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DETERMINATION OF ELIGIBILITY ZAKAT RECIPIENTS USING ANALYTIC HIERARCHY PROCESS FOR UNIVERSITI TEKNOLOGI MARA CAWANGAN PERLIS STUDENTS

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Abstract:

The COVID-19 pandemic and the implementation of the lockdown had a significant impact on the country's community life and economic stability, resulting in job losses, school and educational institution closures, and a loss of foreign investment. Implementing home teaching and learning (PdPR) entailed additional costs, such as purchasing internet access, which increased the financial burden on parents. Therefore, Unit Zakat, Sedekah, & Wakaf (ZAWAF) of Universiti Teknologi MARA (UiTM) Cawangan Perlis is responsible for providing immediate financial assistance to UiTM staff and students. ZAWAF has taken proactive action by introducing an online zakat assistance application in March 2020 as an alternative to traditional face-to-face interviews during the pandemic. However, receiving a large number of applications and numerous reasons why students apply for zakat assistance to be processed urgently has affected ZAWAF during the zakat evaluation

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process. The Analytical Hierarchy Process (AHP) method has been used to assist ZAWAF in classifying which zakat applicants are eligible to receive zakat assistance immediately and ranking the important factors. The results revealed that the less capable family had been the most important factor, having the highest judgment and getting the highest average ranking from the three experts interviewed by Zawaf. The AHP method can be used to determine the other factors that contribute to the eligibility of students to receive zakat assistance and can help ZAWAF speed up the process of distributing zakat assistance to eligible zakat recipients. Future research can be made using other factors, such as a history of receiving previous zakat assistance and subfactors for each criterion (factor) that can contribute to whether students are eligible to receive zakat assistance.

Keywords:

Zakat Assistance, Eligibility, Analytical Hierarchy Process (AHP)

Introduction

Implementing a lockdown or Movement Control Order (MCO) was put in place in response to the COVID-19 pandemic, which has harmed community life and the stability of the country's economy. These effects include job losses, a drop in foreign investment, and the closing schools and other educational facilities. Implementing Home Teaching and Learning (PdPR) is an action plan used by the Ministry of Education to reduce COVID-19 infection among teachers and students. However, implementing PdPR challenges teachers, parents, and students in particular. Low-income families face financial burdens cause they need to provide children's learning facilities such as laptops and internet data facilities. Some students have to share laptops with other siblings to attend online teaching sessions. The same thing also happens to students in institutions of higher learning, especially at Universiti Teknologi MARA Perlis Branch when implementing Open & Distance Learning (ODL) studies during the pandemic. Therefore, Unit Zakat, Sedekah & Wakaf (ZAWAF) of Universiti Teknologi MARA (UiTM) Cawangan Perlis is responsible for providing immediate financial assistance to UiTM staff and students.

ZAWAF provides the conventional procedure of applying for zakat assistance was less efficient because zakat applications had to go through a lengthy process that included physical forms and face-to-face interviews before students could receive zakat assistance (Azlan, Nor Azriani, Wan Nurshazelin., Siti Nor Nadrah & Nur Syuhada, 2023). However, the conventional procedure complicates the ZAWAF because it requires them to manually select eligible applicants while the students need financial assistance immediately to continue their studies. ZAWAF has taken proactive action by introducing an online zakat assistance application in March 2020 as an alternative to traditional face-to-face interviews during the pandemic. With a large number of zakat assistance applications to be processed and numerous reasons why students apply for zakat assistance to be considered urgently, lecturers from different faculties were assigned by ZAWAF as interviewers for the zakat evaluation process (Rahman et al., 2023). Because the interviewer's evaluation or opinion is subjective and might be different, ZAWAF needs to identify criteria or factors that contribute to the eligibility of zakat assistance as a guide to the interviewers so that they can help the interviewers deliver consistent and fair judgment during zakat process selection. Therefore, this study uses the Analytic Hierarchy Process (AHP) method to identify the important factors (criteria) determining students'

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eligibility for zakat assistance to speed up the zakat application process to distribute zakat assistance.

