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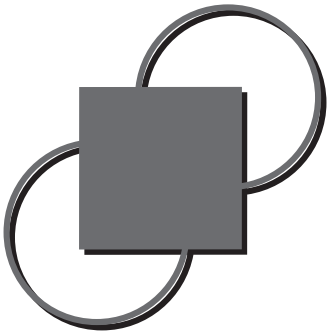
7TH INTERNATIONAL CONFERENCE OF EDUCATION, RESEARCH AND INNOVATION

CONFERENCE PROCEEDINGS

SEVILLE (SPAIN)
17-19 NOVEMBER 2014



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WELCOME INTRODUCTION

Dear ICERI2014 participants,

In this 7th edition of ICERI2014, we are honoured to welcome you all to this international conference that brings together experts from all over the world.

ICERI2014 is a key annual networking platform to discuss the latest trends about education and research in a varied atmosphere. This is an excellent opportunity to acquire new skills and get inspired by listening to innovative approaches in education. We hope you get the best of ICERI2014 thematic sessions, discussions and debates, as well as the poster presentations and exhibition.

This year, it is a pleasure to welcome 600 professionals and experts from all disciplines, representing more than 75 countries.

Academics, researchers, educational scientists and technologists will present and share the most up-to-date information on education and pedagogical innovations.

We hope you take ICERI2014 as an opportunity to exchange ideas and results, to discover different ways of applying new educational technologies and broaden your vision about new ways of teaching and learning.

In addition to your professional experience, Seville will provide you a large offer of cultural and leisure activities to do during your stay here. We really wish you an unforgettable stay in this unique city.

Thank you very much for coming to ICERI2014 and for being part of the education change. We wish you a fruitful conference!

ICERI2014 Organising Committee

ICERI2014 COMMITTEE AND ADVISORY BOARD

CONFERENCE SESSIONS

ORAL SESSIONS, 17th November 2014.

Blended & Flipped Learning
International Projects
Technology in Teaching and Training (1)
Experiences in Research
Meet the Keynote
Language Learning Innovations
Collaborative and Problem Based Learning

Emerging Technologies in Education
University-Industry Cooperation (1)
Online Assessment
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m-learning
Language Learning Experiences
New Technologies in Architecture & Urban Planning

Learning and Teaching Technologies and Innovations (1)
University-Industry Cooperation (2)
Evaluation and Assessment of Student Learning
STEM Education Experiences (1)
MOOCs: Massive Open Online Courses
Technology in Foreign Language Education
Experiences in Engineering Education

Blended Learning
Cultural Diversity and Inclusive Learning (1)
Education Management and Leadership in Schools
STEM Education Experiences (2)
Web 2.0 and Social Networking
Technology in Language Learning
Experiences in Engineering and Industrial Design Education

POSTER SESSIONS, 17th November 2014.

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ORAL SESSIONS, 18th November 2014.

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Curriculum Design (1)
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Experiences in Business Administration Education

Learning and Teaching Technologies and Innovations (2)
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Cultural Diversity and Inclusive Learning (2)
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Technology in Health Sciences Education

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Life-Long Learning
Accreditation and Quality in Education
Pedagogical Methods and Innovations
Health Sciences Education Experiences (2)

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Labour Market Skill Needs and Challenges for Higher Education Institutions
Pre-service and In-service Teacher Experiences
Adult and Vocational Education
Student Support in Education
Experiences in Undergraduate Education
Global, Social and Legal Issues in Education

POSTER SESSIONS, 18th November 2014.

Challenges in Education and Research

Emerging Technologies in Teaching and Learning

VIRTUAL SESSIONS

Academic Research Projects
Accreditation and Quality in Education
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Advanced classroom applications and technologies
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Blended Learning and Flipped Classroom
Collaborative and Problem-based Learning
Curriculum Design
E-content Management and Development
e-learning experiences
ECTS experiences
Education practice trends and issues
Education, Research and Globalization
Emerging Technologies in Education
Experiences in Post-graduate education
Experiences in Primary and Secondary education
Experiences in Undergraduate education
Global Issues in Education and Research
International Projects
Language Learning Innovations
Learning and Teaching Innovations
Life-long learning
Life-long learning experiences
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Special education
Student Support in Education
Teacher Training
Technology in Teaching and Learning
University-Industry Cooperation
Virtual Learning Environments (VLE)
Web 2.0 and Social Networking

ABOUT ICERI2014 Proceedings CD

HTML Interface: Navigating with the Web browser

This CD includes all presented papers at ICERI2014 conference. It has been formatted similarly to the conference Web site in order to keep a familiar environment and to provide access to the papers trough your default Web browser (open the file named " ICERI2014.html").

