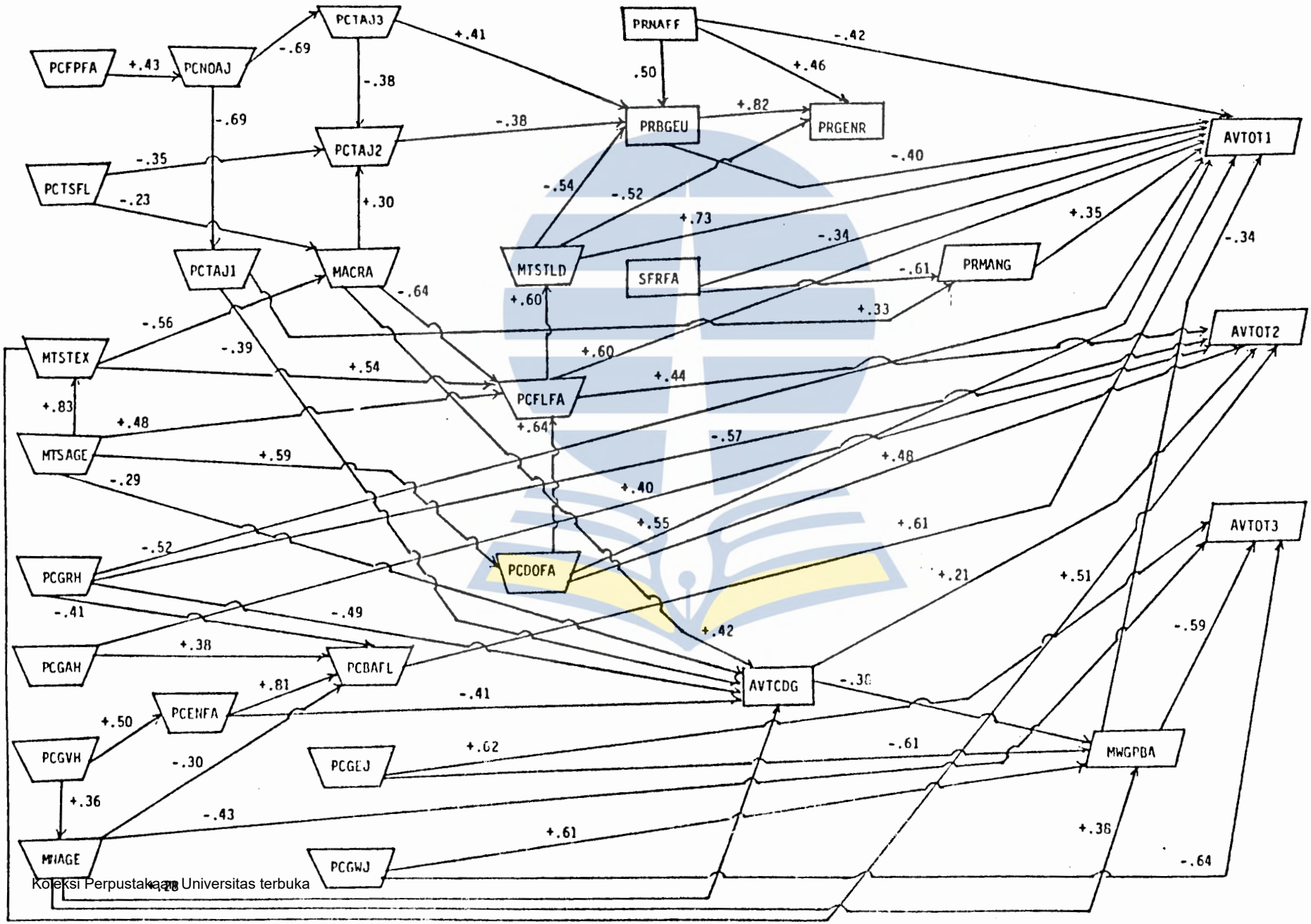


FIGURE 7.1 PATH DIAGRAM OF THE BASIC MODEL

which are conceived to be both statistically and educationally meaningful in evaluating the efficiency and effectiveness of an institituon of higher education.

The input variables[1] are depicted in Figure 7.1 in trapezium shaped boxes. They consist of students' characteristics such as the mean of B.A. graduates' age (MNAGE) and the percentage of enrolment who are female (PCENFA), as well as of teaching staff's characteristics such as the mean of teaching staff's age (MTSAGE) and the mean of teaching staff's teaching experience (MTSTEX).

The process variables[1] are depicted in Figure 7.1 in rectangular shaped boxes. They include the proportion of the number of administrative officials to the number of full-time faculty members (PRNAFF), the student faculty ratio (SFRFA), the proportion of graduates to enrolment (PRGENR), the proportion of B.A. graduates to enrolment in undergraduate program (PRBGEU) and the average amount of time to complete the B.A. degree (AVTCDG). The variable used as a measure of efficiency is AVTCDG.

Finally, the output variables[1] are depicted in Figure 7.1 in parallelogram shaped boxes. They include those composite variables defined statistically in earlier analyses such as the average of students' satisfaction with their educational environment (AVTOT1), the average of students' satisfaction with their study experience and its benefits (AVTOT2) and the average of students' satisfaction with the institutional operation (AVTOT3). In addition, the output variables include the proportion of M.A. graduates to the total number of graduates (PRMANG) and the mean weighted B.A. graduates' grade point average

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[1] The mnemonic for each variable is presented with description in Table 5.2.

(MWGPBA). The output variables are all used as measures of effectiveness together with the two process variables PRBGEU and PRGENR.

The paths shown in Figure 7.1 depict the causal relations among the variables included in the basic model. Some of the causal relations are now described to show the pattern of effects assumed to exist in sequence among particular subsets of variables in the model. Not all paths should be described here for fear of confusing the reader with an overabundance of detail.

One path which is important is that leading to the variable measuring the proportion of graduates to enrolment (PRGENR). This variable is assumed to be dependent simultaneously on three variables - the proportion of the number of administrative officials to the number of full-time faculty members (PRNAFF), the proportion of B.A. graduates to undergraduate enrolment (PRBGEU) and the mean of teaching staff's teaching load (MTSTLD). This dependence therefore implies that a faculty with a larger proportion of administrators to full-time teaching staff and a larger proportion of B.A. graduates to undergraduate enrolment, but a lower mean for the staff teaching load tends to have a higher proportion of graduates to enrolment.

The relationship can be traced back in the basic model by hypothesizing causes for the proportion of B.A. graduates to enrolment in the undergraduate program (PRBGEU). The diagram shows that this variable is conceived to be dependent on the proportion of administrative officials to the number of full-time faculty members (PRNAFF), on the percentage of teaching staff who are also part-time administrators (PCTAJ3), on the percentage of teaching staff who are also part-time teachers at secondary schools (PCTAJ2), and the mean of teaching staff's teaching load (MTSTLD). In other words, a faculty with a larger

proportion of administrators to full-time teaching staff and a higher percentage of teaching staff who also work as administrators, but a lower percentage of teaching staff who also teach at secondary schools and a lower mean of teaching staff's teaching load tends to have a larger proportion of B.A. graduates to undergraduate enrolment.

Other relationships hypothesized to exist in the model could also be described. As this is only a tentative model which must be tested statistically however, a description of all paths is a little superfluous at present. Hence the required regression equations are now computed so that paths with little statistical support can be eliminated.

The parsimonious model

In all path analyses, a value for judging whether a path is significant or not needs to be selected. It is not appropriate to retain paths in a model which have no statistical support. Some studies use the criterion of a level of statistical significance such as 1% or 5% level. With only 26 faculties being used here, such a level would force a very high beta weight to be calculated. This in turn would eliminate many educationally significant paths. Hence an alternative approach, used in many studies, is adopted here of nominating a value for the beta weights computed for each path. The value nominated is 0.10. Hence paths with estimated beta weights below an absolute value of 0.10 are eliminated from Figure 7.1. In addition, paths with inconsistencies between the sign of their beta weights and their zero order correlations are also deleted. All remaining paths are then recomputed to estimate their new path coefficients (beta weights) and these recomputed values are reported on the causal paths in the reduced

model in Figure 7.2.

A path coefficient indicates the magnitude of the direct effect of an independent variable taken as cause on a dependent variable taken as effect - that is, the amount of expected change in the dependent variable as a result of a standardized unit of change in the independent variable. The path coefficients are obtained from the multiple regression analyses where they are calculated as the standardized regression coefficients. A path coefficient is equal to a zero order correlation coefficient whenever a variable is conceived to be dependent on a single cause (Kerlinger and Pedhazur, 1973:310-314).

It should be noted that raising the criterion for eliminating paths from Figure 7.1 to an absolute value for the beta weight equal to or greater than 0.35, for instance, would result in a more simplified model with fewer statistically significant paths. Some educationally meaningful paths and/or variables would then be eliminated from the model and this in turn would reduce the usefulness of the model for evaluating the efficiency and effectiveness of an institution of higher education.

The basic path model presented in Figure 7.1 is depicted by a path diagram with 60 paths and 30 variables, while the parsimonious model in Figure 7.2 is more simplified with 42 paths and 27 variables. In fact, 18 paths and three variables have been deleted from the original model. The full description of the hypothesized causal relationships in the parsimonious model is given in Appendix E.1.

7.2 TRIAL OF THE MODEL ON FOUR FACULTIES IN THE SAMPLE

The parsimonious model is now tested to ascertain its applicability in providing useful information for administrators to evaluate the

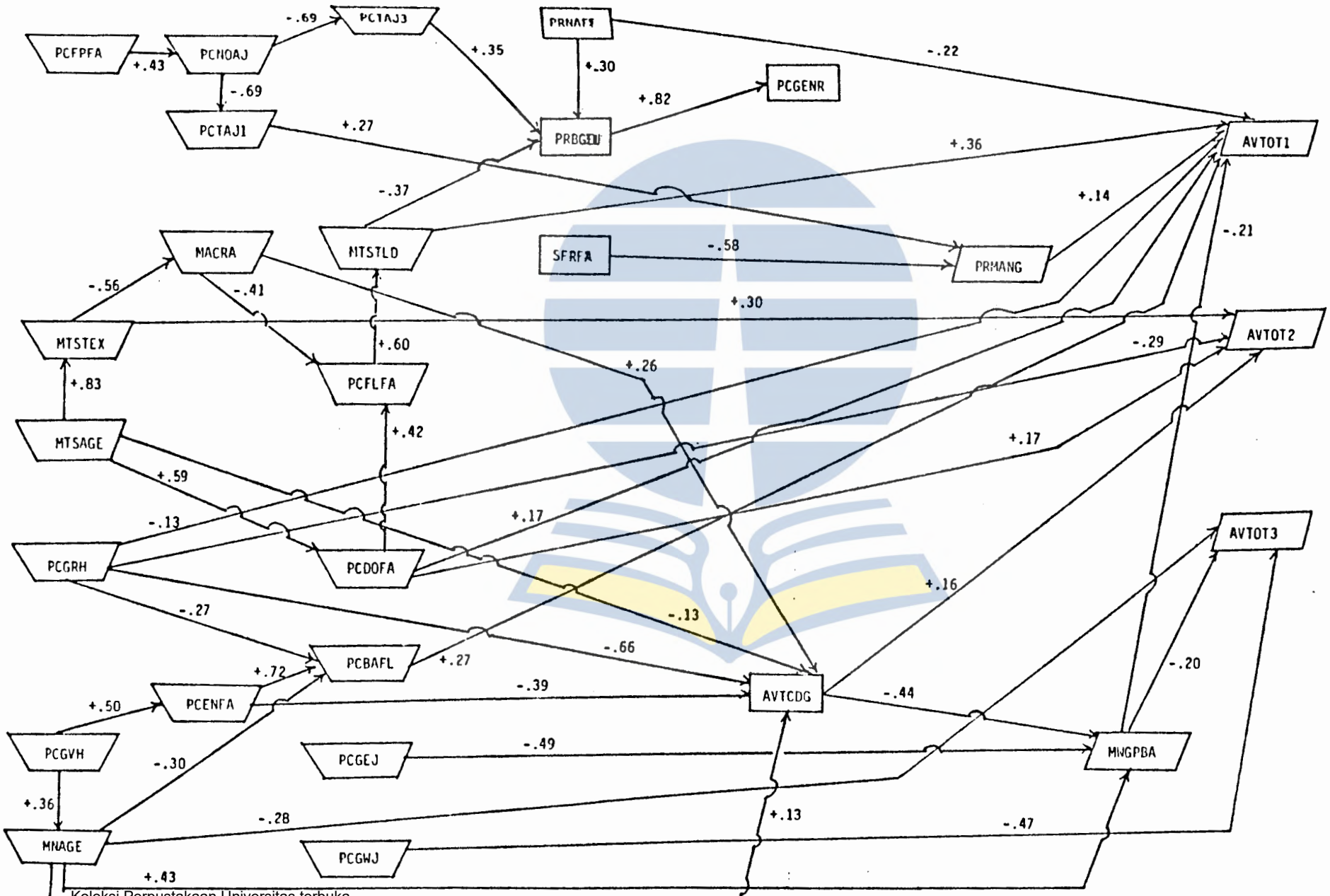


FIGURE 7.2 PATH DIAGRAM OF THE PARSIMONIOUS MODEL

efficiency and effectiveness of their institutions of higher education. In other words, for the theoretical model to have practical implications for the Indonesian setting, it is necessary to ascertain whether the reduced model can be used in practice for evaluating institutional performance.

It is important to note that this trial is conducted in an environment which would optimize the results because the faculties were used in the development of the model itself. It might of course give different results when applied to other institutions not included in the sample. Admittedly three options are available here. Firstly, data could be collected from additional institutions. This option is not open to the present study because of resource constraints. Secondly, some faculties could have been omitted from the development of the model. This option is not considered practicable in the present situation because of the already small number of institutions and faculties. The third option - and the one adopted here - is to use data from faculties included in the model development and to admit that, although this optimizes any result, it does allow one to obtain an estimate of the model's applicability and worth. Perhaps in the future, analyses could be performed to test the first option, if and when additional resources were available.

The faculties selected for the trial are two corresponding faculties at the State Institute for Islamic Studies (IAIN) and two corresponding faculties at the Institute of Higher Teacher Training (IKIP). They are the Faculties of Islamic Law at IAIN Bandung and IAIN Surabaya and the Faculties of Education at IKIP Bandung and IKIP Malang. These four faculties are considered to have enough information for testing the model.

The actual values of each variable in the 26 faculties used in developing the model were recoded into a three point scale viz. 1 for the eight lowest values, 3 for the eight highest values and 2 for the other 10 values. The recoded values of each variable were then inserted into the respective boxes in the model for each of the faculties selected for the trial.

It is possible that the model could have been tested by grouping the actual values of each variable into a four rather than the three point scale. The effect of creating four subdivisions would be to increase the variance in observed recoded values. For the purpose of demonstrating the usefulness of the model here however, a three point scale is considered to be adequate.

Figure 7.3, Figure 7.4, Figure 7.5 and Figure 7.6 show respectively the recoded values for each variable in the parsimonious model for the Faculty of Islamic Law at IAIN Bandung, the Faculty of Education at IKIP Bandung, the Faculty of Islamic Law at IAIN Surabaya and the Faculty of Education at IKIP Malang. Each diagram thus depicts a general description of the characteristics of each faculty on the variables in the model. It also indicates the position of a faculty in a rank order on the three point scale for each variable. The recoded values for each variable thus allow an identification of the strengths and weaknesses of a faculty. To be consistent, high values of a variable have been recoded as 3. Not all faculty characteristics might be considered to be desirable if they have a high value however. The average time to complete a B.A. degree (AVTCDG) is one of such variable. Hence in reading the diagrams in Figures 7.3 to 7.6, cognizance should be paid to the sign of the path coefficient before deciding whether a 3 - 3 or a 3 - 1 link between consecutive variables represents a desirable or an undesirable situation.

FIGURE 7.3 RECODED VALUES IN THE PARSIMONIOUS MODEL FOR THE FACULTY OF ISLAMIC LAW AT IAIN BANDUNG

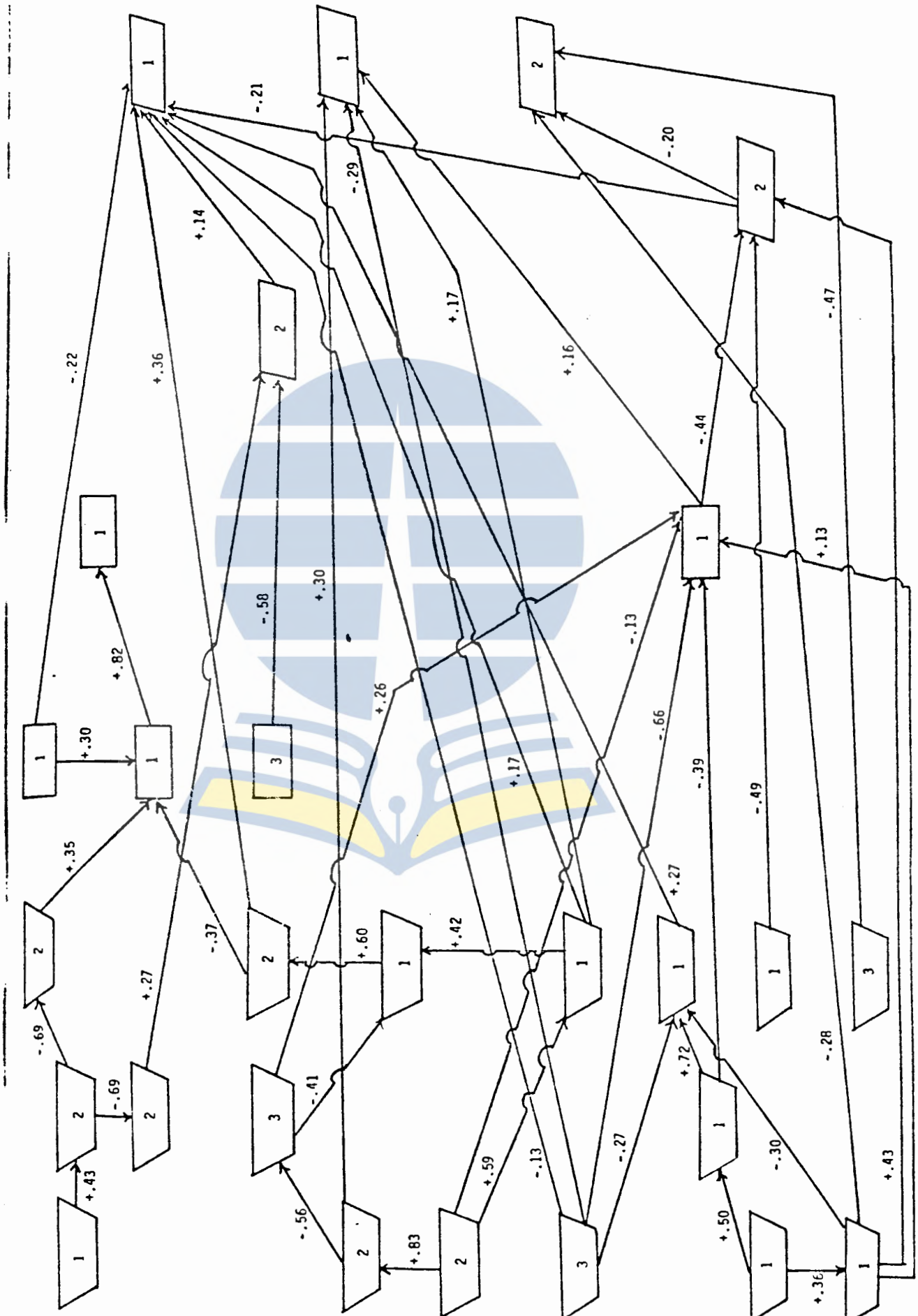
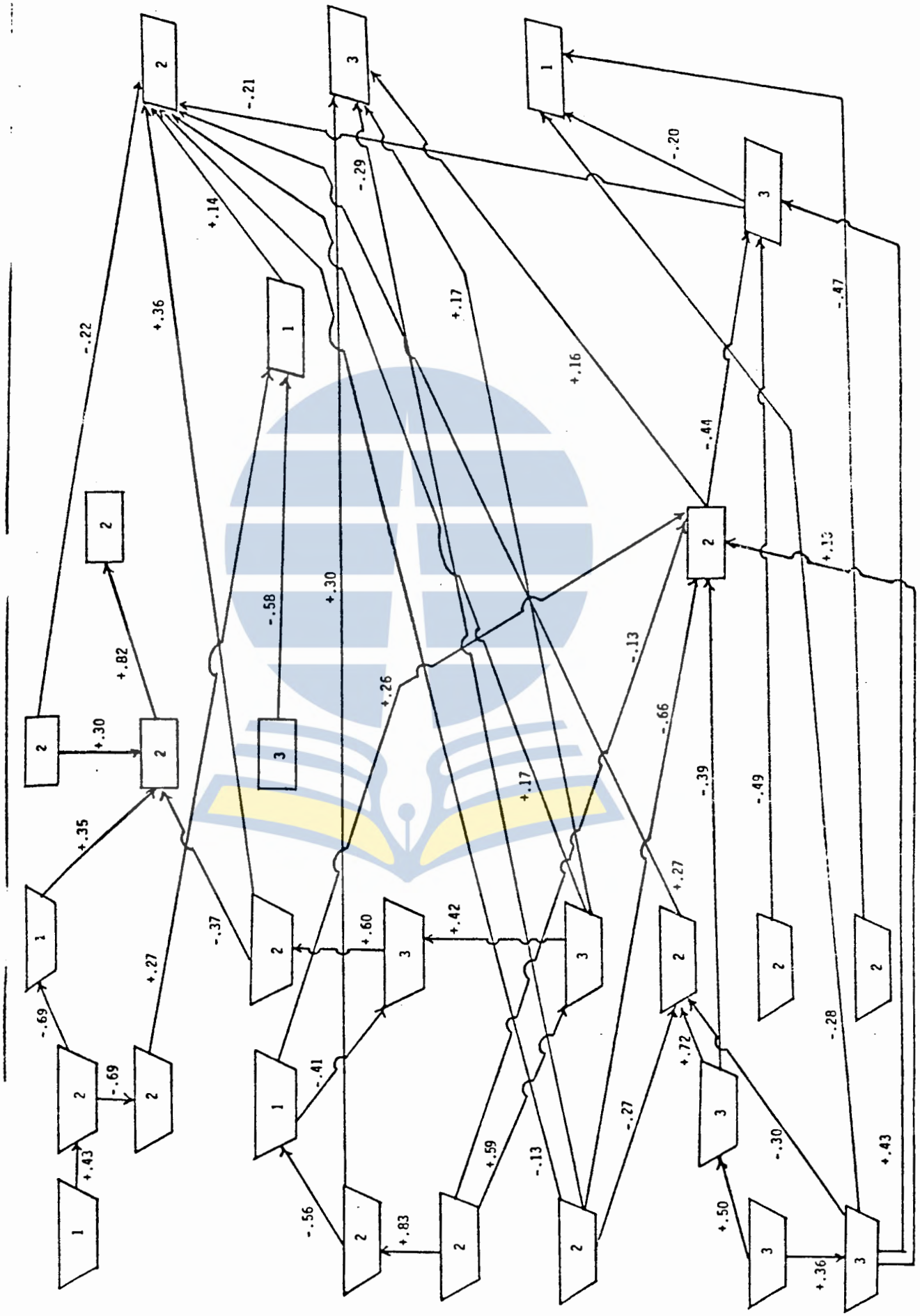


