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CIPTO WARDOYO

for presenting research paper

"Performance Efficiency of Higher Education in Indonesia: From Stakeholders' Perspective"

in the ASIA International Multidisciplinary Conference 2017

1st – 2nd May, 2017

At

Universiti Teknologi Malaysia, Johor Bahru Campus

Organized by

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Prof. Dr. Amran Bin Md. Rasli
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ASIA International Multidisciplinary Conference

Acceptance of Abstract

Ref: AIMC-2017- SSH-304

Dear Aulia Herdiani

I am pleased to inform you that your abstract entitled "**Performance Efficiency of Higher Education in Indonesia: From Stakeholders' Perspective**" has been accepted for oral presentation in ASIA International Multidisciplinary Conference (AIMC-2017) after peer review by the editorial board (AIMC 2017). Please note that the conference will be held on 1-2 May, 2017 at Universiti Teknologi Malaysia, Johor Bahru, Malaysia. You are hereby requested to email your payment proof at **aimc2017@utm.my** before 31st March 2017. Participants who can't ensure their presences at conference venue are allowed to present virtually through **video conferencing (see Section 2).** A separate email for the selection of journals will be sent later. The full paper will be published in an SCOPUS / ISI Indexed journal as mentioned in the conference website (see link for detail).

For future correspondence, use this AIMC-2017- SSH-304 as reference.
If you have any queries, feel free to contact any of the undersigned accordingly.

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Thank You

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

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Abstract

This study aims to analyze the necessity of performance evaluation in higher education institutions based on 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 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 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 related 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 assessment conducted by National Accreditation Institution for Higher Education based on standardized aspects. In many countries, the rank of 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 society that we could call as *Tridharma*[2] (three obligations) of higher education institutions in Bahasa. *Tridharma* has become tangible proofs of resources management of each institution. This is similar to the concept of measurement of departmental efficiency in higher education by Martin (2003) where 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 *tridharma* is held.

An autonomous of higher education institution to manage academic and non-academic activities, as stipulated in Act No.12 Year 2012 about Higher Education, enacts the legality of university to be a corporation[3]. Holding this form of legality, a university has boarder authority in establishing a funding mechanism as stipulated in Government Regulation No. 58 Year 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 Year 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 other hand, the performance of higher education can be evaluated based on this issue; whether each

[1] Based on the inflation data in Bank Indonesia, after Melting Down in 2008, inflation rate in Indonesia was fluctuated and has reached the highest rate (after inflation rate during 2008) in 2013. Over 2013, the rate was gradually decreased up to 3,02% on December 2016 which is the lowest rate. (Retrieved from http://www.bi.go.id/id/moneter/inflasi/data/Default.aspx on January 2017).

[2] Act of Republic of Indonesia No. 12 Year 2012 about Higher Education regulates higher education in Indonesia. Based on this act, *tridharma* of higher education institutions is the obligation of each institution and the academicians to conduct education, research, and society-based activities. The academicians are urged to be innovative, responsive, creative, skilled, competitive, and cooperative through *tridharma*.

[3] In Indonesia using Bahasa, based on Act No. 12 Year 2012 about Higher Education, a university as a corporation is known as PTN BH.

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 education 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 a desired job after graduated (Kong & Fu, 2012). Hence, this study aims to examine whether the efficiency of higher education institution can influence the decision making of stakeholder.

The performance of education institutions can be evaluated based on its efficiency and effectivity in carrying out the activities. Research, Technology and Higher Education Ministry of Indonesia issues a ranking system from the evaluation results of university performance in Indonesia, where the evaluation consists of the quality of human resource, management system, students' activities, research and publication, and a total score of portfolio. Based on the ranking system, this study tries to compare it to efficiency scores calculated using *data envelopment analysis* (DEA) as shown in Table 1.

