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The Implementation of ORESTE using Basson Rank for Selecting The TOEFL Preparation Courses in Yogyakarta

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Abstract

TOEFL is one of the most frequently used international standardized tests for registering for masters and doctoral degrees, seeking study scholarships or for promotions. Unfortunately, there are still many students and employees who still experience difficulties in taking the TOEFL test. This is what then becomes the reason for them to take English courses, especially to prepare themselves for preparing the TOEFL test. Yogyakarta, which has the title of "Student City", has many campuses and many English courses that offer the TOEFL Preparation Course. There are many types of TOEFL formats and many TOEFL Preparation Programs are offered by English courses in Yoggyakarta. The TOEFL Preparation courses has various programs including different price, teacher competencies, and facilities. In this study, the ORESTE method was used to help the people determining the best course according to its ranking. This method is one of the Multiple Attribute Decision Making (MADM) methods used to find alternatives using predetermined criteria and preference weights. The criteria used are price, instructor, materials, facilities and location. The results showed that the best TOEFL course ranking/order alternative was A16 with a preference score of 3.9425 and the course with the lowest score was A4 with a score of 9.878177.

I. INTRODUCTION

In this globalization era, the mastery of English in daily communication and interaction must be mastered well, both in written and verbally. Global competition has forced human resources to equipped themselves with many skills. Indonesian people iare required to have many skills so that Indonesian products or services and workers can compete in the MEA era [1] English mastery becomes the main key to success in someone's career. A good command of English will be very beneficial to have more opportunities to develop your studies, get scholarships, have a more successful career, or work in multinational companies abroad. Therefore, formal and informal English learnings need to be done to equip oneself with good English skills.

English proficiency can be seen in standardized test results that are recognized internationally. The English proficiency test can be used as a prerequisite for graduating from a Diploma or Bachelor level, a condition for receiving a Masters or Doctoral degree scholarship, as well as an increase in promotion. The Test of English as a Foreign Language (TOEFL) is one of the internationally standardized tests most often used as a test tool for English proficiency because the price is quite affordable and the form is multiple choice questions. The TOEFL test in Indonesia is coordinated by the English Testing System (ETS) in collaboration with language institutions on campus or with English courses as ETS partners. In the TOEFL, there are three abilities tested, namely the listening test, the sentence structure test and the reading test which is done in about 2 hours [2]. In reality, there are still many students and employees who are still experiencing difficulties and have to repeat the TOEFL test because the desired score has not been achieved [3]. So, they take English courses to prepare the strategies for doing the TOEFL test.

This study aimed to design a decision support system in choosing a TOEFL course using the Oreste method in Yogyakarta Special Region. Decision Support Systems are used to help people making decisions based on several criteria. The decision-making criteria used in this study are the price, the instructor, the training materials, the facilities and the location. The data were taken by conducting online data searches and direct surveys to

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TOEFL course locations. The ORESTE method is used because this method is a multi-criteria decision-making method, or better known as the Multi-Criteria Decision Making (MCDM) [4].The results of the study are expected to be able to show the order/ranking of the TOEFL course places from the best to the worst in the Yogyakarta area based on several criteria.

II. Related Works/Literature Review

The Test of English as a Foreign Language (TOEFL) is one of the internationally standardized examinations to measure the English mastery. The official TOEFL test is regulated by Educational Testing Service (ETS) in several formats, namely (1) TOEFL Paper-Based Test (PBT), (2) TOEFL Computer-Based Test (CBT), and (3) TOEFL internet-Based Test (iBT) [5]. Some English skills are tested in TOEFL, namely: Listening Comprehension, Structure, and Reading Comprehension. Besides that, there are also the tests for Writing Essay and Speaking in TOEFL [5]. TOEFL Paper-based Test (PBT) are mostly used because the price is affordable and the test are conducted in many institutions.[3] had a research about creating a teaching module and TOEFL Preparation training programs at STMK AKAKOM Yogyakarta to help students prepare for the TOEFL exam and to increase the TOEFL score. From this research, the instructional objectives and training module were designed to help the students to increase on their TOEFL score.