An Author Index, a Session Index, and the Technical Program are included in HTML format on this disk to aid you in finding conference papers. Using these HTML files as a starting point, you can access other useful information related to the conference.

The links in the Session List jump to the corresponding location in the Technical Program. The links in the Technical Program and the Author Index open the selected paper in a new window. These links are located on the titles of the papers and the Technical Program or Author Index window remains open.

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2. A new window will appear with search options. Enter your search terms and proceed with your search as usual.

For Acrobat 8:

1. Open the Search window, type the words you want to find, and then click Use Advanced Search Options (near the bottom of the window).
2. For Look In, choose Select Index.
3. In the Index Selection dialog box, select an index, if the one you want to search is available, or click Add and then locate and select the index to be searched, and click Open. Repeat as needed until all the indexes you want to search are selected.
4. Click OK to close the Index Selection dialog box, and then choose Currently Selected Indexes on the Look In pop-up menu.
5. Proceed with your search as usual, selecting other options you want to apply, and click Search.

For Acrobat 7 and earlier:

1. In the “Edit” menu, choose “Full Text Search”.
2. A new window will appear with search options. Enter your search terms and proceed with your search as usual.

EVALUATION OF THE EFFICIENCY OF TEACHER TRAINING INSTITUTION IN INDONESIA BY USING DATA ENVELOPMENT ANALYSIS DURING YEAR OF 2011

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Universitas Negeri Yogyakarta (INDONESIA)

Abstract

The work presented aims to analyze the efficiency of Indonesia *Teacher Training Institutions* in Indonesia in 2011. The study is based on field research and documents executed in four (4) phases: data collection, choice of variables under study, calculations and analysis of results. Data Envelopment Analysis (DEA), which estimates the optimal production frontier is used. The data are processed using the tool OSDEA. As a result the Indonesia *Teacher Training Institutions* efficiency ranking is obtained. It is concluded that there are four (4) *Teacher Training Institutions* efficient and the least efficient of all the analyzed institutions should increase its output to improve its performance.

Keywords: Efficiency, Data Envelopment Analysis, *Teacher Training Institutions*.

1 INTRODUCTION

In the field of *Teacher Training Institutions* is important to conduct ongoing assessments to measure how efficient are the processes that take place there. Comparisons between *Teacher Training Institutions* in terms of their institutional process helps determine how efficient actors are relative to each other, which serves for academic managers to make decisions based on quantitative data. The *Teacher Training Institution* is an institution of higher education in Indonesia that has been established in twelve cities: Jakarta, Yogyakarta, Semarang, Surabaya, Malang, Bandung, Padang, Medan, Manado, Gorontalo, Makassar, and Singaraja. Institutions of higher education, and nonprofit organizations need to make changes in their organizational structures that lend their decision centers of modern and innovative management techniques that improve resource allocation and effectively contribute to the process of making decisions; able to provide profitability measures with which resources are invested, considering that in those entities, the objectives are not merely economic and profitability concept differs from that used in the business world [1]. Efficiency is one of the important aspects that need to be considered when assessing the management processes university. In this regard academic managers require indicators that allow them to establish relationships or comparisons between the various actors that make up each of the academic units. For this process to be effective, it is important to have a system of evaluation to measure the efficiency of the units. Efficiency is the capacity to produce maximum results with minimum resources [2]. Data Envelopment Analysis (DEA) is also used to assess the efficiency of the 25 best U.S. universities [3] and showed that DEA is the correct method for measuring the efficiency of higher education. DEA method is also used in the calculation of the efficiency of several universities in Norway in 1994, 1995 and 1996 [4]. As such, it is a relative term: to be established by comparing dependencies or a pattern. A method to quantify the efficiency is data envelopment analysis (Data Envelopment Analysis or DEA). This technique has its origins in the article Charnes, Cooper and Rhodes in 1978 [5] and is based on the notion of relative efficiency introduced by Farrell [6]. By virtue of the above, in this work the efficiency of Indonesia *Teacher Training Institutions year* 2011 is analyzed, using the DEA.

