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Research paper



Performance Efficiency of Higher Education in Indonesia: a Stakeholders' Perspective

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Abstract

This study aims at analyzing the necessity of performance evaluation in higher education institutions based on a benchmarking model of Educational Development Efficiency (EDE), which further will be employed to analyze the inclination of stakeholder in deciding which program and university they prefer to choose. The analysis is performed by using binary logistic regression to predict the inclination of stakeholder based on provided assessment factors. The results of this study are consistent with previous studies where input variables in EDE model significantly influence the quality of university outcomes. Furthermore, referring to observed factors, quality of academic services and comprehensive quality of educational institution are emphasized by a stakeholder in choosing program and university, while the rank issued by National Accreditation Institution of Higher Education in Indonesia contributes as supporting information.

Keywords: *Performance Evaluation; Performance Efficiency; University Ranks; Educational Development Efficiency*

1. Introduction

Education cost has increased of 15%-20% annually over inflation rate of 3,02%[1] in Indonesia. The increase of education cost boosts the expectation of stakeholders toward the quality of education as a trade-off on the cash paid. Nonetheless, it also drives a fundamental question whether a qualified education is really a matter to the stakeholder. The quality of higher education institutions is related to its performance in resulting qualified and competitive outcomes. It is urged to explore relevant information needed by stakeholder for decision making, however, the information provided is likely difficult to understand. Hence, valuable information pertinent to the performance of higher education institutions (efficiency) is highly demanded.

The performance of higher education institution, either academic and non-academic performance, has been extensively concerned by various parties. Both aspects determine the quality of outcomes which is credibly used as assessment factors of institutions. The accreditation of department is often used as a consideration in choosing a study program since this accreditation is the result of an assessment conducted by the National Accreditation Institution for Higher Education based on standardized aspects. In many countries, the rank of the university is highly considered in assessing the performance of university, especially to assess the outcomes. The university ranks (the accreditation of department) has been used extensively and it indeed represents the quality of institution performance.

The main academic activities in higher education are lecturing, conducting a research and getting involved in a society that is commonly called as *Tri dharma*[2] (three obligations) of higher education institutions in the Indonesian Language. *Tri dharma* has become tangible proofs of resources management of each institution. This is identical to the concept of measurement of departmental efficiency in higher education suggested by(1) which by using accountable human resources, sufficient funding and infrastructure are expected to be the strength to support teaching and learning process. Therefore, the strength and weakness of higher education can be assessed from how the *tri dharma* is conducted.

An autonomous of higher education institution to manage academic and non-academic activities, as stipulated in Act No.12 of 2012 concerning Higher Education, enacts the legality of the university to be a corporation[3]. Holding this form of legality, a university has broader authority in establishing a funding mechanism as stipulated in Government Regulation No. 58 of 2013 which a university as a corporation (PTN BH) can also obtain funds from operating activities by establishing business entities, which was adjusted to Government Regulation No. 26 of 2015 to respond the discrepancy of autonomous implementation by higher education institutions based on previous government regulation. Therefore, utilization of university funds has become an endless issue by considering that virtually the budget and actual practice are always being evaluated and improved. In another hand, the performance of higher education can be evaluated based on the following issue; whether each department in a university has optimally utilized the annual planned budget to improve the quality of services and outcomes.

Previous studies found that efficiency of educational institutions cannot be considered as a factor to choose a study program for stakeholder (students). The main consideration is whether a prospective university can help or ease them in finding the desired job after graduated (2). Hence, this study aims at examining whether the efficiency of higher education institution can influence the decision-making of stakeholder. Using the perception of stakeholder (students) as an assessment, the efficiency of higher education institution will be assessed using standard assessment components in a portfolio of each department. The proposed assessment

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is based on assessment standards from Indonesia Accreditation Institution for higher education. Further, the assessment results from stakeholders' perspective will be examined whether it is linear and positively related to the ranking system.

2. Literature Review

2.1. University Ranks

The ranking system is one of a simpler way to evaluate differences. This system has been used by a stakeholder to assess the performance of higher education institution and as a consideration for making a decision in choosing a university. University ranks have been extensively and significantly used since 2003. There are some international ranking systems often used, i.e., *Academic Ranking of World Universities'* (ARWU) established in 2003 by Shanghai Jiaotong so that it is known as *Shanghai Ranking*; the first ranking system in the United States, *the U.S. News and World Report's 'America's Best Colleges'* was established in 1983 by American culture developed back then; in European countries, *the British Times Higher Education Supplement and Quacquarelli Symonds* (QS), as known as *Times Higher Education*, is an education consultant and currently in collaboration with *Thomson Reuters*; and the ranking system in Indonesia is nationally issued by Research, Technology, and Higher Education Ministry.