FIGURE 7.4 RECODED VALUES IN THE PARSIMONIOUS MODEL FOR THE FACULTY OF EDUCATION AT IKIP BANDUNG



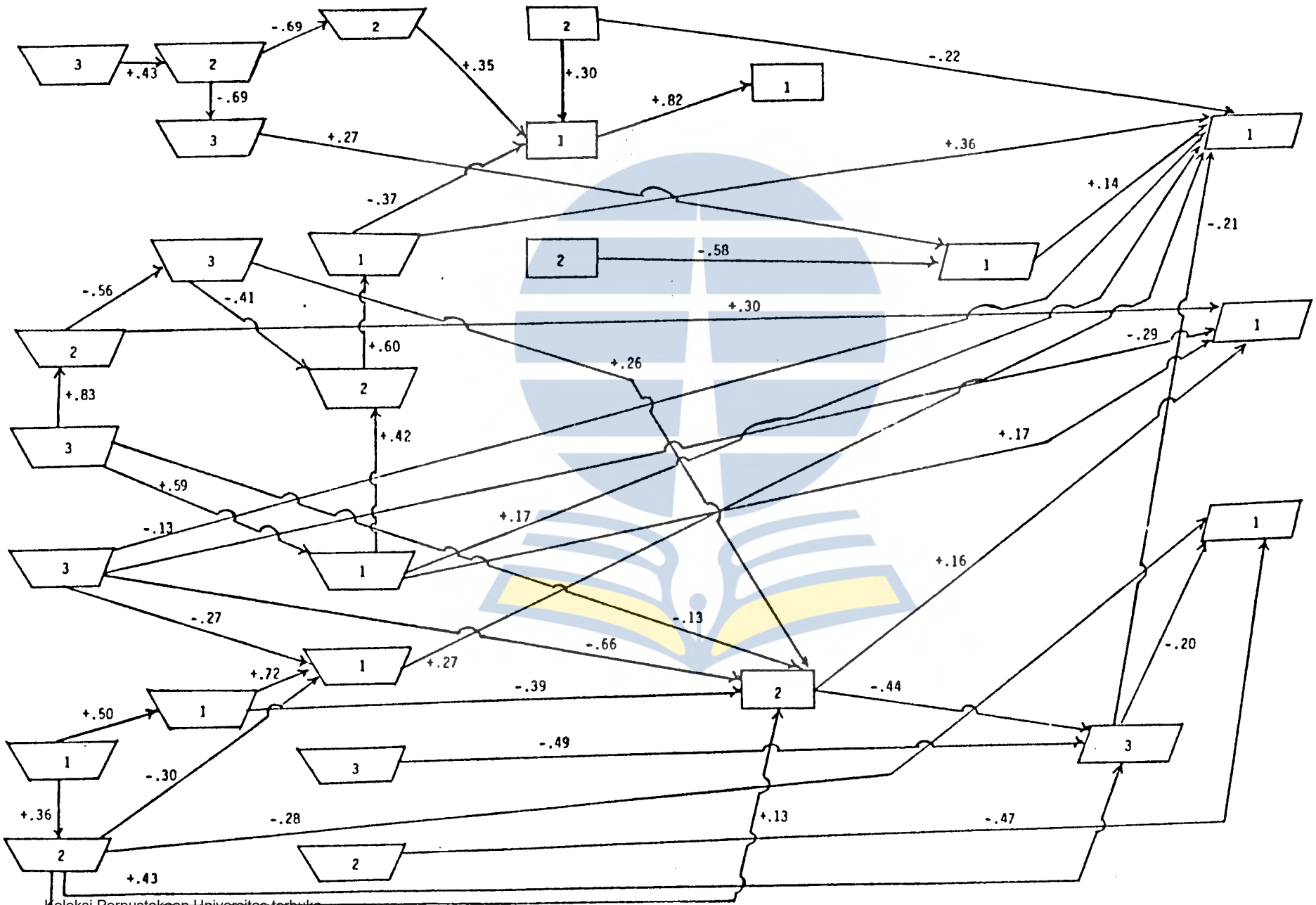
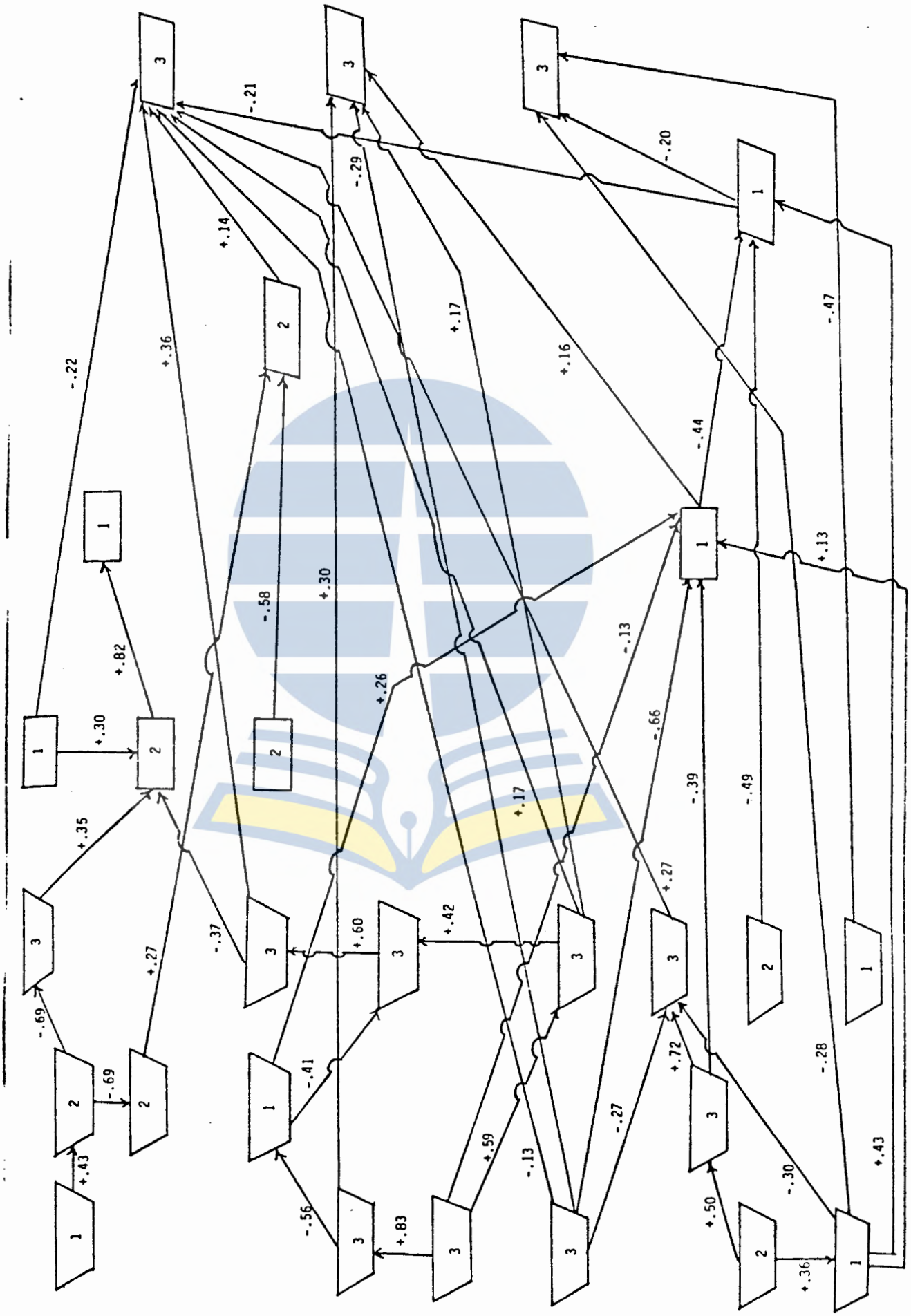


FIGURE 7.5 RECODED VALUES IN THE PARSIMONIOUS MODEL FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA

FIGURE 7.6 RECODED VALUES IN THE PARSIMONIOUS MODEL FOR THE FACULTY OF EDUCATION AT IKIP MALANG



The causal links between consecutive variables can be classified into three categories on the basis of hypothesized causal relationships in the parsimonious model. First, the causal links which are completely consistent with the hypothesized causal relationships in the model. They are called fully expected causal links and cover 1 - 1 and 3 - 3 links with positive path coefficients and 1 - 3 and 3 - 1 links with negative path coefficients. Second, the causal links which are moderately consistent with the hypothesized causal relationships in the model and are called moderately expected or "on the threshold" causal links such as 1 - 2 and 2 - 3 links with positive path coefficients and 3 - 2 and 2 - 1 links with negative path coefficients. Third, the causal links which are completely inconsistent with the hypothesized causal relationships in the model and are called unexpected causal links, that is, 1 - 1 and 3 - 3 links with negative path coefficients and 1 - 3 and 3 - 1 links with positive path coefficients.

Table 7.1 shows the causal links of consecutive variables for the four faculties selected for the trial of the model. The frequencies for each causal link category are calculated from the causal paths presented in Figures 7.3 to 7.6. The proportion of unexpected causal links to the number of hypothesized causal relationships in the parsimonious model is relatively small - the values for the four faculties ranging from just over 2% to almost 12%. Hence, most of the causal links of consecutive variables are still in the range of fully expected and moderately expected values. These empirical findings indicate that the parsimonious model seems to be suitable for evaluating the efficiency and effectiveness of an institution of higher education.

Figure 7.3 shows that the Faculty of Islamic Law at IAIN Bandung has middle values for the average of students' satisfaction with the

TABLE 7.1

THE CAUSAL LINKS OF CONSECUTIVE VARIABLES FOR THE FACULTIES SELECTED FOR THE TRIAL OF THE MODEL

No.	Faculty	Number of hypothesized causal links	Causal links of consecutive variables			Proportion of unexpected to number of hypothesized causal links
			fully expected	moderately expected (on the threshold)	unexpected	
1.	Faculty of Islamic Law IAIN Bandung	42	21	17	4	.0952
2.	Faculty of Education IKIP Bandung	42	21	20	1	.0238
3.	Faculty of Islamic Law IAIN Surabaya	42	14	24	4	.0952
4.	Faculty of Education IKIP Malang	42	28	9	5	.1190
	Total: 4 faculties	168	84	70	14	.0833

institutional operation (AVTOT3), the proportion of M.A. graduates to the total number of graduates (PRMANG) and the mean weighted B.A. graduates' grade point average (MWGPBA). The middle values for these measures of effectiveness indicate that this faculty has a relatively moderate performance for these indicators in comparison with other faculties under study.

This faculty has low values for the proportion of B.A. graduates to undergraduate enrolment (PRBGEU) and the proportion of graduates to enrolment (PRGENR), thus indicating that its effectiveness in producing graduates especially B.A. graduates is relatively low and this reflects the important weaknesses of the faculty. Then the low values for the average of students' satisfaction with their educational environment (AVTOT1) and the average of students' satisfaction with their study experience and its benefits (AVTOT2) indicate that this faculty has a relatively low performance for these indicators. On the other hand, the low value for the average time to complete the B.A. degree (AVTCDG) indicates that the efficiency of the undergraduate program is relatively high which reflects a strength of this faculty.

This faculty has four unexpected causal links. Two of them are causal relations from:

. the mean academic rank of the teaching staff (MACRA),

. the percentage of enrolment who are female (PCENFA).

Both leading to the variable measuring the average time to complete a B.A. degree. This dependent variable is also assumed to be dependent on the percentage of B.A. graduates who come from religious senior high schools (PCGRH) and the mean of teaching staff's age (MTSAGE). The recoded value for PCGRH is high (that is 3) and the causal link between this variable and the average time to complete a B.A. degree (AVTCDG)

is consistent with the hypothesized relationship in the model and it has a high path coefficient (-.66). Hence PCGRH appears to have a very dominant effect on AVTCDG in this faculty particularly and this effect may be overriding the effect of the other three variables. Such a dominant effect is assumed mainly because of the religious context involved here.

Another unexpected causal link in this faculty is from the mean of B.A. graduates' age (MNAGE) leading to the percentage of B.A. graduates who are female (PCBAFL). This latter variable is also assumed to be dependent on two other variables, that is, the percentage of B.A. graduates who come from religious senior high schools (PCGRH) and the percentage of enrolment who are female (PCENFA). The hypothesized causal relationship between PCENFA and PCBAFL has a very high path coefficient (+.72), hence it may also override the effect of MNAGE on PCBAFL.

Finally, one last unexpected causal link in this faculty is from the proportion of administrative officials to the number of full-time faculty members (PRNAFF) leading to the average of students' satisfaction with their educational environment (AVTOT1). This latter variable is assumed to be dependent on six other variables; therefore, the effect of PRNAFF on the dependent variable (AVTOT1) might be overridden by other independent variables, especially the percentage of B.A. graduates who come from religious senior high schools (PCGRH), the percentage of teaching staff with the doctorate degree (PCDOFA) and the percentage of B.A. graduates who are female (PCBAFL).

In the same way, the recoded values in Figures 7.4 to 7.6 may reflect the strengths and/or weaknesses of the Faculty of Education at IKIP Bandung, the Faculty of Islamic Law at IAIN Surabaya and the

Faculty of Education at IKIP Malang about their performance related to the measures of effectiveness and efficiency of an institution of higher education. Then, the unexpected causal links for each faculty could also be identified and explained.

As the first step in this process, measures of the efficiency and effectiveness of each faculty could be compared. Table 7.2 summarizes the performance of each of the four faculties on the key variables. This table is derived from Figures 7.3 to 7.6, hence it may also show the strengths and/or weaknesses of each faculty on these measures. This information is potentially very useful for administrators as a starting point in identifying decision alternatives for improving the performance of a faculty.

Several variables in the parsimonious model are considered to be decision variables - that is, variables that can be changed or manipulated by administrators directed towards the improvement of efficiency and effectiveness. These decision variables are the proportion of the number of administrative officials to the number of full-time faculty members (PRNAFF), the student faculty ratio (SFRFA), the mean of teaching staff's teaching load (MTSTLD), the percentage of teaching staff with doctorate degree (PCDOFA), the mean of teaching staff's teaching experience (MTSTEX), the mean of teaching staff's age (MTSAGE), the percentage of B.A. graduates from religious senior high schools (PCGRH), the percentage of B.A. graduates from vocational senior high schools (PCGVH), the mean of B.A. graduates' age (MNAGE), the percentage of B.A. graduates who come from East Java (PCGEJ) and the percentage of B.A. graduates who come from West Java (PCGWJ). It is necessary to note, that the percentage of enrolment who are female (PCENFA) is excluded as a decision variable taking into consideration

TABLE 7.2

SUMMARY OF THE PERFORMANCE OF THE FACULTIES SELECTED FOR THE TRIAL ON MEASURES OF THEIR EFFICIENCY AND EFFECTIVENESS

No.	Measures of efficiency and effectiveness	Faculty of Islamic Law IAIN Bandung		Faculty of Education IKIP Bandung		Faculty of Islamic Law IAIN Surabaya		Faculty of Education IKIP Malang	
		Recoded values	Performance description	Recoded values	Performance description	Recoded values	Performance description	Recoded values	Performance description
	Efficiency measures								
1.	The average time to complete a B.A. degree (AVTCDG)	1	high	2	moderate	2	moderate	1	high
	Effectiveness measures								
2.	The proportion of graduates to enrolment (PRGENR)	1	low	2	moderate	1	low	1	low
3.	The proportion of B.A. graduates to undergraduate enrolment (PRBGEU)	1	low	2	moderate	1	low	2	moderate
4.	The proportion of M.A. graduates to the number of graduates (PRMANG)	2	moderate	1	low	1	low	2	moderate
5.	The average of students' satisfaction with their educational environment (AVTOT1)	1	low	2	moderate	1	low	3	high
6.	The average of students' satisfaction with their study experience (AVTOT2)	1	low	3	high	1	low	3	high
7.	The average of students' satisfaction with institutional operation (AVTOT3)	2	moderate	1	low	1	low	3	high
8.	The mean of weighted B.A. graduates' gradepoint average (MWGPBA)	2	moderate	3	high	3	high	1	low

equal educational opportunity irrespective of an individual's sex and social status as being one of the democratic principles adopted in Indonesia.

It can be seen in Figures 7.3 to 7.6 that some of these decision variables are very important for improving the performance of an institution of higher education. These key variables include the percentage of teaching staff with a doctorate degree, the student faculty ratio and the percentage of B.A. graduates who come from religious senior high schools.

In the parsimonious model, the average of students' satisfaction with their study experience and its benefits (AVTOT2) is assumed to be dependent on the mean of teaching staff's teaching experience (MTSTEX), the percentage of B.A. graduates who come from religious senior high schools (PCGRH), the percentage of teaching staff with a doctorate degree (PCDOFA) and the average time to complete a B.A. degree (AVTCDG). Figure 7.4 shows that the Faculty of Education at IKIP Bandung has a high value for AVTOT2, a middle value for MTSTEX, a middle value for PCGRH, a middle value for AVTCDG and a high value for PCDOFA. In contrast Figure 7.5 shows that the Faculty of Islamic Law at IAIN Surabaya has a low value for AVTOT2, a middle value for MTSTEX, a high value for PCGRH, a middle value for AVTCDG and a low value for PCDOFA. The comparison of the two sets of recoded values confirms the more general assertion in the model that PCDOFA has an important positive effect on improving students' satisfaction with their study experience and its benefits.

The proportion of M.A. graduates to the number of graduates (PRMANG) is assumed to be dependent on the percentage of teaching staff who also teach at other institutions of higher education (PCTAJ1)

and the student faculty ratio (SFRFA). The comparison of the values for these three variables in Figures 7.3 to 7.6 indicates that SFRFA has a dominant effect on PRMANG. In other words, determining the student faculty ratio is a very important decision variable for improving the proportion of M.A. graduates to the total number of graduates, which in turn has a positive effect on students' satisfaction with their educational environment (AVTOT1).

The average time to complete a B.A. degree (AVTCDG) is assumed to be dependent on the mean academic rank of the teaching staff (MACRA), the mean of teaching staff's age (MTSAGE), the percentage of B.A. graduates who come from religious senior high schools (PCGRH), the percentage of enrolment who are female (PCENFA) and the mean of B.A. graduates' age (MNAGE). The comparison of the values for these six variables in Figures 7.3 to 7.6 indicates that PCGRH has a very consistent and important effect on AVTCDG. Hence it is a very important decision variable for improving the average time to complete the B.A. degree.

An administrator can use the parsimonious model to identify possible decision alternatives to improve the efficiency and effectiveness of an institution of higher education. First, the administrator can use the model to identify what cause(s) would be important to achieve a desired effect on the dependent variable. Second, the administrator can identify what decision variable(s) could be changed or manipulated to achieve the desirable effect, which could in turn result in a set of decision alternatives. Third, the administrator can identify what possible effect(s) would be the result of a decision alternative.

Table 7.2 shows, for instance, that the Faculty of Islamic Law at IAIN Bandung has a relatively low performance on the proportion of B.A.

graduates to undergraduate enrolment (PRBGEU). The parsimonious model depicts that this variable is conceived to be dependent on the proportion of administrative officials to the number of full-time faculty members (PRNAFF), the percentage of teaching staff who also work as part-time administrators (PCTAJ3) and the mean of teaching staff's teaching load (MTSTLD). Two of these are decision variables - namely PRNAFF with a positive path coefficient and MTSTLD with a negative path coefficient.

The administrator can improve PRBGEU by using any or all of the following decision alternatives. First, he can increase the proportion of administrative officials to the number of full-time faculty members (PRNAFF) and this should also bring about the decrease in students' satisfaction with their educational environment (AVTOT1). Second, he can decrease MTSTLD and this would also result in the possible decrease in AVTOT1. The final decision on how far the increase in PRNAFF and/or decrease in MTSTLD in order to achieve the desirable effect on PRBGEU is completely in the hands of the administrator taking the institutional constraints such as budget, institutional policy and government regulations into consideration.

It can also be seen in Table 7.2 that the Faculty of Education at IKIP Bandung has a relatively low performance with respect to the proportion of M.A. graduates to the total number of graduates (PRMANG). The parsimonious model depicts that this variable is assumed to be dependent on the student faculty ratio (SFRFA) and the percentage of teaching staff who also teach at other institutions of higher education (PCTAJ1). One of these (SFRFA) is a very important decision variable with a negative path coefficient. The administrator of this faculty can thus lower the student faculty ratio in order to achieve a better

proportion of M.A. graduates to the total number of graduates, which in turn would have a positive effect on students' satisfaction with their educational environment.

An administrator can use the parsimonious model to trace back from the dependent variable taken as effect to the previous cause(s), finding out the decision variables and the respective decision alternatives, indicating the possible effect - either desirable or undesirable - of a decision alternative, and tabulate the important information for all measures of efficiency and effectiveness available in the model. This table might be called a decision table and it provides useful information for improving institutional performance.

A tentative decision table for the Faculty of Islamic Law at IAIN Surabaya is presented here in order to show how the parsimonious model might be used in providing useful information for improving the efficiency and effectiveness of that faculty. This decision table is made on the basis of information available in Figure 7.2, Figure 7.5 and Table 7.2. The decision table is reported as Table E.2.1 (Appendix E.2) and shows for this faculty the information pertaining to the performance of the faculty, the possible decision alternatives for inducing the improvement and the expected or possible effect of these decisions on the efficiency and effectiveness of the faculty. The final decision to be adopted and implemented is in the hands of the Dean, who is in charge of the administration of the faculty and who must take into account the institutional constraints such as the budget, institutional policy and government regulations.

7.3 SUMMARY

A parsimonious causal path model for evaluating the efficiency and

effectiveness of an institution of higher education has been developed and presented in this chapter. The applicability of the model in providing information useful for allowing administrators to evaluate the performance of a faculty has also been tested.

The result of the trial indicates that the parsimonious model is appropriate for providing administrators with useful information for judging decision alternatives with which to improve the efficiency and effectiveness of an institution of higher education.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 SUMMARY OF THE MAJOR FINDINGS OF THE PRESENT STUDY

The results of the present study can be presented in the form of four major findings and two specific findings. These are summarized as follows:

1. Major findings

1. A set of seven general criteria with which to evaluate the efficiency and effectiveness of an institution of higher education have been identified and tested. These criteria, in order of importance, are:

   . the overall size of an institution in all respects other than enrolment,

   . the quantity of the output,

   . the students' success in completing their degree in reasonable time,

   . the level of students' academic performance,

   . the quality of teaching staff,

   . the general characteristics of students attending an institution,

   . the overall size of an institution in terms of enrolments in various categories.

   These criteria were identified on the basis of analysing teaching staff perceptions of what specific criteria were both conceptually and statistically similar. On testing the seven general criteria, quite wide variations among institutions were observed.

2. An evaluation model with which to identify possible control factors in terms of decision variables affecting the level of

efficiency and effectiveness of an institution of higher education has been developed. Its applicability in providing information for allowing administrators to evaluate the performance of a faculty has been tested. On trial, the model appears to be acceptable, since it gives a feeling for the accuracy and range of applicability of the model as required by Bender (1978:7).

3. Students' satisfaction with an institution of higher education has been described in multi-dimensional terms. The main dimensions, in decreasing order of importance, are:

   . students' satisfaction with their educational environment,

   . students' satisfaction with their study experience and its benefits,

   . students' satisfaction with the institutional operation.

   These dimensions were identified on the basis of analysing students' opinions on the degree of their satisfaction with the skills, knowledge and experiences they obtained from their institutions of higher education.

