Implementation of Multi Criteria Decision Making In The Evaluation Of The Work Of FKIP UHN Lecturers

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Article Info

ABSTRACT

The purpose of this study is to implement the multi criteria decision making (MCDM) with the Analytical Hierarchy Process (AHP) method to obtain the results of the assessment of the performance of the lecturer in determining the best lecturer. The use of this method begins with creating a hierarchical structure of the problem to be studied. A matrix of pairs of comparisons will be searched for the weight of each criterion by normalizing the average of the opinion of the respondent. Maximum eigen values and normalized eigen vectors will be obtained from the matrix. In the process of determining the hierarchical weighing factor, the competence test should be performed CR< 0,1. The factor variables used are student questionnaires towards learning (C1), Research (C2), Commitment to the community (C3), and Seminar/Workshop/General College/recognition (C4). Based on the data processing results, the priority is Research criteria (C2) of 0.318505; then the second criterion is Student questionnaire towards learning(C1) of 0.287053; the third is Abdimas's (C3) criteria of 0.237667 and the last is the Seminar/workshop/general class/recognitive (C4) of 0.156775. And based on analysis using Analytical Hierarchy Process (AHP) then who becomes the best lecturer in the Faculty of Education and Sciences of the University of HKBP Nommensen is initially D15 set as the best faculty in position 1 with a score of 0.35 or 35%, D 14 is in position 2 with a rating of 0.335 or 33.5% and D12 is in the third position with the score of 0,325 or 32.5%.

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1.   INTRODUCTION

The university needs to evaluate the performance of the faculty in order to improve its internal quality continuously. This evaluation includes an assessment of the implementation of the university's tri-dharma activities, namely the education, research, and commitment to the community carried out by each faculty. Currently, evaluation and monitoring of lecturer performance is carried out only through data from questionnaires completed by students related to the teaching learning process. However, this does not include the activities of lecturers in the field of research and dedication to the community. In the previous year, all lecturers who taught mathematics taken by students would receive questionnaires completed by students. The questionnaires will be filled out manually using a sheet of paper, then collected and the staff will enter the questionnaire data into the system. Next, the questionnaire data will be summarized to obtain the average of each lecturer, and scrutiny will be performed to determine the lecturer's rank. However, the current development of questionnaire data is spread through google forms so that students just fill out the

links shared to each group, and the major staff are easier to summarize than the excel data [1]. The method of evaluation of lecturer performance implemented at the Faculty of Education and Science of the University of HKBP Nommensen still uses a manual approach that has some weaknesses. Some of these weaknesses include the lack of a control device that forces students to fill in questionnaires, filling them at the end of the semester so that students spend time working on issues, potentially increasing errors when entering data. Based on these weaknesses, the researchers felt the need to design a decision-making support system with an assessment of the performance of the lecturer. A decision support system is a system designed to assist one or more leaders in solving problems. Where in solving the problem, it has to be transformed into a model of solution. To find a best alternated in a problem involving more than one alternative based on a specific criterion in a decision support system can use a Multi Criteria Decision Making (MCDM) method. One of the examples of research is "Evaluation of the performance of lecturers using the method of AHP case studies at STIE Ahmad Dahlan Jakarta" done by Sestri [2]. The study used AHP method with Saaty random index and succeeded in producing accurate calculations with inconsistency values of less than 10% of all respondents [3]. Some other studies also used the AHP approach, such as the "Decision Support System for Assessing the Performance of Lecturers Using AHP Methods at STIMIK Ten November Jayapura" conducted by Hasan, P., Utami, E., & Nasiri, A. [4]. The results of the research showed that a decision-support system for assessing the performance of lecturers using the AHP method has been successfully developed and is able to asses the lecturers based on the aspects of Tri Dharma College.

