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Abstract

This study explores the design of performance efficiency measurement for private university's programs. Performance measurement is generally a basis for decision making that should reflect information such as efficiency, effectiveness and productivity. In this research, we used input and output variables that found from pra reseach through desk study and focus group discussion, then grouped based on the perspective of stakeholders from the private universities each programs, in particular university management and faculty. By using Data Envelopment Analysis (DEA), the relative efficiency of the program can be known.

The research subject is selected program at some private universieis in Kopertis III. Where the offender is selected Programs from private Universities which represents the level of activity in Tridarma activity during the last 3 years. At this early stage is the determination of input and output measures the performance study program by doing desk study of the existing concept and equipped with empirical evidence, followed by conducting focus group discussions, the results of the second stage is then used instrument questionnaires used by using instruments questionnaire and added with instruments developed from Kongar models that measure the efficiency of performance measurement study program. At the final stage of the research was conducted through a questionnaire survey, whose results are processed by the method of Data Envelopment Analysis (DEA).

The results of the desk study indicates that in every programs in all private universities, found that work engagement and competence of lecturers are factors that determine the performance of the program. And the result is confirmed from the results of focus group discussions, which also reveal that the performance of specified courses of the competence of lecturers and professors were feeling attachment to this course. Then the results of this pre-study followed by a survey, the results are processed by the DEA. DEA results indicate that in the Kopertis Region III, program in private university that is the most efficient in improving its performance through the competence of lecturers is Science Program Administration. While the views of work engagement as an input, the most efficient is the study of medicine and science program administration.

Keywords : Data Envelopment Analysis, Efficiency, Work Engagement, Competency, Performance

MEASUREMENT OF PERFORMANCE EFFICIENCY IN PRIVATE UNIVERSITIES' PROGRAM USING *DATA ENVELOPMENT ANALYSIS* (DEA) APPROACH

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Abstract

This study explores the design of efficient performance measurement courses in universities. Performance measurement is generally a basis for decision-making so it should reflect the information such as efficiency, effectiveness and productivity. In this study the input and output variables are set, grouped by perspectives from *stakeholder* of private universities of each Study Program, especially university management and lecturers. By using the *Data Envelopment Analysis (DEA)*, the relative efficiency of the study program can be known.

The research subject is selected by study program at some Private Universities in Kopertis III. Where the study program subject is selected by study program from private universities which represents the active engagement level in TriDarma activity over the last 3 years. At this early stage is the determination of the input and output measures the performance study program by doing desk study from the existing concept and equipped with empirical evidence, then followed by conducting focus group discussions, the results of the second stage is then used for questionnaires instrument by using questionnaires instrument and added with developed instruments from Kongar models that measure the efficiency of performance measurement of study program. In the final stage, the research is conducted through a questionnaire survey, whose results are processed by the method of *Data Envelopment Analysis (DEA)*.

The results from desk study shows that in study program, work engagement and competence of lecturers is a factor that determine the performance of the study program. And the result is strengthened from the results of focus group discussions, which also reveal that the performance of specified study program from the competence of lecturers and the attachment feeling of the lecturers to their study program. Then the results of this pre-study followed by a survey, the results are processed by the DEA. DEA results indicate that in the Kopertis Region III, study program that is efficient in improving its performance through the competence of lecturers is administrative science courses. While the views from work engagement as an input, the most efficient is the study of medicine and science program administration.

INTRODUCTION

University is an organization that creates a complex result by using multiple resources. University requires continuous monitoring and evaluation in order to remain competitive in the educational arena. Generally, educational institutions are evaluated by the agency / external institution to (1) academic and (2) administrative and financial activities. In addition, educational institutions also have the internal assessment conducted to (1) ensure the ability to comply and / or exceed the national standards for education, (2) adjust the organization's statement of mission and vision, and (3) ensure the continuous improvement of the students, academic and administrative personnel. Internal assessment process includes a broad overview of the performance criteria such as the development and revision of curriculum, contribute to the literature, the profile of gender / ethnicity, budget allocation, and development of students and personnel. Therefore, several factors which real or unreal in the environment must be considered during the internal review, thereby creating a complex environmental problem for the evaluator / decision. (Kongar, Pallis, and Sobh, 2010). To be able to compete and maintain its existence, a university should be able to plan and implement an appropriate management strategies that are adapted to the vision and mission that has been set. This can be done by measuring the performance of higher education as a whole so they will know the situation of the overall productivity of the organization related to the implementation of Tridharma University.