Various ranking systems have been established and used for over a decade, however, every institution has different potential features that lead to inconsistencies of performance assessment. Hence, no harmonization in employing the assessment components and standards of each system that accommodate the unique features of institutions(3) will turn a ranking system become less reliable. However, a ranking system has become an essential component to assess the performance of higher education institutions.

Initially, a ranking system of universities was proposed to provide a consideration in choosing a study program or a university. (3) has reviewed several criteria used as evaluation components to obtain university ranks, i.e. the quality of teaching and curriculum, the quality of departments in a university, and empirical studies and its implication as citations. Further, (3) argues that the aforementioned components are measured employing various methods. Therefore, university ranks cannot be used as the main reference in assessing whether the related University meets the expectation before a standard assessment to obtain the ranks is well-established.

2.2. The Efficiency of Educational Institution

Both profit-oriented and non-profit-oriented institutions tend to improve its performance and standards along with the increasing of necessity (of sustainability) of relevant system, even the educational needs are urged to improve its sustainability. At the beginning period of the establishment of educational institutions, stakeholders competed for each other to study due to the limited number of educational institutions. It is significantly different from the current condition, where stakeholders have been faced with many options thus it is necessary to require the relevant and valuable information to making a decision (choosing a university and a study program). In this case, knowing the value of educational establishments will be beneficial.

The value of an educational institution varies from the value of a company in which the performance of an enterprise can be seen from the financial statements. Educational institutions have performance assessment standards or *benchmarks* that cannot be aggregately systemized and based on *ad hoc* (4). This is apparent from the Ranking System which had been discussed in the previous subsection, which even though the components are used in performing the same assessment, the results obtained will vary depending on the methods and procedures used in assessing these components. Therefore, the educational institution requires a *benchmarking* that is more systematic and standardized thus each educational institution and each assessment institution will get the reliable results in accordance with the performance and free from bias.

The university ranking systems using components and different methods are less appropriate in measuring performance, especially the ranking will give the *brand* of university that will influence the point of views of stakeholders towards the performance of related universities. Actually, the rating system does not consider the improvement process of education, where the assessment is likely made towards the outcomes regardless of inputs. For instance, the number of publications is considered as a reference in assessing the quality of research or researchers, or the employed graduates are used as an important proxy of educational outcomes. These components do not consider whether the colleges have or do not have available sources. However, a low-ranked university might be known that it effectively and efficiently provides less educational experience to students with limited resources.

The National Accreditation Institution of Higher Education (BAN PT) serves as the only institution that evaluates the study program and educational institution performance pursuant to the performance portfolio and publishes the accreditation grade as the result of the evaluation. Different from the ranking system, the components and methods of the assessment conducted by BAN PT are standardized for all of the educational institutions in Indonesia. There are seven assessment standards used by BAN PT, as follows: (1) Standard 1: vision, mission, goals and objectives, as well as the achievement strategies; (2) Standard 2: governance, leadership, management systems, and quality assurance; (3) Standard 3: students and graduates; (4) Standard 4: human resources; (5) Standard 5: curriculum, learning, and academic atmosphere; (6) Standard 6: financing and infrastructure, as well as the information system; and (7) Standard 7: research, societal service, and cooperation.

The fundamental question is who are the main stakeholders of educational institutions. They are students and the users of educational services provided by educational institutions, which they generally refer the results of an evaluation issued by BAN PT to choose a study program and a university. However, stakeholders will only interpret the provided grade based on the category that is A for 'very good ', B for 'good ', and C for 'sufficient', without knowing which components make an educational institution decided as a very good, a good, or a sufficient institution. In addition, all components used in performing the assessment is not necessarily required by stakeholders in decision-making process, moreover, when the main concern of stakeholder is the optimization of the *pay-off* between the quality and the money paid. In this case, the performance efficiency of educational institutions is very important to be considered in preferring the university.