Other research such as "Fuzzy Based Teachers Performance Assessment Decision Support System - AHP on STMIK STIKOM Bali" conducted by Budiarto in 2013 using the fuzzy AHP method and produced a prototype system using the Fuzzy method – Wihandar [5]. In addition, the research "System Support Decision Monitoring & Performance Evaluation of the Teacher's Informatics Studies Program of the Faculty of Computer Sciences Ida Kosgoro 1957 Using Analythic Hierarchy Process (AHP)" conducted in 2020 by Firmansyah and Wihanandar also used the AHP Method and successfully helped the assessment of performing lecturers at the Institute of Business and Information Kosgaro 1957 [6].

In the implementation of the AHP method, the calculation of coherence ratios still relies on the inherent random index values discovered by Thomas L. Saaty. However, there have been quite a few other researchers who have found a random index value with a different number of matrix dimensions or with larger dimensions. Based on the above description to determine the evaluation of the performance of the lecturer optimally based on the specified criteria, it is necessary to study the application of the decision-making support system with the AHP method. The performance of the lecturer can be seen from a variety of factors, such as presentation of work, performance of tasks, achievement of work results, and demonstration of work. Evaluations or performance assessments can also be used as measurements. According to Robbins [7], performance can be measured by actions performed and not performed by an employee. The performance of a lecturer at a college is the real behavior that each lecturer displays as the work achievement produced by the lecturer according to his role. To be able to determine the quality of the performance of a lecturer [8], there must be clear criteria. Indicators that are used as parameters of the performance of the lecturer are the ability of lecturer among others, performing as a lecturer, developing themselves as an academic staff, following the iptek, formulating a work programme, optimizing study programmes resources, managing the administration of the university tridarma, carrying out the duties of the college triderma, fulfilling the tasks of fostering, having a strong personality, having vision and mission, making decisions and finding new ideas.

2.　RESEARCH METHODE

This type of research is descriptive qualitative research with a case study approach. The subjects in the research are FKIP UHN's lecturer who consists of 7 study programmes namely Prodi Mathematical Education, Prodi Physics Education, prodi English Language Education, the prodi Indonesian Education, economic Education, Christian Religion Education and PPKN. Sampling of the seven study programmes is as much as 15 lecturers. Data collection methods are interviews and lifts.

a. Criteria determination
In order to obtain quality results in research on the Multi Criteria Decision Support System (MCDM), the selection of criteria is based on the source and relevance to the research environment [9].

Table 1. Table Criteria

No	Codes Criteria	Criteria
1	C1	Student Questionnaires
2	C2	Research and Publication
3	C3	Public service and Publications
4	C4	Seminar/Workshop/General College/Rekognition

b. Priority Setting

Each element present in the hierarchy must know its relative weight to each other. The aim is to find out the level of interest of the parties concerned in the problem to the criteria and structure of the hierarchy or system as a whole. To set priorities is done by compiling pairs of comparisons that compare the entire elements for each hierarchy. If in a subsystem of operations there are n operating elements namely A1, A2,...,An then the comparison of these operational elements will form a matrix A of the size n × n as follows:

Table 2. Matrix of pairs of comparisons

	A1	A2	...	An
A1	a11	a12	...	a1n
A2	a21	a22	...	a2n
...	...	...	...	...
An	an1	an2	...	aₘₘ

Based on the matrix of pairs of comparisons then normalization is done with the following steps:
1. The weight of each column j is summed, the total column value is represented by Sij

$$Sij = \sum_{i=1}^{n} a_{ij}$$

2. The value of each column is divided by the total value of the column. The result of that division is represented by Vij

$$Vij = \frac{a_{ij}}{S_{ij}}, \text{ where } ij = 1,2,3,...,n$$

3. Next by calculating the relative priority vector of each criterion by equalizing the normalized weight with the line-i.

$$Pi = \sum_{i=1}^{n} \frac{Q_{ij}}{n}$$

c. Determine eigenvector and eigenvalue

The eigenvector value is the weight of each element. Eigenvectors show which criteria are most preferred or most important and are presented in a comparison matrix in each level. The final result of the calculation of the priority weight (eigenvector value) is a decimal number below one with the total priority for criteria in a group equal to one. Whereas eigenvalue is a scalar number or parameter multiplied by a eigenvector. Eigenvectors are commonly referred to as the characteristic vectors of a cage matrix, whereas eigenvalues are characteristic roots of the matrix.