Assessment of productivity within the organization is very important. In fact, a major factor productivity include: efficiency and effectivity. Therefore, in order to assess the productivity, the organization should control these two parameters. To measure effectiveness, HR scorecard on the basis of the Balanced Scorecard (BSC) is introduced as a new performance evaluation method, which is a new approach to achieve the strategy. This method have been very effective in many organizations so that most successful companies, using the BSC as a means of powerful achieving. Meanwhile, to measure the efficiency is using Data Envelopment Analysis (DEA) method which tries to maximize the efficiency by taking into consideration the input and output. It is a mathematical programming technique that calculates the relative efficiency of several decision-making units / Decision Making Units (DMUs) on the basis of observable inputs and outputs, which can be expressed with different types of metrics. The basic concept of the DEA is to measure the efficiency of a particular DMU to the point of being projected on an "efficiency borderline". The use of DEA in evaluating a multi-criteria system and provide system improvement targets. So that both factors of productivity (effectiveness and efficiency) can be measured by combining the two models simultaneously (Seyyed Asghar, et al. 2009). Therefore, every program of study requires a draft of performance measurement method that is effective and efficient, holistic and being able to see the condition of organizations from different points of view. By the performance measurement results, each program of study can set the management strategies for the improvement and development organization in the future.

This study explores the design of efficient performance measurement study program in private universities. Performance measurement is generally a basis for decision-making so it should reflect the information such as efficiency, effectiveness and productivity. In this study the

input and output variables are set, grouped by perspectives from *stakeholder* of private universities of each Study Program, especially students and lecturers. By using Data Envelopment Analysis (DEA), the relative efficiency of the program of study can be known.

LITERATURE REVIEW

Definition of Performance Measurement

Understanding performance measurement according to Neely et.al (1995) is the process of quantifying action, where measurement is the quantification process, and action leads to performance. A further purpose of this performance is the efficiency and effectiveness of any action taken. More broadly performance measurement can be interpreted as a process of assessment of the progress achieved by the company in order to achieve the targets including an assessment of resource efficiency in delivering products and services, the company's output quality and effectiveness of the organization's activities in order to achieve organizational goals. (Abduh, 2007, P8).

From the definitions of some literatures, Yuwono et.al (2004, P.23) concluded that performance measurement is the act of measurement carried out on various activities in the value chain in the company. The measurement results are then used as feedback that will provide information on the achievements of the implementation plan and the point where companies require adjustments on the planning and control activities. (Rogan, 2008, p.II-7).

According to Ekawati (2006), performance measurement is generally a basis for decision making so that must be reflect information such as efficiency, effectiveness and productivity. Efficiency is defined as an attempt to achieve as much as possible by using the possibilities provided in a relatively short time, without disturbing the balance between the factors of purpose, tools, energy and time (The Liang Gie, 1981). Effectiveness is a measurement of the level of output achieved by productivity, clearly seen is the level of results obtained by a measure of productivity (in a specific time range). In describing the differences in the effectiveness and efficiency as follows:

- Effectiveness is doing the right thing (doing the " RIGHT " thing)
- Efficiency is doing things right (doing the " THING " right)

Productivity is a universal concept that aims to provide more goods and services to humans by using fewer real sources. Productivity can also be interpreted as an inter-disciplinary approach to determine effective goal, making a plan, application usage productive ways to use resources efficiently and maintain their high quality. Productivity included in an integrated utilization of human resources and skills, technology, management, information, energy and other resources which aimed at the development and improvement of living standards through productivity concepts total or universe (Oslo, 1984).

Performance Measurement Study Program

According to Minister of National Education of Republic Indonesia Number 232 / U / 2000 on Guidelines for Higher Education Curriculum Development and Assessment of Student Learning Outcomes explained that the course is an integrated study plan to guide the implementation of academic education and / or professional that is organized on the basis of a curriculum and is intended to students in order to master the knowledge, skills, and attitudes in accordance with the objectives of the curriculum.