Since education is a natural process of change, thus a fundamental question that will be brought up regarding the performance of educational institutions is related to the performance efficiency of the related institution. When utilizing the same inputs, the ranking system predicated on the measurement of the outputs will be relevant and unbiased (5). Obviously, this is not a major issue at public universities. Instead, the ideal objectives of the policy makers and stakeholders are the management of educational institutions that are accountable in providing optimal results in educating learners using the provided resources.

Basically, a measurement of efficiency is absolutely required in assessing the accountability of related institutions in organizing accountable activities (5). But, absolute efficiency measurements on decision-making units (DMUs) which produce a product, much more easily than an institution that provides services. Therefore, the absolute efficiency values of the institutions producing abstracts, as well as a learning at educational institutions, are not likely to be calculated.

Accordingly, there are two methods that can be utilized to measure efficiency. The first is a *cost-benefit analysis* which is not appropriate to be applied in educational institutions since all the

components of the assessment should be quantified as a currency. The second method is by analyzing the relative efficiency values i.e. technical efficiency of the assessment component of an analysis unit. Technical efficiency has been broadly calculated using *data envelopment analysis* (DEA). Therefore, the preliminary observation of this study was done by calculating the efficiency of the performance of the program of study and the educational institutions using DEA.

From Figure 1, (6) explains that the basic criteria for evaluating the performance of an organization are based on the output, while the evaluation of outputs is suppositiously for quantifying the procurement by adjusting the results and the criteria of learners. In this case, the selection of variables used to evaluate the process should be significantly correlated with inputs and outputs. Benchmarking model by (6) known as *educational development efficiency* (EDE) identifies the ease of access to education, infrastructure, teachers, and the components of management as important factors that influence the development of education. In addition, it is presented in Figure 2 that the number of new enrolled and current students as learning outcomes are necessarily considered.

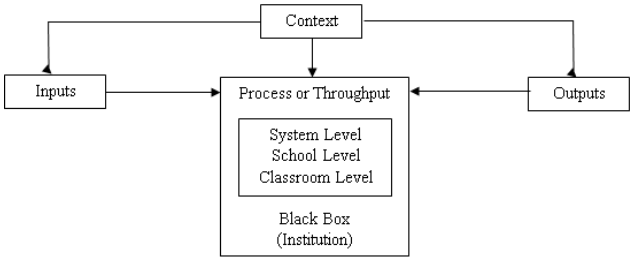

Fig. 1: The basic function of education system model

The Basic Function of Education System model on Figure 1 is modified by(6). (6) assumes the educational institutions as a *Black Box*, which there are complex processes within educational institutions that combine inputs and constraints to generate expected outputs, where the change of inputs into outputs occurs and is recorded in the related institutions. In this case, the quality of education is very influential. Further, (6) explains that to test the basic aspects of the basic function of education system model can be reviewed at least from six perspectives, i.e. *instrumental view*, *productivity effectiveness view*, *adaptation perspective*, *equity perspective*, *efficiency perspective*, and *disjointed view*.

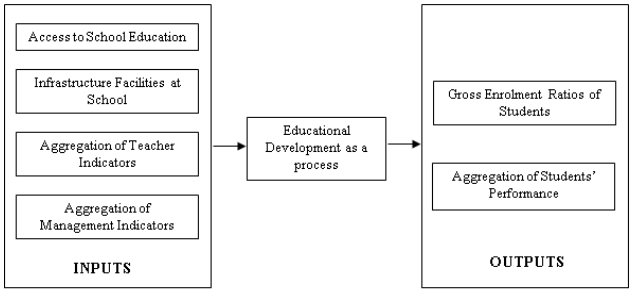

Fig. 2: Modified educational development efficiency (EDE)

2.3. The Attitude of Prospective Students

The initial definition of attitude is expressed by(7). According to (7), an attitude as one of a fairly simple concept is a number of individual influences over or against an object. Falk and Lieberman (in (8) suggest that an attitude encompasses a long-term assessment, places, and ideas that possibly influence behavior, including those that directly affect political behavior, relationships between groups, and healthy behavior, among other consequences. Furthermore, (9) states an attitude as a concept of one simple dimension. Currently, most researchers agree that the simple concept of attitude by (9) is the most beneficial. It means that an attitude represents a happy or unhappy feeling towards the observed object. Beliefs (cognition) and the desire to Act (*conation*) are viewed to have a correlation with an attitude over a separated cognitive concept not a part of the attitude itself.

