American International Journal of Business Management (AIJBM)
ISSN- 2379-106X, www.aijbm.com Volume 2, Issue 7 (July- 2019), PP 01-07

An Evaluation of Lecturer Performance in PoliteknikNegeri Tanah Laut, Indonesia

Mufrida Zein[1], Muhammad Ghalih[2]
[1](Department of Accounting, PoliteknikNegeri Tanah Laut, South Kalimantan, Indonesia)
[2](Department of Accounting, PoliteknikNegeri Tanah Laut, South Kalimantan, Indonesia)
*Corresponding Author: Muhammad Ghalih[2]

ABSTRACT: *This study uses Techniques for Order Preference by Similarity to Ideal Solution (TOPSIS) collective within construction Entropy weight to examine the performance of 8 lecturers in PoliteknikNegeri Tanah Laut (Politala), Indonesia especially in the program study of Accounting as the newest program study. Calculations in education and research and improvement ability reveal short-term and long-term performance. Particular values and intervals distinguish theattribute values in the current model. Evaluation and experimental analysis show the applicability, feasibility, effectiveness, and advantages of the recommended method. This study addresses the TOPSIS and Entropy to analyze the lecturer's performance for their daily activities does not include publication or social responsibility. Firstly, in this study, the judiciousness of TOPSIS conferring to the ordinary decision theory. It forms that TOPSIS also has aintegrated multi-attribute value meaning that not discovered explicitly. To this point, this has been an unknown section of TOPSIS. Secondly, Entropy useful for the decision maker's (DM) behavioral propensity into TOPSIS. Finally, to improvement evaluation accuracy of lecturer performance, TOPSIS and Entropy practical to rank the lecturer with various criteria such as Service orientation (C1), Integrity (C2), Commitment (C3), Discipline (C4), and Cooperation (C5).*

KEYWORDS -*Entropy, Evaluation, Performance, Politeknik, Politala, TOPSIS, Lecturer, Tanah Laut*

I. INTRODUCTION

Politeknik Negeri Tanah Laut (Politala) is a State University in Pelaihari city Tanah Laut Regency, South Kalimantan province. This Polytechnic was established on September 25, 2009, but could only be officially opened as a Public on February 2, 2014, and stands until now. The establishment of Politala is a manifestation of a desire and mutual understanding between the Regional Government and the people of Tanah Laut Regency who see the fact that in this area desperately need a college by considering various aspects. Since the 1990s, quality, and quality assurance have become the critical themes of higher education institutions almost universally(Akweley Adotey, 2017). The process of pioneering the establishment of higher education institutions in Tanah Laut Regency began in 2006 involving the Regional Government, the Education Council, and the Business and Industry World, and community leaders in Tanah Laut Regency.

However, caused by various practical limitations, the Aspect Technical Skills on the Formation Workability at Polytechnic(Nur Hafiz Fauzi, 2017). It was only at the end of 2008 that the determination seemed to be paying off afterward several schemes for the establishment of the Directorate General of Higher Education of the Ministry of National Education or Ministry of Research, Technology and Higher Education of the Republic of Indonesia with different proposals. Then, based on the results of the feasibility study in the field, finally, the form and level of higher education can be determined that is by the conditions and needs of the region. Since then, the Politala agreed upon as the primary choice.

After all administrative requirements were met; the proposal for the establishment of Politala then received a positive response from the Directorate General of Higher Education of the Ministry of National Education by issuing Education Operational Permits dated September 25, 2009. Factors Affecting Polytechnic Students' Perception of Building-Based Vocational Skills(Oluwatoyin Adewale, 2017). After officially obtaining permission from the Government, acceptance of students opened with three study programs, namely Program Study Informatics Engineering (IT), Agricultural Industrial Technology (TIP), and Automotive Machinery (MO). The opening of the three study programs began on August 4, 2009, with the number of first-year students (Academic Year 2009/2010) as many as 110 people. Also, the objective of this study was to identify differences employability among lecturers and focus on the direction of the transformation of the relationship with the employability of vocational education and vocational skills to identify the relationship with the employability of education students in vocational (Sulaiman, 2017).