In practice, the study program are in universities according to the Indonesian Government Regulation No. 60 of 1999 on Higher Education explained that the university is an educational unit that organizes higher education which is an education on the education track at a higher level than secondary education in education track.

Additionally to Article 19 paragraph (1) of Law Number 20 In 2003 regarding National Education System explained that higher education is an education after secondary education includes diplomas, bachelor's, master's, specialist, and doctoral organized by higher education. According to Article 20 paragraph (2) of Law Number 20 In 2003 regarding National Education System, university is obliged to provide education, research, and community services. Therefore, as part of the university, study program also obliged to carry this out, known as the Tridharma of Higher Education.

The importance of performance measurement also apply for the study program. Thus the importance of performance measurement in the management of universities or education, then by forming the National Accreditation Board of Higher Education (BAN-PT), Ministry of National Education try to monitor and foster the quality of higher education. The quality of education as a constitutional obligation to make some performance indicators of a university as a parameter. Performance appraisal system BAN-PT is more emphasis on the assessment of the criteria and requirements for licensing or implementation of the University, so it is more of an administrative. Whereas the introduction of quality functional performance to plan activities towards continuous quality improvement is still not fully realized.

***Data Envelopment Analysis* (DEA)**

One of the techniques for the measurement of performance is Data Envelopment Analysis (DEA) who is trying to maximize efficiency by taking consideration of input and output. DEA is the mathematical programming techniques to calculate the relative efficiency of some decision makers/Decision Making Units (DMUs) on the basis of input and output are observed, which could be expressed with different types of metrics. DEA is very useful in evaluating the system of multi-criteria and providing target system improvements as stated in many applications that are reported. (Ebnerasoul et al., 2009)

DEA is a non-parametric approach that compares the same entity, for example, against the best virtual DMU from DMU. DEA is usually modeled as a model of linear programming (LP) which gives the relative efficiency score for each DMU. The most attractive advantage of DEA is not a parametric approach, such as regression analysis/regression analysis (RA), that the DEA

optimizing each individual observations and does not require a single function that best fits all the observations. (Kongar, Pallis, Sobh, 2010)

According to Achirulloh (2006), as well as other concepts, methods of DEA has various advantages and disadvantages in the use of it is cited from the Dervishes (2004) summarizes the advantages and disadvantages of the method of DEA as follows. The superiority of DEA include

- Does not require assumptions about the form of functional connecting input and output variables of a function of the production.
- Flexibility in the selection of data to be used.
- DEA can use small-sized samples.
- In determining the input as well as output which is used including in terms of the number of variables to be used. DEA allows the analyst in choosing the input and output based on managerial focus.
- Input and output can have a different unit of measurement, can be either continuous or ordinal variables category.
- DEA can be used to assess the efficiency, effectiveness, quality and combination.

While the weakness of the use of DEA are as follows:

- Assume data must be free of measurement error due to errors in measurement can be fatal given the DEA classified as extreme point technique.
- The specific nature of the sample, where the results of the calculations was later greatly influenced by where samples are used. The DEA is also sensitive to the unavailability of the data in the sample.
- DEA only measure the relative efficiency of the DMU is not absolute efficiency given the efficiency of a DMU is only measured in himpunannya only.
- No statistical indicators to measure the error given the DEA are deterministic. Moreover test the hypothesis statistically from the DEA is also difficult to do.
- The calculation manually is difficult especially when it involves the number of DMU which is a lot because it uses a linear programme formulation which is separate for each DMU.

The selection of the sample of the DMU must also consider the number of DMU itself. There are some conditions that are usually made as guidelines in determining the number of samples used. According to Rachmat Achirulloh (2006) which CITES Dyson et al, (1998) that the number of DMU must be greater than the number of multiplication of input and output variables used in the model, while in other literature was also found the use of a smaller sample that is at least three DMU. In principle the determination of numbers of DMU used should consider the number of input and output variables are used so that the results obtained are sufficiently discriminating to be able to compare the efficiency between each DMU and also to investigate the *production of surface* production function used in the model. In Cooper et al. (2007, p. 284) mentioned that in order to determine the amount of DMU should follow the

formula as follows: ' n ≥ ' max ' {' m × s, 3 ' (' m s ')} where: n = number of DMU; m = number of input; s = number of output

In DEA models use known presence of orientation that is the input output maximization and minimization. Model-oriented input *minimization (output oriented)* trying to see the extent to which the input can be reduced while maintaining the level of output. Instead of model-oriented output *maximization (input oriented)* trying to see the extent to which the output can be enhanced by maintaining the level of inputs.