The ORESTE method has been used in several studies. [6] used the ORESTE method for Assessing Community Satisfaction with Sari Mutiara Lubuk Pakam Hospital Services, the results showed that this method was capable of supporting decision making. In the field of logistics transportation, oreste was also carried out to support decision making. Selection of Fast Motor Boat Transporter Vendors. The results showed that the smallest distance score is 48.2 and the CVND-T alternative vendor was selected [7]. The selection of promotional locations has also been determined using the ORESTE method. The results showed that the application can provide convenience for users and was suitable for use in determining promotional locations [8].

III. Methods

A. Multi Criteria Decision Making (MCDM)

Decision support systems are used as a tool for the decision makers by expanding the capabilities of the decision makers, but not to replace them[9], [10]. To assist the decision making, there are several methods in decision support systems that can be used, one of which is MCDM. MCDM is a decision making that involves many criteria. This is necessary because in some cases, decision making cannot be done with only one criterion. These criteria are used simultaneously to evaluate and compare various alternatives to make an appropriate and balanced decision [11].

There are several MCDM methods used to help the decision making process including Analytical Hierarchy Process (AHP), Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS), Elimination and Choice Expressing Reality (ELECTRE), Preference Ranking Organization Method for Enrichment Evaluations (PROMETHEE) and Objective Rational Evaluation of Simplicity (ORESTE) [12].

B. ORESTE

The ORESTE method is a method where this method can be used to help the decision-making process. The Oreste method is focused on making decisions through several factors, namely convenience, trust, and simplicity [13]. This method is used according to conditions where a set of alternatives will be sorted based on criteria according to their level of importance [14]. The way the Oreste method works is by calculating each criterion with a certain value where the total value of the criteria is 100%. The weight of this criterion is used in calculating the final score for each alternative.

The stages in calculating oreste values are as follows [15]

1. Determine what criteria that will be used as a benchmark for problem solving, complemented by the value of each criterion
2. Changing each alternative data into Basson Rank.
3. Calculating The Value of the distance score of each pair of the alternative

$$D(aj\ cj) = \left[\frac{1}{2}\ r\ cj\ R + \frac{1}{2} r\ cj\ (a)\ R\right] \frac{1}{r} \quad \text{.....(1)}$$

Notes:
D = Distance Score
aj = Alternative
cj = Criteria
R = Strength of Rank
r = Ratio

4. Calculating The Preference Score
   $Vi = \sum(Distance\ score\ x\ W_j)$ ……..(2)
   Notes:
   $Vi = preference\ value$
   $W_j = the\ value\ of\ the\ criteria$
5. Rank The Data
   Ranking the data is done by looking at the results of calculating the final number of preference values, where the lowest value becomes rank 1 and so on.

IV. RESULTS

The research methodology for the implementation of the Oreste method in selecting TOEFL Preparation course locations can be seen in Figure 1.

Fig. 1 Research Methodology

From Figure 1 it can be seen that the stages of the research was begun with an analysis of the required data, it was followed by determining the criteria for selecting the course location. After the criteria were determined, then the next step was to look for alternative data for TOEFL preparation courses in Yogyakarta, namely 26 alternatives. Each alternative was searched for the data for all existing criteria. After the data were collected, the next process was to perform data calculations using the Oreste method and using Basson rank. Based on these calculations, a ranking of the 26 alternatives would be obtained.

A. Determine The Criteria

The criteria data, the values and the descriptions of each criterion used in this study can be seen in table 1. In Table 1, it can be seen that there were 5 criteria used with different values for each criterion. The highest value in selecting the TOEFL course location is the Cost criterion, while the lowest value is the distance criterion from the city center. For star rating criteria, teachers and facilities had the same value.