Therefore, in 2017 program study Accounting established with 22 students, and increase significantly in 2018 about 109 students. In this research focus on program study Accounting as an object for the evaluation

of TOPSIS-Entropy for Lecturer Performance in Politala such identified from reports, academic papers, and a combination of both(Ngure, 2019).

II. THE LITERATURE AND CONCEPT OF TOPSIS

A study on the machinability of some metal alloys using grey TOPSIS method (Dey & Chakraborty, 2016). Application of Grey-TOPSIS approach to evaluating value chain performance of tea processing chains(Nyaoga, Magutu, & Wang, 2016). Prioritizing the performance of public development projects in governmental administration agencies, using gray relational analysis (GRA) and TOPSIS approach(Mohammadi, Shojaei, Kaydan, & Akbari, 2016). Multiple attribute decision making (MADM) methods are advantageous in choosing the best alternative among the available finite but conflicting alternatives. TOPSIS is one of the MADM methods, which is simple in its methodology and logic(Vommi, 2017).

Detailed examination Fuzzy TOPSIS (Technique for Order Performance by Similarity to Ideal Solution) and generalized Choquet integral are used individually in the solution of the problem(Yildiz & Yayla, 2017). In a randomized controlled study, the investment development framework in Iran's seashores using TOPSIS and best-worst multi-criteria decision-making methods(Askarifar, Motaffef, & Aazaami, 2018). In another significant study, the comparative survey of the condition of tourism infrastructure in Iranian provinces using VIKOR and TOPSIS(Bagheri, Shojaei, & Khorami, 2018). However, in this research focus on Evaluation of TOPSIS-Entropy (Ghalih & Rohanah, 2018) focus on Lecturer Performance.

Researcher	Objective
(Chakraborty & Chatterjee, 2013)	The selection of material for a specific engineering component.
(Mehdiabadi, Rohani, & Amirabdollahiyan, 2013)	Ranking various industries is also a multiple criteriondecision-makingproblems.
(Roghanian, Sheykhan, & Abendankashi, 2014)	determines different suppliers and using various criteria, the study applies a Fuzzy TOPSIS to rank different alternatives.
(Karimi, Azizi, Javanshir, Mohammad, & Fatemi, 2015)	Quality of services in the banking industry plays an essential role in measuring the performance of banks.
(Soloukdar & Parpanchi, 2015)	Identify the most important criteria and indicators in selection of business intelligence vendors, and ranking the vendors of such tools using Fuzzy Analytical Hierarchy Process (FAHP) and Fuzzy Technique for Order Preference by Similarity to Ideal Solution (FTOPSIS), to compare results of these two methods and to provide appropriate solutions for the sample company, namely National Iranian Oil Company (NIOC).
(Mohammadi et al., 2016)	Evaluate the performance of governmental administration agencies based on the realization of civil project goals.
(Nyaoga et al., 2016)	integrates the advantage of grey systems theory and TOPSIS to evaluate and rank value chain performance.
(Dey & Chakraborty, 2016)	found that the ranking performance of grey TOPSIS method remains unaffected with the variation in the greyness of the considered mechanical property values.
(Vommi, 2017)	Euclidean distances of each alternative from the positive and negative ideal solutions are utilized to find the best alternative.
(Aikhuele & Turan, 2017)	Proposed an exponential-related function (ER) and developed an intuitionistic fuzzy TOPSIS model based on the function (IF-TOPSIS$_{EF}$) to solve multi-attribute decision making (MADM) problems in which the performance ratings expressed in intuitionistic fuzzy sets (IFSs).
(Eseoghene & Olubayo, 2018)	Presented a framework for ranking mini-grid business models used the framework combines Criteria Importance Through Inter-criteria Correlation (CRITIC), TOPSIS (Technique for Order Performance by Similarity to Ideal Solution) and WASPAS (weighted aggregated sum product assessment) methods.
(Askarifar et al., 2018)	The necessary public infrastructure requirements ranked in eleven groups with TOPSIS.
(Bagheri et al., 2018)	Focus on the condition of hard tourism infrastructure in the provinces of Iran.
(Babatunde & Ighravwe, 2019)	Focus on applicability was tested using six HRESs under economic and technical criteria.
(Borjy, Baradaran, Zandi, & Taheri, 2019)	Chose the agriculture sector as a case study used Delphi, TOPSIS, and AHP methods.
(Biswas & Saha, 2019)	Focus on identifying the attributes like kerb weight, mileage, top speed, fuel tank capacity, and price playing a prominent role in the buying behavior of the working women while purchasing scooters.