4. Different bases for analysis provide different statistical results. Both bases of analysis used in the present study provide administrators with useful information for judging decision alternatives. That is:

   . using student as the unit of analysis provides results indicating the important variables that account for and help explain individual student's performance,

   . using faculty as the unit of analysis provides results indicating the important variables that account for the efficiency and effectiveness of faculty within an institution of higher education.

b. Specific findings

1. Students' success in completing the B.A. degree is heavily

dependent on student's characteristics rather than on levels of students' satisfaction or the interrelationship between characteristics and satisfaction. In other words, student characteristic variables are better predictors for the time to complete the B.A. degree than are students' satisfaction variables.

2. In measuring the efficiency and effectiveness of an institution of higher education, the relative contribution of the characteristics of a faculty, in decreasing order of importance, are:

   . teaching staff's characteristics of the faculty. These show the largest relative contribution to the variance of the measures of efficiency and effectiveness,

   . students' characteristics of the faculty. These are generally moderate in their unique contribution to the variance of the measures,

   . the general characteristics of the faculty. These are relatively low in the unique contribution made to the variance of the measures.

   The variance that these three sets of variables share in common is generally low although two values indicate high or moderate levels of explanation.

8.2 IMPLICATIONS OF THE STUDY

The policy implications of the results of this study are important for administrators holding influential positions in institutions of higher education especially those in Indonesia. Such people include Rectors and Deans, who are responsible for the improvement of institutional efficiency and effectiveness. Several important policy implications are now presented to provide examples of how administrators might use the information in judging among possible alternatives.

1. By drawing the profile of student educational satisfaction for an institution of higher education, administrators will be able to identify the strengths and/or weaknesses of their institutions in this regard. The administrators could then pay more attention to improving any weaknesses of their institutions so as to develop greater satisfaction in their students. In other words, they can make appropriate policy and administrative decisions to introduce changes so that their institutions would operate more effectively.
2. The information about individual student's performance obtained from analyses using student as the unit of analysis can be used by administrators for individual advising of students to improve their performances. Such advising should be given by taking into consideration the important variables that account for the student's performance. On the other hand, the information about the variables contributing to the efficiency and effectiveness of an institution of higher education obtained from analyses using faculty as the unit of analysis can be used by administrators as the basis for improving the performance of an institution.
3. Administrators of higher education institutions can take into account the students' characteristics in their admission policy for the selection of new students to be admitted and in giving advice to students related to the efficient use of their study time while they are working for a degree.
4. The information about the relative contribution of the characteristics of faculty to the variance of the measures of efficiency and effectiveness of an institution of higher education can be taken into consideration by administrators in their efforts to identify the alternative ways to improve the performance of an institution of higher education.

5. The seven factors perceived to be important and useful by the teaching staff for evaluating the efficiency and effectiveness of an institution of higher education can be used by administrators, who are in charge of the assessment of higher education in Indonesia, as criteria for the evaluation of higher education institutions. In other words, these criteria can be used as empirical support for developing the policy on the institutional evaluation of higher education in Indonesia.
6. The evaluation model developed in this study can be used by administrators in their efforts to evaluate the efficiency and effectiveness of an institution of higher education and to identify decision alternatives and critical points to improve performances.

8.3 THE WEAKNESSES OF THE PRESENT STUDY

There are several limitations of the present study that can be considered to be weaknesses.

The first limitation is that three important variables have necessarily had to be excluded from the analysis. These three variables are as follows:

The first variable is the research output of an institution of higher education. This variable could not be included as a measure of institutional effectiveness. The reasons for not including the research output are:

a. The complete data are not available at the institutions of higher education under study.
b. Relatively few teaching staff in higher education in Indonesia are involved in research activities and not many of them have many publications in terms of articles and books published. There would

thus be little variance in the variable even if the data had been available.

c. The use of an index of the number of articles and books published as the measure of research output would not per se provide an optimum criterion of institutional effectiveness. As Carlson points out, not only it is "difficult to obtain this detailed data (but) the measure still neglects consideration of the research quality" (Carlson, 1976:47).

The second variable is the expenditure variable. This could not be included in the parsimonious model. The central accounting procedures used at the institutions of higher education under study do not make it possible to identify the value for each defined expenditure variable by faculty. This situation will continue to limit any input-output studies using faculty as the unit of analysis in Indonesia until such time as changes in accounting methods are introduced.

The third variable is cost per student. Despite its crucial importance in planning and administrative considerations, this variable could not be included in the parsimonious model to indicate the efficiency of an institution of higher education. The reason for its exclusion is data related to this variable - it was simply not possible to obtain estimates of cost per student by faculty at the institutions of higher education under study. There is no clear breakdown of some expenditure variables by faculty in the Indonesian institutions. Although the inclusion of such a variable would have strengthened the evaluation model developed, other problems would necessarily have been introduced. For example, the variable itself is a contentious one in its interpretation. Bowen and Douglass (1971:3) state: "Merely because a given educational method results in lowered cost per student does not

prove that it is more efficient unless it is agreed that there has been no qualitative deterioration of output". OECD (1964:35) also asserts as follows:

> One can easily be misled by studies of unit costs. It does not follow, because the unit cost is high, that the institution is doing a poor and inefficient job. As a matter of fact one generally finds that the higher the unit cost the better the product turned out. As one author put it, there are dangers in these unit costs.

The second limitation is that only six institutions could be used in the present study. Such a small sample perhaps could affect the results of analysis, but the time and resource constraints forced the sample size to be small. In addition, all institutions taken as the sample are in Java. This restriction is not a serious one however, since the important kinds of institutions of higher education have been selected as a purposive sample.

The third limitation is that only one model was developed and tested. It is possible and therefore must be acknowledged here that to another observer a different set of interrelationships might constitute a basic evaluation model. If this were so, decision making guided by the ensuing parsimonious model could be slightly different in its emphases. The possible existence of a significantly better or different model using the same variables as those constituting the present model does not however seem likely. It is considered that only slight changes if any would be incorporated into an alternative formulation. The reason for this strong assertion is that a full conceptual analysis was conducted independently and this was checked by other experts. Following concurrence on conceptual grounds, statistically relationships of a highly significant nature were used to check the assumed relationships. Such actions should strengthen the claims of the model proposed.

8.4 RECOMMENDATIONS FOR FURTHER RESEARCH

The previous discussion of the results of analyses and the development of the parsimonious model provide the bases for further research on the evaluation of the performance of an institution of higher education, especially its efficiency and effectiveness.

First, further research could be performed by collecting the data from additional institutions of higher education and using those data to retest the model's accuracy and range of applicability using the institutions not included in developing the model. This research could be conducted in Indonesia so as to broaden the basis developed here as well as in other countries to determine the applicability of the model in different cultural settings.

Second, further study of accounting procedures and practice in Indonesian higher education institutions could be performed with the purpose of developing new accounting procedures which would make it possible to identify the breakdown of all expenditure variables by faculty. Such a study would make it possible to include the expenditure variables in the evaluation model. Hence it would be a significant inclusion in any attempt to improve the model.

Third, further research could be performed at the national level to assess the relative performance of all higher education institutions in Indonesia. Data would need to be collected on the seven factors perceived to be important and useful by the teaching staff in the present study together with other data, especially those related to students' educational satisfaction. Such an undertaking would provide a comprehensive basis for assessing all institutions of higher education in Indonesia. It would overcome the difficulty of attempting to establish

relativities on the basis of a small sample as was attempted in the present study.

8.5 FINALE

The results of the present study, especially the parsimonious causal model, will hopefully add further contributions to the overall attempt of making institutions of higher education more effective and more efficient in their operation. At the level of the educational system, considerable costs - human, finance and facilities - must be made available by both governments and individuals. If the operation of higher education can be improved not just in one country but also internationally, then some of these burdens might be alleviated at least partially. It is therefore believed that attempts to analyse the multiple and complex interrelationships among factors operating in higher education must continue.

APPENDIX A

THE QUESTIONNAIRE USED FOR DATA COLLECTION

APPENDIX A.1

QUESTIONNAIRE

ON STUDENT EDUCATIONAL SATISFACTION

APPENDIX A.1 THE QUESTIONNAIRE FOR STUDENTS

(See Appendix B for English Translation of Items)

DAFTAR ISIAN

TENTANG KEPUASAN MAHASISWA

MENGENAI PENDIDIKAN YANG DIPEROLEHNYA

Rahasia pribadi anda terjamin.

Kerjasama anda sangat diharapkan dan dihargai.

PENGANTAR

Maksud dari daftar isian ini ialah untuk memperoleh pendapat tentang informasi yang menunjukkan tingkat kepuasan saudara mengenai keterampilan, pengetahuan dan pengalaman yang saudara peroleh dari perguruan tinggi tempat saudara belajar. Daftar isian ini terdiri dari sejumlah pernyataan dan untuk setiap pernyataan saudara diminta memberi tanda pada jawaban yang tersedia. Silakan beri tanda (✓) pada jawaban yang tersedia yang menurut pendapat saudara adalah tepat.

Contoh:

Pernyataan	TSS	TS	S	SS
1. Tugas-tugas akademis (the academic work) di perguruan tinggi ini sangat berat.	___	___	✓	___

TSS = tidak setuju sekali

TS = tidak setuju

S = setuju

SS = setuju sekali

Silakan mulai pada halaman berikutnya!

No.	Pernyataan	TSS	TS	S	SS
1.	Tugas-tugas akademis (the academic work) di perguruan tinggi ini membosankan.	___	___	___	___
2.	Senbagai mahasiswa di perguruan tinggi ini, saya tidak bergairah dalam pelajaran saya.	___	___	___	___
3.	Sebagai mahasiswa, saya senang belajar di perguruan tinggi ini.	___	___	___	___
4.	Sebagai mahasiswa, saya tidak mempunyai keluhan yang penting mengenai pengalaman pendidikan saya di perguruan tinggi ini.	___	___	___	___
5.	Sebagai mahasiswa di perguruan tinggi ini, saya tidak merasa puas dengan pengalaman belajar saya.	___	___	___	___
6.	Saya merasa bahwa saya memperoleh manfaat dari pada pendidikan umum yang diberikan di perguruan tinggi ini.	___	___	___	___
7.	Saya rasa bahwa pengetahuan dan keterampilan yang saya peroleh di perguruan tinggi ini sangat berguna.	___	___	___	___
8.	Saya rasa bahwa kecakapan dan keterampilan yang saya peroleh dari perguruan tinggi ini ada hubungannya dengan karir pekerjaan yang saya cita-citakan.	___	___	___	___

No.	Pernyataan	TSS	TS	S	SS
9.	Pengalaman pendidikan yang saya peroleh dari perguruan tinggi ini meningkatkan kesanggupan saya untuk memecahkan persoalan dalam kehidupan yang nyata.	___	___	___	___
10.	Pengalaman pendidikan yang saya peroleh dari perguruan tinggi ini telah ketinggalan zaman.	___	___	___	___
11.	Saya rasa bahwa situasi akademis di perguruan tinggi ini merangsang kebanyakan mahasiswa untuk mencapai prestasi yang sebaik-baiknya.	___	___	___	___
12.	Sebagai mahasiswa, saya merasa bahwa program pendidikan di perguruan tinggi ini tinggi mutunya.	___	___	___	___
13.	Sebagai mahasiswa, saya puas dengan prestasi saya di perguruan tinggi ini.	___	___	___	___
14.	Saya kira bahwa dosen-dosen di perguruan tinggi ini umumnya bermutu baik.	___	___	___	___
15.	Sebagai mahasiswa, saya merasa bahwa kebanyakan dosen di perguruan tinggi ini sangat baik dan membantu mahasiswa.	___	___	___	___

No.	Pernyataan	TSS	TS	S	SS
16.	Saya merasa bangga dengan perguruan tinggi ini karena prestasinya yang baik dalam kegiatan-kegiatan penelitian.	___	___	___	___
17.	Sebagai mahasiswa, saya merasa tidak puas dengan uang kuliah yang tinggi yang harus dibayar oleh mahasiswa.	___	___	___	___
18.	Sebagai mahasiswa, saya rasa bahwa tugas-tugas administrasi di perguruan tinggi ini berjalan dengan baik.	___	___	___	___
19.	Sebagai mahasiswa, saya tindak puas dengan kebanyakan ruangan kelas yang pada umumnya penuh sesak.	___	___	___	___
20.	Sebagai mahasiswa di perguruan tinggi ini, saya merasa puas dengan bahan-bahan bacaan yang tersedia di perpustakaan.	___	___	___	___

KETERANGAN LATAR BELAKANG

Silakan isi blanko di bawah ini dengan jawaban yang benar atau cantumkan tanda "X" pada jawaban yang sesuai.

1. Nama : _____
2. Umur : _____ tahun
3. Jenis kelamin: _____ pria
   _____ wanita
4. Pendidikan (gelar kesarjanaan atau tingkat pendidikan tertinggi yang telah dicapai):
   _____ Sarjana Muda (B.A.)
   _____ Sarjana Lengkap (M.A. atau Drs.)
5. Jangka waktu yang sesungguhnya diperlukan untuk mencapai gelar itu:
   a. Sarjana Muda: _____ tahun dan _____ bulan.
   b. Sarjana Lengkap setelah menyelesaikan Sarjana Muda:
      _____ tahun dan _____ bulan.
6. Sekolah Lanjutan Tingkat Atas sebelum memasuki perguruan tinggi:
   _____ SMA (Sekolah Menengah Atas)
   _____ SPG (Sekolah Pendidikan Guru) atau SGA (sekolah Guru Atas)
   _____ PGA (Pendidikan Guru Agama)
   _____ Sekolah Lanjutan Tingkat Atas lainnya, silakan sebutkan:
   _____
7. Daerah asal: _____
   di propinsi: _____

Terima kasih atas bantuan dan kerjasama anda.

APPENDIX A.2

QUESTIONNAIRE

ON THE USEFULNESS OF POTENTIAL MEASURES FOR EVALUATING THE EFFICIENCY AND EFFECTIVENESS OF AN INSTITUTION OF HIGHER EDUCATION

APPENDIX A.2.1 THE QUESTIONNAIRE FOR TEACHING STAFF

[See Appendix B for English Translation of Items]

DAFTAR ISIAN

TENTANG KEGUNAAN DARI PADA UKURAN YANG MUNGKIN DIPERGUNAKAN UNTUK MENILAI EFISIENSI DAN EFEKTIVITAS SUATU PERGURUAN TINGGI

Rahasia pribadi anda terjamin.

Kerjasama anda sangat diharapkan dan dihargai.

PENGANTAR

Maksud dari pada daftar isian ini ialah untuk memperoleh pendapat Saudara/Bapak tentang variabel atau ukuran yang Saudara/Bapak rasa akan memberikan informasi yang berguna untuk menilai efisiensi dan efektivitas suatu perguruan tinggi. Daftar isian ini mengemukakan daftar dari pada ukuran-ukuran yang mungkin dipergunakan dan untuk setiap ukuran, Saudara/Bapak diharapkan menjawab pertanyaan berikut: Bagaimanakah kegunaan informasi ini bagi Saudara/Bapak untuk menilai efisiensi dan efektivitas perguruan tinggi ini?

Silahkan beri tanda (✓) pada jawaban yang sesuai dengan pendapat Saudara/Bapak!

Contoh:

Bagaimanakah kegunaan informasi ini bagi Saudara/Bapak untuk menilai efisiensi dan efektivitas perguruan tinggi ini?	TB	AB	B	SB
1. Rata-rata angka yang diperoleh mahasiswa.	___	___	___	✓

TB = tidak berguna

AB = agak berguna

B = berguna

SB = sangat berguna

Silakan mulai pada halaman berikutnya!

Bagaimana kegunaan informasi ini bagi Saudara/Bapak untuk menilai efisiensi dan efektivitas perguruan tinggi ini?	TB	AB	B	SB
1. Rata-rata angka yang diperoleh mahasiswa pada ujian masuk.	___	___	___	___
2. Rata-rata angka yang diperoleh mahasiswa pada ujian Sekolah Lanjutan Tingkat Atas.	___	___	___	___
3. Jenis kelamin mahasiswa.	___	___	___	___
4. Umur mahasiswa.	___	___	___	___
5. Daerah asal mahasiswa.	___	___	___	___
6. Jenis Sekolah Lanjutan Tingkat Atas tempat mahasiswa belajar sebelumnya.	___	___	___	___
7. Jumlah mahasiswa yang terdaftar pada suatu perguruan tinggi.	___	___	___	___
8. Jumlah mahasiswa yang terdaftar pada program sarjana muda.	___	___	___	___
9. Jumlah mahasiswa yang terdaftar pada program sarjana.	___	___	___	___
10. Pengalaman mengajar dosen.	___	___	___	___
11. Tingkat pendidikan tertinggi yang telah diselesaikan oleh tenaga pengajar (dosen).	___	___	___	___

	TB	AB	B	SB
12. Pangkat akademis dosen.	___	___	___	___
13. Beban atau jumlah jam mengajar dosen.	___	___	___	___
14. Pekerjaan lain dari pada dosen (Bila ia mempunyai pekerjaan lain di lembaga atau kantor lain).	___	___	___	___
15. Jumlah dosen di suatu perguruan tinggi.	___	___	___	___
16. Jumlah dosen yang berpangkat Profesor, Lektor Kepala atau Lektor.	___	___	___	___
17. Jumlah biaya yang dikeluarkan suatu perguruan tinggi.	___	___	___	___
18. Biaya yang dikeluarkan untuk pengajaran.	___	___	___	___
19. Jumlah ruangan kelas.	___	___	___	___
20. Jumlah buku yang tersedia di perpustakaan.	___	___	___	___
21. Jumlah tenaga administratif dan tenaga penunjang lainnya.	___	___	___	___
22. Persentase mahasiswa wanita yang terdaftar pada suatu perguruan tinggi.	___	___	___	___
23. Persentase dosen yang bergelar doktor.	___	___	___	___

		TB	AB	B	SB
24.	Persentase dosen yang berpangkat Profesor, Lektor Kepala dan Lektor.	____	____	____	____
25.	Persentase tenaga pengajar yang statusnya adalah dosen tetap.	____	____	____	____
26.	Persentase dari pada anggaran belanja suatu perguruan tinggi yang digunakan untuk pembangunan.	____	____	____	____
27.	Persentase dari pada pengeluaran suatu perguruan tinggi untuk gaji dosen.	____	____	____	____
28.	Biaya yang dikeluarkan per mahasiswa.	____	____	____	____
29.	Rata-rata waktu yang dalam kenyataannya diperlukan untuk mencapai gelar sarjana muda.	____	____	____	____
30.	Rata-rata waktu yang dalam kenyataannya diperlukan untuk mencapai gelar sarjana lengkap setelah memperoleh gelar sarjana muda.	____	____	____	____
31.	Rata-rata waktu yang dalam kenyataannya diperlukan untuk memperoleh gelar doktor setelah memperoleh gelar sarjana lengkap.	____	____	____	____
32.	Persentase tenaga administrasi yang memperoleh gelar sarjana lengkap atau yang telah memperoleh gelar doktor.	____	____	____	____

	TB	AB	B	SB
33. Rata-rata jumlah buku per mahasiswa yang tersedia di perpustakaan.	___	___	___	___
34. Rata-rata luas ruangan kelas yang tersedia per mahasiswa dalam meter persegi.	___	___	___	___
35. Rata-rata jumlah murid per kelas.	___	___	___	___
36. Rata-rata angka yang diperoleh lulusan.	___	___	___	___
37. Rata-rata angka yang diperoleh lulusan dalam mata kuliah umum. (general education)	___	___	___	___
38. Rata-rata angka yang diperoleh lulusan dalam mata pelajaran kejuruannya.	___	___	___	___
39. Rata-rata angka yang diperoleh lulusan dalam mata pelajaran pokoknya.	___	___	___	___
40. Jangka waktu yang sesungguhnya diperlukan seorang mahasiswa untuk mencapai suatu gelar (degree).	___	___	___	___
41. Rata-rata angka yang diperoleh para mahasiswa dalam suatu mata pelajaran.	___	___	___	___
42. Persentase mahasiswa yang keluar dari suatu perguruan tinggi sebelum memperoleh suatu gelar kesarjanaan (dropouts).	___	___	___	___

		TB	AB	B	SB
43.	Jumlah mahasiswa yang lulus atau tamat tepat pada waktunya sebagai persentase dari pada jumlah mahasiswa yang sama-sama masuk dengan mereka pada suatu perguruan tinggi.	___	___	___	___
44.	Jumlah lulusan.	___	___	___	___
45.	Jumlah lulusan sarjana muda.	___	___	___	___
46.	Jumlah lulusan sarjana (Lengkap).	___	___	___	___
47.	Jumlah lulusan doktor.	___	___	___	___
48.	Jumlah proyek penelitian yang telah diselesaikan.	___	___	___	___
49.	Jumlah publikasi/karangan tenaga pengajar.	___	___	___	___

50. Menurut pendapat Saudara/Bapak apakah ada ukuran-ukuran lain yang harus digunakan dalam menilai efisiensi dan efektivitas suatu perguruan tinggi?
Harap tuliskan di bawah ini!

51. Silakan Saudara/Bapak sebutkan tiga ukuran dengan urutan dari yang paling penting, yang menurut pandangan saudara/Bapak sangat berguna dalam menilai efisiensi dan efektivitas suatu perguruan tinggi. Harap gunakan nomor dari pada pertanyaan-pertanyaan diatas!

a. Ukuran yang paling penting ialah nomor .....
b. Ukuran yang nomor dua pentingnya ialah nomor .....
c. Ukuran yang nomor tiga pentingnya ialah nomor .....

52. Apakah Saudara/Bapak mempunyai komentar lain mengenai evaluasi dari pada efisiensi dan efektivitas suatu perguruan tinggi? Silakan tulis di bawah ini!

KETERANGAN LATAR BELAKANG

Silakan isi blangko di bawah ini dengan jawaban yang benar atau cantumkan tanda "X" pada jawaban yang sesuai.

1. Nama : _____
2. Umur : _____ tahun.
3. Pangkat akademis:

   _____ Profesor

   _____ Lektor Kepala

   _____ Lektor

   _____ Lektor Madya

   _____ Lektor Muda

   _____ Asisten Ahli

   _____ Lainnya, sebutkan _____
4. Jenis kelamin: _____ pria

   _____ wanita
5. Pendidikan (gelar kesarjanaan atau tingkat pendidikan tertinggi yang telah dicapai):

   _____ Sarjana Muda (B.A.)

   _____ Sarjana Lengkap (M.A. atau Drs.)

   _____ Doktor (Dr.)

   _____ Lainnya, sebutkan _____
6. Lama pengalaman mengajar di perguruan tinggi: _____ tahun.
7. Beban mengajar per minggu: _____ jam mengajar.
8. Apakah Saudara/Bapak mempunyai pekerjaan di lembaga atau kantor lain?

   _____ ya

   _____ tidak

   Bila ya, sebutkan _____

Terimakasih atas bantuan dan kerjasama anda.

APPENDIX A.2.2 THE QUESTIONNAIRE FOR ADMINISTRATORS
[See Appendix B for English Translation of Items]

DAFTAR ISIAN

TENTANG KEGUNAAN DARI PADA UKURAN YANG MUNGKIN DIPERGUNAKAN UNTUK MENILAI EFISIENSI DAN EFEKTIVITAS SUATU PERGURUAN TINGGI

Rahasia pribadi anda terjamin.

Kerjasama anda sangat diharapkan dan dihargai.