TABLE 1
Criteria Table

No	Name of Criteria	Value	Notes
1	Distance	10%	The distance between the city center and the course
2	Star Rank	20%	Star rating for Review that is based on public opinion
3	Cost	30%	Cost of the course/hour
4	Teacher	20%	The Teacher (Native Speaker/Local)
5	Facilities	20%	Various kinds of facilities that is obtained during the course

B. Data Gathering Techniques

Data gathering technique was carried out in three ways, namely coming directly to the course location, via telephone and using a search engine. TOEFL Preparation course location data can be seen in TABLE 2.

TABLE 2
TOEFL Preparation Course Data

No.	Institution Names	K1	K2	K3	K4	K5
1	EF English First	4,6	4,6	65625	Luar	2
2	English Cafe Jogja	6,1	4,7	20000	lokal	2
3	LIA Yogyakarta	8,1	4,7	35909	lokal	3
4	Pusat Bahasa FIB UGM	5,4	4,3	50000	lokal	3
5	Lembaga Bahasa USD	6	4,8	39800	lokal	3

6	ELTI Gramedia Sabirin	3	4,5	28000	lokal	3
7	HARVARD ENGLISH	3,7	5	23000	lokal	3
8	CILACS UII	5,4	4,5	38636	lokal	4
9	Jogja English Training (JET) Centre	3,6	4,7	60000	lokal	4
10	GMES English	1,3	4,8	33000	lokal	4
11	ALPHA ENGLISH COURSE	6,8	4,8	35000	lokal	3
12	Pusat Pelatihan Bahasa LPPMP UNY	5,5	4,9	60000	lokal	3
13	Kursus LPK eFAC	9,2	4,7	38000	lokal	3
14	IONS International Education	4,3	4,6	82500	lokal	3
15	ILP	3	4,1	10900	lokal	3
16	CIE (Central International Education)	4,8	5	20000	lokal	4
17	Sire Gadjah Mada	6,6	4,6	57500	lokal	3
18	TOP English	4,5	4,8	30000	lokal	3
19	IEC Jogja (International English Center)	4,3	4,8	24000	lokal	3
20	Nusantara Training Centre(NTC)	3,4	4,4	30000	lokal	4
21	Rumah Inggris Jogja	4,6	4,3	37000	lokal	4
22	ENTER (English Center)	4,8	5	66633	lokal	4
23	Kampung Inggris Jogja - Classy English Course	7,2	5	35200	lokal	3
24	FOKUS TOEFL	17,8	5	36000	lokal	4
25	P2B UIN Sunan Kalijaga Yogyakarta	5,7	4,7	22000	lokal	3
26	Pelatihan P2EB FEB UGM	5,7	4,7	13500	lokal	4

In Table 2, there were 26 alternatives used in this study. The value of each criterion of the 26 alternatives is different. After the data is collected, then the ORESTE calculation was carried out.

C. ORESTE Calculation

The data described in Table 2 would be converted first by creating a range for each criterion and giving a score to the range that has been made. Table 3 for the conversion of the distance criterion score (K1), Table 4 for the star rating criteria (K2), Table 5 for the cost criteria score (K3), Table 6 for the teacher criteria score (K4) and Table 7 for the facility criteria score (K5) . As an example for the distance criterion score, 4 ranges of values were created where the smaller the value, the greater the score because of course the user prefers a closer distance.

TABLE 3
Distance Criterion Score (K1)

Value	Score
0-5	4
5,1 - 10	3
10,2 - 15	2
>15	1

TABLE 4
Star Criterion Score (K2)

Value	Score
4,6 - 5	4
4,1 - 4,5	3
3,6 - 4	2
<3,6	1

TABLE 5
Cost Criteria Score (K3)

Value	Score
10 -- 20	4
21 -- 30	3
31 -- 40	2
>40	1

TABLE 6
Teacher Criteria Score (K4)

Value	Score
Native Speaker	4
Local Teacher	3

TABLE 7
Facility Criteria Score (K5)

Value	Score
Module, Certificate, Training Session, Simulation Test	4
Module, Certificate, Simulation Test	3
Module, Certificate	2
Certificate	1

The results of converting values into scores as a whole can be seen in Table 8. In Table 8 it can be seen that all scores are the same from 1 to 4.