According to (10), an attitude, that is the tendency to respond with the degree of *favorableness* or *un-favorableness* to a psychological object, is a paramount concept and very subsidiary to understand and to predict human social behavior. An attitude leads someone to consistently behave against similar objects. People do not interpret or react to each object with an entirely new way. It saves energy and reduces mind burdens because it is difficult to change attitudes. The attitude of individual forms a consistent pattern and so, to change a specific attitude may require a number of adjustments in other attitudes.

Someone was born without concrete attitudes and point of views, but rather the attitudes are composed throughout his or her growth and development. Where in social interaction, an individual reacts to form a pattern of a specific attitude towards various psychological objects(11). (12) explain that there are four attitude-forming sources i.e. personal experience, interaction with another individual or group, the influence of the mass media, and the influence of variables which is considered important. (13) include that the traditions, customs, cultures, and educational levels influence in shaping the attitude. Based on these definitions, it can be concluded that the determinants of attitude-forming are a) personal experience, b) the influence of others who are considered important, c) cultural influence d) mass media, e) educational and religious institutions, and f) the emotional factor.

2.4. The Performance Efficiency of Educational Institution for Decision Making

The main concern examined in this study is whether the performance efficiency of higher school affects the decision of prospective students in selecting a study program or a university. From a few investigations that surveyed the performance efficiency of educational departments in universities, the degree of efficiency is able to resolve the complicated relationship between inputs and outputs in providing optimal outcomes (14), both the monetary or non-monetary variables (2, 5), particularly in the benchmarking procedure with the intend to enhance the nature of education(6, 15). The attitude of stakeholders in deciding the decision depends on the appraisal procedure against an object in light of individual encounters, social conditions, mass medias, thoughts, and particularly in light of educational environments (7, 9); Falk & Lieberman in (8) that build the trust (cognition) and the desire to act. Therefore, the degree of higher school efficiency is expected to become a consideration by stakeholders in making a good decision. Furthermore, the University Rankings has long been used by the *stakeholders* in assessing College will be chosen. Because of rating colleges is not aggregate (3, 4, 16) and does not contain all the information needed stakeholders then rank colleges can moderate the influence of level of efficiency against the attitude of *stakeholders* (prospective students).

3. Methodology

3.1. Research Design

Generally, this research was started by analyzing the research potential and needs that direct it using a quantitative approach with descriptive analysis and binary logistic regression. The conceptual framework of this study and the data sources are adjusted to define inputs and outputs that will be tailored and adjusted for the purpose of data analysis in assessing the performance efficiency. After defining the inputs and outputs, we calculate the determination level of inputs towards outputs from the assessment of respondents which would be used as a reference to the performance assessment of courses and institutions. After obtaining

judgments of students, then logit regression analysis with the attitude of students as a dependent variable is performed to know how much the influence of higher school efficiency as the consideration of decision-making by stakeholders in selecting a course or a university.
Inputs and outputs used to assess the performance efficiency in this research are selected components of the portfolio of courses and colleges in accordance with the guidelines of accredited assessment issued by the Ministry of Research, Technology and Higher Education and the accreditation institution of higher education in Indonesia, that is tailored to the model of *educational development efficiency* (EDE) by (6) as shown in Figure 2.

3.2. Research Sample

This research will be done to the courses in public cluster I universities[4] in East Java based on the rating system of BAN PT and that have the certificate of accreditation by 2015. There are three public universities and 29 bachelor programs that have the certificate of accreditation by 2015. The required data are obtained from 461 students that perceive the performance of the corresponding courses and the university rankings by Ministry of Research, Technology and Higher Education in Indonesia. After deducting the respondents with missing values, outliers and double counted data, respectively 49, 11 and 1 observations, the number of the data used in this study is 400 observations.

3.3. Data Analysis

It has been mentioned that there are two procedures of data analysis conducted in this study. A descriptive analysis is conducted to describe the information based on the data obtained, including the reasons why respondents select the course. Furthermore, analysis of the determination is carried out in two stages where the first stage is to regress the determination of inputs toward outputs that reflect the performance efficiency of the courses and the second one is to analyze the inclination of higher school students in selecting courses based on their assessment against the courses after a while by using binary logistic regression.
On the second regression model, the dependent variable is *Inclination* as the tendency of students whether they keep choosing their courses or not, in order to gauge the attitude of prospective students in selecting a course or a university. Independent variables used in the assessment grade from students towards the faculties, facilities, services, and the overall value towards the institution. This analysis is intended to find out how efficient higher educational institutions affect the decision-making process of stakeholders (prospective students).