III. RESEARCH AIMS & SIGNIFICANCES

The main intentions of the study are mention as follows:

- Highlight the significance of lecturer performance in program study accounting, Politala.
- Arrange that a direct relationship exists between several factors used in this research.
- Characterize alternative tools in evaluation performance that can be used more creatively and efficiently to improve quality the lecturer.

The proposed research is noteworthy as not only highlights the importance of the lecturer performance but provides strategies that can be employed by management to improve the quality of the lecturer more effective and efficient manner. Theory, as well as applied strategies, can be tied to the proposed study using several of case studies with different strategies employed by a lecturer in Politala, primarily in program study Accounting as the youngest department in Politala.

IV. THE PROPOSED METHODOLOGY

Step 1. Create a data evaluation matrix

$$D=\left[x_{ij}\right]_{m\times n}=\begin{array}{c} \\ A_1 \\ A_2 \\ \vdots \\ A_m \end{array}\begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \cdots & C_n \end{array} \\ \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix}_{m\times n} \end{array}$$

$$i=1,2,\ldots,m\ ,\ j=1,2,\ldots,n \tag{1}$$

Step 2. Normalization of the matrix

$$r_{ij}=\frac{x_{ij}}{\sqrt{\sum_{i=1}^{m}x_{ij}^2}}$$

$$i=1,2,\ldots,m\ ,\ j=1,2,\ldots,n \tag{2}$$

$$R=\left[r_{ij}\right]_{m\times n}=\begin{array}{c} \\ A_1 \\ A_2 \\ \vdots \\ A_m \end{array}\begin{array}{c} \begin{array}{cccc} C_1 & C_2 & \cdots & C_n \end{array} \\ \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix}_{m\times n} \end{array}$$

$$i=1,2,\ldots,m\ ,\ j=1,2,\ldots,n \tag{3}$$

Step 3. Calculate the objective weight with Entropy

$$e_j=-\frac{1}{\ln m}\sum_{i=1}^{m}r_{ij}\ln r_{ij}$$

$$i=1,2,\ldots,m\ ,\ j=1,2,\ldots,n \tag{4}$$

Recalculate the value of each evaluation criterion

$$W=(w_1,w_2,...,w_n)$$

$$w_j=\frac{1-e_j}{\sum_{j=1}^{n}(1-e_j)}$$

$$i=1,2,\ldots,m\ ,\ j=1,2,\ldots,n \tag{5}$$

Step 4. Weight matrix

$$v_{ij} = r_{ij} \times w_j \tag{6}$$

$$V = \left[v_{ij} \right]_{m \times n}$$

$$i = 1, 2, \ldots, m \ , \ j = 1, 2, \ldots, n \tag{7}$$

Step 5. Calculate positive and negative ideal solutions

$$V^{+} = \left\{ v_1^{+}, v_2^{+}, ..., v_n^{+} \right\} \tag{8}$$

$$V^{-} = \left\{ v_1^{-}, v_2^{-}, ..., v_n^{-} \right\} \tag{9}$$

Step 6. Calculate the distance between the sample being evaluated and the ideal positive and negative solution

$$S_i^{+} = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^{+} \right)^2}$$

$$i = 1, 2, \ldots, m \ , \ j = 1, 2, \ldots, n \tag{10}$$

$$S_i^{-} = \sqrt{\sum_{j=1}^{n} \left(v_{ij} - v_j^{-} \right)^2}$$

$$i = 1, 2, \ldots, m \ , \ j = 1, 2, \ldots, n \tag{11}$$

Step 7. Calculate the relative ability indicator value

$$C_i = \frac{S_i^{-}}{S_i^{+} + S_i^{-}} \tag{12}$$

Step 8. Sorting (Ranking)