PENGANTAR

Maksud dari pada daftar isian ini ialah untuk memperoleh pendapat Saudara/Bapak tentang variabel atau ukuran yang Saudara/Bapak rasa akan memberikan informasi yang berguna untuk menilai efisiensi dan efektivitas suatu perguruan tinggi. Daftar isian ini mengemukakan daftar dari pada ukuran-ukuran yang mungkin dipergunakan dan untuk setiap ukuran, Saudara/Bapak diharapkan menjawab pertanyaan berikut: Bagaimanakah kegunaan informasi ini bagi Saudara/Bapak untuk menilai efisiensi dan efektivitas perguruan tinggi ini?

Silahkan beri tanda (✓) pada jawaban yang sesuai dengan pendapat Saudara/Bapak!

Contoh:

Bagaimanakah kegunaan informasi ini bagi Saudara/Bapak untuk menilai efisiensi dan efektivitas perguruan tinggi ini?	TB	AB	B	SB
1. Rata-rata angka yang diperoleh mahasiswa.	___	___	___	✓

TB = tidak berguna

AB = agak berguna

B = berguna

SB = sangat berguna

Silakan mulai pada halaman berikutnya!

	Bagaimana kegunaan informasi ini bagi Saudara/Bapak untuk menilai efisiensi dan efektivitas perguruan tinggi ini?	TB	AB	B	SB
1.	Rata-rata angka yang diperoleh mahasiswa pada ujian masuk.	___	___	___	___
2.	Rata-rata angka yang diperoleh mahasiswa pada ujian Sekolah Lanjutan Tingkat Atas.	___	___	___	___
3.	Jenis kelamin mahasiswa.	___	___	___	___
4.	Umur mahasiswa.	___	___	___	___
5.	Daerah asal mahasiswa.	___	___	___	___
6.	Jenis Sekolah Lanjutan Tingkat Atas tempat mahasiswa belajar sebelumnya.	___	___	___	___
7.	Jumlah mahasiswa yang terdaftar pada suatu perguruan tinggi.	___	___	___	___
8.	Jumlah mahasiswa yang terdaftar pada program sarjana muda.	___	___	___	___
9.	Jumlah mahasiswa yang terdaftar pada program sarjana.	___	___	___	___
10.	Pengalaman mengajar dosen.	___	___	___	___
11.	Tingkat pendidikan tertinggi yang telah diselesaikan oleh tenaga pengajar (dosen).	___	___	___	___

		TB	AB	B	SB
12.	Pangkat akademis dosen.	___	___	___	___
13.	Beban atau jumlah jam mengajar dosen.	___	___	___	___
14.	Pekerjaan lain dari pada dosen (Bila in mempunyai pekerjaan lain di lembaga atau kantor lain).	___	___	___	___
15.	Jumlah dosen di suatu perguruan tinggi.	___	___	___	___
16.	Jumlah dosen yang berpangkat Profesor, Lektor Kepala atau Lektor.	___	___	___	___
17.	Jumlah biaya yang dikeluarkan suatu perguruan tinggi.	___	___	___	___
18.	Biaya yang dikeluarkan untuk pengajaran.	___	___	___	___
19.	Jumlah ruangan kelas.	___	___	___	___
20.	Jumlah buku yang tersedia di perpustakaan.	___	___	___	___
21.	Jumlah tenaga administratif dan tenaga penunjang lainnya.	___	___	___	___
22.	Persentase mahasiswa wanita yang terdaftar pada suatu perguruan tinggi.	___	___	___	___
23.	Persentase dosen yang bergelar doktor.	___	___	___	___

		TB	AB	B	SB
24.	Persentase dosen yang berpangkat Profesor, Lektor Kepala dan Lektor.	___	___	___	___
25.	Persentase tenaga pengajar yang statusnya adalah dosen tetap.	___	___	___	___
26.	Persentase dari pada anggaran belanja suatu perguruan tinggi yang digunakan untuk pembangunan.	___	___	___	___
27.	Persentase dari pada pengeluaran suatu perguruan tinggi untuk gaji dosen.	___	___	___	___
28.	Biaya yang dikerluarkan per mahasiswa.	___	___	___	___
29.	Rata-rata waktu yang dalam kenyataannya diperlukan untuk mencapai gelar sarjana muda.	___	___	___	___
30.	Rata-rata waktu yang dalam kenyataannya diperlukan untuk mencapai gelar sarjana lengkap setelah memperoleh gelar sarjana muda.	___	___	___	___
31.	Rata-rata waktu yang dalam kenyataannya diperlukan untuk memperoleh gelar doktor setelah memperoleh gelar sarjana lengkap.	___	___	___	___
32.	Persentase tenaga administrasi yang memperoleh gelar sarjana lengkap atau yang telah memperoleh gelar doktor.	___	___	___	___

	TB	AB	B	SB
33. Rata-rata jumlah buku per mahasiswa yang tersedia di perpustakaan.	___	___	___	___
34. Rata-rata luas ruangan kelas yang tersedia per mahasiswa dalam meter persegi.	___	___	___	___
35. Rata-rata jumlah murid per kelas.	___	___	___	___
36. Rata-rata angka yang diperoleh lulusan.	___	___	___	___
37. Rata-rata angka yang diperoleh lulusan dalam mata kuliah umum. (general education)	___	___	___	___
38. Rata-rata angka yang diperoleh lulusan dalam mata pelajaran kejuruannya.	___	___	___	___
39. Rata-rata angka yang diperoleh lulusan dalam mata pelajaran pokoknya.	___	___	___	___
40. Jangka waktu yang sesungguhnya diperlukan seorang mahasiswa untuk mencapai suatu gelar (degree).	___	___	___	___
41. Rata-rata angka yang diperoleh para mahasiswa dalam suatu mata pelajaran.	___	___	___	___
42. Persentase mahasiswa yang keluar dari suatu perguruan tinggi sebelum memperoleh suatu gelar kesarjanaan (dropouts).	___	___	___	___

	TB	AB	B	SB
43. Jumlah mahasiswa yang lulus atau tamat tepat pada waktunya sebagai persentase dari pada jumlah mahasiswa yang sama-sama masuk dengan mereka pada suata perguruan tinggi.	___	___	___	___
44. Jumlah lulusan.	___	___	___	___
45. Jumlah lulusan sarjana muda.	___	___	___	___
46. Jumlah lulusan sarjana (Lengkap).	___	___	___	___
47. Jumlah lulusan doktor.	___	___	___	___
48. Jumlah proyek penelitian yang telah diselesaikan.	___	___	___	___
49. Jumlah publikasi/karangan tenaga pengajar.	___	___	___	___

50. Menurut pendapat Saudara/Bapak apakah ada ukuran-ukuran lain yang harus digunakan dalam menilai efisiensi dan efektivitas suatu perguruan tinggi?
Harap tuliskan di bawah ini!

51. Silakan Saudara/Bapak sebutkan tiga ukuran dengan urutan dari yang paling penting, yang menurut pandangan saudara/Bapak sangat berguna dalam menilai efisiensi dan efektivitas suatu perguruan tinggi. Harap gunakan nomor dari pada pertanyaan-pertanyaan diatas!

a. Ukuran yang paling penting ialah nomor .....
b. Ukuran yang nomor dua pentingnya ialah nomor .....
c. Ukuran yang nomor tiga pentingnya ialah nomor .....

52. Apakah Saudara/Bapak mempunyai komentar lain mengenai evaluasi dari pada efisiensi dan efektivitas suatu perguruan tinggi? Silakan tulis di bawah ini!

51. Silakan Saudara/Bapak sebutkan tiga ukuran dengan urutan dari yang paling penting, yang menurut pandangan saudara/Bapak sangat berguna dalam menilai efisiensi dan efektivitas suatu perguruan tinggi. Harap gunakan nomor dari pada pertanyaan-pertanyaan diatas!

a. Ukuran yang paling penting ialah nomor .....
b. Ukuran yang nomor dua pentingnya ialah nomor .....
c. Ukuran yang nomor tiga pentingnya ialah nomor .....

52. Apakah Saudara/Bapak mempunyai komentar lain mengenai evaluasi dari pada efisiensi dan efektivitas suatu perguruan tinggi? Silakan tulis di bawah ini!

KETERANGAN LATAR BELAKANG

Silakan isi blanko di bawah ini dengan jawaban yang benar atau cantumkan tanda "X" pada jawaben yang sesuai.

1. Nama : _____

2. Jabatan di perguruan tinggi ini:

   _____ Rektor

   _____ Pembantu/Wakil Rektor Bidang Administrasi.

   _____ Dekan

3. Umur : _____ tahun

4. Jenis kelamin: _____ pria

   _____ wanita

5. Pendidikan (gelar kesarjanaan atau tingkat pendidikan tertinggi yang telah dicapai):

   _____ Sarjana Muda (B.A.)

   _____ Sarjana Lengkap (M.A. atau Drs.)

   _____ Doktor (Dr.)

   _____ Lainnya, sebutkan _____

6. Lama pengalaman sebagai tenaga administrasi di perguruan tinggi:

   _____ tahun.

7. Apakah Saudara/Bapak mempunyai pekerjaan di lembaga atau kantor lain?

   _____ ya

   _____ tidak

   Bila ya, sebutkan _____

8. Apakah Saudara/Bapak juga mempunyai tanggung jawab mengajar?

   _____ ya

   _____ tidak

   Bila ya, teruskan pada pertanyaan nomor 9.

9. Beban mengajar per minggu: _____ jam mengajar.

Terima kasih atas bantuan dan kerjasama anda.

APPENDIX B

RESPONSES TO EACH ITEM OF THE QUESTIONNAIRES

AND ENGLISH TRANSLATION OF ITEMS

In the following tables the meaning of the abbreviations used in the heading is:

DS = disagree strongly
D = disagree
A = agree
AS = agree strongly
NR = no response

NU = not useful
SU = somewhat useful
U = useful
VU = very useful

The meaning of the abbreviations used in the line under the percentage figures is:

M = mean
SD = standard deviation
S = skewness

TABLE B.1

SUMMARY OF THE PERCENTAGES OF STUDENTS' RESPONSES TO THE QUESTIONNAIRE ON STUDENT EDUCATIONAL SATISFACTION BY INSTITUTION

No.	Statement	IAIN SGD Bandung (n=42)					IKIP Bandung (n=102)					Padjadjaran University (n=113)				
		DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
1.	The academic or school work in this institution of higher education is a drudgery	2.4	61.9	33.3	2.4	-	8.8	67.7	23.5	-	-	8.8	78.8	9.7	2.7	-
		M=2.64		SD=0.58		S=-0.60	M=2.85		SD=0.55		S=-0.06	M=2.94		SD=0.54		S=-1.10
2.	As a student in this institution, I was not enthusiastic in my studies	4.8	73.8	21.4	-	-	31.4	63.7	3.9	1	-	38.9	54.9	5.3	-	0.9
		M=2.83		SD=0.49		S=-0.41	M=3.26		SD=0.58		S=-0.38	M=3.31		SD=0.66		S=-1.20
3.	As a student, I enjoyed studying in this institution of higher education	-	16.7	66.6	16.7	-	1	4.9	75.5	18.6	-	-	5.3	72.6	22.1	-
		M=3.00		SD=0.58		S=0.00	M=3.12		SD=0.51		S=-0.26	M=3.17		SD=0.50		S=0.33
4.	As a student, I did not have any important complaint regarding my educational experience in this institution	16.6	40.5	40.5	2.4	-	13.7	60.8	23.5	2	-	12.4	55.8	28.3	3.5	-
		M=2.29		SD=0.77		S=-0.22	M=2.14		SD=0.66		S=0.27	M=2.23		SD=0.71		S=0.26

No.	IAIN Sunan Ampel (n=77)					Airlangga University (n=127)					IKIP Malang (n=108)					Total: 6 Institutions (n=569)				
	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
1.	11.7	67.5	20.8	-	-	7.1	74.8	16.5	0.8	-	13	78.7	6.5	0.9	0.9	9.1	73.1	16.3	1.1	0.4
	M=2.91	SD=0.57	S=-0.02			M=2.87	SD=0.57	S=-1.33			M=3.02	SD=0.56	S=-1.59			M=2.90	SD=0.56	S=-0.85		
2.	23.4	53.2	22.1	1.3	-	35.4	55.1	8.7	0.8	-	36.1	60.2	2.8	0.9	-	31.6	58.7	8.8	0.7	0.2
	M=2.98	SD=0.72	S=-0.20			M=3.25	SD=0.64	S=-0.47			M=3.32	SD=0.57	S=-0.44			M=3.21	SD=0.64	S=-0.54		
3.	1.3	13	70.1	15.6	-	0.8	5.5	67.7	25.2	0.8	-	2.8	70.3	26.9	-	0.5	6.7	70.8	21.8	0.2
	M=3.00	SD=0.59	S=-0.40			M=3.16	SD=0.62	S=-1.12			M=3.24	SD=0.49	S=0.48			M=3.14	SD=0.55	S=-0.38		
4.	19.5	50.6	26	2.6	1.3	14.2	48.8	35.4	1.6	-	7.4	48.2	39.8	3.7	0.9	13.4	51.8	31.8	2.6	0.4
	M=2.09	SD=0.78	S=0.01			M=2.24	SD=0.71	S=-0.12			M=2.38	SD=0.72	S=-0.25			M=2.23	SD=0.72	S=-0.01		

No.	Statement	IAIN SGD Bandung (n=42) DS	D	A	AS	NR	IKIP Bandung (n=102) DS	D	A	AS	NR	Padjadjaran University (n=113) DS	D	A	AS	NR
5.	As a student in this institution, I was dissatisfied with my learning experience.	2.4	7.1	61.9	28.6	-	3.9	30.4	49	16.7	-	3.5	32.7	54.1	9.7	-
		M=1.83	SD=0.66	S=0.72			M=2.22	SD=0.77	S=0.15			M=2.30	SD=0.69	S=0.18		
6.	I feel that I benefitted from the general education offered in this institution.	2.4	4.8	71.4	21.4	-	-	5.9	82.3	11.8	-	-	4.4	70.8	24.8	-
		M=3.12	SD=0.59	S=-0.76			M=3.06	SD=0.42	S=0.40			M=3.20	SD=0.50	S=0.34		
7.	I feel that the knowledge and skills I gained from this institution are very useful.	-	11.9	52.4	35.7	-	-	5.9	62.7	31.4	-	-	2.7	57.5	38.9	0.9
		M=3.24	SD=0.66	S=-0.29			M=3.26	SD=0.56	S=0.02			M=3.34	SD=0.62	S=-1.28		
8.	I feel that the competence and skills I gained from this institution are relevant to my occupational career goals.	4.8	7.1	69.1	19	-	1	7.8	59.8	30.4	1	-	4.4	59.3	36.3	-
		M=3.02	SD=0.68	S=-1.00			M=3.18	SD=0.70	S=-1.15			M=3.32	SD=0.56	S=-0.04		

No.	IAIN Sunan Ampel (n=77)					Airlangga University (n=127)					IKIP Malang (N=108)					Total: 6 Institutions (n=569)				
	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
5.	3.9	23.4	53.2	19.5	-	4.7	31.5	53.6	10.2	-	7.4	50	37	5.6	-	4.6	32.2	50.2	13	-
	M=2.12	SD=0.76	S=0.35			M=2.31	SD=0.72	S=0.25			M=2.59	SD=0.71	S=-0.18			M=2.28	SD=0.75	S=0.16		
6.	-	16.9	67.5	14.3	1.3	1.6	4.7	71.7	22	-	-	4.6	79.7	15.7	-	0.5	6.5	74.3	18.5	0.2
	M=2.94	SD=0.66	S=-1.08			M=3.14	SD=0.56	S=-0.51			M=3.11	SD=0.44	S=0.56			M=3.10	SD=0.53	S=-0.40		
7.	-	15.6	70.1	14.3	-	0.8	1.6	62.9	33.9	0.8	-	3.7	67.6	28.7	-	0.2	5.6	62.9	30.9	0.4
	M=2.99	SD=0.55	S=-0.01			M=3.28	SD=0.62	S=-1.30			M=3.25	SD=0.51	S=0.29			M=3.24	SD=0.59	S=-0.58		
8.	5.2	15.6	55.8	23.4	-	1.6	6.3	60.6	30.7	0.8	1.9	9.3	59.2	29.6	-	1.9	8.1	59.9	29.7	0.4
	M=2.97	SD=0.78	S=-0.64			M=3.19	SD=0.69	S=-1.16			M=3.17	SD=0.66	S=-0.59			M=3.17	SD=0.68	S=-0.86		

No.	Statement	IAIN SGD Bandung (n=42)					IKIP Bandung (n=102)					Padjadjaran University (n=113)				
		DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
9.	The educational experience I obtained from this institution of higher education increased my ability to cope with problems in real life.	2.4	2.4	85.7	9.5	-	1	4.9	70.6	22.5	1	0.9	6.2	77.9	15	-
		M=3.02	SD=0.47	S=-1.41			M=3.13	SD=0.62	S=-1.34			M=3.07	SD=0.50	S=-0.29		
10.	The educational experience I obtained from this institution of higher education was out-of-date.	31	40.5	21.4	7.1	-	23.5	61.7	11.8	2	1	20.4	61.9	11.5	6.2	-
		M=2.95	SD=0.91	S=-0.52			M=3.05	SD=0.72	S=-1.04			M=2.97	SD=0.76	S=-0.83		
11.	I feel that the academic situation in this institution of higher education stimulated most students to attain the best possible performance.	7.1	47.6	40.5	4.8	-	3.9	29.4	58.8	6.9	1	6.2	32.7	54.9	6.2	-
		M=2.43	SD=0.70	S=0.04			M=2.67	SD=0.71	S=-0.78			M=2.61	SD=0.70	S=-0.40		

No.	IAIN Sunan Ampel (n=77)					Airlangga University (n=127)					IKIP Malang (n=108)					Total: 6 Institutions (n=569)				
	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
9.	2.6	15.6	64.9	15.6	1.3	0.8	13.4	73.2	11.8	0.8	1.9	14.8	65.7	17.6	-	1.4	10.2	72.1	15.8	0.5
	M=2.91	SD=0.73	S=-1.12			M=2.95	SD=0.60	S=-1.13			M=2.99	SD=0.63	S=-0.44			M=3.01	SD=0.60	S=-0.97		
10.	20.8	61	14.3	3.9	-	10.2	65.3	20.5	2.4	1.6	28.7	63.9	7.4	-	-	21.1	61.3	13.9	3.2	0.5
	M=2.99	SD=0.72	S=-0.64			M=2.80	SD=0.71	S=-1.16			M=3.21	SD=0.57	S=0.01			M=2.99	SD=0.72	S=-0.83		
11.	10.4	53.2	29.9	6.5	-	6.3	48.1	41.7	3.9	-	-	20.5	59.2	20.4	-	5.3	37.1	49	8.4	0.2
	M=2.33	SD=0.75	S=0.34			M=2.43	SD=0.67	S=0.01			M=3.00	SD=0.64	S=0.00			M=2.60	SD=0.73	S=-0.18		

No.	Statement	IAIN SGD Bandung (n=42)					IKIP Bandung (n=102)					Padjadjaran University (n=113)				
		DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
12.	As a student, I felt that the educational program of this institution of higher education was of good quality.	7.1	42.9	38.1	7.1	4.8	3.9	30.4	56.9	7.8	1	2.7	35.4	53.9	8	-
		M=2.36	SD=0.91	S=-0.58			M=2.67	SD=0.72	S=-0.68			M=2.67	SD=0.66	S=-0.10		
13.	As a student, I was satisfied with my achievement in this institution of higher education.	4.8	71.4	23.8	-	-	5.9	57.8	32.4	3.9	-	2.7	60.1	35.4	0.9	0.9
		M=2.19	SD=0.51	S=0.34			M=2.34	SD=0.65	S=0.39			M=2.33	SD=0.59	S=-0.23		
14.	I think that the teaching staff of this institution of higher education are generally of good quality.	9.5	50	28.6	11.9	-	7.8	33.3	54	4.9	-	1.8	42.5	53	2.7	-
		M=2.43	SD=0.83	S=0.37			M=2.56	SD=0.71	S=-0.46			M=2.57	SD=0.58	S=-0.12		
15.	As a student, I feel that most of the teaching staff of this institution of higher education were very kind and helpful to students	7.1	33.3	57.2	2.4	-	2	38.2	51	8.8	-	3.5	33.6	59.4	3.5	-
		M=2.55	SD=0.67	S=-0.69			M=2.67	SD=0.67	S=0.08			M=2.63	SD=0.62	S=-0.50		

No.	IAIN Sunan Ampel (n=77)					Airlangga University (n=127)					IKIP Malang (n=108)					Total: 6 Institutions (n=569)				
	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
12.	11.7	55.8	28.6	3.9	-	6.3	51.9	38.6	2.4	0.8	-	26.9	55.5	16.7	0.9	4.7	39.9	46.8	7.7	0.9
	M=2.25	SD=0.71	S=0.28			M=2.35	SD=0.67	S=-0.25			M=2.87	SD=0.71	S=-0.44			M=2.56	SD=0.74	S=-0.30		
13.	18.2	59.7	22.1	-	-	6.3	60.7	28.3	3.9	0.8	5.6	50.9	38	4.6	0.9	6.9	58.9	31.1	2.6	0.5
	M=2.04	SD=0.64	S=-0.03			M=2.28	SD=0.68	S=0.21			M=2.40	SD=0.71	S=-0.11			M=2.29	SD=0.65	S=0.09		
14.	22.1	49.3	26	2.6	-	8.7	49.6	40.9	0.8	-	3.7	24.1	62.9	9.3	-	8.1	40.4	46.9	4.6	-
	M=2.09	SD=0.76	S=0.21			M=2.34	SD=0.65	S=-0.28			M=2.78	SD=0.66	S=-0.52			M=2.48	SD=0.71	S=-0.22		
15.	13	42.8	41.6	2.6	-	6.3	42.5	48	2.4	0.8	1.9	37	54.6	6.5	-	5.1	38.3	51.8	4.6	0.2
	M=2.34	SD=0.74	S=-0.23			M=2.45	SD=0.69	S=-0.56			M=2.67	SD=0.53	S=-0.04			M=2.56	SD=0.67	S=-0.34		

No.	Statement	IAIN SGD Bandung (n=42)					IKIP Bandung (n=102)					Padjadjaran University (n=113)				
		DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
16.	I feel proud of this institution of higher education due to its high performance in research activities.	2.4	50	38.1	9.5	-	1	38.2	52.9	5.9	2	0.9	30.1	61.9	5.3	1.8
		M=2.55		SD=0.71		S=0.48	M=2.60		SD=0.71		S=-0.78	M=2.68		SD=0.67		S=-1.14
17.	As a student, I was dissatisfied with the high tuition that a student should pay.	4.8	35.7	42.8	16.7	-	3.9	32.4	41.1	20.6	2	2.7	31	43.2	20.4	2.7
		M=2.29		SD=0.81		S=0.01	M=2.16		SD=0.87		S=-0.12	M=2.11		SD=0.85		S=-0.21
18.	As a student, I feel that the administrative functions in this institution of higher education are well managed.	14.3	35.7	38.1	11.9	-	12.7	31.4	51.9	2	2	6.2	37.2	52.1	1.8	2.7
		M=2.48		SD=0.89		S=-0.03	M=2.39		SD=0.81		S=-0.84	M=2.44		SD=0.76		S=-1.07
19.	As a student, I was dissatisfied with most of the classrooms which were generally crowded.	4.8	28.6	35.6	31	-	5.9	8.7	42.2	42.2	1	-	11.5	54.9	32.7	0.9
		M=2.07		SD=0.89		S=0.28	M=1.77		SD=0.86		S=0.96	M=1.77		SD=0.66		S=0.08