4. Results and Findings

4.1. Descriptive Analysis

The data of variables used in this study are described in Table 3. Most of 400 respondents used in this study are female students. Most of the students consider the tightness ratio when choosing a course (*Access mean of* .71) and are satisfied with the faculties, provided facilities, and governance of institutions in improving the quality of academic services.

Table 3: Data Statistics

	Min	Max	Mean	Std. Deviation
Institution	1	3	1.63	.837
Rank	1	3	2.07	.623
Gender	0	1	.37	.482
Access	0	1	.71	.455
Infrastructure	-4.361	2.188	.025	1.690
Teacher	2.40	19.11	12.866	2.761
Management	7.66	39.44	29.309	5.261
Outcomes	1.57	16.39	10.692	3.184
EduPoint	4	10	7.94	1.014
FacilPoint	1	10	7.37	1.486
ServPoint	1	10	7.16	1.572
InsPoint	2	10	8.17	1.379
Inclination	0	1	.73	.445

Table 3 provides statistics of variables used in this study. This research uses 400 respondents from 29 courses of three cluster I universities in East Java. Variables used in this study are described in Appendix 2. The dependent variable used to examine the determination based on the EDE model is *Outcomes*, while the variable used to examine the tendency of stakeholders (students) is *Inclined.*
There are students giving low points to the quality of faculties (*EduPoint*), facilities (*FacilPoint*), the quality of services (*ServPoint*) and the overall assessment of institution (*InsPoint*), however, most of the students are satisfied with the four components. This can be seen from the average grades more than 7 out of 10. In addition, most of the students tend to choose to study in their current course. This is proven by the un-tabulated results that 66.3% of the total respondents keep selecting a course where they study because of their interest in the field currently studied.

4.2. Analysis Results

Table 4 provides the results of correlation analysis among variables used in this study. Variables in Panel A represent input variables (*access, infrastructure, teacher, and management*) towards the output (*outcomes*). Almost all of the correlations among variables in this study is positive and significant. It shows that the increase in the quality of one component drives the increase in the quality of other components.

Table 4 provides the correlation matrix of 400 respondents from 29 courses of 3 cluster I universities in East Java. The correlation coefficients above are *Pearson coefficient*. All of the coefficients are significant at the level of 1%, 5% and 10% with indicators ***, **, and *, except for italics. Variables are described in Appendix 2. Panel B shows the correlation among variables used to examine the tendency of students in selecting courses. Almost all of the correlations are positive and significant, except *Gender* which does not contribute to the assessment of student towards the performance of each institution. University ranks (*Rank*) contribute to the student's judgment to the components of assessment, where the higher the ranking of a university, the better the students' judgment of the quality of faculties, facilities, academic services and overall assessment of the institution. In other words, the institution can satisfy stakeholders. Accordingly, the higher the quality of the assessment components mentioned above, the higher the probability of student will choose the course or the university.
Table 5 provides the findings of this study. Panel A provides the results of the determination analysis of inputs on the output of EDE model for each institution and for overall. It can be seen from Panel A that almost all inputs positively and significantly influence the *Outcomes* of institution 1, 3 and overall institutions. The quality of faculties (*Teacher*) significantly influences the graduates of each institution. This is proven by a positive and significant coefficient of *Teacher* for each university and the overall. Outcomes of each university cannot be differentiated based on *Gender*, but it has a negative and significant effect on the *outcomes* for overall institutions. This shows that female students tend to have a better quality than male students.