$$A. w = \lambda. w$$

Where,

w = eigenvector
λ = eigenvalue
A = matrixs of cages

d. Calculating Consistency Index (CI)

Measuring the consistency ratio in the AHP method, requires the value of the index consistence [10].

$$CI = (\lambda \, maks - n)/(n - 1)$$

Where,

CI = Consistency Index
$\lambda \, maks$ = eigen value maximum

e. Consistency ratio value (CR)

The consistency of the ratio is calculated by dividing the previously obtained CI value by the random index value according to the matrix dimension or the number of criteria used.

3. RESULT AND ANALYSIS

Based on the problem that has been defined, the determination of the desired solution then creates a hierarchical structure that begins with the general objective of determining the weight of each criterion. As for the criteria referred to are student questionnaires on the learning given by the lecturer, lecturer research, commitment to the community and seminar/workshop/recognition owned by lecturer.

1. Results of criteria analysis in determining objectives

   1. Matrix Comparison Pairs on Criteria

   The Analytic Hierarchy Process (AHP) matrix is used to observe things that are homogeneous and compare them in pairs so that determining preferences over things compared would be easier and more objective. Pair comparison matrix is a basic concept used in the AHP method in generating relative weight between criteria and alternatives [11]. Based on the Slovenian formula with a rate of error of 10% of the total population of docents of 89 then obtained the number of samples used is 15 docents. As for the results of the combined preference analysis of 15 respondents can be seen from the combination matrix below:

   Table 3. Matrix Comparison Pairs on Criteria and its Sum

	Student Questionnaires (C1)	Research and Publication (C2)	Public service and Publications (C3)	Seminar/Workshop/General College/Recognition (C4)
C1	1	2,98	1,52	0,36
C2	2,04	1	1,31	1,42
C3	0,41	1,21	1	2,11
C4	0,32	0,96	0,85	1
Sum	3,77	6,15	4,68	4,89

The sum of the values of each j-column, Sj is obtained by summing up the elements on the column in the matrix of comparison pairs on the criteria. So we get a vector of the number of values of each column which is:

Table 4. Normalization processes of criteria matrix values

	Student Questionnaires (C1)	Research and Publication (C2)	Public service and Publications (C3)	Seminar/workshop/kuliah umum/Rekognisi (C4)	Jumlah baris	Vector Eigen
C1	0,265251989	0,4845528	0,3247863	0,073619632	1,148211	0,287053
C2	0,541114058	0,1626016	0,2799145	0,290388548	1,274019	0,318505
C3	0,108753316	0,1967479	0,2136752	0,431492843	0,950669	0,237667
C4	0,084880637	0,1560975	0,1816239	0,204498978	0,627101	0,156775

The above table 4 is a table of normalization processes of criteria matrix values. If the normalization value of the data has been obtained, then the next step is to summarize the criterion value on each line and perform the average search to determine the value of a eigen (priority) vector.

If you look at the main own vector generated by the system, then it can be seen that the priority of the criteria obtained is the Research criterion (C2) which is 0.318505; then the second criteria is the Student Questionnaire toward learning (C1) which is 0.0287053; the third Abdimas criteria (C3) is 0.237667 and the last is the seminar/workshop/general lecture/recognition (C4) that is 0.156775.

   2. Consistency Testing Criteria

   After performing the normalization of the matrix value of the criteria, the next step is to perform a test against the already specified criteria matrix values, only consistent criteria matrices values can be used for the process of calculation using the AHP method. To test whether the value of a criterion matrix is consistent or not a summing of the values of the number of criteria values with the own vector value of each line.