Table 1. Comparison of the Rank of Universities in Indonesia and Its Efficiency using DEA

DMU (Institution Code)	Total Score	Ranking	Efficiency Score (BCC-I)	Efficiency Score (CCR-I)
2001	3,743	1	1	1
1001	3,690	2	1	1
2003	3,490	3	0,9821	0,9329
1002	3,412	4	0,9816	0,9281
2002	3,289	5	0,9912	0,9276
1019	3,217	6	1	0,9233
1007	3,075	7	1	0,9019
1004	3,064	8	1	0,8628
1027	3,035	9	0,9862	0,8779
1008	2,983	10	0,9994	0,8724

DMUs are universities cluster 1 in Indonesia ordered based on the ranks in 2015 from Research, Technology and Higher Education Ministry.

Table 1 shows that efficiency scores from DEA provide different information from the ranks given to universities cluster I in Indonesia. the first rank university has a linear efficiency score, however for universities with a rank from 2 to 10 shows different results, even the second-best university has also a perfect efficiency score as the first one. This study aims to observe the perception of stakeholder (students) as an assessment of the related study program. The proposed assessment is based on assessment standards from Indonesia Accreditation Institution for higher education. In other words, the efficiency of higher education institution will be assessed using standard assessment components in portfolio of each department. 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

Ranking system is one of simpler way to evaluate differences. This system has been used by stakeholder to assess the performance of higher education institution and as a consideration to making 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 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 (Smith, 2004) will turn a ranking system become less reliable. However, a ranking system has become an important 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. Smith (2014) 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, Smith (2014) explained that each of those components is measured using various methods. Therefore, university ranks cannot be used as a main reference in assessing whether the related university meets the expectation until there is a standard assessment to obtain the ranks.

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 increase to improve its sustainability. At the beginning period of the establishment of educational institutions, stakeholders competed 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 so that 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 an educational establishments will be helpful.

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 *benchmarking* that cannot be aggregately systemized and based on *ad hoc* (Asif, 2015). This is apparent from the system of ranking (*Ranking System*) which had been discussed in the previous subsection, where even though the components are used in performing the same assessment, but 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, so that 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 is 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) in Indonesia performs functions as the only institution that evaluates the performance of the program of study and educational institutions in Indonesia based on the portfolio of performance and publishes the accreditation grade as the result of evaluation. Different from the ranking system, the components and methods of assessment conducted by BAN PT are standardized for all of educational institutions in Indonesia. There are 7 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, the users of educational services provided by educational institutions, where they generally refer the results of an evaluation conducted 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 'enough ', without knowing which components make an educational institution decided as a very good, a good, or a good enough 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.

Due to the process of education is naturally a process of changes, a fundamental question that will be questioned regarding the performance of educational institutions is related to the performance efficiency of the related institution. The ranking system based on the measurement of the outputs will be relevant and unbiased when using the same inputs (Wootton, 2003). 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 is 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 (Wootton, 2003). 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 used to measure efficiency. The first is *cost benefit analysis* which is not appropriate to be applied in educational institutions because 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, Scheerens (2004) explained that the basic criteria in evaluating the performance of an organization is based on the output, while the evaluation of outputs is supposedly for measuring the attainment 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 Scheerens (2004) known as *educational development efficiency* (EDE) identifies the ease of access on education, infrastructure, teachers, and the components of management as important factors that influence the development of education. In addition, it can be seen from Figure 2 that the number of new admitted and current students as learning outcomes are necessarily considered.