Panel B presents the results of the student inclination analysis in selecting courses based on the assessment results of courses' performance by students as respondents in this research. From the results above,

Table 4: The Correlation Analysis

Panel A					
	Access	Infrastructure	**Teacher**	**Management**	**Outcomes**
Access	1				
Infrastructure	.146***	1			
Teacher	*.004*	.167***	1		
Management	*-.009*	*080*	.424***	1	
Outcomes	.177***	.233***	.353***	.451***	1

Panel B							
	Rank	**Gender**	**EduPoint**	**FacilPoint**	**ServPoint**	**InsPoint**	**Inclined**
Rank	1						
Gender	.113**	1					
EduPoint	.127**	*-.044*	1				
FacilPoint	.110**	*.034*	.487***	1			
ServPoint	.114**	*.031*	.453***	.638***	1		
Inspoint	.157***	*-.030*	.517***	.555***	.556***	1	
Inclination	.083*	*-.065*	.250***	.267***	.289***	.318***	1

Table 5: Analysis of Determination

Panel A: Outcomes				
	1	**2**	**3**	**Overalls**
Access	1.121 (2.729)***	-.371 (-.523)	1.503 (2.734)***	1.069 (3.574)***
Infrastructure	.314 (2.810)***	.232 (1.331)	.067 (.445)	.276 (3.383)***
Teacher	.194 (2.627)***	.334 (2.875)***	.194 (1.811)*	.198 (3.651)***
Management	.212 (5.811)***	.070 (1.079)	.351 (6.110)***	.227 (8.021)***
Gender (1)	-.539 (-1.419)	-.769 (-1.260)	-.891 (-1.536)	-.571 (-2.030)**
Adj-R^2	.253	.217	.415	.289
Panel B: Inclined				
			Exp (B)	
EduPoint			1.167	.155 (1.200)
FacilPoint			1.115	.109 (.973)
ServPoint			1.223	.201 (3.867)**
InsPoint			1.350	.300 (6.762)***
Gender (1)			.673	-.397 (2.457)
Institution			.663	.411 (5.836)**
Rank			.855	.157 (.483)
Cox & Snell R^2				.134
Nagelkerke R^2				.195
Percentage Correct (1)				95.5%

It can be seen that the quality of academic services and educational institutions based on student assessment affect the student tendency in selecting courses where they learn. Even after they undergo a learning process in that institution, the tendency of students in selecting courses is significantly influenced by the educational institutions (*Institution of 0.411 with Wald of 5.836 at the level of 0.05*), where the tendency of students to keep choosing the same course is 95.5%. In addition, the results show that university ranks based on BAN PT (*Rank*), the quality of faculties and provided facilities do not contribute to the tendency of students in selecting courses.

4.3. The Determinant of Higher Education Outcomes

The assessment of higher education performance is generally carried out by the Government as the authorities in the determination of standards implementation and evaluation. The evaluation con

ducted by the Government of Indonesia on educational institutions generally includes criteria for performance evaluation based on the output of the purpose of achievement measurement adjusted with the criteria of learners on the benchmarking model of educational development efficiency (EDE). The EDE model developed by(6) identifies the determinants of the quality and development of education from the accessibility to education, infrastructures, educators and the institution governance. From the research conducted in three clusters I universities in East Java, the results obtained are consistent with EDE model where overall factors in this model affect the higher education outcomes.

The accessibility to education, infrastructure, educators and the institution governance can be assessed effectively and efficiently when the institution can help students get a proper education in accordance with the purposes of the course or gain knowledge, experience, and expertise as learned. So, after graduated from the course, students can find a job in accordance with their talents and interests. The assessment of performance efficiency can be done by examining the perception and assessment of students who after a while they are proceeding in that environment (Falk & Lieberman in (8). Consistent with the previous research, this study also proves that the inputs on EDE model significantly affect the higher education outcomes, but it also depends on the respective edu-

cational institutions: whether the educational institutions have a very good reputation to the stakeholders, or whether the institutions have the significant inputs to produce credibility and competitiveness outcomes, that are always taken into account(9, 10) and Falk & Lieberman in (8).

4.4. The Inclination of Students in Selecting Courses

Students consider many aspects to determine a course and an educational institution where they will pursue higher education. From the collected data, 41.2% of respondents chose a course based on their interests and talents, 23% based on the popularity and good name, many of them consider the academic services, and some consider the quality of educators and education costs. Information obtained by prospective students largely comes from third parties, neither directly related to the individual concerned or indirectly by inquiring the information from the provider. However, the most credible information is derived either from experience or directly obtained by means of their processes (7, 9) and Falk & Lieberman in(8) that drives the trust (cognition) and the desire to act. Therefore, in this study, the assessment of students who have proceeded for sometimes, is considered as a reference to analyze the needs that will determine the tendency of prospective students in selecting courses.