No.	IAIN Sunan Ampel (n=77)					Airlangga University (n=127)					IKIP Malang (n=108)					Total: 6 Institutions (n=569)				
	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
16.	9.1	49.3	35.1	6.5	-	8.7	36.2	52	3.1	-	0.9	11.1	78.7	7.4	1.9	3.9	33.4	55.8	5.8	1.1
	M=2.39	SD=0.75	S=0.20			M=2.50	SD=0.70	S=-0.48			M=2.89	SD=0.62	S=-2.12			M=2.62	SD=0.70	S=-0.70		
17.	3.9	31.2	51.9	13	-	9.4	51.2	31.5	7.9	-	14.8	38.9	32.4	13	0.9	7	37.6	39.4	14.9	1.1
	M=2.26	SD=0.73	S=0.17			M=2.62	SD=0.77	S=-0.31			M=2.54	SD=0.93	S=-0.22			M=2.35	SD=0.86	S=-0.15		
18.	11.7	42.8	40.3	5.2	-	5.5	41	47.2	6.3	-	4.6	29.6	50.9	13	1.9	8.3	36.2	48.1	6.2	1.2
	M=2.39	SD=0.76	S=-0.07			M=2.54	SD=0.70	S=-0.09			M=2.69	SD=0.83	S=-0.66			M=2.50	SD=0.78	S=-0.51		
19.	7.8	28.6	45.4	18.2	-	5.5	17.3	48.1	29.1	-	7.4	17.6	46.3	27.8	0.9	5.1	17	46.8	30.6	0.5
	M=2.26	SD=0.85	S=0.26			M=1.99	SD=0.83	S=0.60			M=2.03	SD=0.89	S=0.51			M=1.96	SD=0.84	S=0.55		

No.	Statement	IAIN SGD Bandung (n=42)					IKIP Bandung (n=102)					Padjadjaran University (n=113)				
		DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
20.	As a student at this institution of higher education, I was satisfied with reading materials available in the library.	38.1	52.3	4.8	4.8	-	23.5	42.1	26.5	6.9	1	11.5	53.9	31	2.7	0.9
		M=1.76		SD=0.76		S=1.14	M=2.15		SD=0.89		S=0.21	M=2.23		SD=0.72		S=-0.08

No.	IAIN Sunan Ampel (n=77)					Airlangga University (n=127)					IKIP Malang (n=108)					Total: 6 Institutions (n=569)				
	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR	DS	D	A	AS	NR
20.	41.5	36.4	14.3	7.8	-	16.5	45.7	32.3	5.5	-	7.4	36.2	33.3	22.2	0.9	20	44.2	26.7	8.6	0.5
	M=1.88		SD=0.93		S=0.84	M=2.27		SD=0.80		S=0.14	M=2.69		SD=0.93		S=-0.17	M=2.23		SD=0.88		S=0.24

TABLE B.2

SUMMARY OF THE PERCENTAGES OF TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE ON USEFULNESS OF MEASURES BY INSTITUTION

No.	How useful is the following information for you to evaluate the efficiency and effectiveness of an institution of higher education?	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
1.	The grade point average of a student's entrance examination scores.	-	11.5	40.4	48.1	-	-	6	48.2	45.8	-	3.4	6.8	43.2	45.5	1.1
		M=3.37	SD=0.69	S=-0.62			M=3.40	SD=0.60	S=-0.45			M=3.28	SD=0.83	S=-1.44		
2.	The grade point average of a student's scores on high school examination.	1.9	11.5	48.1	38.5	-	4.8	18.1	49.4	27.7	-	6.8	18.2	43.2	30.7	1.1
		M=3.23	SD=0.73	S=-0.70			M=3.00	SD=0.81	S=-0.56			M=2.96	SD=0.93	S=-0.78		
3.	Student's sex.	26.9	19.2	44.3	9.6	-	32.5	19.3	39.8	8.4	-	48.9	19.3	25	5.7	1.1
		M=2.37	SD=0.99	S=-0.70			M=2.24	SD=1.01	S=-0.01			M=1.85	SD=1.00	S=0.59		
4.	Student's age.	11.5	13.5	57.7	15.4	1.9	22.9	27.7	39.8	8.4	1.2	28.4	18.2	45.5	6.8	1.1
		M=2.73	SD=0.93	S=-0.94			M=2.31	SD=0.96	S=-0.17			M=2.28	SD=0.99	S=-0.24		
5.	The place of origin of the student (residential origin).	38.5	19.2	32.7	7.7	1.9	33.8	32.5	27.7	6	-	42.1	22.7	27.3	6.8	1.1
		M=2.06	SD=1.06	S=0.19			M=2.06	SD=0.93	S=0.35			M=1.97	SD=1.01	S=0.41		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
1.	2	9.8	58.8	29.4	-	4.9	5.9	56.8	32.4	-	2.4	15.9	54.9	26.8	-	2.4	9	50.6	37.8	0.2
	M=3.16	SD=0.67	S=-0.60			M=3.17	SD=0.75	S=-1.01			M=3.06	SD=0.73	S=-0.49			M=3.23	SD=0.73	S=-0.90		
2.	2	15.7	49	33.3	-	15.7	21.6	44.1	18.6	-	4.9	23.2	51.2	20.7	-	7	18.8	47.1	26.9	0.2
	M=3.14	SD=0.75	S=-0.53			M=2.66	SD=0.96	S=-0.36			M=2.88	SD=0.79	S=-0.39			M=2.93	SD=0.87	S=-0.60		
3.	29.4	23.5	41.2	5.9	-	53.9	23.5	15.7	6.9	-	53.6	15.9	25.6	4.9	-	43.2	20.1	29.7	6.8	0.2
	M=2.24	SD=0.95	S=-0.06			M=1.76	SD=0.96	S=0.99			M=1.82	SD=0.98	S=0.70			M=2.00	SD=1.01	S=0.40		
4.	21.6	21.6	45	11.8	-	29.4	34.4	28.4	7.8	-	28	36.6	29.3	6.1	-	24.9	26.6	39.1	8.7	0.7
	M=2.47	SD=0.97	S=-0.26			M=2.15	SD=0.94	S=0.29			M=2.13	SD=0.90	S=0.25			M=2.30	SD=0.96	S=-0.09		
5.	48.9	27.5	19.6	2	2	59.8	20.6	15.7	3.9	-	40.3	28	28	3.7	-	44.5	25.1	24.7	5	0.7
	M=1.71	SD=0.88	S=0.62			M=1.64	SD=0.89	S=1.13			M=1.95	SD=0.95	S=0.40			M=1.89	SD=0.95	S=0.53		

No.	Statement	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
6.	The kind of high school previously attended by the student.	7.7	13.5	40.3	38.5	-	9.6	13.3	47	30.1	-	17	23.9	35.2	23.9	-
		M=3.10	SD=0.91	S=-0.84			M=2.98	SD=0.91	S=-0.75			M=2.66	SD=1.03	S=-0.25		
7.	Number of students registered in an institution of higher education.	1.9	11.5	57.8	28.8	-	3.6	21.7	48.2	26.5	-	5.7	10.2	56.8	27.3	-
		M=3.14	SD=0.69	S=-0.56			M=2.98	SD=0.80	S=-0.40			M=3.06	SD=0.78	S=-0.85		
8.	Number of students registered in undergraduate studies.	1.9	7.7	57.7	32.7	-	3.6	3.6	59.1	33.7	-	4.5	10.2	60.3	25	-
		M=3.21	SD=0.67	S=-0.68			M=3.23	SD=0.69	S=-1.02			M=3.06	SD=0.73	S=-0.81		
9.	Number of students registered in postgraduate studies.	1.9	3.8	59.7	34.6	-	2.4	4.8	61.5	31.3	-	3.4	9.1	53.4	34.1	-
		M=3.27	SD=0.63	S=-0.76			M=3.22	SD=0.65	S=-0.79			M=3.18	SD=0.74	S=-0.83		
10.	Faculty member's teaching experience.	-	3.8	25	71.2	-	-	2.4	38.6	59	-	1.1	2.3	22.7	73.9	-
		M=3.67	SD=0.55	S=-1.47			M=3.57	SD=0.55	S=-0.73			M=3.69	SD=0.58	S=-2.11		
11.	The highest level of education that a faculty member has completed.	-	5.8	26.9	67.3	-	-	3.6	47	49.4	-	-	3.4	27.3	69.3	-
		M=3.62	SD=0.60	S=-1.32			M=3.46	SD=0.57	S=-0.44			M=3.66	SD=0.54	S=-1.32		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
6.	7.8	15.7	45.1	31.4	-	20.6	26.5	38.2	14.7	-	8.5	23.2	57.3	11	-	12.9	20.3	43.7	23.1	-
	M=3.00	SD=0.89	S=-0.70			M=2.47	SD=0.98	S=-0.11			M=2.71	SD=0.78	S=-0.56			M=2.77	SD=0.95	S=-0.44		
7.	2	17.6	60.8	19.6	-	6.9	15.7	48.9	27.5	1	4.9	19.5	43.9	30.5	1.2	4.6	16.2	51.7	27.1	0.4
	M=2.98	SD=0.68	S=-0.38			M=2.95	SD=0.89	S=-0.84			M=2.98	SD=0.90	S=-0.78			M=3.00	SD=0.81	S=-0.73		
8.	3.9	9.8	66.7	19.6	-	2	19.6	54.9	22.5	1	8.5	15.9	46.4	28	1.2	4.1	11.8	56.8	26.9	0.4
	M=3.02	SD=0.68	S=-0.82			M=2.96	SD=0.77	S=-0.77			M=2.92	SD=0.95	S=-0.82			M=3.06	SD=0.77	S=-0.88		
9.	5.9	7.8	60.8	25.5	-	2.9	16.7	50	29.4	1	6.1	14.6	47.6	31.7	-	3.7	10.3	54.6	31.2	0.2
	M=3.06	SD=0.76	S=-0.96			M=3.04	SD=0.82	S=-0.84			M=3.05	SD=0.85	S=-0.72			M=3.13	SD=0.75	S=-0.86		
10.	-	2	31.4	66.6	-	1	3.9	27.5	66.6	1	1.2	3.7	30.5	63.4	1.2	0.7	3.1	29.2	66.6	0.4
	M=3.65	SD=0.52	S=-1.07			M=3.58	SD=0.71	S=-2.23			M=3.54	SD=0.74	S=-2.19			M=3.61	SD=0.63	S=-1.95		
11.	-	-	37.3	62.7	-	1	1	31.4	66.6	-	1.2	4.9	35.4	58.5	-	0.4	3.1	34.3	62.2	-
	M=3.63	SD=0.49	S=-0.54			M=3.64	SD=0.56	S=-1.60			M=3.51	SD=0.65	S=-1.28			M=3.58	SD=0.58	S=-1.16		

No.	Statement	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
12.	Faculty member's academic rank.	-	11.5	50	38.5	-	3.6	24.1	50.6	21.7	-	5.7	10.2	53.4	30.7	-
		M=3.27 SD=0.66 S=-0.35					M=2.90 SD=0.78 S=-0.31					M=3.09 SD=0.80 S=-0.86				
13.	Faculty member's teaching load.	-	1.9	48.1	50	-	-	4.8	38.6	56.6	-	-	5.7	45.5	48.8	-
		M=3.48 SD=0.54 S=-0.31					M=3.52 SD=0.59 S=-0.80					M=3.43 SD=0.60 S=-0.54				
14.	Faculty member's other job. (If he has another job in another institution or office.)	15.4	17.3	51.9	13.5	1.9	8.4	24.1	41	26.5	-	9.1	10.2	60.2	18.2	2.3
		M=2.60 SD=0.98 S=-0.68					M=2.86 SD=0.91 S=-0.40					M=2.83 SD=0.91 S=-1.14				
15.	Number of faculty in an institution of higher education.	1.9	5.8	40.4	51.9	-	1.2	4.8	47	45.8	1.2	2.3	3.4	33	61.3	-
		M=3.42 SD=0.70 S=-1.17					M=3.45 SD=0.74 S=-1.59					M=3.53 SD=0.68 S=-1.60				
16.	Number of faculty who are Professors, Senior Lecturers or Lecturers.	-	-	36.5	63.5	-	1.2	9.6	37.3	51.9	-	3.4	1.1	39.8	55.7	-
		M=3.64 SD=0.49 S=-0.58					M=3.40 SD=0.72 S=-0.96					M=3.48 SD=0.69 S=-1.60				
17.	Total expenditure of an institution of higher education.	-	7.7	26.9	65.4	-	-	6	28.9	65.1	-	1.1	5.7	27.3	65.9	-
		M=3.58 SD=0.64 S=-1.25					M=3.59 SD=0.61 S=-1.20					M=3.58 SD=0.66 S=-1.55				

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
12.	3.9	3.9	54.9	35.3	2	5.9	12.7	53	28.4	-	3.7	26.8	39	30.5	-	4.1	15.7	50.1	29.9	0.2
	M=3.18	SD=0.84	S=-1.61			M=3.04	SD=0.81	S=-0.76			M=2.96	SD=0.85	S=-0.30			M=3.05	SD=0.80	S=-0.69		
13.	-	5.9	54.9	39.2	-	2	2	42.2	53.8	-	1.2	-	29.3	69.5	-	0.7	3.3	41.9	54.1	-
	M=3.33	SD=0.59	S=-0.23			M=3.48	SD=0.64	S=-1.31			M=3.67	SD=0.55	S=-1.89			M=3.50	SD=0.60	S=-0.92		
14.	2	35.3	54.8	5.9	2	9.8	18.6	41.2	30.4	-	6.1	23.2	39	31.7	-	8.5	20.5	47.2	22.9	0.9
	M=2.61	SD=0.72	S=-0.89			M=2.92	SD=0.94	S=-0.57			M=2.96	SD=0.90	S=-0.46			M=2.83	SD=0.91	S=-0.62		
15.	2	7.8	43.1	47.1	-	-	4.9	40.2	54.9	-	1.2	3.7	34.1	61	-	1.3	4.8	39.3	54.4	0.2
	M=3.35	SD=0.72	S=-0.99			M=3.50	SD=0.59	S=-0.73			M=3.55	SD=0.63	S=-1.39			M=3.46	SD=0.67	S=-1.30		
16.	11.8	35.3	52.9	-	-	2	6.9	38.2	51.9	1	1.2	8.5	56.2	34.1	-	1.5	6.3	41	51	0.2
	M=3.41	SD=0.70	S=-0.77			M=3.38	SD=0.78	S=-1.55			M=3.23	SD=0.65	S=-0.55			M=3.41	SD=0.70	S=-1.18		
17.	2	7.8	25.5	64.7	-	1	7.9	49	42.2	-	1.2	3.7	14.1	81	-	0.9	6.3	33.4	59.4	-
	M=3.53	SD=0.73	S=-1.55			M=3.32	SD=0.66	SD=-0.68			M=3.55	SD=0.63	S=-1.39			M=3.51	SD=0.66	S=-1.20		

No.	Statement	IAIN SGD Bandung (n=52)					IKIP Bandung (n=83)					Padjadjaran University (n=88)				
		NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
18.	Instructional expenditure.	-	1.9	26.9	71.2	-	-	2.4	34.9	62.7	-	2.3	3.4	37.3	67	-
		M=3.69	SD=0.51	S=-1.32			M=3.60	SD=0.54	S=-0.90			M=3.59	SD=0.67	S=-1.85		
19.	Number of classrooms.	-	-	40.4	59.6	-	1.2	3.6	31.3	62.7	1.2	1.1	1.1	21.6	76.2	-
		M=3.60	SD=0.50	S=-0.40			M=3.53	SD=0.74	S=-2.16			M=3.73	SD=0.54	S=-2.33		
20.	Total number of volumes available in the library.	-	1.9	25	73.1	-	-	2.4	22.9	73.5	1.2	1.1	3.4	12.5	83	-
		M=3.71	SD=0.50	S=-1.45			M=3.68	SD=0.65	S=-2.91			M=3.77	SD=0.56	S=-2.80		
21.	Number of administrative officials and supporting staff.	-	5.8	46.2	48	-	-	10.8	49.4	39.8	-	2.3	10.2	51.1	36.4	-
		M=3.42	SD=0.61	S=-0.52			M=3.29	SD=0.65	S=-0.38			M=3.22	SD=0.72	S=-0.73		
22.	The percentage of enrolment who are female.	32.7	32.7	30.8	-	3.8	31.3	39.8	26.5	2.4	-	50	14.8	28.4	5.7	1.1
		M=1.90	SD=0.89	S=-0.15			M=2.00	SD=0.83	S=0.27			M=1.88	SD=1.03	S=0.52		
23.	The percentage of faculty with earned doctorate.	-	13.5	46.1	40.4	-	2.4	15.7	47	33.7	1.2	1.1	10.2	37.6	51.1	-
		M=3.27	SD=0.69	S=-0.41			M=3.10	SD=0.84	S=-0.96			M=3.39	SD=0.72	S=-0.92		
24.	The percentage of faculty who are professors, senior lecturers and lecturers.	-	7.7	59.6	32.7	-	2.4	9.6	56.7	31.3	-	5.7	8	36.4	48.8	1.1
		M=3.25	SD=0.59	S=-0.11			M=3.17	SD=0.70	S=-0.69			M=3.26	SD=0.92	S=-1.37		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
18.	2	7.8	23.5	66.7	-	-	4.9	46.1	49	-	-	3.7	32.9	63.4	-	0.7	3.9	33.4	62	-
	M=3.55	SD=0.73	S=-1.62			M=3.44	SD=0.59	S=-0.51			M=3.60	SD=0.56	S=-1.03			M=3.57	SD=0.60	S=-1.25		
19.	2	9.8	41.2	47	-	1	4.9	24.5	68.6	1	-	2.4	34.1	62.3	1.2	0.9	3.5	30.6	64.3	0.7
	M=3.33	SD=0.74	S=-0.94			M=3.59	SD=0.72	S=-2.24			M=3.56	SD=0.67	S=-2.26			M=3.57	SD=0.67	S=-2.00		
20.	-	5.9	3.9	90.2	-	-	2	21.6	76.4	-	-	2.4	22	75.6	-	0.2	2.8	18.6	78.2	0.2
	M=3.84	SD=0.51	S=-3.20			M=3.75	SD=0.48	S=-1.67			M=3.73	SD=0.50	S=-1.66			M=3.74	SD=0.54	S=-2.42		
21.	-	9.8	51	39.2	-	1	8.8	60.8	29.4	-	1.2	4.9	54.9	39	-	0.9	8.5	53	37.6	-
	M=3.29	SD=0.64	S=-0.35			M=3.19	SD=0.63	S=-0.40			M=3.32	SD=0.63	S=-0.66			M=3.27	SD=0.65	S=-0.53		
22.	23.5	31.4	43.1	2	-	48	32.4	15.7	3.9	-	45.1	30.5	20.7	3.7	-	40.3	29.9	25.8	3.3	0.7
	M=2.24	SD=0.84	S=-0.26			M=1.78	SD=0.86	S=0.88			M=1.83	SD=0.89	S=0.67			M=1.91	SD=0.90	S=0.40		
23.	2	9.8	52.9	35.3	-	2	15.7	36.3	46	-	1.2	12.2	43.9	42.7	-	1.5	13.1	42.8	42.4	0.2
	M=3.22	SD=0.70	S=-0.69			M=3.27	SD=0.80	S=-0.76			M=3.28	SD=0.73	S=-0.68			M=3.26	SD=0.76	S=-0.80		
24.	2	13.7	49	35.3	-	2	9.8	48	40.2	-	2.4	15.9	46.3	35.4	-	2.6	10.7	48.5	38	0.2
	M=3.18	SD=0.74	S=-0.60			M=3.27	SD=0.72	S=-0.77			M=3.15	SD=0.77	S=-0.59			M=3.21	SD=0.75	S=-0.87		

No.	Statement	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
25.	The percentage of faculty with permanent status (full-time).	-	1.9	46.2	51.9	-	-	4.8	43.4	51.8	-	2.3	3.4	31.8	61.4	1.1
		M=3.50	SD=0.54	S=-0.38			M=3.47	SD=0.59	S=-0.61			M=3.50	SD=0.77	S=-2.06		
26.	The percentage of total budget of an institution of higher education spent on capital expenditure.	1.9	5.8	55.8	36.5	-	-	10.8	50.6	38.6	-	1.1	9.1	38.6	48.9	2.3
		M=3.27	SD=0.66	S=-0.78			M=3.28	SD=0.65	S=-0.34			M=3.31	SD=0.86	S=-1.63		
27.	The percentage of total expenditure of an institution of higher education spent on faculty salaries.	3.8	5.8	53.9	36.5	-	2.4	14.5	37.3	45.8	-	2.3	6.8	35.2	54.6	1.1
		M=3.23	SD=0.73	S=-1.02			M=3.27	SD=0.80	S=-0.81			M=3.40	SD=0.81	S=-1.65		
28.	Expenditure (cost) per student.	1.9	13.5	61.5	23.1	-	3.6	10.8	49.5	36.1	-	5.7	17	42.1	34.1	1.1
		M=3.06	SD=0.67	S=-0.47			M=3.18	SD=0.77	S=-0.82			M=3.02	SD=0.92	S=-0.86		
29.	The average actual length of time for completing a B.A. degree.	-	3.8	52	44.2	-	-	4.8	49.4	45.8	-	-	5.7	45.5	47.7	1.1
		M=3.40	SD=0.57	S=-0.27			M=3.41	SD=0.59	S=-0.39			M=3.39	SD=0.70	S=-1.52		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
25.	-	7.8	29.4	62.8	-	-	4.9	35.3	59.8	-	-	3.7	34.1	62.2	-	0.4	4.4	36.5	58.5	0.2
	M=3.55 SD=0.64 S=-1.13					M=3.55 SD=0.59 S=-0.93					M=3.59 SD=0.57 S=-0.98					M=3.53 SD=0.62 S=-1.29				
26.	7.8	17.6	47.1	27.5	-	1	17.6	45.1	36.3	-	2.4	18.3	43.9	35.4	-	2	13.5	46.1	38	0.4
	M=2.94 SD=0.88 S=-0.61					M=3.17 SD=0.75 S=-0.43					M=3,12 SD=0.79 S=-0.53					M=3.19 SD=0.77 S=-0.83				
27.	9.8	11.8	43.1	35.3	-	2.9	9.8	52	35.3	-	8.5	9.8	46.4	34.1	1.2	4.6	9.8	44.4	40.8	0.4
	M=3.04 SD=0.94 S=-0.84					M=3.20 SD=0.73 S=-0.79					M=3.04 SD=0.95 S=-1.05					M=3.21 SD=0.33 S=-1.07				
28.	11.8	19.6	45.1	23.5	-	2.9	28.4	43.2	24.5	1	1.2	14.6	46.4	37.8	-	4.1	17.9	46.9	30.6	0.4
	M=2.80 SD=0.94 S=-0.50					M=2.87 SD=0.85 S=-0.44					M=3.21 SD=0.73 S=-0.54					M=3.03 SD=0.83 S=-0.68				
29.	-	9.8	58.8	31.4	-	-	10.8	55.9	33.3	-	-	9.8	45.1	45.1	-	-	7.6	50.7	41.5	0.2
	M=3.22 SD=0.61 S=-0.14					M=3.23 SD=0.63 S=-0.21					M=3.35 SD=0.66 S=-0.52					M=3.33 SD=0.63 S=-0.62				