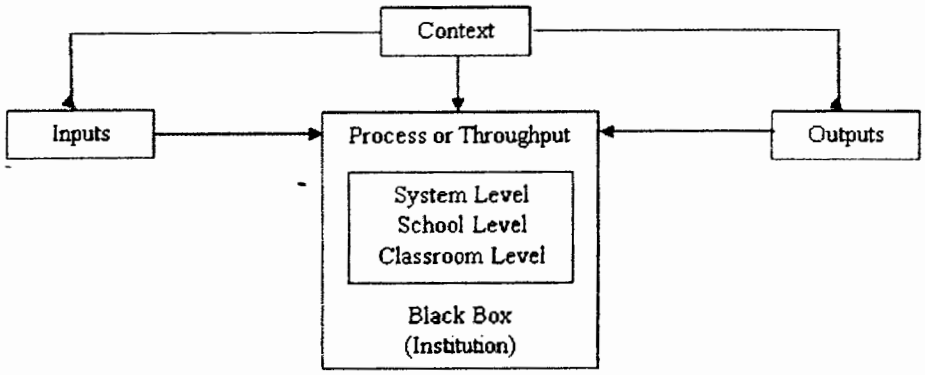

Figure 1. The Basic Function of Education System Model

The Basic Function of Education System model on Figure 1 is modified by Scheerens (2004). Scheerens (2004) assumes the educational institutions as a *Black Box*, where there are complex processes in educational institutions that combines inputs and constrains to become 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, Scheerens (2004) explains that to test the basic aspects on the basic function of education system model can be reviewed at least from 6 perspectives, i.e. *instrumental view, productivity effectiveness view, adaptation perspective, equity perspective, efficiency perspective,* and *disjointed view*.

2.3 The Attitude of Prospective Students

The initial definition of attitude expressed by Thursthone (1928). According to Thursthone (1928), an attitude as one of a fairly simple concept, is the amount of individual influences over or against an object. Falk and Lieberman (2012) 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, Fishbein (1979) states an attitude as a concept of one simple dimension. Currently, most researchers agree that the simple concept of attitude by Fishbein (1979) 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 Ajzen and Gilbert (2008), an attitude, that is the tendency to respond with the degree of *favorableness* or *un-favorableness* to a psychological object, is an important concept and very useful 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 reduce mind burdens, because it is difficult to change attitudes. The attitude of an individual forms a consistent pattern and so, to change a specific attitude may require number of adjustments in other attitudes.

Someone was born without specific attitudes and point of views, but rather the attitudes are formed throughout his growth and development. Where in social interaction, an individual reacts to form a pattern of a specific attitude towards various psychological objects (Azwar, 1995). Loudon and Bitta (1984) 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. Swasta and Handoko (1982) add 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.

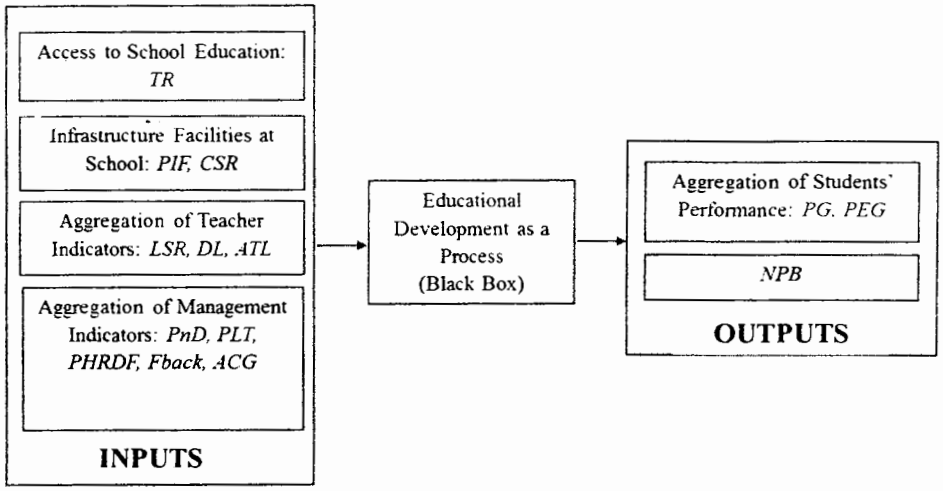

Figure 2. Educational Development Efficiency (EDE) Model

*The components of both variables input and outputs are described in Table 2

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 some studies that assessed 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 (Agha, et al., 2013), both the monetary or non-monetary variables (Wootton, 2003; Kong & Fu, 2012), especially in the benchmarking process with the aim to improve the quality of education (Scheerans, 2004; Gourishankar & Lokachari, 2012). The attitude of stakeholders in determining the choice is based on the assessment process against an object based on personal experiences, social environments, mass medias, ideas, and especially based on educational environments (Thrusthone, 1928; Fishbein, 1979; Falk & Lieberman, 2012) 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 not aggregate (Smith, 2012; Smith, 2014; Asif, 2015) 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* (a candidate).