   Searching for maximum lamda value ($\lambda maks$) is done by searching for the average of the number of results

$$\lambda maks = \frac{1{,}435263 + 1{,}592523 + 1{,}188337 + 0{,}783876}{4} = 1{,}25$$

Consistency Index (CI) values are as follows:

$$CI = \frac{(\lambda\ maks - n)}{n - 1}$$
$$CI = \frac{1{,}25 - 4}{4 - 1}$$
$$CI = -0{,}92$$

Consistency ratio value (CR) is divide CI by indeks random (IR). For the n = 4 matrix order then the IR value is 0.90.

$$CR = \frac{CI}{IR} = \frac{-0{,}92}{0{,}90} = -1{,}02$$

More details can be found in table 5 below.

Table 5. Criteria Consistency Testing

	Number of rows	Vector Eigen	Results
C1	1,148211	0,287053	1,435263
C2	1,274019	0,318505	1,592523
C3	0,950669	0,237667	1,188337
C4	0,627101	0,156775	0,783876
	Total	5	
	$\lambda maks$	1,25	
	CI	-0,92	
	CR	-1,02	

Based on the results of the calculation then the value of the consistent ratio is -1,02 which means less than 0,1 then it can be concluded that the matrix of the comparison of criteria values is consistent and can be used for further calculations.

3. **Alternative Weight Value**

Once the priority weight of the criterion has been previously obtained, a comparative matrix assessment and calculation against alternatives will be performed.

a. Calculation of matrix comparison pairs on student questionnaire criteria towards learning (C1)

Normalize the value of the matrix by comparing alternative criteria C1 and determine the eigen vector with the resulting number of lines divided by the value 4.

Table 6. Matrix comparison pairs on student questionnaire criteria towards learning (C1)

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	Number of rows	Vector eigen
D1	0,0408	0,0392	0,0136	0,0326	0,0571	0,0509	0,0173	0,0177	0,0362	0,0299	0,0632	0,0674	0,0719	0,1143	0,0698	0,72188	0,1805
D2	0,0408	0,0392	0,0102	0,0217	0,0286	0,017	0,0694	0,0265	0,0725	0,0597	0,0316	0,0225	0,0719	0,0571	0,0349	0,60356	0,1509
D3	0,1224	0,1569	0,0407	0,0652	0,0286	0,0168	0,0694	0,0265	0,0362	0,0149	0,0208	0,0674	0,0719	0,0571	0,0349	0,82985	0,2075
D4	0,0816	0,1176	0,0407	0,0652	0,0571	0,0509	0,0694	0,0531	0,0362	0,1194	0,0632	0,0337	0,0719	0,0571	0,0698	0,987	0,2467
D5	0,0408	0,0784	0,0814	0,0652	0,0571	0,1017	0,0347	0,0531	0,0725	0,0597	0,0632	0,0674	0,018	0,0571	0,0698	0,92012	0,23
D6	0,0408	0,0784	0,122	0,0652	0,0286	0,0509	0,0347	0,0265	0,0725	0,0299	0,0632	0,0337	0,0719	0,0286	0,0698	0,81661	0,2042
D7	0,1633	0,0392	0,0407	0,0652	0,1143	0,1017	0,0694	0,1593	0,1449	0,0299	0,0632	0,0674	0,2157	0,0571	0,023	1,35427	0,3386
D8	0,1224	0,0392	0,0814	0,0652	0,0571	0,1017	0,0229	0,0531	0,0362	0,0597	0,0632	0,0337	0,0237	0,0571	0,0698	0,88655	0,2216
D9	0,0816	0,0196	0,0814	0,1304	0,0571	0,0509	0,0347	0,1062	0,0725	0,0597	0,1263	0,2022	0,0719	0,0571	0,0349	1,1866	0,2967
D10	0,0816	0,0392	0,1627	0,0326	0,0571	0,1017	0,1388	0,0531	0,0725	0,0597	0,0632	0,0337	0,0359	0,0286	0,0698	1,03026	0,2576
D11	0,0408	0,0784	0,122	0,0652	0,0571	0,0509	0,0694	0,0531	0,0362	0,0597	0,0632	0,0674	0,0359	0,0571	0,0698	0,92638	0,2316
D12	0,0408	0,1176	0,0407	0,1304	0,0571	0,1017	0,0694	0,1062	0,0217	0,1194	0,0632	0,0674	0,0719	0,0286	0,1396	1,17578	0,2939
D13	0,0408	0,0392	0,0407	0,0652	0,2286	0,0509	0,0229	0,1593	0,0725	0,1194	0,1263	0,0674	0,0719	0,1714	0,1396	1,41606	0,354
D14	0,0204	0,0392	0,0407	0,0652	0,0571	0,1017	0,0694	0,0531	0,0725	0,1194	0,0632	0,1348	0,0237	0,0571	0,0349	0,9525	0,2381
D15	0,0408	0,0784	0,0814	0,0652	0,0571	0,0509	0,2082	0,0531	0,1449	0,0597	0,0632	0,0337	0,0719	0,1143	0,0698	1,19257	0,2981
Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The 13th lecturer (D13) has a value of 0.354, making it the first priority according to the primary own vector that is formed. The seventh lecturer (D7) has a score of 0.3386, making it the second priority according to the student's questionnaire criterion towards learning (C1).