TABLE 8
TOEFL PREPARATION COURSE DATA

No.	INSTITUTION NAMES	K1	K2	K3	K4	K5
1	A1	4	4	1	4	2
2	A2	3	4	4	3	2
3	A3	3	4	2	3	3
4	A4	3	3	1	3	3
5	A5	3	4	2	3	3
6	A6	3	3	3	3	3
7	A7	4	4	3	3	3
8	A8	3	3	2	3	4
9	A9	4	4	1	3	4
10	A10	4	4	2	3	4
11	A11	3	4	2	3	3
12	A12	3	4	1	3	3
13	A13	3	4	2	3	3
14	A14	4	4	1	3	3
15	A15	4	3	4	3	3
16	A16	4	4	4	3	4
17	A17	3	4	1	3	3
18	A18	4	4	3	3	3
19	A19	4	4	3	3	3
20	A20	4	3	3	3	4
21	A21	4	3	2	3	4
22	A22	4	4	1	3	4
23	A23	3	4	2	3	3
24	A24	1	4	2	3	4
25	A25	3	4	3	3	3
26	A26	3	4	4	3	4

The next step was to calculate the basson rank values for all criteria, where if there are the same values it is necessary to find the mean value. For example, the alternative value of criteria 1 from A1 to A26 has similarities, A1 has the same value as A7, A9, A10, A14, A15, A16, A18, A19, A20, A21, and A22 so that when the rank value is needed, A1 is ranked 1 , as well as for A7 and others with the same value will both rank 1 because the value is the same. Because the 12 alternatives have the same value, the next rank is 13. This rank will also be the same for all the alternatives with the same value. After getting the rank, the next step is to determine the basson rank value.

The basson rank value for criterion 1 can be seen in Table 9. This value was obtained by adding up the number of the same value and then dividing the number of the same value (1+2+3+4+5+6+7+8+9+10+11+12)/12 = 6,5.

TABLE 9
THE BASSON RANK- CRITERION 1

ALTERNATIVE	ALTERNATIVE VALUE	NOTES		VALUE
A1	4	RANK	1	6,5
A2	3	RANK	13	19
A3	3	RANK	13	19
A4	3	RANK	13	19
A5	3	RANK	13	19
…	…	RANK	…	…
A25	3	RANK	13	19
A26	3	RANK	13	19

The values of the Basson rank criterion 2 can be seen in Table 10.

TABLE 10
THE BASSON RANK- CRITERION 2

ALTERNATIVE	ALTERNATIVE VALUE	NOTES		VALUE
A1	4	RANK	1	10,5
A2	4	RANK	1	10,5
A3	4	RANK	1	10,5
A4	3	RANK	21	23,5
A5	4	RANK	1	10,5
…	…	RANK	…	…
A25	4	RANK	1	10,5
A26	4	RANK	1	10,5

The values of the Basson rank criterion 3 can be seen in Table 11.

TABLE 11
THE BASSON RANK - CRITERION 3

ALTERNATIVE	ALTERNATIVE VALUE	NOTES		VALUE
A1	1	RANK	20	23
A2	4	RANK	1	2,5
A3	2	RANK	11	15
A4	1	RANK	20	23
A5	2	RANK	11	15
…	…	RANK	…	…
A25	3	RANK	5	7,5
A26	4	RANK	1	2,5

The values of the Basson rank criterion 4 can be seen in Table 12.

TABLE 12
THE BASSON RANK - CRITERION 4

ALTERNATIVE	ALTERNATIVE VALUE	NOTES		VALUE
A1	4	RANK	1	1
A2	3	RANK	2	14
A3	3	RANK	2	14
A4	3	RANK	2	14
A5	3	RANK	2	14
…	…	RANK	…	…
A25	3	RANK	2	14
A26	3	RANK	2	14

The values of the Basson rank criterion 5 can be seen in Table 13.