2 OBJECTIVE

Analyze the efficiency of Indonesia *Teacher Training Institutions i*n 2011, using the Data Envelopment Analysis.

3 METHODOLOGY

The methodology consists of four phases: In Phase I field research and documentation is performed to obtain the input data and concepts, theories, and background relating to the measurement of efficiency through Data Envelopment Analysis. In phase-II are chosen in response to the data

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obtained-the objects of study variables. In phase III the OSDEA computational software tool is used for processing the data. Subsequently, in step IV, the analysis of the results is performed. The input data for the software used in this work are: (1) undergraduate student body, (2) the number of academic staff, (3) the number of administrative staff, (4) university budget, and the output for this work are (5) the number of research funded by university (6) the number of book and journal published by academic staff, (7) the number of publication cited in scopus database journal, (8) the number of granted patent, and (9) the number of social services conducted by academic staff in 2011. All of the data were taken from the Indonesian Accreditation Institutional report prepared by the each university. Efficiency values are calculated using the CCR model developed by oriented Input.

4 ANALYSIS OF RESULT

Table 1 below are the data that were obtained from official sources about the input and output variables needed in the assessment of the efficiency of a university.

Table 1. Data from University Accreditation conducted by National Board Accreditation in the year of 2011

Universitas	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Universitas Pendidikan GANESHA	10318	434	247	4342540000	144	30	0	1	81
universitas Negeri YOGYAKARTA	29908	1038	454	13511960000	428	43	89	8	228
Universitas Negeri Semarang	26800	1003	767	14912360000	592	105	4	1	378
Universitas NEGERI makassar	22064	891	548	11087330000	271	73	9	1	236
Universitas Negeri Surabaya	23965	860	456	10870540000	306	22	16	12	25
Universitas Negeri Gorontalo	16201	634	414	3371540000	41	85	6	25	264
Universitas Negeri Medan	15473	965	398	4558480000	206	69	18	4	29

Table 1 shows an example of the information obtained in field research and documentary data entry software OS DEA in the columns headed -Variables of input and Variables of output. Calculation to obtain the level of efficiency of the University Education in Indonesia performed using OSDEA software and this software capables in calculating several types of DEA method. Fig 1. is the initial view of the OSDEA software.

Figure 1 . Open Source DEA (OSDEA)

The nine variables are the base of the calculations, and those are undergraduate student body, the number of academic staff and university budget as an input, and the output for this work are the number of research funded by university, the number of book and journal published by academic staff, the number of publication cited in Scopus database journal, the number of granted patent, and the number of social services conducted by academic staff in 2011. Fig 2 displays the process of DEA calculation by using OSDEA.

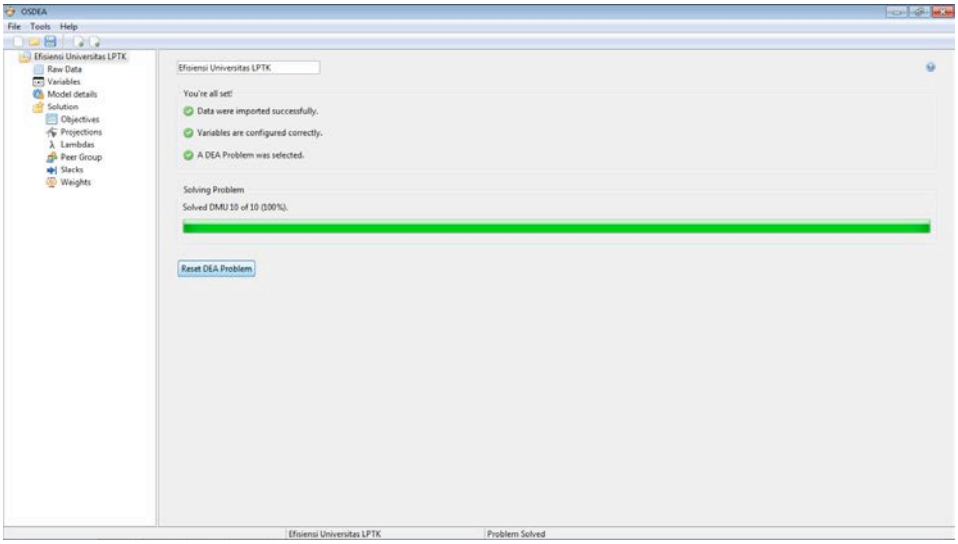

Figure 2 . Process with the DEA calculation OSDEA

All university that do not have the level 1 of efficiency should strive to be efficient in a way : reducing inputs while maintaining a constant output (this is an input-oriented approach), increase output while maintaining a constant input. This is an output-oriented approach, or a third model which seeks to reduce input and increase output.