Conferring to the relative distance values of each *Ci* assessment model, it is the comparative pros and cons of each evaluation sample after evaluation. 0 <*Ci*<1, *Ci* the closer the value becomes 1, the closer the evaluation sample is to a positive ideal solution; it also means that under the existing calculation criteria, illustration evaluation is the best assessment illustration relative to other evaluation samples. Contrariwise, if *Ci* values are further detached,respectively, it means that the evaluation sample is a poor evaluation sample, and there is sufficient room for improvement.

V. RESULTS

Before starting the study, ethical permits obtained from mathematical programs developed for this reason allow one to obtain weighted Entropy coefficients and output from the TOPSIS method. Themethod shows that the material index considered above in Table 1 is assumed to be an independent measure of each of the appropriate performance parameters. Service orientation (C1), Integrity(C2), Commitment (C3), Discipline (C4), and Cooperation (C5) those collected as an assessment of work performance in every semester. Thus, this study has encouraged essential questions for future research on lecturer performance.

The objective is to optimize each index, nevertheless of the values of individual material stuff defined in that index. Additionally, the initial optimum value of each criterion is self-determining of the value of other criteria (i.e., there are no acceptable interactions). However, when this criterion is used with the Technique for Preference for Similarity to Ideal Solution (TOPSIS) method which cannot treat the material property as an individual criterion, the ranking results obtained in this work may not be susceptible to inclusion from the index. The analysis focuses on five criteria for calculating student performance and abilities. The most exciting discovery is that the actual values calculated by equation step 3 by Entropy shown in Table 2.

Table 1. Normalized student performance matrix

	C1	C2	C3	C4	C5
L1	0,3556	0,3530	0,3487	0,3557	0,3465
L2	0,3514	0,3487	0,3530	0,3557	0,3465
L3	0,3514	0,3487	0,3530	0,3514	0,3551
L4	0,3514	0,3530	0,3530	0,3514	0,3508
L5	0,3556	0,3530	0,3530	0,3514	0,3551
L6	0,3514	0,3572	0,3530	0,3514	0,3508
L7	0,3641	0,3657	0,3657	0,3642	0,3679
L8	0,3472	0,3487	0,3487	0,3471	0,3551

Table 2. Objective values with Entropy

	C1	C2	C3	C4	C5
L1	-0,3677	-0,3676	-0,3674	-0,3677	-0,3672
L2	-0,3675	-0,3674	-0,3676	-0,3677	-0,3672
L3	-0,3675	-0,3674	-0,3676	-0,3675	-0,3677
L4	-0,3675	-0,3676	-0,3676	-0,3675	-0,3675
L5	-0,3677	-0,3676	-0,3676	-0,3675	-0,3677
L6	-0,3675	-0,3677	-0,3676	-0,3675	-0,3675
L7	-0,3679	-0,3679	-0,3679	-0,3679	-0,3679
L8	-0,3673	-0,3674	-0,3674	-0,3673	-0,3677

Table 3 summarizes the weighted coefficients of different performance indices obtained using the Entropy method, with or without considering the criteria. Also, Table 4 shows intensification in the order according to the overall ranking, which describes lecturers. Further analysis showed that lecturers absolute rankings give the impression to be L8, L2, and L4 were the three best lecturers voguish the program study of Accounting in Politala.