TABLE 13
THE BASSON RANK - CRITERION 5

ALTERNATIVE	ALTERNATIVE VALUE	NOTES		VALUE
A1	2	RANK	25	25,5
A2	2	RANK	25	25,5
A3	3	RANK	10	17
A4	3	RANK	10	17

A5	3	RANK	10	17
…	…	RANK	…	…
A25	3	RANK	10	17
A26	4	RANK	1	5

After calculating the basson rank then we need to determine the normalization value where the normalized value can be seen in TABLE 14. This normalized value was obtained from the previous basson rank calculation for each criterion in each alternative.

TABLE 14
Normalisation Value

No.	Alternative	K1	K2	K3	K4	K5
1	A1	6,5	10,5	23	1	25,5
2	A2	19	10,5	3	14	25,5
3	A3	19	10,5	15	14	17
4	A4	19	23,5	23	14	17
5	A5	19	10,5	15	14	17
…	…	…	…	…	…	…
25	A25	19	10,5	8	14	17
26	A26	19	10,5	3	14	5

The next step after determining the normalization value was calculating the distance score using equation (1). The results of the distance score can be seen in Table 15, with detailed calculations for criterion 1 as follows:

D11 = (((0,5x6,5)^3)+((0,5x1)^3))^0,333 = 3,25394
D12 = (((0,5x19)^3)+((0,5x1)^3))^0,333 = 9,500462
D13 = (((0,5x19)^3)+((0,5x1)^3))^0,333 = 9,500462
…..
D126 = (((0,5x19)^3)+((0,5x1)^3))^0,333 = 9,500462

For the criteria 2 to 5, it is done in the same way. The examples of the calculations for criterion 5 are as follows:

D51 = (((0,5x25,5)^3)+((0,5x5)^3))^0,333 = 12,78196
D52 = (((0,5x25,5)^3)+((0,5x5)^3))^0,333 = 12,78196
D53 = (((0,5x17)^3)+((0,5x5)^3))^0,333 = 8,571485
…
D526 = (((0,5x5)^3)+((0,5x5)^3))^0,333 = 3,149803

TABLE 15
Distance Score Value

No.	Alternative	K1	K2	K3	K4	K5
1	A1	3,25394	5,262066	11,50850033	2,0104	12,78196
2	A2	9,500462	5,262066	1,746592007	7,054	12,78196
3	A3	9,500462	5,262066	7,519946902	7,054	8,571485
4	A4	9,500462	11,752414	11,50850033	7,054	8,571485
5	A5	9,500462	5,262066	7,519946902	7,054	8,571485
…	…	…	…	…	…	…
25	A25	9,500462	5,262066	3,828351542	7,054	8,571485
26	A26	9,500462	5,262066	1,746592007	7,054	3,149803

The next step was to calculate the preference value with equation (2). This preference value was obtained by multiplying the distance score by the weight that has been determined for each criterion. The results of preference values can be seen in TABLE 16, with an example of the calculation as follows:

A1=(0,325394*0,1)+(1,0524132*0,2)+(3,452550099*0,3)+(0,4021*0,2)+(2,556392*0,2)=7,788822
A2=(0,950046*0,1)+ (1,0524132*0,2)+(0,523977602*0,3)+(1,4108*0,2)+(6,49363*0,2)=6,49363
…
…
A26=(0,950046*0,1)+((1,0524132*0,2)+(0,523977602*0,3)+(1,4108*0,2)+(0,629961*0,2)= 4,567198