3 Methods

3.1 Research Design

Generally, this research was started by analyzing the research potential and needs that directs 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 with 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 against the performance assessment of courses and institutions. After obtaining judgments of students, then logit regression analysis with 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. The design of this study can be seen from Figure 3.

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 3 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 Measure of Performance Efficiency

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 Scheerens (2004).

Table 2. Inputs and Outputs of Educational Development Analysis Model

Categories	Variables	Description	Form BAN PT
Access (Input)	*TR*	Tightness Ratio	Standard 3
Infrastructure (Input)	*PIF*	Percentage of Infrastructure Funds	Standard 6
	CSR	Classroom–Students Ratio	Standard 3
Teacher (Input)	*LSR*	Lecturers–Students Ratio	Standard 1
	DL	Doctorate Lecturer	Standard 4
	ATL	Average Teaching Loads	Standard 5
Management (Inputs)	*PnD*	Promotion and Dissemination	Standard 1
	PLT	Percentage of Lecturers attending trainings in the current year	Standard 4
	PHRDF	Percentage of Human Resources Development Funds	Standard 6
	Fback	Feedback from Lecturers, Students, Alumnus and Users	Standard 2
	ACG	The Number of Additional Competencies for Graduates	Standard 5
Outcomes (Output)	*PG*	The Percentage of Graduates in the current year	Standard 3
	NPB	The Number of Publications and Books	Standard 7
	PEG	The Percentage of Employed Graduates	Standard 3

Table 2 provides the detail of assessment components based on EDE model. Input variables include *access, infrastructure, teacher,* and *management*, while the output variable is *outcomes* of higher education. *TR* is the tightness ratio used to measure the quality of prospective students as a major input in higher schools that is also one of the main component in assessing the quality of higher educational in Indonesia. *PIF* is used to analyze the funds to provide the proper infrastructures (Lopes & Lanzer, 2002; Waldo, 2006; Sutherland & Price, 2007; Agha, et. Al., 2011). *CSR* represents the ratio of the number of classrooms and students to measure the availability of infrastructures for students (Moreno & Tadepalli, 2002; Fare et al., 2006; Gourishankar & Lokachari, 2012).

LSR, the ratio of lecturers over students, is used to measure the ideal conditions between the number of available lecturers and the number of students registered. The smaller the *LSR,* the higher the quality of a

[4] Public Islamic universities are not included as the sample of this study since it is not under the authority of the Ministry of Research, Technology and Higher education instead under the authority of the Ministry of Religious Affairs. The list of universities is attached as Appendix 1.

teaching and learning process (Fare, et al., 2006; Hu, et al., 2009; Gourishankar & Lokachari, 2012). *DL* is the ratio of lecturers holding a doctorate degree (Chakraborty & Mohapatra, 1997; Gourishankar & Lokachari, 2012). *ATL* is the average teaching loads of lecturers in one semester calculated from the amount of credits and taught hours (Fare, et al., 2006; Kao & Hung, 2006; Waldo, 2006; Agha, et al., 2011). *PLT* is the percentage of lecturers attending educational workshops as an effort to improve the quality of lecturers (Ghourishankar & Lokachari, 2012).

PHRDF is the percentage of funds used to improve the quality of lecturers over the total operational funds (Waldo, 2001; Waldo, 2006, Sutherland & Price, 2007; Gourishankar & Lokachari, 2012). *Fback* is a dummy variable used the record whether the educational department gets the continuing feedback of operational process as the assessment component of the accreditation. *ACG* is the number of additional competencies afforded by the educational department as an effort to improve the quality of graduates.