Table 3. Ideal positive and negative solutions

	C1	C2	C3	C4	C5
V_j^+	0,0728	0,0731	0,0732	0,0729	0,0736
V_j^-	0,0694	0,0697	0,0698	0,0694	0,0693

Table 4. Ranking of lecturers

	Calculation Result	Ranking
L1	0,7177	5
L2	0,7638	2
L3	0,7311	4
L4	0,7634	3
L5	0,6563	7
L6	0,7082	6
L7	0,0000	8
L8	0,8096	1

VI. CONCLUSION

The application of a variety of decision criteria approaches to evaluating lecturer performance discussed. The results obtained from the two Techniques for Preference by Similarity to Ideal Solution (TOPSIS) and Entropy methods are reliable techniques for prioritizing alternatives to ideal solutions such that the chosen alternative must have the shortest distance from the ideal solution and distance the longest of dysfunctional solutions.

Meanwhile, the basis of these methods is different; the difference in the final results of the evaluation justified. Lecturer performance have an extra critical part of learning. Classification of lecturer performance is a strategic concern and has a significant impact on the efficiency of education management. Some alternatives must be considered and evaluated on many different encounter criteria in the problem of education management, which leads to a broad range of subjective or ambiguous data from the results.

Consequently, an adequate evaluation approach is fundamental to improve the quality of decisions. This study presents a scientific framework for assessing management education in Politala to get more information about lecturer performance. Although the model was developed and tested for use in lecturer performance, it can used with little modification in other decision-making problems in education management. Also, mathematical models combined with the proposed model. The improvement suggested a method and is one direction in future research.

ACKNOWLEDGEMENTS

This research sponsored by Department of Accounting, Politeknik Negeri Tanah Laut. Also, this study supported by the Ministry of Research, Technology and Higher Education of the Republic of Indonesia.

REFERENCES

[1]. Aikhuele, D. O., & Turan, F. M. (2017). Extended TOPSIS model for solving multi-attribute decision making problems in engineering, *6*, 365–376. https://doi.org/10.5267/j.dsl.2017.2.002

[2]. Akweley Adotey, J. (2017). Quality Assurance and Higher Fashion Education in Ghana: Examining the Contemporary Quandary. *International Journal of Vocational Education and Training Research*, *2*(6), 39. https://doi.org/10.11648/j.ijvetr.20160206.12

[3]. Askarifar, K., Motaffef, Z., & Aazaami, S. (2018). An investment development framework in Iran ' s seashores using TOPSIS and best-worst multi-criteria decision making methods. *Letters, Decision Science*, *7*, 55–64. https://doi.org/10.5267/j.dsl.2017.4.004

[4]. Babatunde, M. O., & Ighravwe, D. E. (2019). A CRITIC-TOPSIS framework for hybrid renewable energy systems evaluation under techno-economic requirements. *Journal of Project Management*, *4*, 109–126. https://doi.org/10.5267/j.jpm.2018.12.001

[5]. Bagheri, M., Shojaei, P., & Khorami, M. T. (2018). A comparative survey of the condition of tourism infrastructure in Iranian provinces using VIKOR and TOPSIS. *Letters, Decision Science*, *7*, 87–102. https://doi.org/10.5267/j.dsl.2017.4.001

[6]. Biswas, T. K., & Saha, P. (2019). Selection of commercially available scooters by new MCDM method. *International Journal of Data and Network Science*, *3*, 137–144. https://doi.org/10.5267/j.ijdns.2018.12.002

[7]. Borjy, A., Baradaran, V., Zandi, P., & Taheri, M. (2019). A hybrid of Delphi, AHP and TOPSIS Methods for project portfolio management. *Journal of Project Management*, *4*, 141–156. https://doi.org/10.5267/j.jpm.2019.1.004

[8]. Chakraborty, S., & Chatterjee, P. (2013). Selection of materials using multi-criteria decision-making methods with minimum data. *Decision Science Letters*, *2*, 135–148. https://doi.org/10.5267/j.dsl.2013.03.005

[9]. Dey, S., & Chakraborty, S. (2016). A study on the machinability of some metal alloys using grey TOPSIS method, *5*, 31–44. https://doi.org/10.5267/j.dsl.2015.9.002

[10]. Eseoghene, D., & Olubayo, M. (2018). Selection of a mini-grid business model for developing countries using CRITIC- TOPSIS with interval type-2 fuzzy sets, *7*, 427–442. https://doi.org/10.5267/j.dsl.2018.1.004

[11]. Ghalih, M., & Rohanah, S. (2018). Evaluasi Kemampuan dan Penghitungan Peringkat Siswa Menggunakan Metode TOPSIS dan Entropy. Idaarah: Jurnal Manajemen Pendidikan, 2(2), 252-259.