PREVIOUS STUDIES

Previous research, measuring the effectiveness and efficiency of College performance measurement approach to Data Envelopment Analysis, performed by:

1. Baysal, Mehmet Emin. Toklu, Bilal. Done in 2010, mengkuur Efiseisn Performance at universities in Turkey and Lebanon. Where are the Input and Output are becoming HUMAN RESOURCES University, the number of articles and research conducted by the lecturer as well as a number of financial expenditure.
2. Paul Lau Ngee Kiong, et al. in 2009 to measure the efficiency of the performance of the school which became the adalahSDM input, principles embraced by the school, the potential of murud while being output is achievements earned by learners.
3. Elif Kongar, et al. in 2006 to do research on the course of engineering in the United Kingdom, where the pengukuruan efficiency using input from the financial side, business processes, customers and growth. While being output is the acceptance of students, the number of published journal, align = average GPA graduates and the number of new courses persemester offered.

RESEARCH DESIGN

The selected research subjects is a Program of study at some Private Colleges in Kopertis III. Where the perpetrator of the selected study Program is a Program of study from the private university that represents the level of liveliness in the activity of TriDarma during the last 3 years. At an early stage is the determination of the inputs and outputs to measure Program performance by conducting a Study desk study of existing concepts and come up with empirical evidence, then proceeded to do a focus group discussion, the results of the second stage is then used the instrument a questionnaire used by using questionnaire and added instruments with instrument developed from the model that measures the level of efficiency of Kongar performance measurement Courses. The last stage, namely the result of study and FGD des are used as inputs and outputs in measuring the efficiency of the performance of the Program of study, will be calculated the level of efficiency and Effectiveness through the approach Data Envelopment Analysis (DEA). Efficiency performance measurement Courses. The last stage, namely the result of study and FGD des are used as inputs and outputs in measuring the

efficiency of the performance of the Program of study, will be calculated the level of efficiency and Effectiveness through the approach Data Envelopment Analysis (DEA).

RESULT AND DISCUSSION

Desk Study Results

The linkage between Competency with Performance

The ability of a lecturer as human resources personnel at the Institution (PTS) in carrying out all aspects of the TriDarma College, coordinate with the whole work unit that is in College, are able to work together and communicate with not only send Academica will make professors as educators are able to achieve internal quality assurance standards are set, performance research, public service, integrated publication of scientific works and academic performance.

Spencer and Spencer (1993) in Vazirani (2010:126) sure that the competence which is owned by an employee of the associated skills and his intelligence will be able to affect his performance in the future. The same conviction delivered by Selgman (1991) the mencotohkan competence on salespeople, where salespeople who have skills and knowledge will be selling products that are sold, will result in higher sales volumes compared to the salespeople who do not have skills and knowledge.

Studies conducted by Tippin and Sohi (2003:765) showed the link between Learning Organization, competencies and performance. Described in this study is that organizations that implement and facilitate continuous learning will improve the competence of its members, which in turn is able to improve the company's performance is measured from the side of finance.

Related to competence and performance lecturer, a lecturer in performing success TriDarma College depends greatly of the dimiiki competence, seriousness in working and focus on work so a Lecturer can optimize its performance (Sihite, 2011:3). Besides, the study of Narimawati (2010) also showed there are relations of competence lecturer with individual lecturer's performance.

The Relations Between Work Engagement With The Performance

Lecturer who have involvement in the Organization and trying to give more effort for the sake of organization, interested in working, have high dedication and enjoy the whole tasks and obligations, and have the desire to remain in the Organization, which in the end have a strong conviction to remain in the Organization will strive to meet the performance standards set by the organization.