The outcomes of this study indicate that students emphasize the importance of academic service quality and the quality of educational institutions, or the credibility of educational institutions in creating graduates that can meet the expectation of stakeholders. Consistent with previous research, this study is not able to determine the contribution of university ranks issued by BAN PT in determining the students' inclination in selecting courses. This is due to the issuing of university ranks based on aggregate information (3, 4, 16) and it does not reflect all the information needed by stakeholders. In this case, the ranking system of higher education issued by BAN PT can be used as supporting information for stakeholders in assessing the educational institutions.

5. Conclusion

This research proposes to offer an analysis of needs in assessing the operation efficiency of educational departments and institutions with respect to the usefulness of efficiency assessment results for stakeholders in decision making. The carrying out an assessment of universities in Indonesia has been executed by the National Accreditation Institution of Higher Education (BAN PT) with the measures applicable to all establishments of higher education in Indonesia. Nonetheless, stakeholders can only obtain the aggregate results provided by BAN PT to make a decision without knowing the assessment results of which components are needed for decision-making. Thus, this inquiry employs a theoretical account of educational development efficiency (EDE) for measuring the efficiency of educational departments and institutions by examining the determination of inputs towards the output (the assessment components of paths and institutions accreditation established by BAN PT).

To accomplish the aims above, this research uses educational development efficiency (EDE) model to key out the input and output variables that will be utilized as the foundation for the performance efficiency assessment of higher instruction. Furthermore, the identification results are used to examine the tendency of prospective students in selecting courses. In other words, this research is intended to give an overview about the urgency of university performance assessment based on the efficiency level. Furthermore, the answers will be utilized as the basis for identifying the inefficiency of university functioning.

The results of this study suggest that, consistent with previous research, accessibility of education, infrastructure, educators and educational institutions governance can be assessed effectively and efficiently when the educational departments have been able to help students to get the appropriate education in accordance with the programs planned or to gain knowledge, experience and expertise as learned, so that, after graduated from these programs, students can find the job in accordance with their talents and interests. In other words, the components as the input variables determine the quality of *outcomes* produced by the educational institutions. In addition, the quality of academic service and the reputation of educational institutions significantly affect the tendency of students in selecting courses.

A few things that need to be highlighted and resolved in this research is that the analysis of assessment components is necessary for educational institutions. Therefore, the availability of data from the portfolio of the institution's performance is desirable. In addition, it is also required to control the respondents based on the length of studying on related courses and educational institutions.

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Appendix

APPENDIX 1

List of Public Cluster I Universities Holding the Accreditation Certificate 2015 in East Java, Indonesia

Universities	Bachelor Program	Accreditation Rank
Institut Teknologi Sepuluh November, Surabaya (6)	Interior Design	B
	Urban and Regional Planning	A
	Statistics	A
	Environmental Engineering	A
	Material and Metallurgical Engineering	A
	Civil Engineering	A
University of Airlangga, Surabaya (5)	Accounting	A
	Environmental Science and Technology	A
	Management	A
	Indonesian Literature	A
	Japanese	B
University of Brawijaya, Malang (18)	Biotechnology	A
	Business Administration Science	A
	Public Administration Science	A
	Law Science	A
	Library Science	A
	Management	A
	Mathematics	A
	Tourism	B
	Indonesian Language and Literature	B
	English Language and Education	B
	Japanese Language and Education	B
	Urban and Regional Planning	A
	Chinese Literature	B
	Fine Arts	B
	Architecture Engineering	A
	Electric Engineering	A
	Chemical Engineering	B
	Water Source Engineering	A

APPENDIX 2

Description of Variables

Variable	Description
Access	Accessibility of prospective students to obtain higher education
Infrastructure	Infrastructure supporting teaching and learning process
Teacher	Lecturers with educational background and skills as required
Management	Good university governance
Outcomes	The quality of graduates and other outcomes of educational institution
Rank	University ranks issued by National Accreditation Institution in Indonesia
Institution	The Reputation of university
Gender	A dummy variable, 1 for male respondents and 0 for female respondents
EduPoint	Assessment performed by students toward the quality of faculties
FacilPoint	Assessment performed by students toward the quality of infrastructure
ServPoint	Assessment performed by students toward the quality of academic and non-academic services
Inspoint	Assessment performed by students toward the quality of overall institution
Inclined	A dummy variable of the tendency of students in selecting a course. 1 is for those who keep selecting the course after giving an assessment and 0 is for those who choose another course than their current course

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