[12]. Karimi, M., Azizi, M., Javanshir, H., Mohammad, S., & Fatemi, T. (2015). Decision Science Letters, *4*, 349–362. https://doi.org/10.5267/j.dsl.2015.4.003

[13]. Mehdiabadi, A., Rohani, A., & Amirabdollahiyan, S. (2013). Decision Science Letters, *2*, 251–256. https://doi.org/10.5267/j.dsl.2013.07.001

[14]. Mohammadi, A., Shojaei, P., Kaydan, B., & Akbari, Z. (2016). Prioritizing the performance of civil development projects in governmental administration agencies , using gray relational analysis (GRA) and TOPSIS approach, *5*, 487–498. https://doi.org/10.5267/j.dsl.2016.5.003

[15]. Ngure, S. (2019). A Proposed National Model of Vocational Education and Training for Micro and Small Enterprises in Kenya. *International Journal of Vocational Education and Training Research*, *4*(1), 28. https://doi.org/10.11648/j.ijvetr.20180401.15

[16]. Nur Hafiz Fauzi, M. (2017). Readiness Level Students in Electrical Engineering from the Aspect Technical Skills on the Formation Workability at Polytechnic. *International Journal of Vocational Education and Training Research*, *2*(5), 28. https://doi.org/10.11648/j.ijvetr.20160205.11

[17]. Nyaoga, R., Magutu, P., & Wang, M. (2016). Application of Grey-TOPSIS approach to evaluate value chain performance of tea processing chains, *5*, 431–446. https://doi.org/10.5267/j.dsl.2016.1.002

[18]. Oluwatoyin Adewale, P. (2017). Factors Affecting Polytechnic Students' Perception of Building-Based Vocational Skills. *International Journal of Vocational Education and Training Research*, *3*(4), 29. https://doi.org/10.11648/j.ijvetr.20170304.11

[19]. Roghanian, E., Sheykhan, A., & Abendankashi, E. S. (2014). Decision Science Letters, *3*, 17–26. https://doi.org/10.5267/j.dsl.2013.10.001

[20]. Soloukdar, A., & Parpanchi, S. A. (2015). Decision Science Letters, *4*, 137–164. https://doi.org/10.5267/j.dsl.2015.1.002

[21]. Sulaiman, G. (2017). The Role of Basic Vocational Education Towards Students Employability. *International Journal of Vocational Education and Training Research*, *3*(1), 1. https://doi.org/10.11648/j.ijvetr.20170301.11

[22]. Vommi, V. B. (2017). TOPSIS with statistical distances : A new approach to MADM. *Decision Science Letters*, *6*, 49–66. https://doi.org/10.5267/j.dsl.2016.8.001

[23]. Wondal, R., Akbar, M., Supena, A., & Samad, F. (2019). The Effect of Tiered Training and Self Regulated Learning (SRL) on Teacher Pedagogic Competence of Early Childhood Education in North Maluku Province. *International Journal of Vocational Education and Training Research*, *4*(1), 22. https://doi.org/10.11648/j.ijvetr.20180401.14

[24]. Yildiz, A., & Yayla, A. Y. (2017). Application of fuzzy TOPSIS and generalized Choquet integral methods to select the best supplier. *Letters, Decision Science*, *6*, 137–150. https://doi.org/10.5267/j.dsl.2016.11.001

**Corresponding Author: Muhammad Ghalih[2]*
[2](Department of Accounting, PoliteknikNegeri Tanah Laut, South Kalimantan, Indonesia)