As expressed by Karatape (2011:645) and Burke and Elkot (2010:44-6), research of the Harter (2002), Bakker and Demerouti (2008) as well as the Salanova (2007, 2008) shows that the Work Engagement will give positive results against employees, including performance in it. Then to prove the more empirically, Medhurst and Albrecht (2011:398-9) conducts research on salespeople in Amerikal, same thing tested by Tegarden, et.al (2005:76-7), both of which show

the results of that Work engagement has a strong influence and a positive performance against individual employees, where the results of the study in accordance with the results of the research of Salanova and Piero (2005) and Schaufeli Bakker (2008) which shows a strong link between Work engagements, with the performance of employees. The results of the last study from Van den Berg and bakker (2013:265-6) committed against a lecturer or teacher at the Faculty of Health Sciences shows the level of work of high engagement and connect in a positive and powerful performance with teaching of the teaching staff. This is supported by studies of Halbeslebenm and Wheeler (2008), which empirically shows that the variable Work Engagement variables closely related to Performance. Another study done by Mone, et.al (2011:207) show that 19 indicators of work engagement is a predictor of the performance of employees, where the 19 indicators taken from previous research conducted by London (2009).

The results of Focus Group Discussion

FGD results on May 17, 2016 revealed that competency development must comply with the design work and development plan of the University in the future, where individual competence development lecturer ideally should be done in a balanced way between intellectual, social competence and emotional. Participants added, that this taxonomy complies with a teacher, cited from Balnaldi (1995), by Narimawati (2010:149) is as follows:

1. competence of Lecturer to ' assessing and evaluating student behavior '
2. competence of Lecturer to ' planning instruction '
3. competencies of lecturer to ‘ conduction or implementing instruction '

The discussion lasted two hours reveals that in addition to the minimum qualifications in accordance with Act No. 14 of 2005, regulation Mendiknas RI No. 42 in 2007 about the certification of Lecturers have established four aspects of competence that should be owned by a Lecturer, namely:

1. The competence of pedagogic
   a. Ability make planning lecture
   b. ability to apply a variety of approaches, methods and techniques of instruction
   c. Ability to evaluate and provide an assessment of the learning outcomes
   d. Ability to evaluate themselves against the learning process
   e. Ability to develop an ongoing learning process

2. Professional Competencies
   a. Ability carry out all aspects of the College b TriDarma.
   b. ability to coordinate with all work units in carrying out TriDarma College
   c. the ability of designing and implementing learning programs
   d. Ability provides excellent service to the community

3. Competence of personality and social
   a. Ability works closely with the various elements that akademika
   b. Ability to communicate, to share that unsir akademika

c. social Sensitivity towards the environment

In line with the Law Lecturer Certification, as well as a professional, a lecturer is also an employee of the educational institutions where skills and competencies need to be owned by an employee determined by the tasks and responsibilities encountered by these employees. Similarly, the ability that needs to be owned by the lecturers determined by the duties, including carrying out the task of education and teaching, research and community services. Associated with the ability of professors, according to Natawidjaja (1991:37), among other things:

1. Professional Capabilities include mastery of material materials, concepts relating to the materials, educational foundation, the processes of education and learning, learners.
2. Social Capabilities include the ability to menyesesuaikan themselves to the purpose of the work and the environment while carrying out tasks as a teacher
3. Personal abilities include the appearance of a positive attitude over the work situation as pengaar and educational situation, understanding of the values that should be embraced by a teacher and the appearance of an effort to establish himself as a role model and exemplary.

The results of Data Envelopment Analysis

In a proposal to Indonesia's lecturers, profile Ngarap Beads (2010:6-8) detailing what the necessary indicators in measuring the competence of the lecturers, namely, formal education, non formal education, a scientific paper is published, the number of research within a year, and student satisfaction index against the lecturer.