No.	Statement	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
30.	The average actual length of time for completing an M.A. degree after the B.A. degree.	-	7.7	48.1	44.2	-	-	10.8	43.4	45.8	-	1.1	5.7	45.5	46.6	1.1
		M=3.37	SD=0.63	S=-0.46			M=3.35	SD=0.67	S=-0.55			M=3.35	SD=0.74	S=-1.54		
31.	The average actual length of time for completing a Dr. degree after the M.A. degree.	3.8	11.5	52	32.7	-	2.4	20.5	43.4	33.7	-	4.5	12.5	47.8	34.1	1.1
		M=3.14	SD=0.77	S=-0.78			M=3.08	SD=0.80	S=-0.45			M=3.09	SD=0.87	S=-1.05		
32.	Percentage of administrative officials with M.A. or Dr. degree.	13.5	28.8	42.3	15.4	-	18.1	34.9	32.5	13.3	1.2	15.9	30.7	40.9	11.4	1.1
		M=2.60	SD=0.91	S=-0.22			M=2.39	SD=0.97	S=-0.04			M=2.46	SD=0.93	S=-0.26		
33.	Library books per student.	3.8	3.8	30.8	61.6	-	1.2	10.8	31.3	56.7	-	1.1	3.4	27.3	68.2	-
		M=3.50	SD=0.75	S=-1.71			M=3.43	SD=0.74	S=-1.08			M=3.63	SD=0.61	S=-1.72		
34.	The square metre area per student available in a classroom.	-	17.3	42.3	40.4	-	4.8	7.2	44.6	43.4	-	-	11.4	26.1	62.5	-
		M=3.23	SD=0.73	S=-0.39			M=3.27	SD=0.80	S=-1.11			M=3.51	SD=0.70	S=-1.09		
35.	The average number of students per class.	3.8	9.6	44.3	40.4	1.9	3.6	4.8	44.6	47	-	1.1	6.8	34.1	58	-
		M=3.17	SD=0.90	SD=-1.36			M=3.35	SD=0.74	S=-1.22			M=3.49	SD=0.68	S=-1.20		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
30.	-	15.7	56.8	27.5	-	-	9.8	54.9	35.3	-	-	7.3	45.1	47.6	-	0.2	9.2	48.7	41.7	0.2
	M=3.12 SD=0.65 S=-0.12					M=3.26 SD=0.62 S=-0.24					M=3.40 SD=0.63 S=-0.55					M=3.31 SD=0.66 S=-0.68				
31.	2	29.4	52.9	13.7	2	4.9	20.6	49	25.5	-	-	12.2	50	37.8	-	3.1	17.5	48.7	30.3	0.4
	M=2.75 SD=0.80 S=-0.74					M=2.95 SD=0.81 S=-0.47					M=3.26 SD=0.66 S=-0.34					M=3.06 SD=0.80 S=-0.67				
32.	13.7	29.4	53	3.9	-	15.7	39.2	40.2	4.9	-	6.1	48.8	37.8	7.3	-	14	36.2	40.2	9.2	0.4
	M=2.47 SD=0.78 S=-0.55					M=2.34 SD=0.80 S=-0.12					M=2.46 SD=0.72 S=0.23					M=2.44 SD=0.86 S=-0.14				
33.	2	17.6	23.5	56.9	-	1	4.9	32.4	61.7	-	-	7.3	26.8	65.9	-	1.3	7.4	29	62.3	-
	M=3.35 SD=0.84 S=-0.97					M=3.55 SD=0.64 S=-1.35					M=3.58 SD=0.63 S=-1.25					M=3.52 SD=0.69 S=-1.36				
34.	5.9	31.4	43.1	17.6	2	2	14.7	39.2	43.1	1	3.7	8.5	48.8	39	-	2.6	13.8	40.2	43	0.4
	M=2.69 SD=0.91 S=-0.50					M=3.22 SD=0.84 S=-1.04					M=3.23 SD=0.76 S=-0.94					M=3.23 SD=0.81 S=-0.93				
35.	5.9	23.5	54.9	13.7	2	2	4.9	35.3	57.8	-	1.2	-	53.7	43.9	1.2	2.6	7	43.2	46.5	0.7
	M=2.73 SD=0.85 S=-0.85					M=3.49 SD=0.69 S=-1.37					M=3.38 SD=0.68 S=-1.85					M=3.32 SD=0.77 S=-1.32				

No.	Statement	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
36.	Graduate's grade point average.	-	9.6	44.2	46.2	-	1.2	13.3	50.6	34.9	-	2.3	8	55.6	34.1	-
		M=3.37	SD=0.66	S=-0.55			M=3.19	SD=0.71	S=-0.50			M=3.22	SD=0.69	S=-0.74		
37.	Graduate's grade point average on general achievement.	-	17.3	63.5	19.2	-	3.6	19.3	60.2	16.9	-	5.7	18.2	67	9.1	-
		M=3.02	SD=0.61	S=-0.01			M=2.90	SD=0.71	S=-0.49			M=2.80	SD=0.68	S=-0.84		
38.	Graduate's grade point average on professional achievement.	1.9	5.8	34.6	57.7	-	2.4	4.8	41	51.8	-	3.4	5.7	42	47.8	1.1
		M=3.48	SD=0.70	S=-1.36			M=3.42	SD=0.70	S=-1.24			M=3.32	SD=0.82	S=-1.54		
39.	Graduate's grade point average on major achievement.	-	1.9	40.4	57.7	-	3.6	4.8	44.6	47	-	1.1	5.7	35.2	58	-
		M=3.56	SD=0.54	S=-0.63			M=3.35	SD=0.74	S=-1.22			M=3.50	SD=0.66	S=-1.22		
40.	The actual amount of time needed to complete a degree.	1.9	5.8	38.5	53.8	-	3.6	8.4	45.8	42.2	-	-	8	40.9	51.1	-
		M=3.44	SD=0.70	S=-1.23			M=3.27	SD=0.77	S=-1.00			M=3.43	SD=0.64	S=-0.68		
41.	The mean score in a course.	1.9	5.8	55.8	36.5	-	4.8	12	57.9	25.3	-	4.5	21.6	51.2	22.7	-
		M=3.27	SD=0.66	S=-0.78			M=3.04	SD=0.76	S=-0.75			M=2.92	SD=0.79	S=-0.43		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
36.	-	7.8	66.7	25.5	-	1	8.8	61.7	27.5	1	3.7	8.5	42.7	45.1	-	1.5	9.4	53.7	35.2	0.2
	M=3.18	SD=0.56	S=0.07			M=3.14	SD=0.69	S=-1.11			M=3.29	SD=0.78	S=-1.05			M=3.22	SD=0.69	S=-0.76		
37.	2	27.5	60.7	7.8	2	3.9	24.5	61.8	9.8	-	6.1	19.5	58.5	15.9	-	3.9	21	62	12.9	0.2
	M=2.71	SD=0.73	S=-1.09			M=2.78	SD=0.67	S=-0.49			M=2.84	SD=0.76	S=-0.58			M=2.83	SD=0.70	S=-0.61		
38.	-	5.9	54.9	39.2	-	-	9.8	58.8	31.4	-	3.7	8.5	41.5	46.3	-	2	7	46	44.8	0.2
	M=3.33	SD=0.59	S=-0.23			M=3.22	SD=0.61	S=-0.14			M=3.31	SD=0.78	S=-1.08			M=3.33	SD=0.71	S=-1.06		
39.	-	2	45.1	52.9	-	-	7.8	52	40.2	-	1.2	8.5	36.6	52.5	1.2	1.1	5.7	42.6	50.4	0.2
	M=3.51	SD=0.54	S=-0.43			M=3.32	SD=0.62	S=-0.33			M=3.38	SD=0.80	S=-1.55			M=3.42	SD=0.67	S=-1.12		
40.	-	17.6	53	29.4	-	2.9	2.9	57.9	36.3	-	-	7.3	41.5	51.2	-	1.5	7.6	46.8	44.1	-
	M=3.12	SD=0.68	S=-0.15			M=3.28	SD=0.66	S=-0.99			M=3.4[illegible]	SD=0.[illegible]	S=-0.67			M=3.33	SD=0.68	S=-0.83		
41.	-	13.7	66.7	19.6	-	2	13.7	61.8	22.5	-	3.7	19.5	48.[illegible]	28	-	3.1	15.1	56.5	25.3	-
	M=3.06	SD=0.58	S=0.00			M=3.05	SD=0.67	S=-0.46			M=3.01	SD=0.[illegible]9	S=-0.48			M=3.04	SD=0.73	S=-0.55		

No.	Statement	IAIN SGD Bandung (n=52) NU	SU	U	VU	NR	IKIP Bandung (n=83) NU	SU	U	VU	NR	Padjadjaran University (n=88) NU	SU	U	VU	NR
42.	The percentage of students who left an institution before getting a degree (drop-outs).	7.7	19.2	55.8	17.3	-	9.6	4.8	54.3	31.3	-	5.7	12.5	40.9	40.9	-
		M=2.83	SD=0.81	S=-0.59			M=3.07	SD=0.87	S=-1.06			M=3.17	SD=0.86	S=-0.89		
43.	The number of students graduating as the percentage of their entering class.	1.9	7.7	50	38.5	1.9	1.2	10.8	45.8	41	1.2	1.1	5.7	34.1	58	1.1
		M=3.21	SD=0.83	S=-1.51			M=3.24	SD=0.79	S=-1.22			M=3.47	SD=0.76	S=-1.83		
44.	Number of graduates.	-	3.8	57.8	34.6	3.8	1.2	7.2	42.2	49.4	-	2.3	2.3	43.2	52.2	-
		M=3.19	SD=0.84	S=-2.03			M=3.40	SD=0.68	S=-0.93			M=3.46	SD=0.66	S=-1.31		
45.	Number of B.A. graduates.	-	7.7	55.8	34.6	1.9	1.2	8.4	48.2	42.2	-	2.3	5.7	54.5	37.5	-
		M=3.21	SD=0.75	S=-1.53			M=3.31	SD=0.68	S=-0.72			M=3.27	SD=0.67	S=-0.85		
46.	Number of M.A. graduates.	-	3.8	53.9	40.4	1.9	1.2	6	48.2	44.6	-	2.3	1.1	39.8	56.8	-
		M=3.31	SD=0.73	S=-1.82			M=3.36	SD=0.66	S=-0.80			M=3.51	SD=0.64	S=-1.50		
47.	Number of doctorate graduates.	1.9	5.8	57.7	30.8	3.8	2.4	16.9	47	32.5	1.2	1.1	8	44.3	46.6	-
		M=3.10	SD=0.89	S=-1.75			M=3.07	SD=0.84	S=-0.90			M=3.36	SD=0.68	S=-0.83		

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
42.	13.7	19.6	52.9	11.8	2	7.8	17.6	46.2	28.4	-	3.7	15.9	37.8	42.6	-	7.6	14.4	47	30.8	0.2
	M=2.59	SD=0.94	S=-0.71			M=2.95	SD=0.88	S=-0.61			M=3.20	SD=0.84	S=-0.77			M=3.00	SD=0.88	S=-0.76		
43.	5.9	13.7	49	27.5	3.9	2	6.9	50.9	40.2	-	-	12.2	31.7	54.9	1.2	1.7	9.2	43	44.8	1.3
	M=2.90	SD=1.01	S=-1.15			M=3.29	SD=0.68	S=-0.83			M=3.39	SD=0.80	S=-1.43			M=3.28	SD=0.81	S=-1.36		
44.	2	5.9	60.7	31.4	-	2	4.9	59.7	32.4	1	1.2	8.5	48.8	41.5	-	1.5	5.5	51.3	41	0.7
	M=3.22	SD=0.64	S=-0.70			M=3.21	SD=0.71	S=-1.34			M=3.31	SD=0.68	S=-0.71			M=3.31	SD=0.70	S=-1.23		
45.	2	5.9	64.6	27.5	-	2.9	8.8	60.8	25.5	2	1.2	12.2	46.4	40.2	-	1.7	8.3	54.6	34.7	0.7
	M=3.18	SD=0.62	S=-0.65			M=3.05	SD=0.80	S=-1.39			M=3.26	SD=0.72	S=-0.63			M=3.21	SD=0.72	S=-1.05		
46.	2	11.8	52.9	33.3	-	2	5.9	60.7	30.4	1	1.2	4.9	51.2	42.7	-	1.5	5.2	51.2	41.7	0.4
	M=3.18	SD=0.71	S=-0.62			M=3.18	SD=0.71	S=-1.29			M=3.35	SD=0.64	S=-0.76			M=3.32	SD=0.68	S=-1.13		
47.	3.9	23.5	56.9	15.7	-	3.9	14.7	50	30.4	1	2.4	11	41.5	45.1	-	2.6	13.1	48.5	34.9	0.9
	M=2.84	SD=0.73	S=-0.38			M=3.05	SD=0.84	S=-0.92			M=3.29	SD=0.76	S=-0.90			M=3.14	SD=0.80	S=-0.97		

No.	Statement	IAIN SGD Bandung (n=52)					IKIP Bandung (n=83)					Padjadjaran University (n=88)				
		NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
48.	Number of research projects completed.	-	5.8	50	42.3	1.9	-	8.4	44.6	47	-	2.3	6.8	40.9	50	-
		M=3.31	SD=0.76		S=-1.72		M=3.39	SD=0.64		S=-0.56		M=3.39	SD=0.72		S=-1.11	
49.	Number of the publications of the faculty.	-	3.8	40.4	53.9	1.9	-	13.2	43.4	43.4	-	2.3	4.5	40.9	52.3	-
		M=3.44	SD=0.75		S=-2.10		M=3.30	SD=0.69		S=-0.48		M=3.43	SD=0.69		S=-1.24	

No.	IAIN Sunan Ampel (n=51)					Airlangga University (n=102)					IKIP Malang (n=82)					Total: 6 Institutions (n=458)				
	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR	NU	SU	U	VU	NR
48.	-	13.7	53	33.3	-	1	9.8	57.8	30.4	1	1.2	8.6	45.1	45.1	-	0.9	8.7	48.5	41.5	0.4
	M=3.20	SD=0.66		S=-0.24		M=3.16	SD=0.71		S=-1.07		M=3.34	SD=0.69		S=-0.80		M=3.3-	SD=0.70		S=-0.94	
49.	-	17.6	52.9	27.5	2	-	4.9	49	46.1	-	1.2	7.3	31.7	59.8	-	0.7	8.1	42.8	48	0.4
	M=3.04	SD=0.80		S=-1.05		M=3.14	SD=0.59		S=-0.40		M=3.50	SD=0.69		S=-1.27		M=3.37	SD=0.70		S=-1.09	

TABLE B.3

PERCENTAGES OF ADMINISTRATORS' RESPONSES TO THE QUESTIONNAIRE ON THE USEFULNESS OF MEASURES FOR EVALUATING THE EFFICIENCY AND EFFECTIVENESS OF AN INSTITUTION OF HIGHER EDUCATION

How useful is the following information for you to evaluate the efficiency and effectiveness of your institution of higher education?	NU	SU	U	VU	NR
1. The grade point average of a student's entrance examination scores.	3.3	6.7	46.7	43.3	-
	M=3.30	SD=0.75	S=-1.09		
2. The grade point average of a student's scores on high school examination.	10	13.3	60.0	16.7	-
	M=2.83	SD=0.83	S=-0.81		
3. Student's sex.	26.7	33.3	33.3	6.7	-
	M=2.20	SD=0.93	S=0.14		
4. Student's age.	23.3	36.7	30	10	-
	M=2.27	SD=0.94	S=0.21		
5. The place of origin of the student (residential origin).	26.7	43.4	23.3	3.3	3.3
	M=1.97	SD=0.89	S=0.07		
6. The kind of high school previously attended by the student.	10	16.7	46.6	26.7	-
	M=2.90	SD=0.92	S=-0.6		
7. Number of students registered in an institution of higher education.	3.3	13.3	63.4	16.7	3.3
	M=2.87	SD=0.86	S=-1.47		
8. Number of students registered in undergraduate studies.	6.7	10	73.3	10	-
	M=2.87	SD=0.68	S=-1.23		
9. Number of students registered in postgraduate studies.	-	13.3	66.7	20	-
	M=3.07	SD=0.58	S=0.00		
10. Faculty member's teaching experience.	-	-	30	70	-
	M=3.70	SD=0.47	S=-0.92		

	NU	SU	U	VU	NR
11. The highest level of education that a faculty member has completed.	-	-	40	60	-
	M=3.60	SD=0.50	S=-0.43		
12. Faculty member's academic rank.	-	-	76.7	23.3	-
	M=3.23	SD=0.43	S=1.33		
13. Faculty member's teaching load.	-	-	40	60	-
	M=3.60	SD=0.50	S=-0.43		
14. Faculty member's other job. (If he has another job in another institution or office.)	3.3	13.3	60.1	23.3	-
	M=3.03	SD=0.72	S=-0.65		
15. Number of faculty in an institution of higher education.	-	-	40	60	-
	M=3.60	SD=0.50	S=-0.43		
16. Number of faculty who are Professors, Senior Lecturers or Lecturers.	-	6.7	36.7	56.6	-
	M=3.50	SD=0.63	S=-0.89		
17. Total expenditure of an institution of higher education.	-	3.3	26.7	70	-
	M=3.67	SD=0.55	S=-1.41		
18. Instructional expenditure.	-	6.7	13.3	80	-
	M=3.73	SD=0.58	S=-2.15		
19. Number of classrooms.	-	-	30	70	-
	M=3.70	SD=0.47	S=-0.92		
20. Total number of volumes available in the library.	-	6.7	10	83.3	-
	M=3.77	SD=0.57	S=-2.43		
21. Number of administrative officials and supporting staff.	-	6.7	60	33.3	-
	M=3.27	SD=0.58	S=-0.09		
22. The percentage of enrolment who are female.	26.7	50	23.3	-	-
	M=1.97	SD=0.72	S=0.05		
23. The percentage of faculty with earned doctorate.	3.3	10	50	36.7	-
	M=3.20	SD=0.76	S=-0.86		
24. The percentage of faculty who are professors, senior lecturers and lecturers.	3.3	10	46.7	40	-
	M=3.23	SD=0.77	S=-0.92		

	NU	SU	U	VU	NR
25. The percentage of faculty with permanent status (full-time).	-	3.3	30	66.7	-
	M=3.63	SD=0.56	S=-1.22		
26. The percentage of total budget of an institution of higher education spent on capital expenditure.	-	6.7	46.7	43.3	3.3
	M=3.27	SD=0.87	S=-1.92		
27. The percentage of total expenditure of an institution of higher education spent on faculty salaries.	6.7	16.7	43.3	33.3	-
	M=3.03	SD=0.89	S=-0.70		
28. Expenditure (cost) per student.	-	16.7	70	13.3	-
	M=2.97	SD=0.56	S=-0.02		
29. The average actual length of time for completing a B.A. degree.	3.3	3.3	56.7	36.7	-
	M=3.27	SD=0.69	S=-1.08		
30. The average actual length of time for completing an M.A. degree after the B.A.	-	3.3	56.7	40	-
	M=3.37	SD=0.56	S=-0.07		
31. The average actual length of time for completing a Dr. after the M.A.	6.7	20	30	43.3	-
	M=3.10	SD=0.96	S=-0.71		
32. Percentage of administrative officials with an M.A. or Dr. degree.	20	33.3	40	6.7	-
	M=2.33	SD=0.88	S=-0.10		
33. Library books per student.	-	6.7	36.7	56.6	-
	M=3.50	SD=0.63	S=-0.89		
34. The square metre area per student available in a classroom.	-	10	53.3	36.7	-
	M=3.27	SD=0.64	S=-0.29		
35. The average number of students per class.	-	10	50	40	-
	M=3.30	SD=0.65	S=-0.38		
36. Graduate's grade point average.	3.3	13.3	56.7	26.7	-
	M=3.07	SD=0.74	S=-0.66		
37. Graduate's grade point average on general achievement.	3.3	20	56.7	16.7	3.3
	M=2.80	SD=0.89	S=-1.17		

	NU	SU	U	VU	NR
38. Graduate's grade point average on professional achievement.	3.3	10	36.7	50	-
	M=3.33	SD=0.80	S=-1.13		
39. Graduate's grade point average on major achievement.	3.3	3.3	43.3	50.1	-
	M=3.40	SD=0.72	S=-1.38		
40. The actual amount of time needed to complete a degree.	-	6.7	36.7	56.6	-
	M=3.50	SD=0.63	S=-0.89		
41. The mean score in a course.	-	20	50	30	-
	M=3.10	SD=0.71	S=-0.15		
42. The percentage of students who left an institution before getting a degree (dropouts).	3.3	13.3	53.4	30	-
	M=3.10	SD=0.76	S=-0.68		
43. The number of students graduating as the percentage of their entering class.	3.3	6.7	50	40	-
	M=3.23	SD=0.86	S=-1.89		
44. Number of graduates.	-	10	46.7	43.3	-
	M=3.33	SD=0.66	S=-0.48		
45. Number of B.A. graduates.	3.3	3.3	63.4	30	-
	M=3.20	SD=0.66	S=-1.00		
46. Number of M.A. graduates.	-	3.3	60	36.7	-
	M=3.33	SD=0.55	S=0.05		
47. Number of doctorate graduates.	10	-	46.7	43.3	-
	M=3.23	SD=0.90	S=-1.42		
48. Number of research projects completed.	6.7	3.3	43.3	46.7	-
	M=3.30	SD=0.84	S=-1.39		
49. Number of the publications of the faculty.	3.3	6.7	36.7	53.3	-
	M=3.40	SD=0.77	S=-1.34		

APPENDIX C

CORRELATION MATRICES FOR THE VARIABLES

APPENDIX C.1

THE CORRELATION MATRIX OF THE VARIABLES FOR ANALYSING THE DATA USING STUDENT AS THE UNIT OF ANALYSIS

TABLE C.1

THE CORRELATION MATRIX OF THE VARIABLES FOR ANALYSING THE DATA USING STUDENT AS THE UNIT OF ANALYSIS

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	TCDG	TOT1	TOT2	TOT3	AGE	SEX	REOR1	REOR2	PRHS1	PRHS2
TCDG	1.0000	.1271	.0211	.0981	.3787	.0302	-.0868	.0657	.1925	.0200
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P=*****	P= .001	P= .308	P= .126	P= .000	P= .236	P= .019	P= .059	P= .000	P= .317
TOT1	.1271	1.0000	.4282	.2520	.0846	.2625	.0133	-.0582	.0120	.1576
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .001	P=*****	P= .000	P= .000	P= .022	P= .000	P= .376	P= .083	P= .388	P= .000
TOT2	.0211	.4282	1.0000	.0638	.0273	.0339	.0293	-.0992	.1972	.0301
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .308	P= .000	P=*****	P= .064	P= .258	P= .210	P= .202	P= .009	P= .000	P= .237
TOT3	.0981	.2520	.0638	1.0000	.0335	.1094	-.2197	.1683	.0094	.0255
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .126	P= .000	P= .064	P=*****	P= .212	P= .005	P= .000	P= .000	P= .458	P= .272
AGE	.3787	.0846	.0273	.0335	1.0000	-.2194	-.0367	-.0119	-.0110	.1777
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .000	P= .022	P= .258	P= .212	P=*****	P= .000	P= .191	P= .388	P= .396	P= .000
SEX	.0302	.2625	.0339	.1094	-.2194	1.0000	.0411	.0157	.0802	.0806
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .236	P= .000	P= .210	P= .005	P= .000	P=*****	P= .164	P= .354	P= .028	P= .027
REOR1	-.0868	.0133	.0293	-.2197	-.0367	.0411	1.0000	-.7157	-.0558	.0497
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .019	P= .376	P= .282	P= .000	P= .191	P= .164	P=*****	P= .000	P= .092	P= .199
REOR2	.0657	-.0582	-.0992	.1683	-.0119	.0157	-.7157	1.0000	-.0906	-.0560
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .059	P= .083	P= .009	P= .000	P= .388	P= .354	P= .000	P=*****	P= .167	P= .091
PRHS1	.1925	.0120	.1972	.0094	-.0110	.0802	-.0558	-.0906	1.0000	-.4956
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .000	P= .388	P= .000	P= .458	P= .396	P= .028	P= .092	P= .167	P=*****	P= .000
PRHS2	.0200	.1576	.0301	.0255	.1777	.0806	.0497	-.0560	-.4956	1.0000
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .317	P= .000	P= .237	P= .272	P= .000	P= .027	P= .199	P= .091	P= .000	P=*****
PRHS3	-.1842	-.1872	-.1966	-.0498	-.1942	-.1390	.0294	.0720	-.6403	-.2082
	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)	(5691)
	P= .000	P= .000	P= .000	P= .193	P= .000	P= .000	P= .281	P= .043	P= .000	P= .000