b. Calculation of matrix comparison pairs on research criteria (C2)

Normalize the value of the matrix by comparing alternative criteria C2 and determine the eigen vector with the result number of lines divided by the value 4. Can be described from the following table:

Tabel 7. matrix comparison pairs on research criteria (C2)

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	Number of raws	Vektor eigen
D1	0,0323	0,0189	0,0148	0,0221	0,0099	0,0498	0,0231	0,0116	0,0334	0,0224	0,0375	0,0448	0,0635	0,0455	0,0984	0,527847	0,132
D2	0,0645	0,0377	0,0111	0,0147	0,0198	0,0249	0,0462	0,0463	0,0334	0,0448	0,0375	0,0299	0,0635	0,091	0,0492	0,61449	0,1536
D3	0,0968	0,1509	0,0443	0,0221	0,0198	0,0164	0,0923	0,0232	0,0334	0,0896	0,0248	0,0897	0,0635	0,03	0,0984	0,895113	0,2238
D4	0,0645	0,1132	0,0886	0,0442	0,0396	0,0125	0,0152	0,0232	0,0667	0,1343	0,075	0,0448	0,0317	0,0455	0,0492	0,848289	0,2121
D5	0,129	0,0755	0,0886	0,0442	0,0396	0,0249	0,0462	0,0153	0,022	0,0148	0,0375	0,0897	0,0159	0,0455	0,0984	0,786968	0,1967
D6	0,0323	0,0755	0,1328	0,1767	0,0792	0,0498	0,0152	0,0232	0,0334	0,0896	0,0375	0,0448	0,0635	0,091	0,0325	0,97694	0,2442
D7	0,0645	0,0377	0,0221	0,1325	0,0396	0,1494	0,0462	0,0232	0,022	0,0448	0,0375	0,0296	0,127	0,0455	0,0492	0,870871	0,2177
D8	0,129	0,0377	0,0886	0,0884	0,1188	0,0996	0,0923	0,0463	0,022	0,0224	0,075	0,0296	0,0317	0,03	0,0325	0,944049	0,236
D9	0,0645	0,0755	0,0886	0,0442	0,1188	0,0996	0,1385	0,139	0,0667	0,0448	0,0375	0,0296	0,0317	0,091	0,0984	1,168421	0,2921
D10	0,0645	0,0377	0,0221	0,0133	0,1188	0,0249	0,0462	0,0927	0,0667	0,0448	0,075	0,0296	0,0317	0,0455	0,0492	0,762761	0,1907
D11	0,0645	0,0755	0,1328	0,0442	0,0792	0,0996	0,0923	0,0463	0,1334	0,0448	0,075	0,0897	0,0317	0,091	0,0492	1,14933	0,2873
D12	0,0645	0,1132	0,0443	0,0884	0,0396	0,0996	0,1385	0,139	0,2001	0,1343	0,075	0,0897	0,0635	0,0455	0,0984	1,43367	0,3584
D13	0,0323	0,0377	0,0443	0,0884	0,1584	0,0498	0,0231	0,0927	0,1334	0,0896	0,15	0,0897	0,0635	0,03	0,0492	1,132035	0,283
D14	0,0645	0,0377	0,1328	0,0884	0,0792	0,0498	0,0923	0,139	0,0667	0,0896	0,075	0,1793	0,1905	0,091	0,0492	1,425116	0,3563
D15	0,0323	0,0755	0,0443	0,0884	0,0396	0,1494	0,0923	0,139	0,0667	0,0896	0,15	0,0897	0,127	0,182	0,0984	1,464102	0,366
Jumlah	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The priority of the research criteria (C2), namely the 12th lecturer (D12) with a value of 0.3584, and the 14th lecturer (D14) with a value of 0.3563, can be identified based on table 4.8 of the primary own vector created.