TABLE 16
The Preference Value

No.	Alter native	K1	K2	K3	K4	K5	Vi	Rank
1	A1	0,325394	1,0524132	3,452550099	0,4021	2,556392	7,788822	22
2	A2	0,950046	1,0524132	0,523977602	1,4108	2,556392	6,49363	10
3	A3	0,950046	1,0524132	2,255984071	1,4108	1,714297	7,383541	15
4	A4	0,950046	2,3504828	3,452550099	1,4108	1,714297	9,878177	26
5	A5	0,950046	1,0524132	2,255984071	1,4108	1,714297	7,383541	15
6	A6	0,950046	2,3504828	1,148505462	1,4108	1,714297	7,574132	20
7	A7	0,325394	1,0524132	1,148505462	1,4108	1,714297	5,65141	3
8	A8	0,950046	2,3504828	2,255984071	1,4108	0,629961	7,597274	21
9	A9	0,325394	1,0524132	3,452550099	1,4108	0,629961	6,871119	12
10	A10	0,325394	1,0524132	2,255984071	1,4108	0,629961	5,674553	6
11	A11	0,950046	1,0524132	2,255984071	1,4108	1,714297	7,383541	15
12	A12	0,950046	1,0524132	3,452550099	1,4108	1,714297	8,580107	24
13	A13	0,950046	1,0524132	2,255984071	1,4108	1,714297	7,383541	15
14	A14	0,325394	1,0524132	3,452550099	1,4108	1,714297	7,955455	23
15	A15	0,325394	2,3504828	0,523977602	1,4108	1,714297	6,324952	9
16	A16	0,325394	1,0524132	0,523977602	1,4108	0,629961	3,942546	1
17	A17	0,950046	1,0524132	3,452550099	1,4108	1,714297	8,580107	24
18	A18	0,325394	1,0524132	1,148505462	1,4108	1,714297	5,65141	3
19	A19	0,325394	1,0524132	1,148505462	1,4108	1,714297	5,65141	3
20	A20	0,325394	2,3504828	1,148505462	1,4108	0,629961	5,865144	7
21	A21	0,325394	2,3504828	2,255984071	1,4108	0,629961	6,972622	14
22	A22	0,325394	1,0524132	3,452550099	1,4108	0,629961	6,871119	12
23	A23	0,950046	1,0524132	2,255984071	1,4108	1,714297	7,383541	15
24	A24	1,300025	1,0524132	2,255984071	1,4108	0,629961	6,649183	11
25	A25	0,950046	1,0524132	1,148505462	1,4108	1,714297	6,276063	8
26	A26	0,950046	1,0524132	0,523977602	1,4108	0,629961	4,567198	2

The last step of using the ORESTE method was to determine the rank of all the alternatives. The best rank was obtained if the preference value is the lowest, and vice versa, the lowest rank is the alternative that has the highest preference value.

V. DISCUSSION

There are 26 TOEFL preparation courses (referred to as alternatives in this study). All of the TOEFL preparation courses are located in the Special Region of Yogyakarta. There are 5 criteria used in this study, namely distance, star rating, hourly fee, instructor and facilities. Based on the interviews conducted with several users of the TOEFL preparation course, the weight values for each criterion were taken. The highest weight is the cost criterion with a value of 30%. Star ratings, instructors and facilities have the same value, namely 20%. As for the lowest weight, namely the weight of the distance criterion. The distance referred to here is the distance between the course and KM 0 Yogyakarta.

Based on the several steps that have been carried out as shown from Table 1 to Table 16, it can be seen that the use of basson rank in the Oreste method produced a varied rank and twin values. If there is a rank with twin values, then it is necessary to find the average value. From the results of Table 16, it can be seen that there are several preference values (Vi) that are the same, for example in rank 3, it is found in alternative 7, A18, and A19. Likewise with those that is in rank 12, the same results are obtained on A9 and A22. Moreover, rank 15 is obtained in alternatives A3, A5, A11, A13, and A23. The alternative/the course place that gets the 1st rank is the 16th alternative (A16) with a Vi value of 3.942546, while the one that gets the lowest rank is the 4th alternative/the course place with a value of 9.878177.

VI. CONCLUSIONS

Based on the discussion that has been described previously, it can be concluded that the Oreste method can be used as a tool in a decision support system, especially in choosing a TOEFL course in Yogyakarta Special Region. The results of this study indicated that from the 26 data locations of the TOEFL preparation course used in the research, the first rank is the 26th alternative (A16) with a value of 3.9425 and the last rank is the fourth alternative with a preference value of 9.878177.

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