The following variable is the output variable in this research. *PG* is the percentage of graduates in the current year over the total registered students (Abbott & Doucouliagos, 2002; Lopes & Lanzer, 2002; Moreno & Tadepalli, 2002; Agha, et al., 2011). *NPB* is the number of scientific journals and books published by lecturers (Kao & Hung, 2006; Hu, et al., 2009; Agha, et al., 2011). The last variable is *PEG* which is the percentage of graduates who have worked within a maximum of 1 year after graduated (Wootton, 2003).

3.4 Data Analysis

It has been mentioned that there are 2 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 reflects 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 *Inclined* 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 is 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 is described in table 3. Most of 400 respondents used in this study is 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

	Minimum	Maximum	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
Inclined	0	1	.73	.445

Table 3 provides statistics of variables used in this study. This research uses 400 respondents from 29 courses of 3 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 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 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. The Correlation Analysis

Panel A

	Access	Insfrastructure	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	
Inclined	.083*	*-.065*	.250***	.267***	.289***	.318***	1

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 A.

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 judgement to the components of assessment, where the higher the ranking of a university, the better the students' judgement 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.

Table 5. Analysis of Determination

Panel A: Outcomes				
	1	**2**	**3**	**Overalls**
Access	1.121	-.371	1.503	1.069
	(2.729)***	(-.523)	(2.734)***	(3.574)***
Infrastructure	.314	.232	.067	.276
	(2.810)***	(1.331)	(.445)	(3.383)***
Teacher	.194	.334	.194	.198
	(2.627)***	(2.875)***	(1.811)*	(3.651)***
Management	.212	.070	.351	.227
	(5.811)***	(1.079)	(6.110)***	(8.021)***
Gender (1)	-.539	-.769	-.891	-.571
	(-1.419)	(-1.260)	(-1.536)	(-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%

Table 5 provides the findings of this study. Panel A is the results of determination analysis of inputs as independent variables on the output (*Outcomes*) as the dependent variable. The analysis is differentiated based on institutions (1 = "Universitas Brawijaya"; 2 = "Institut Teknologi Sepuluh Nopember"; 3 = "Universitas Airlangga") and as overall institutions. Panel B provides the results of student inclination analysis in selecting courses based on students' perspective regarding the performance of universities and the ranking system. The results obtained are significant at level 1%, 5% and 10% with indicators ***, **, and *, respectively. Variables used are described in Appendix A.

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, 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 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 conducted 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 Scheerens (2004) 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 cluster 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 to 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 proceed in that environment (Falk and Lieberman, 2012). 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 educational 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 (Fishbein , 1979; Ajzen and Gilbert, 2008; Falk and Lieberman, 2012).

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 (Thrusthone, 1928; Fishbein, 1979; Falk & Lieberman, 2012) that drives the trust (cognition) and the desire to act. Therefore, in this study, the assessment of students who have proceed for some times, is considered as a reference to analyze the needs that will determine the tendency of prospective students in selecting courses.

The results of this study show 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 see 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 (Smith, 2012; Smith, 2014; Asif, 2015) 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 aims to provide an analysis of needs in assessing the performance efficiency of educational departments and institutions with regard to the usefulness of efficiency assessment results for stakeholders in decision making. The performance assessment of universities in Indonesia has been performed by National Accreditation Institution of Higher Education (BAN PT) with the standards applicable to all institutions of higher education in Indonesia. Nonetheless, stakeholders can only obtain the aggregate results provided by BAN PT to making decision without knowing the assessment results of which components are needed for decision-making. Therefore, this research uses a model of *educational development efficiency* (EDE) for assessing the efficiency of educational departments and institutions by analyzing the determination of inputs towards the output (the assessment components of courses and institutions accreditation established by BAN PT).

To achieve the purposes above, this research uses *educational development efficiency* (EDE) model to identify the input and output variables that will be used as the basis for the performance efficiency assessment of higher education. 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 results will be used as the foundation to identifying the inefficiency of university performance.

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 from educational institutions. Therefore, the availability of data from the portfolio of institutions 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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