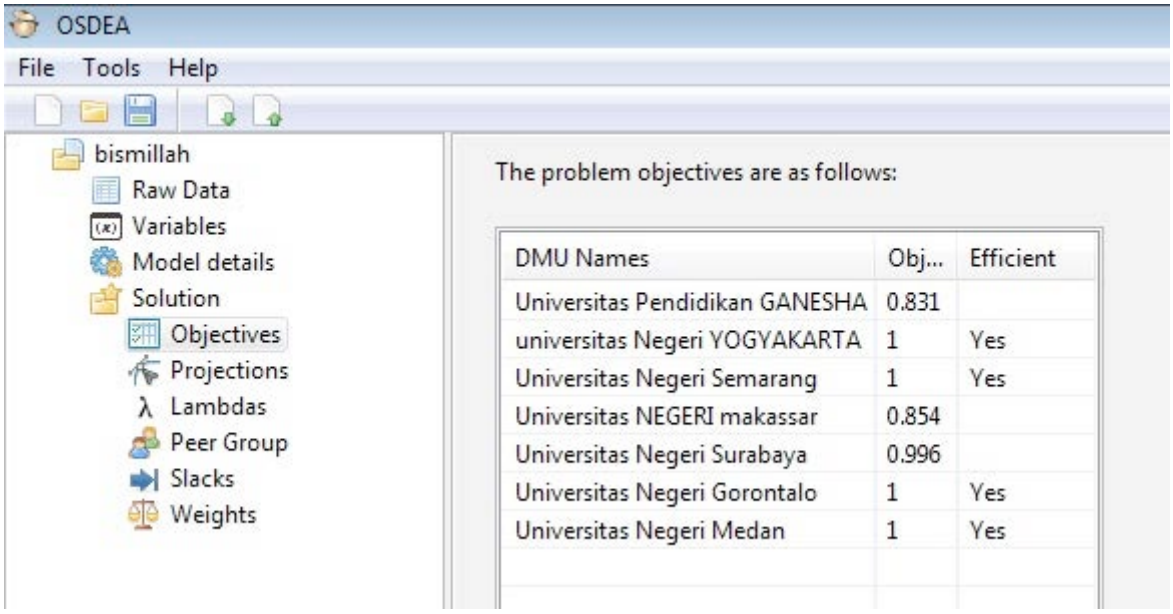

Figure 3 . Results of efficiency calculation Process with the DEA

From the calculation results in fig 3. shows that Universitas Negerri Yogyakarta, Universitas Negeri Semarang, Universitas Negeri Gorontalo, and Universitas Negeri Medan are the universities with the highest efficiency rating in Indonesia, by consecutive followed by Universitas Negeri Surabaya, Universitas Negeri Makassar, and Universitas Pendidikan Ganesha.

5 CONCLUSIONS

This paper presents an analysis of efficiency in Indonesia Teacher Training Institutions or universities in the year of 2011, using the Data Envelopment Analysis. The database used contains input variables (undergraduate student body, the number of academic staff, the number of administrative staff, and university budget as an input, and the output for this work) and output variables (the number of research funded by university, the number of book and journal published by academic staff, the number of publication cited in scopus database journal, the number of granted patent, and the number of social services conducted by academic staff) viewed as an output. Using the computational tool OSDEA, a ranking of departments based on efficiency is obtained. In this article the data entered to the software and the results it yields for 2011 are illustrated Five departments are efficient independently of the model used DEA. The most inefficient department with CCR model should increase the level of its output variables to improve its efficiency, since the input variables considered can hardly be controlled in practice. It is concluded that majority of teacher training institutions in Indonesia are already in efficient academic process. It is suggested that further research to quantify the effect of these variables influence the output in increased efficiency.

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