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - - -

	PRHS3
TCDG	-.1892 (5691) P= .000
TOT1	-.1872 (5691) P= .000
TOT2	-.1966 (5691) P= .000
TOT3	-.0448 (5691) P= .143
AGE	-.1492 (5691) P= .000
SEX	-.1390 (5691) P= .000
REOR1	.0244 (5691) P= .281
REOR2	.0720 (5691) P= .043
PRHS1	-.6403 (5691) P= .000
PRHS2	-.2082 (5691) P= .000
PRHS3	1.0000 (5691) P=*****

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

APPENDIX C.2

THE CORRELATION MATRIX OF THE VARIABLES FOR ANALYSING THE DATA USING FACULTY AS THE UNIT OF ANALYSIS

TABLE C.2

THE CORRELATION MATRIX OF THE VARIABLES FOR ANALYSING THE DATA USING FACULTY AS THE UNIT OF ANALYSIS

- - - - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - - - -

	AVTOT1	AVTOT2	AVTOT3	AVTCOG	MACRA	MNAGE	MTSAGE	MTSTEX	MTSTLD	MWGPBA
AVTOT1	1.0000	.5762	.1937	.1890	-.3176	-.0525	.1834	.4639	.7341	-.3395
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P=*****	P= .001	P= .172	P= .184	P= .057	P= .399	P= .185	P= .008	P= .000	P= .045
AVTOT2	.5762	1.0000	-.1609	.2137	-.2006	.0762	.3652	.5086	.2275	-.0454
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .001	P=*****	P= .216	P= .147	P= .163	P= .356	P= .033	P= .004	P= .132	P= .413
AVTOT3	.1937	-.1609	1.0000	-.0067	-.1217	-.4285	-.0926	-.0203	.3053	-.5927
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .172	P= .216	P=*****	P= .487	P= .277	P= .019	P= .326	P= .461	P= .065	P= .001
AVTCOG	.1890	.2137	-.0067	1.0000	.4161	.2770	-.2900	-.2095	.2320	-.3814
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .184	P= .147	P= .487	P=*****	P= .017	P= .085	P= .095	P= .152	P= .127	P= .027
MACRA	-.3176	-.2006	-.1217	.4161	1.0000	.0348	-.6849	-.5583	-.0849	-.1109
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .057	P= .163	P= .277	P= .017	P=*****	P= .433	P= .000	P= .002	P= .340	P= .295
MNAGE	-.0525	.0762	-.4285	.2770	.0348	1.0000	.0192	-.0728	.0242	.3840
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .399	P= .356	P= .019	P= .085	P= .433	P=*****	P= .463	P= .362	P= .453	P= .026
MTSAGE	.1834	.3652	-.0926	-.2900	-.6849	.0192	1.0000	.8289	.0508	.2329
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .185	P= .033	P= .326	P= .075	P= .000	P= .463	P=*****	P= .000	P= .403	P= .126
MTSTEX	.4639	.5086	-.0203	-.2095	-.5583	-.0728	.8289	1.0000	.2860	.1732
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .008	P= .004	P= .461	P= .152	P= .002	P= .362	P= .000	P=*****	P= .078	P= .199
MTSTLD	.7341	.2275	.3053	.2320	-.0849	.0242	.0508	.2860	1.0000	-.2853
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .000	P= .132	P= .065	P= .127	P= .340	P= .453	P= .403	P= .078	P=*****	P= .079
MWGPBA	-.3395	-.0454	-.5927	-.3814	-.1109	.3840	.2329	.1732	-.2853	1.0000
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .045	P= .413	P= .001	P= .027	P= .295	P= .026	P= .126	P= .199	P= .079	P=*****
PCGAM	.2449	.3950	.0368	.3065	-.2778	-.1362	.3673	.4072	.0931	-.1247
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .114	P= .023	P= .429	P= .069	P= .085	P= .254	P= .032	P= .019	P= .326	P= .272
PCGRM	-.5217	-.5704	.0282	-.4076	.2114	-.1720	-.2567	-.4176	-.4505	.1472
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .003	P= .001	P= .446	P= .006	P= .150	P= .200	P= .103	P= .017	P= .010	P= .236

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	AVTOT1	AVTOT2	AVTOT3	AVTCDG	MACRA	MNAGE	MTSAGE	MTSTEX	MTSTLD	MWGPBA
PCGVH	.5057	.3708	.0118	-.0343	-.2492	.3612	.0263	.2807	.4865	.1839
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .009	P= .031	P= .477	P= .434	P= .110	P= .035	P= .449	P= .082	P= .006	P= .184
PCGEJ	.0063	-.2851	.6215	.1284	.1877	-.1483	-.3235	-.4287	.1770	-.6127
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .488	P= .079	P= .000	P= .266	P= .179	P= .235	P= .053	P= .014	P= .194	P= .000
PCGWJ	-.0392	.1703	-.6358	-.1377	-.1219	.1547	.2492	.3529	-.1834	.6053
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .425	P= .203	P= .000	P= .251	P= .277	P= .225	P= .110	P= .038	P= .185	P= .001
PCBAFL	.6090	.2837	.2231	-.1933	-.4107	-.3039	.2288	.3617	.3834	-.0764
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .000	P= .080	P= .137	P= .172	P= .019	P= .066	P= .130	P= .035	P= .027	P= .355
PCDOFA	.5487	.4811	.2220	-.1679	-.5502	.0195	.5901	.7018	.3141	-.0891
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .002	P= .006	P= .138	P= .206	P= .002	P= .462	P= .001	P= .000	P= .059	P= .333
PCENFA	.5324	.2531	.1481	-.4062	-.5145	-.0658	.3958	.4862	.3993	.1707
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .003	P= .106	P= .235	P= .020	P= .004	P= .375	P= .023	P= .006	P= .023	P= .202
PCFLFA	.6045	.4414	.2993	-.0815	-.6414	.1362	.4767	.5403	.6031	-.1119
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .001	P= .012	P= .069	P= .346	P= .000	P= .253	P= .007	P= .002	P= .001	P= .293
PCFPFA	-.0326	.2322	-.0489	.1897	.1144	.1174	-.0133	-.1350	-.3078	-.0604
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .437	P= .127	P= .407	P= .177	P= .289	P= .284	P= .474	P= .255	P= .063	P= .385
PCNOAJ	.1253	.0784	-.0381	.3067	.0158	.4017	.0524	-.0233	.1449	-.0012
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .271	P= .352	P= .427	P= .064	P= .469	P= .021	P= .400	P= .455	P= .240	P= .498
PCTAJ1	-.0130	.0689	-.2050	-.3856	-.1880	-.1744	.1724	.1838	-.2289	.1960
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .475	P= .389	P= .158	P= .025	P= .179	P= .197	P= .200	P= .184	P= .130	P= .238
PCTAJ2	.1010	-.1476	-.2367	.1549	.3027	-.0364	-.2339	-.0905	.2402	.0420
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .312	P= .236	P= .122	P= .225	P= .066	P= .430	P= .125	P= .330	P= .119	P= .419
PCTAJ3	-.1007	-.0339	.3521	-.1357	-.1215	-.4563	.1677	.2274	-.0892	-.2878
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .312	P= .435	P= .039	P= .254	P= .277	P= .010	P= .207	P= .132	P= .332	P= .077

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	AVTOT1	AVTOT2	AVTOT3	AVTCDG	MACRA	MNAGE	MTSAGE	MTSTEX	MTSTLD	M*GPBA
PCTAJM	-.1669	-.0628	.0830	-.1003	.0710	-.0171	-.2626	-.3075	-.0921	.1134
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .208	P= .380	P= .343	P= .313	P= .365	P= .467	P= .097	P= .063	P= .327	P= .291
PCTSFL	.1996	.3786	-.1961	-.0355	-.2348	-.1168	.3889	.3265	-.0105	.0079
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .241	P= .028	P= .168	P= .432	P= .124	P= .285	P= .025	P= .052	P= .480	P= .485
PRBGEU	-.3997	-.0377	.1716	.0617	.0566	-.0933	-.0108	-.2283	-.5429	-.1492
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .022	P= .427	P= .201	P= .382	P= .392	P= .325	P= .429	P= .131	P= .002	P= .233
PRGENR	-.1720	.2616	-.0783	.1751	-.0350	.0094	.0200	-.0915	-.5230	.0887
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .200	P= .098	P= .352	P= .196	P= .433	P= .482	P= .461	P= .328	P= .003	P= .333
PRNAFF	-.4198	-.1949	.0729	.1756	.1871	.0597	-.1163	-.2905	-.4661	-.0218
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .016	P= .170	P= .362	P= .195	P= .180	P= .386	P= .286	P= .075	P= .008	P= .458
SFRFA	-.3415	-.2497	-.1501	.0439	.0175	.5014	.1044	-.0158	-.0941	.1697
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .049	P= .114	P= .232	P= .416	P= .466	P= .005	P= .306	P= .469	P= .324	P= .209
EFRABA	-.1945	-.2413	-.0055	-.9928	-.3720	-.2478	.2797	.1782	-.2193	.3653
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .171	P= .117	P= .489	P= .000	P= .031	P= .111	P= .083	P= .192	P= .141	P= .033
PRMANG	.3517	.4247	-.1113	.0475	-.3080	-.1568	.1183	.1742	.0129	.1212
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .039	P= .015	P= .294	P= .409	P= .063	P= .222	P= .283	P= .197	P= .475	P= .278

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	PCGAH	PCGRH	PCGVH	PCGEJ	PCGWJ	PCBAFL	PCDOFA	PCENFA	PCFLFA	PCFPFA
AVTOT1	.2949	-.5217	.5057	.0063	-.0392	.6090	.5487	.5324	.6045	-.0326
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .119	P= .003	P= .004	P= .488	P= .425	P= .000	P= .002	P= .003	P= .001	P= .437
AVTOT2	.3950	-.5704	.3708	-.2851	.1703	.2837	.4811	.2531	.4414	.2322
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .023	P= .001	P= .031	P= .079	P= .203	P= .080	P= .006	P= .106	P= .012	P= .127
AVTOT3	.0368	.0282	.0118	.6215	-.6358	.2231	.2220	.1481	.2993	-.0484
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .429	P= .496	P= .477	P= .000	P= .000	P= .137	P= .138	P= .235	P= .069	P= .407
AVTCDG	.3065	-.4876	-.0343	.1284	-.1377	-.1933	-.1679	-.4062	-.0815	.1897
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .064	P= .006	P= .434	P= .266	P= .251	P= .172	P= .206	P= .020	P= .346	P= .177
MACRA	-.2778	.2119	-.2492	.1877	-.1219	-.4107	-.5502	-.5145	-.6414	.1144
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .085	P= .150	P= .110	P= .179	P= .277	P= .019	P= .002	P= .004	P= .000	P= .289
MNAGE	-.1362	-.1720	.3612	-.1483	.1597	-.3034	.0195	-.0658	.1362	.1174
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .254	P= .200	P= .035	P= .235	P= .225	P= .066	P= .462	P= .375	P= .253	P= .284
MTSAGE	.3673	-.2567	.0263	-.3235	.2492	.2288	.5901	.3958	.4767	-.0133
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .032	P= .103	P= .449	P= .053	P= .110	P= .130	P= .001	P= .023	P= .007	P= .474
MTSTEX	.4072	-.4176	.2807	-.4287	.3529	.3617	.7018	.4862	.5403	-.1350
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .019	P= .017	P= .082	P= .019	P= .038	P= .035	P= .000	P= .006	P= .002	P= .255
MTSTLD	.0931	-.4505	.4865	.1770	-.1834	.3834	.3191	.3943	.6031	-.3078
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .326	P= .010	P= .006	P= .194	P= .185	P= .027	P= .059	P= .023	P= .001	P= .063
MWGPBA	-.1247	.1472	.1839	-.6127	.6053	-.0764	-.0891	.1707	-.1119	-.0604
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .272	P= .236	P= .184	P= .000	P= .001	P= .355	P= .333	P= .202	P= .293	P= .385
PCGAH	1.0000	-.8178	-.1054	-.1197	-.0060	.3807	.3626	.2096	.1980	.0478
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P=*****	P= .000	P= .304	P= .280	P= .488	P= .028	P= .034	P= .152	P= .166	P= .408
PCGRH	-.8178	1.0000	-.3367	.1277	.0221	-.4145	-.4310	-.2720	-.4658	.0809
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .000	P=*****	P= .046	P= .267	P= .457	P= .018	P= .014	P= .089	P= .008	P= .347

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - - -

	PCGAH	PCGRH	PCGVH	PCGEJ	PCGWJ	PCBAFL	PCDOFA	PCENFA	PCFLFA	PCFPFA
PCGVH	-.1054	-.3367	1.0000	-.1185	.0683	.3557	.2805	.5037	.6681	-.1663
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .304	P= .046	P=*****	P= .282	P= .370	P= .037	P= .083	P= .004	P= .000	P= .208
PCGEJ	-.1197	.1277	-.1185	1.0000	-.9620	.0804	-.1987	.0533	.1031	.2506
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .280	P= .267	P= .282	P=*****	P= .000	P= .348	P= .165	P= .398	P= .308	P= .108
PCGWJ	-.0060	.0221	.0683	-.9620	1.0000	-.1403	.1011	-.0887	-.1713	-.1863
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .488	P= .457	P= .370	P= .000	P=*****	P= .247	P= .312	P= .333	P= .201	P= .181
PCBAFL	.3807	-.4145	.3557	.0804	-.1403	1.0000	.4165	.8110	.4742	-.1082
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .028	P= .018	P= .037	P= .348	P= .247	P=*****	P= .017	P= .000	P= .007	P= .299
PCDOFA	.3626	-.4310	.2805	-.1987	.1011	.4165	1.0000	.4399	.6446	-.0974
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .034	P= .014	P= .083	P= .165	P= .312	P= .017	P=*****	P= .012	P= .000	P= .318
PCENFA	.2096	-.2720	.5037	.0533	-.0887	.8110	.4399	1.0000	.6070	-.0436
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .152	P= .089	P= .004	P= .398	P= .333	P= .000	P= .012	P=*****	P= .001	P= .416
PCFLFA	.1980	-.4658	.6681	.1031	-.1713	.4742	.6446	.6070	1.0000	-.0959
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .166	P= .008	P= .000	P= .308	P= .201	P= .007	P= .000	P= .001	P=*****	P= .321
PCFPFA	.0978	.0809	-.1663	.2506	-.1863	-.1082	-.0974	-.0436	-.0959	1.0000
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .408	P= .347	P= .208	P= .108	P= .181	P= .299	P= .318	P= .416	P= .321	P=*****
PCNOAJ	-.0287	-.1045	-.0091	.0153	.0334	-.1686	.1107	.0343	.1078	.4257
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .445	P= .305	P= .482	P= .470	P= .436	P= .205	P= .295	P= .434	P= .300	P= .015
PCTAJ1	-.0317	[illegible]	.0244	-.1702	.2052	.1397	-.0[illegible]32	.1713	-.1066	-.1312
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .439	P= .141	P= .453	P= .203	P= .157	P= .248	P= .[illegible]	P= .201	P= .302	P= .262
PCTAJ2	-.0156	-.0558	-.1280	-.1425	.1907	-.2315	-.0235	-.1852	-.1297	.0209
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .470	P= .393	P= .267	P= .244	P= .175	P= .128	P= .455	P= .182	P= .264	P= .460
PCTAJ3	.2311	-.0631	-.1616	.0124	-.0816	.0492	.1306	-.1843	-.0540	-.3579
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .128	P= .380	P= .215	P= .476	P= .346	P= .406	P= .262	P= .184	P= .397	P= .036

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	PCGAH	PCGRH	PCGVH	PCGEJ	PCGWJ	PCBAFL	PCDOFA	PCENFA	PCFLFA	PCFPFA
PCTAJ4	-.1399	.0577	.2405	.2311	-.3118	.2537	-.2035	.0843	.0701	-.2379
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .248	P= .390	P= .118	P= .128	P= .061	P= .106	P= .159	P= .341	P= .367	P= .121
PCTSFL	.4905	-.4923	.0203	-.3640	.2723	.4091	.2693	.2051	.0949	-.2602
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .005	P= .012	P= .461	P= .034	P= .089	P= .019	P= .096	P= .157	P= .322	P= .100
PRBGEU	.2277	.0035	-.3663	.0908	-.2114	-.1865	-.1028	-.2766	-.3604	.1487
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .132	P= .493	P= .033	P= .330	P= .150	P= .181	P= .309	P= .086	P= .035	P= .234
PRGENR	.3998	-.2290	-.1123	-.2099	.0674	.0202	-.0382	-.1233	-.2861	.1731
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .021	P= .130	P= .293	P= .152	P= .372	P= .461	P= .427	P= .274	P= .078	P= .199
PRNAFF	.3138	-.1225	-.2992	.3801	-.4756	.0345	-.2621	-.0507	-.3095	.1901
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .059	P= .276	P= .069	P= .028	P= .007	P= .434	P= .098	P= .403	P= .062	P= .176
SFRFA	-.3327	.1604	.1145	-.0189	-.0018	-.4933	-.1670	-.2877	.0422	-.0886
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .048	P= .217	P= .289	P= .463	P= .496	P= .005	P= .207	P= .077	P= .419	P= .333
EFRABA	-.3387	.5026	.0089	-.1067	.1188	.1775	.1453	.3922	.0470	-.2155
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .045	P= .004	P= .483	P= .302	P= .282	P= .193	P= .239	P= .024	P= .410	P= .145
PRMANG	.4546	-.3410	.1652	-.2595	.2582	.5311	.1546	.2972	.1586	.0401
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .010	P= .044	P= .210	P= .100	P= .101	P= .003	P= .225	P= .070	P= .219	P= .423

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - - - P E A R S O N   C O R R E L A T I O N   C O E F F I C I E N T S - - - - - - - - - - - - - -

	PCNOAJ	PCTAJ1	PCTAJ2	PCTAJ3	PCTAJ4	PCTSFL	PRRGEU	PRGENR	PRNAFF	SFRFA
AVTOT1	.1253 (26) P= .271	-.0130 (26) P= .475	.1010 (26) P= .312	-.1007 (26) P= .312	-.1664 (26) P= .208	.1446 (26) P= .241	-.3997 (26) P= .022	-.1720 (26) P= .200	-.4198 (26) P= .016	-.3415 (26) P= .044
AVTOT2	.0784 (26) P= .352	.0689 (26) P= .369	-.1474 (26) P= .236	-.0339 (26) P= .435	-.0628 (26) P= .380	.3786 (26) P= .028	-.0377 (26) P= .427	.2616 (26) P= .098	-.1949 (26) P= .170	-.2447 (26) P= .114
AVTOT3	-.0381 (26) P= .427	-.2050 (26) P= .158	-.2367 (26) P= .122	.3521 (26) P= .039	.0830 (26) P= .343	-.1961 (26) P= .168	.1716 (26) P= .201	-.0783 (26) P= .352	.0729 (26) P= .362	-.1501 (26) P= .232
AVTCDG	.3067 (26) P= .064	-.3856 (26) P= .026	.1549 (26) P= .225	-.1357 (26) P= .254	-.1003 (26) P= .313	-.0355 (26) P= .432	.0617 (26) P= .382	.1751 (26) P= .196	.1756 (26) P= .195	.0439 (26) P= .416
MACRA	.0158 (26) P= .469	-.1880 (26) P= .179	.3027 (26) P= .066	-.1215 (26) P= .277	.0710 (26) P= .365	-.2348 (26) P= .124	.0566 (26) P= .392	-.0350 (26) P= .433	.1871 (26) P= .180	.0175 (26) P= .466
MNAGE	.4017 (26) P= .021	-.1744 (26) P= .197	-.0364 (26) P= .430	-.4563 (26) P= .010	-.0171 (26) P= .467	-.1168 (26) P= .285	-.0933 (26) P= .325	.0094 (26) P= .482	.0597 (26) P= .386	.5014 (26) P= .005
MTSAGE	.0524 (26) P= .400	.1724 (26) P= .200	-.2339 (26) P= .125	.1672 (26) P= .207	-.2626 (26) P= .097	.3889 (26) P= .025	-.0108 (26) P= .479	.0200 (26) P= .461	-.1163 (26) P= .286	.1044 (26) P= .306
MTSTEX	-.0233 (26) P= .455	.1838 (26) P= .184	-.0905 (26) P= .330	.2274 (26) P= .132	-.3075 (26) P= .063	.3265 (26) P= .052	-.2283 (26) P= .131	-.0915 (26) P= .328	-.2905 (26) P= .075	-.0158 (26) P= .469
MTSTLD	.1449 (26) P= .240	-.2289 (26) P= .130	.2402 (26) P= .119	-.0892 (26) P= .332	-.0921 (26) P= .327	-.0105 (26) P= .480	-.5429 (26) P= .002	-.5230 (26) P= .003	-.4661 (26) P= .008	-.0941 (26) P= .324
MNGPBA	-.0012 (26) P= .498	.1460 (26) P= .238	.0420 (26) P= .419	-.2878 (26) P= .077	.1134 (26) P= .291	.0079 (26) P= .485	-.1492 (26) P= .233	.0887 (26) P= .333	-.0218 (26) P= .458	.1697 (26) P= .204
PCGAH	-.0287 (26) P= .445	-.0317 (26) P= .439	-.0156 (26) P= [illegible]	.2311 (26) P= .120	-.1399 (26) P= [illegible]	.4905 (26) P= .005	.2277 (26) P= .132	.3998 (26) P= .021	.3138 (26) P= .059	-.3327 (26) P= .048
PCGRH	-.1045 (26) P= .306	.2193 (26) P= .141	[illegible] (26) P= .393	[illegible] (26) P= .380	.0577 (26) P= [illegible]	[illegible] (26) P= .012	.0035 (26) P= .473	-.2290 (26) P= .130	-.1225 (26) P= .276	.1604 (26) P= .217