c. The matrix of comparison is based on the community's evaluation criterion (C3)

Normalize the value of the matrix by comparing alternative criteria C3 and determine the eigen vector with the result number of lines divided by the value 4. Can be described from the following table:

Table 8. Matrix of comparison is based on the community's evaluation criterion (C3)

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	Number of raws	Vektor eigen
D1	0,0488	0,04	0,0444	0,0227	0,0229	0,05	0,0448	0,0252	0,0646	0,0306	0,1349	0,038	0,0645	0,0477	0,0968	0,7759	0,194
D2	0,0488	0,04	0,0222	0,0227	0,0151	0,025	0,0448	0,0504	0,0323	0,0612	0,0337	0,0251	0,0645	0,0953	0,0484	0,629632	0,1574
D3	0,0488	0,08	0,0444	0,0455	0,0229	0,025	0,0448	0,0252	0,0323	0,0612	0,0223	0,076	0,0645	0,0315	0,0968	0,721175	0,1803
D4	0,0976	0,08	0,0444	0,0455	0,0458	0,025	0,0224	0,0252	0,0646	0,0306	0,0674	0,038	0,0323	0,0477	0,0484	0,714829	0,1787
D5	0,0976	0,12	0,0889	0,0455	0,0458	0,025	0,0448	0,0166	0,0213	0,0202	0,0337	0,076	0,129	0,0477	0,0968	0,908913	0,2272
D6	0,0488	0,08	0,0889	0,0909	0,0916	0,05	0,0148	0,0252	0,0323	0,0612	0,0337	0,038	0,0645	0,0953	0,0484	0,86369	0,2159
D7	0,0488	0,04	0,0444	0,0909	0,0458	0,15	0,0448	0,0252	0,0213	0,0306	0,0337	0,0251	0,0323	0,0315	0,0484	0,712792	0,1782
D8	0,0976	0,04	0,0889	0,0909	0,1374	0,1	0,0896	0,0504	0,0213	0,0612	0,0674	0,0251	0,0323	0,0315	0,0484	0,981965	0,2455
D9	0,0488	0,08	0,0889	0,0455	0,1374	0,1	0,1343	0,1513	0,0646	0,0306	0,0337	0,0251	0,0645	0,0953	0,0968	1,196821	0,2992
D10	0,0976	0,04	0,0444	0,0909	0,1374	0,05	0,0896	0,0504	0,1291	0,0612	0,0674	0,0251	0,0323	0,0953	0,0484	1,059202	0,2648
D11	0,0244	0,08	0,1333	0,0455	0,0916	0,1	0,0896	0,0504	0,1291	0,0612	0,0674	0,076	0,0323	0,0953	0,0484	1,124608	0,2812
D12	0,0976	0,12	0,0444	0,0909	0,0458	0,1	0,1343	0,1513	0,1937	0,1837	0,0674	0,076	0,0645	0,0477	0,0319	1,449345	0,3623
D13	0,0488	0,04	0,0444	0,0909	0,0229	0,05	0,0224	0,1009	0,0646	0,1225	0,1349	0,076	0,0645	0,0477	0,0484	0,978809	0,2447
D14	0,0976	0,04	0,1333	0,0909	0,0916	0,05	0,0896	0,1513	0,0646	0,0612	0,0674	0,1521	0,129	0,0953	0,0968	1,410755	0,3527
D15	0,0488	0,08	0,0444	0,0909	0,0458	0,1	0,0896	0,1009	0,0646	0,1225	0,1349	0,2281	0,129	0,0953	0,0968	1,471562	0,3679
Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The priority of the criterion of dedication to the community (C3) is the 15th lecturer (D15), with a value of 0.3679, and the second priority order is the 12th lecturer (D12), with a value of 0.3623, according to table 4.10 of the main own vector produced.