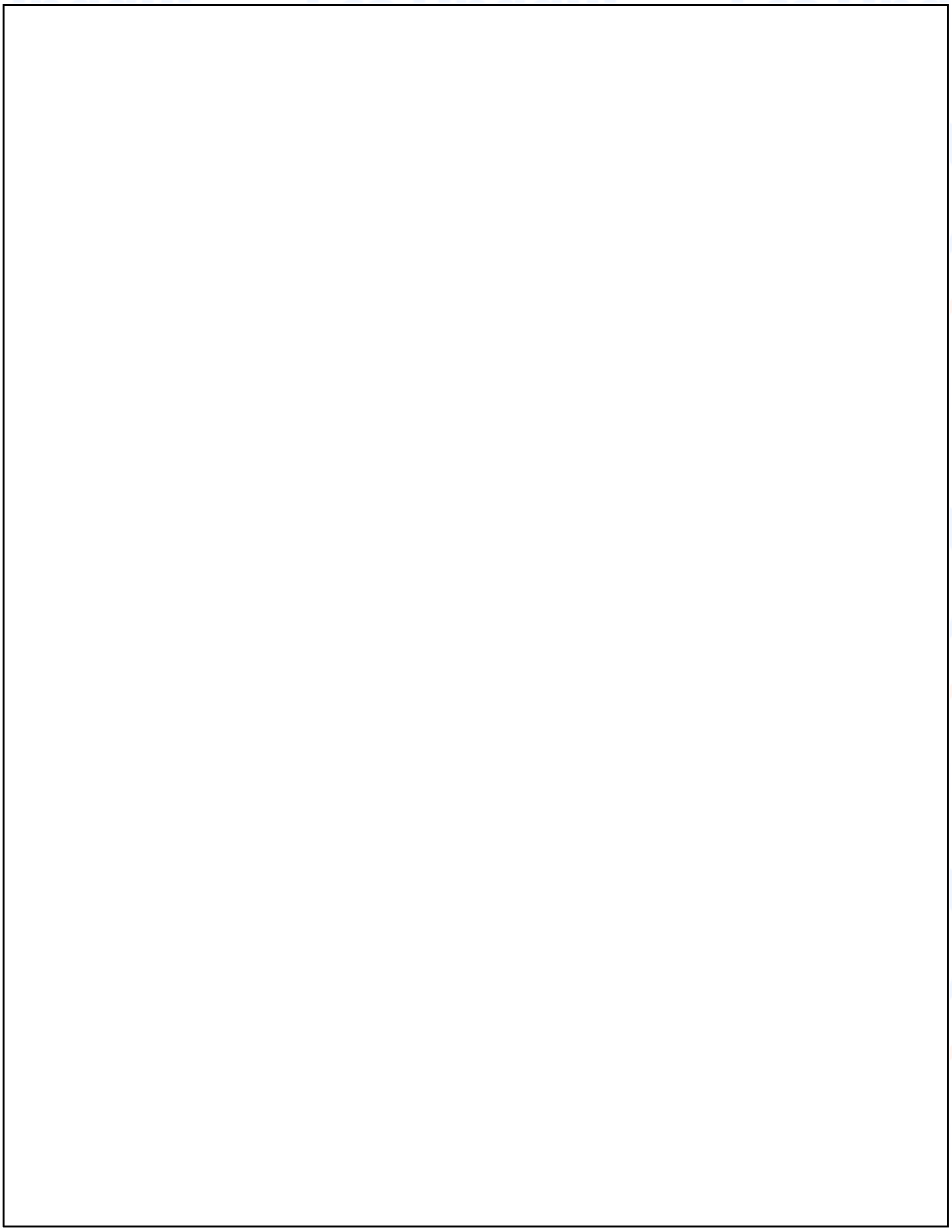
DISCUSSION

RESEARCH LIMITATIONS

There are limitations in the study, namely:

1. The variables used to determine the input obtained from the Desk Study with a limited literature and Focus Group Disscussion who only exercised once, so in fact the basis in determining the input variables affect performance could be enriched further.
2. On the empirical data is not made in advance of testing the influence of work engagement and competence lecturers of the performance of teachers, so it is recommended when using the input work engagement and competence in research further ascertained that the input variables this is indeed penentuk the success of the performance of the program of study.
3. Have not been a lot of research using questionnaires based on the perception by using DEA, so that similar research must be repeatedly tested, and truly ensure the indicator used is the perception of a valid indicator.

IMPLICATIONS OF RESEARCH



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