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- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	PCNOAJ	PCTAJ1	PCTAJ2	PCTAJ3	PCTAJ4	PCTSFL	PRBGED	PRGENR	PRNAFF	SFRFA
PCGVH	-.0091	.0244	-.1280	-.1616	.2905	.0203	-.3663	-.1123	-.2992	.1145
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .482	P= .453	P= .267	P= .215	P= .118	P= .461	P= .033	P= .293	P= .069	P= .289
PCGEJ	.0153	-.1702	-.1425	.0129	.2311	-.3690	.0908	-.2099	.3801	-.0189
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .470	P= .203	P= .244	P= .476	P= .128	P= .034	P= .380	P= .152	P= .028	P= .463
PCGRJ	.0334	.2052	.1907	-.0816	-.3118	.2723	-.2114	.0674	-.4756	-.0018
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .436	P= .157	P= .175	P= .346	P= .061	P= .089	P= .150	P= .372	P= .007	P= .496
PCBAFL	-.1686	.1397	-.2315	.0492	.2537	.9091	-.1865	.0202	.0345	-.4933
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .205	P= .248	P= .128	P= .406	P= .106	P= .019	P= .181	P= .461	P= .434	P= .005
PCDOFA	.1107	-.0952	-.0235	.1306	-.2035	.2643	-.1028	-.0382	-.2621	-.1670
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .295	P= .322	P= .455	P= .262	P= .159	P= .096	P= .309	P= .427	P= .098	P= .207
PCENFA	.0343	.1713	-.1852	-.1843	.0843	.2051	-.2766	-.1233	-.0507	-.2877
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .434	P= .201	P= .182	P= .184	P= .341	P= .157	P= .086	P= .274	P= .403	P= .077
PCFLFA	.1078	-.1066	-.1297	-.0540	.0701	.0949	-.3404	-.2861	-.3095	.0422
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .300	P= .302	P= .264	P= .397	P= .367	P= .322	P= .035	P= .078	P= .062	P= .419
PCFPFA	.9257	-.1312	.0209	-.3579	-.2379	-.2602	.1407	.1731	.1901	-.0886
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .015	P= .262	P= .460	P= .036	P= .121	P= .100	P= .254	P= .199	P= .176	P= .333
PCNOAJ	1.0000	-.6886	.2573	-.6931	-.9710	-.0935	-.2030	-.2123	-.0403	.1728
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P=*****	P= .000	P= .102	P= .000	P= .008	P= .325	P= .160	P= .149	P= .422	P= .199
PCTAJ1	-.6886	1.0000	-.3430	.3705	.0224	.0787	.0838	.1794	-.1217	-.1100
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .000	P=*****	P= .043	P= .031	P= .457	P= .351	P= .342	P= .190	P= .277	P= .296
PCTAJ2	.2573	-.3430	1.0000	-.3727	-.9143	-.3475	-.3797	-.3643	-.3370	-.0913
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .102	P= .043	P=*****	P= .030	P= .018	P= .041	P= .028	P= .034	P= .046	P= .329
PCTAJ3	-.6931	.3705	-.3727	1.0000	.0520	.1954	.4087	.2390	.0843	-.0484
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .000	P= .031	P= .030	P=*****	P= .400	P= .169	P= .019	P= .120	P= .341	P= .407

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- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	PCNOAJ	PCTAJ1	PCTAJ2	PCTAJ3	PCTAJ4	PCTSFL	PRBGEU	PRGENR	PRNAFF	SFRFA
PCTAJ4	-.4710	.0224	-.4143	.0520	1.0000	.1256	.1132	.1914	.3394	-.0671
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .008	P= .457	P= .018	P= .400	P=*****	P= .270	P= .291	P= .174	P= .045	P= .372
PCTSFL	-.0935	.0787	-.3475	.1954	.1256	1.0000	.0945	.2728	.1179	-.1637
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .325	P= .351	P= .041	P= .169	P= .270	P=*****	P= .323	P= .089	P= .283	P= .212
PRBGEU	-.2030	.0838	-.3797	.4087	.1132	.0945	1.0000	.8203	.5015	-.0954
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .160	P= .342	P= .028	P= .019	P= .291	P= .323	P=*****	P= .000	P= .005	P= .321
PRGENR	-.2123	.1794	-.3643	.2370	.1914	.2728	.8203	1.0000	.4650	-.2334
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .149	P= .190	P= .034	P= .120	P= .174	P= .089	P= .000	P=*****	P= .008	P= .126
PRNAFF	-.0403	-.1217	-.3370	.0893	.3394	.1179	.5015	.4650	1.0000	.1543
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .422	P= .277	P= .046	P= .341	P= .045	P= .283	P= .005	P= .008	P=*****	P= .226
SFRFA	.1728	-.1100	-.0913	-.0484	-.0671	-.1637	-.0954	-.2334	.1543	1.0000
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .199	P= .296	P= .329	P= .407	P= .372	P= .212	P= .321	P= .126	P= .226	P=*****
EFRABA	-.2809	.3634	-.1571	.1222	.0942	.0649	-.0538	-.1902	-.1576	-.0178
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .082	P= .034	P= .222	P= .276	P= .324	P= .376	P= .397	P= .176	P= .221	P= .466
PRMANG	-.2203	.3290	-.2032	-.0082	.1893	.4000	-.1076	.3383	-.0997	-.6081
	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)	(261)
	P= .140	P= .050	P= .160	P= .484	P= .177	P= .021	P= .300	P= .045	P= .323	P= .000

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	EFRABA	PRHANG
AVTOT1	-.1945	.3517
	(261)	(261)
	P= .171	P= .039
AVTOT2	-.2413	.4247
	(261)	(261)
	P= .117	P= .015
AVTOT3	-.0055	-.1113
	(261)	(261)
	P= .489	P= .294
AVTCOG	-.9928	.0475
	(261)	(261)
	P= .000	P= .409
MACRA	-.3720	-.3080
	(261)	(261)
	P= .031	P= .063
MNAGE	-.2478	-.1568
	(261)	(261)
	P= .111	P= .222
MTSAGE	.2797	.1183
	(261)	(261)
	P= .083	P= .283
MTSTEX	.1782	.1792
	(261)	(261)
	P= .192	P= .197
MTSTLD	-.2193	.0129
	(261)	(261)
	P= .141	P= .475
MWGPBA	.3653	.1212
	(261)	(261)
	P= .033	P= .278
PCGAH	-.3387	.4596
	(261)	(261)
	P= .045	P= .010
PCGHH	.5026	-.3410
	(261)	(261)
	P= .009	P= .044

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	EFRABA	PRIANG
PCGVH	.0089	.1652
	(261)	(261)
	P= .483	P= .210
PCGEJ	-.1067	-.2595
	(261)	(261)
	P= .302	P= .100
PCGWJ	.1188	.2582
	(261)	(261)
	P= .282	P= .101
PCBAFL	.1775	.5311
	(261)	(261)
	P= .193	P= .003
PCDOFA	.1453	.1546
	(261)	(261)
	P= .239	P= .225
PCENFA	.3922	.2972
	(261)	(261)
	P= .024	P= .070
PCFLFA	.0470	.1586
	(261)	(261)
	P= .410	P= .219
PCFPFA	-.2155	.0401
	(261)	(261)
	P= .145	P= .423
PCNOAJ	-.2809	-.2203
	(261)	(261)
	P= .082	P= .140
PCTAJ1	.3634	.3240
	(261)	(261)
	P= .034	P= .050
PCTAJ2	-.1571	-.2032
	(261)	(261)
	P= .222	P= .160
PCTAJ3	.1222	-.0082
	(261)	(261)
	P= .276	P= .484

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

- - - - - - - - - - - - PEARSON CORRELATION COEFFICIENTS - - - - - - - - - - - -

	EFRABA	PRMANG
PCTAJ4	.0942	.1893
	(261)	(261)
	P= .324	P= .177
PCTSFL	.0649	.4000
	(261)	(261)
	P= .376	P= .021
PRBGEU	-.0538	-.1076
	(261)	(261)
	P= .397	P= .300
PRGENR	-.1902	.3383
	(261)	(261)
	P= .176	P= .045
PRNAFF	-.1576	-.0947
	(261)	(261)
	P= .221	P= .323
SFRFA	-.0178	-.6081
	(261)	(261)
	P= .466	P= .000
EFRABA	1.0000	-.0916
	(261)	(261)
	P=.*****	P= .328
PRMANG	-.0916	1.0000
	(261)	(261)
	P= .328	P=.*****

(COEFFICIENT / (CASES) / SIGNIFICANCE) (A VALUE OF 99.0000 IS PRINTED IF A COEFFICIENT CANNOT BE COMPUTED)

APPENDIX D

THE CALCULATION OF FACTOR SCORES FROM TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE ON THE USEFULNESS OF MEASURES

THE CALCULATION OF FACTOR SCORES FROM TEACHING STAFF RESPONSES TO THE QUESTIONNAIRE ON THE USEFULNESS OF MEASURES

Seven factor scale variables are created by including only the highly loaded items of each factor. The factors are the usefulness of the size of an institution (TOTST1), the usefulness of output quantity considerations (TOTST2), the usefulness of students' success in completing a degree (TOTST3), the usefulness of students' academic performance (TOTST4), the usefulness of the quality of teaching staff (TOTST5), the usefulness of students' characteristics (TOTST6) and the usefulness of the total enrolment (TOTST7).

The formulas used to compute factor scores for each of the seven factors require the combination of the factor score coefficient, the mean and the standard deviation of highly loaded items. The general formula can be written as follows:

$$\text{Factor score for staff member } j = \sum_{i=1}^{n} fsc_i z_{ij}$$

$$= \sum_{i=1}^{n} fsc_i (x_{ij} - \bar{x}_i)/s_i$$

where: fsc_i = factor score coefficient for item i

z_{ij} = standard score for item i for staff member j

x_{ij} = response to item i from staff member j

$\bar{x}_i$ = mean of responses to item i from all staff members

s_i = standard deviation of the responses to item i.

Specifically for each factor score, the computing formula used is:

TOTST1 = .07338 x (item 13 - 3.4956)/.5963

+.15228 x (item 17 - 3.5131)/.6556

+.12812 x (item 18 - 3.5677)/.6034

+.20281 x (item 19 - 3.5983)/.6028

+.13254 x (item 20 - 3.7511)/.5073

+.11966 x (item 21 - 3.2729)/.6497

+.14106 x (item 26 - 3.2052)/.7436

+.12011 x (item 27 - 3.2183)/.8023

+.12037 x (item 33 - 3.5218)/.6911

+.16056 x (item 34 - 3.2445)/.7864

+.12662 x (item 35 - 3.3493)/.7248

TOTST2 = .04598 x (item 43 - 3.3341)/.7154

+.45511 x (item 44 - 3.3253)/.6491

+.14298 x (item 45 - 3.2293)/.6696

+.40574 x (item 46 - 3.3341)/.6480

+.05890 x (item 47 - 3.1659)/.7476

+.08028 x (item 48 - 3.3100)/.6648

TOTST3 = .10189 x (item 28 - 3.0437)/.8063

+.27449 x (item 29 - 3.3384)/.6145

+.35128 x (item 30 - 3.3210)/.6445

+.17637 x (item 31 - 3.0677)/.7728

+.12287 x (item 40 - 3.3341)/.6841

TOTST4 = .19021 x (item 36 - 3.2271)/.6753

+.17422 x (item 37 - 2.8406)/.6865

+.32701 x (item 38 - 3.3384)/.6947

+.29048 x (item 39 - 3.4279)/.6517

+.15083 x (item 41 - 3.0415)/.7250

APPENDIX E

DESCRIPTION OF THE HYPOTHESIZED CAUSAL RELATIONSHIPS AND THE EXAMPLE OF A TENTATIVE DECISION TABLE BASED ON THE PARSIMONIOUS MODEL

APPENDIX E.1

DESCRIPTION OF THE HYPOTHESIZED CAUSAL RELATIONSHIPS IN THE PARSIMONIOUS MODEL

DESCRIPTION OF THE HYPOTHESIZED CAUSAL RELATIONSHIPS IN THE PARSIMONIOUS MODEL

The proportion of graduates to enrolment (PRGENR) is assumed to be dependent on the proportion of B.A. graduates to undergraduate enrolment (PRBGEU) and this dependence implies that a faculty with a larger proportion of B.A. graduates to undergraduate enrolment tends to have a higher proportion of graduates to enrolment.

The relationship can be traced back in the model by hypothesizing causes for the proportion of B.A. graduates to enrolment in the undergraduate program (PRBGEU). The diagram shows that this variable is conceived to be dependent on the proportion of administrative officials to the number of full-time faculty members (PRNAFF), on the percentage of teaching staff who are also part-time administrators (PCTAJ3) and and the mean of teaching staff's teaching load (MTSTLD). In other words, a faculty with a larger proportion of administrators to full-time teaching staff and a higher percentage of teaching staff who also work as administrators, but a lower mean of teaching staff's teaching load tends to have a larger proportion of B.A. graduates to undergraduate enrolment.

The percentage of teaching staff who are also part-time administrators (PCTAJ3) is assumed to be dependent on the percentage of teaching staff who do not have other jobs (PCNOAJ). This variable in turn is conceived to be dependent on the percentage of faculty members or teaching staff with permanent status (PCFPFA). Hence a faculty with a higher percentage of teaching staff with permanent status tends to have a higher percentage of teaching staff who do not

have other jobs. Then, the higher the percentage of teaching staff who have no other jobs, the lower the percentage of teaching staff who also work as administrators.

The average of students' satisfaction with their educational environment (AVTOT1) is assumed to be dependent on the proportion of administrative officials to the number of full-time teaching staff (PRNAFF), on the proportion of M.A. graduates to number of graduates (PRMANG), on the percentage of B.A. graduates who come from religious senior high school (PCGRH), on the percentage of teaching staff with a Doctorate degree (PCDOFA), on the percentage of B.A. graduates who are female (PCBAFL), on the mean of weighted B.A. graduates' grade point average (MWGPBA) and on the mean staff teaching load (MTSTLD). In other words, a faculty with a smaller proportion of administrative officials to the number of full-time teaching staff, a lower percentage of B.A. graduates who come from religious senior high school and a lower mean of weighted B.A. graduates' grade point average, but a higher mean of teaching staff's teaching load, a larger proportion of M.A. graduates to number of graduates, a higher percentage of teaching staff with a Doctorate and a higher percentage of B.A. graduates who are female tends to have a higher average of students' satisfaction with their educational environment.

The proportion of M.A. graduates to number of graduates (PRMANG) is conceived to be dependent on the student faculty ratio (SFRFA) and the percentage of teaching staff who are part-time teaching staff at other institutions of higher education (PCTAJ1). Hence a faculty with a higher percentage of teaching staff who also teach at other institutions of higher education but a lower student faculty ratio

tends to have a larger proportion of M.A. graduates to number of graduates, which in turn has a positive effect on the average of students' satisfaction with their educational environment.

The percentage of teaching staff who are also part-time teaching staff at other institutions of higher education (PCTAJ1) is assumed to be dependent on the percentage of teaching staff who do not have other jobs (PCNOAJ), which in turn is conceived to be dependent on the percentage of teaching staff with permanent status (PCFPFA). Therefore, a faculty with a higher percentage of teaching staff with permanent status tends to have a higher percentage of teaching staff who do not have other jobs. Then, the higher the percentage of teaching staff who have no other jobs, the lower the percentage of teaching staff who also teach at other institutions of higher education.

The average of students' satisfaction with their study experience and its benefits (AVTOT2) is assumed to be dependent on the mean of teaching staff's teaching experience (MTSTEX), the percentage of B.A. graduates who come from religious senior high schools (PCGRH), the percentage of teaching staff with a Doctorate (PCDOFA) and the average amount of time needed by students to complete the B.A. degree (AVTCDG). In other words, a faculty with a higher mean staff teaching experience, a higher percentage of teaching staff with Doctorates and a higher average time required to complete a B.A. degree, but a lower percentage of B.A. graduates who come from religious senior high schools tends to have a higher average of students' satisfaction with their study experience and its benefits.

The average amount of time needed by students to complete the B.A. degree (AVTCDG) is assumed to be dependent on the mean of academic

rank of the teaching staff (MACRA)[1], the mean of teaching staff's age (MTSAGE), the percentage of B.A. graduates who come from religious senior high school (PCGRH), the percentage of enrolment who are female (PCENFA) and the mean of B.A. graduates' age (MNAGE). Therefore, a faculty with a higher mean of academic rank of the teaching staff, a lower mean of teaching staff's age, a lower percentage B.A. graduates who come from religious senior high school, a lower percentage of enrolment who are female and a higher mean of B.A. graduates' age tends to have a higher average time to complete B.A. degree.

The percentage of enrolment who are female (PCENFA) and the mean of B.A. graduates' age (MNAGE) are assumed to be dependent on the percentage of B.A. graduates who come from vocational senior high school (PCGVH). Hence a faculty with a higher percentage of B.A. graduates who come from vocational senior high school tends to have a higher percentage of enrolment who are female and a higher mean of B.A. graduates' age.

The mean staff teaching load (MTSTLD) is assumed to be dependent on the percentage of faculty members who are lecturers or above (PCFLFA) and this dependence implies that a faculty with a higher percentage of teaching staff who are lecturers or above tends to have a higher mean teaching load. Then the percentage of faculty members who are lecturers or above is assumed to be dependent on the mean academic rank of the teaching staff (MACRA) and the percentage of teaching staff with doctorates (PCDOFA). Therefore, a faculty with a higher percentage of teaching staff with doctorates but a lower mean

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[1] The code for academic rank is 1 for senior teaching staff, 2 for junior teaching staff and 3 for not fully qualified teaching staff.

of academic rank tends to have a higher percentage of faculty members who are lecturers or above.

The mean of academic rank of the teaching staff (MACRA) is assumed to be dependent on the mean of teaching staff's teaching experience (MTSTEX), which in turn is conceived to be dependent on the mean of teaching staff's age (MTSAGE). Hence a faculty with a higher mean of teaching staff's age tends to have a higher mean teaching experience. Then, the higher the mean of teaching experience, the lower the mean academic rank.

The percentage of teaching staff with a doctorate degree (PCDOFA) is assumed to be dependent on the mean of teaching staff's age (MTSAGE) and this dependence implies that a faculty with a higher mean of teaching staff's age tends to have a higher percentage of teaching staff with doctorate qualifications.

The percentage of B.A. graduates who are female (PCBAFL) is assumed to be dependent on the percentage of B.A. graduates who come from religious senior high school (PCGRH), the percentage of enrolment who are female (PCENFA) and the mean of B.A. graduates' age (MNAGE). Therefore, a faculty with a higher percentage of enrolment who are female but a lower percentage of B.A. graduates who come from religious senior high schools and a lower mean of B.A. graduates' age tends to have a higher percentage of B.A. graduates who are female.

The average of students' satisfaction with the institutional operation (AVTOT3) is assumed to be dependent on the mean of B.A. graduates' age (MNAGE), the mean of weighted B.A. graduates' grade point average (MWGPBA) and the percentage of B.A. graduates who come from West Java (PCGWJ). Hence a faculty with a lower mean of B.A.

graduates' age, a lower mean of weighted B.A. graduates' grade point average and a lower percentage of B.A. graduates who come from West Java tends to have a higher average for students' satisfaction with the institutional operation.

Finally, the mean of weighted B.A. graduates' grade point average (MWGPBA) is assumed to be dependent on the average amount of time needed by students to complete the B.A. degree (AVTCDG), the percentage of B.A. graduates who come from East Java (PCGEJ) and the mean of B.A. graduates' age (MNAGE). In other words, a faculty with younger B.A. graduates, a lower percentage of B.A. graduates who come from East Java and a lower average time to complete the B.A. degree tends to have a higher mean of weighted B.A. graduates' grade point average.

APPENDIX E.2

THE EXAMPLE OF A TENTATIVE DECISION TABLE BASED ON THE PARSIMONIOUS MODEL

TABLE E.2.1 DECISION TABLE FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA

No.	Measures of efficiency and effectiveness	Recoded values	Performance description	Possible decision alternatives for inducing improvement	Expected or possible effect
1.	The proportion of graduates to enrolment (PRGENR)	1	relatively low	1.1 Increase the proportion of B.A. graduates to undergraduate enrolment (PRBGEU)	1.1 An increase in PRGENR
2.	The proportion of B.A. graduates to undergraduate enrolment (PRBGEU)	1	relatively low	2.1 Increase the proportion of administrative officials to the number of full-time faculty members (PRNAFF)	2.1.1 An increase in PRBGEU 2.1.2 A decrease in the average of students' satisfaction with their educational environment (AVTOT1) as a possible side effect
				2.2 Decrease the mean of teaching staff's teaching load (MTSTLD)	2.2.1 An increase in PRBGEU 2.2.2 A possible decrease in AVTOT1 as a side effect

TABLE E.2.1 DECISION TABLE FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA (Cont.)

No.	Measures of efficiency and effectiveness	Recoded values	Performance description	Possible decision alternatives for inducing improvement	Expected or possible effect
3.	The proportion of M.A. graduates to number of graduates (PRMANG)	1	relatively low	3.1 Decrease the student faculty ratio (SFRFA)	3.1 An increase in PRMANG 3.2 An increase in students' satisfaction with their educational environment (AVTOT1) as an indirect effect
4.	The average of students' satisfaction with their educational environment (AVTOT1)	1	relatively low	4.1 Increase the proportion of M.A. graduates to number of graduates (PRMANG) as an effect of decreasing the student faculty ratio (SFRFA)	4.1 An increase in AVTOT1

TABLE E.2.1 DECISION TABLE FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA (Cont.)

No.	Measures of efficiency and effectiveness	Recoded values	Performance description	Possible decision alternatives for inducing improvement	Expected or possible effect
				4.2 Decrease the proportion of B.A. graduates who come from religious senior high school (PCGRH) by reducing the proportion of students admitted from religious senior high school.	4.2 An increase in AVTOT1
				4.3 Increase the percentage of teaching staff with doctorates (PCDOFA).	4.3 An increase in AVTOT1
5.	The average of students' satisfaction with their study experience and its benefits (AVTOT2)	1	relatively low	5.1 Increase the mean of teaching staff's teaching experience (MTSTEX)	5.1 An increase in AVTOT2

TABLE E.2.1 DECISION TABLE FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA (Cont.)

No.	Measures of efficiency and effectiveness	Recoded values	Performance description	Possible decision alternatives for inducing improvement	Expected or possible effect
				5.2 Decrease the proportion of B.A. graduates who come from religious senior high school (PCGRH) by reducing the proportion of students admitted from religious senior high school	5.2 An increase in AVTOT2
				5.3 Increase the percentage of teaching staff with doctorates (PCDOFA)	5.3 An increase in AVTOT2
6.	The average of students' satisfaction with institutional operation (AVTOT3)	1	relatively low	6.1 Decrease the mean of B.A. graduates' age (MNAGE), for instance by admitting younger high school graduates	6.1.1 An increase in AVTOT3

TABLE E.2.1 DECISION TABLE FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA (Cont.)

No.	Measures of efficiency and effectiveness	Recoded values	Performance description	Possible decision alternatives for inducing improvement	Expected or possible effect
					6.1.2 A decrease in the average time to complate a B.A. degree (AVTCDG) and the mean of weighted B.A. graduates' grade point average (MWGPBA) as the possible side effects.
				6.2 Decrease the proportion of B.A. graduates from West Java (PCGWJ) by reducing the proportion of students admitted from West Java	6.2 An increase in AVTOT3

TABLE E.2.1 DECISION TABLE FOR THE FACULTY OF ISLAMIC LAW AT IAIN SURABAYA (Cont.)

No.	Measures of efficiency and effectiveness	Recoded values	Performance description	Possible decision alternatives for inducing improvement	Expected or possible effect
7.	The average time to complete a B.A. degree (AVTCDG)	2	relatively moderate	7.1 Decrease the mean of academic rank of the teaching staff (MACRA)*	7.1 A decrease in the average time to complete a B.A. degree
				7.2 Increase the proportion of enrolment who are female (PCENFA)	7.2 A decrease in the average time to complete a B.A. degree
				7.3 Decrease the mean of B.A. graduates' age (MNAGE), for instance, by admitting younger high school graduates	7.3 A decrease in the average time to complete a B.A. degree
8.	The mean of weighted B.A. graduates' grade point average (MWGPBA)	3	relatively high	8. No decision alternative	8. Maintaining the present level of performance

*The code for academic rank is 1 for senior teaching staff, 2 for junior teaching staff and 3 for not fully qualified teaching staff.

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