d. Calculation of matrix comparison pairs on the criteria Seminar/workshop/general lecture/recognition (C4)

Normalize the value of the matrix by comparing alternative criteria C4 and determine the eigen vector with the result number of lines divided by the value 4. Can be described from the following table:

Table 9. Matrix comparison pairs on the criteria Seminar/workshop/general lecture/recognition (C4)

	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	D11	D12	D13	D14	D15	raw	Vektor eigen
D1	0,0476	0,0485	0,08	0,0246	0,0204	0,0395	0,0517	0,0166	0,0583	0,0306	0,1244	0,0337	0,0556	0,0455	0,1044	0,7815	0,1954
D2	0,0476	0,0485	0,02	0,0246	0,1224	0,0395	0,0517	0,0252	0,1748	0,0612	0,0311	0,0223	0,0556	0,091	0,0522	0,8678	0,217
D3	0,0238	0,0971	0,04	0,0493	0,0204	0,079	0,0517	0,0252	0,0291	0,0612	0,0205	0,0675	0,0556	0,03	0,0261	0,6765	0,1691
D4	0,0952	0,0971	0,04	0,0493	0,0408	0,0395	0,0259	0,0252	0,0583	0,0306	0,1866	0,0337	0,0278	0,0455	0,0522	0,8476	0,2119
D5	0,0952	0,0146	0,08	0,0493	0,0408	0,013	0,0259	0,0504	0,0192	0,0202	0,0311	0,0675	0,1111	0,0455	0,1044	0,7682	0,1921
D6	0,0476	0,0485	0,02	0,0493	0,1224	0,0395	0,0171	0,0252	0,0291	0,0612	0,0155	0,0337	0,0556	0,0455	0,0522	0,6625	0,1656
D7	0,0476	0,0485	0,04	0,0985	0,0816	0,1184	0,0517	0,0252	0,1166	0,0306	0,0311	0,0223	0,1111	0,0455	0,0522	0,921	0,2303
D8	0,1429	0,0971	0,08	0,0985	0,0408	0,079	0,1035	0,0504	0,0192	0,0612	0,0622	0,0223	0,0278	0,03	0,0522	0,9671	0,2418
D9	0,0476	0,0146	0,08	0,0493	0,1224	0,079	0,0259	0,1513	0,0583	0,0306	0,0311	0,135	0,0556	0,091	0,1044	1,0759	0,269
D10	0,0952	0,0485	0,04	0,0985	0,1224	0,0395	0,1035	0,0504	0,1166	0,0612	0,0622	0,0223	0,0278	0,091	0,0522	1,0313	0,2578
D11	0,0238	0,0971	0,12	0,0148	0,0816	0,1579	0,1035	0,0504	0,1166	0,0612	0,0622	0,0675	0,0278	0,182	0,0522	1,2185	0,3046
D12	0,0952	0,1456	0,04	0,0985	0,0408	0,079	0,1552	0,1513	0,0291	0,1837	0,0622	0,0675	0,0556	0,0455	0,0344	1,2837	0,3209
D13	0,0476	0,0485	0,04	0,0985	0,0204	0,0395	0,0259	0,1009	0,0583	0,1225	0,1244	0,0675	0,0556	0,03	0,0522	0,9317	0,2329
D14	0,0952	0,0485	0,12	0,0985	0,0816	0,079	0,1035	0,1513	0,0583	0,0612	0,0311	0,135	0,1667	0,091	0,1044	1,4252	0,3563
D15	0,0476	0,0971	0,16	0,0985	0,0408	0,079	0,1035	0,1009	0,0583	0,1225	0,1244	0,2024	0,1111	0,091	0,1044	1,5414	0,3853
Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		

The priority criteria can be used to determine the principal own vector produced based on table 4.12. The 15th lecturee (D15) with a value of 0.3853 is recognized for seminar/workshop/general lecture/recognition (C4), and the 14th lecturer (D14) with a score of 0.3563 is in the second priority order.

4. Results Final Eigen Criteria and Alternative

To determine the final result of a eigen value by multiplying each weight of each criterion by each weight from each alternative already obtained from the previous stage. For example, calculation of the eigen value of the criteria and the alternative eigen value:

D1 = (0,180469* 0,287053) + (0,131962*0,318505) + (0,193975*0,237667) + (0,195375*0,156775) = 0,170566

Thus, for the calculations D2 to D15, further more complete is shown in table 4.1.3. To make the calculation is based on the largest final value that can be seen in the table below:

Table 10. Ranking

Alternative	Alternative and criterion eigen values				Vector Eigen	Calculation Results	Ranking
	C1	C2	C3	C4			
D1	0,180469	0,131962	0,193975	0,195375	0,287053	0,170566	14
D2	0,150889	0,153622	0,157408	0,216958	0,318505	0,163667	15
D3	0,207463	0,223778	0,180294	0,169131	0,237667	0,200193	13
D4	0,24675	0,212072	0,178707	0,211907	0,156775	0,214071	10
D5	0,230031	0,196742	0,227228	0,192051		0,212808	12
D6	0,204153	0,244235	0,215923	0,165635		0,213678	11
D7	0,338568	0,217718	0,178198	0,230258		0,244982	7
D8	0,221639	0,236012	0,245491	0,241764		0,235041	9
D9	0,296651	0,292105	0,299205	0,268969		0,29147	4
D10	0,257565	0,19069	0,264801	0,257833		0,238027	8
D11	0,231596	0,287333	0,281152	0,304631		0,272576	6
D12	0,293945	0,358417	0,362336	0,320916		0,334962	2
D13	0,354015	0,283009	0,244702	0,232919		0,286434	5
D14	0,238124	0,356279	0,352689	0,356312		0,321514	3
D15	0,298144	0,366026	0,367891	0,385342		0,350011	1

Based on the results of the calculation of the main own vector resulting, it is possible to know that the priority of the criteria obtained is the Research criteria (C2) is 0.318505; then the second criterion is the Student Questionnaire towards learning (C1) is 0.287053; the third is the Abdimas Criterion (C3) is 0.237667 and the last is the Seminar/workshop/general lecture/recognition (C4) is 0.156775. And for the calculation of the qualifying of the best lecturer then the obtained initials D15 is set to be the best docent in position 1 with a score of 0.35 or 35%, D 14 is in position 2 with a rating of 0.335 or 33.5% and D12 is in the third position with the score of 0,325 or 32.5%.

5. CONCLUSION

Based on the data processing results, the priority is the Research criterion (C2), which is 0.318505; then the second is the Student questionnaire towards learning (C1), which is 0.0287053; the third is the Abdimas criterious (C3), which is the 0.237667 and the last is the Seminar/workshop/general lecture/recognition criteria (C4) that is 0.156775. And based on analysis using Analytical Hierarchy Process (AHP) then who becomes the best lecturer in the Faculty of Education and Sciences of the University of HKBP Nommensen is initially D15 set as the best faculty in position 1 with a score of 0.35 or 35%, D 14 is in position 2 with a rating of 0.335 or 33.5% and D12 is in the third position with the score of 0,325 or 32.5%.

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