Literature Review

The AHP is a decision-making technique that entails building a hierarchical framework to represent the problem and judging the multi-criteria and other alternatives with pairwise comparisons to select the best criteria using the calculated weight (Marfuah & Widiantoro, 2017). At present, although the AHP method has been widely used in various fields such as sports (Anamisa et al., 2021), education (Tümer, 2019), health care services (Citrawati, Widyawati & Suryono, 2020) and others, it has not been used in zakat. Zakat should be an effective instrument in eradicating poverty and improving the socio-economic status of society if the process of collecting and distributing zakat to the asnaf is done efficiently and effectively. However, issues still involve implementing zakat collection and distribution in Malaysia (Khairiah Mohd Yassin, 2020; Kawi & Pao, 2020; Ibrahim, Ali, Muridan, & Jazid, 2020). Most of the previous studies focused on the management and collection of zakat, but too few discussed the best methods of zakat distribution (Abai, Awang, Mohd Yusoff, Mohd Yusoff & Mohd Yusoff, 2020). Meanwhile, the literature offers studies using the AHP method that discuss zakat distribution, which is also limited. Even previous research by Huda, Anggraini, Ali, Rini and Mardoni (2014) used the AHP method; their studies discussed zakat management in Indonesia, which focuses on identifying zakat problems and providing related solutions but did not discuss using the AHP method to identify the factors that contribute to identifying target zakat recipients.

Previous research works have been conducted concerning the UiTM zakat system, especially to improve zakat management in zakat distribution such as using a rule-based technique (Mohd Zamli, 2019), used case-based reasoning (Khairudin, Azlan, Azizan, & Jelani, 2020) and using the e-zakat system. Meanwhile, Azlan, Nor Azriani,, Wan Nurshazelin, Siti Nor Nadrah, & Nur Syuhada (2023) have conducted research and developed a new zakat distribution model using supervised machine learning (binary logistic regression) technique to classify student eligibility receiving zakat assistance. Their study used 15 independent variables, and the dependent variable where represents the eligible and not eligible. The results found that only two variables, parents' income and household size, significantly contributed to successfully receiving zakat assistance after removing the insignificant variables. The accuracy of the developed model could predict the UiTM Cawangan Perlis's students receiving zakat assistance for 97 per cent.

As discussed in a study by Hussain, Azhar and Badarulzaman (2021), ensuring that each asnaf (zakat recipient) is eligible to receive zakat is critical. They conducted research and discovered that screening practices in five particular Malaysian states could spot instances of fake applications and avoid asnaf those potentially eligible for zakat assistance but not receiving it. Meanwhile, their welfare and current eligibility status of asnaf also can be updated. Thus, it is hoped that this will prevent public scepticism regarding the sincerity of the disbursement of zakat assistance to qualified asnaf. According to Rosli, Salamon, Muhamad, Zulkifli, and Ahmad (2018), although zakat distribution management has improved recently, it will not be fully achieved unless a comprehensive procedure is in place to ensure that each applicant is qualified to receive zakat; therefore, the zakat distribution can quickly and effectively. They also stated that routine monitoring would help prevent giving the same applicant the same zakat aid and help determine who will receive it.

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Despite no study found and the fact that the studies mentioned above use the logistic regression method to analyze the dependent variable as a dichotomous variable to predict whether a zakat application would be successful in getting accepted or rejected and only focused on demographic applicant factors, such as gender, age, and others, and did not address the specific reason an applicant might apply for zakat assistance. Further study is needed to look into additional factors that can be considered when conducting interviews with ZAWAF interviewers in determining whether an applicant is eligible to receive zakat assistance and using another method that can observe other factors that can be used to determine students eligible for zakat assistance.

Methodology

This study aims to identify factors that need to be considered in determining eligibility for students receiving zakat assistance based on why students apply. Then, rank the important factors. Six phases were used in this study. 1) Data acquisition and preparation; 2) construction of hierarchy structure; 3) creation of a pairwise comparison matrix for the factors; 4) normalizing the pairwise comparison matrix; 5) calculation of weighted values for the factors; and 6) ranking the priority values.

In the first phase, data from online zakat applications from the Covid-19 pandemic from March 2020 until March 2021 was obtained from Unit Zakat, Sedekah & Wakaf (ZAWAF) of Universiti Teknologi MARA (UiTM) Cawangan Perlis. A total of 1525 data (the reason why students apply for zakat assistance) throughout three semesters have been screened. After discussing with the coordinator ZAWAF UiTM Cawangan Perlis, the reasons why students apply have been categorized into six factors. The details number of applications according to factors is shown in Table 1. In the second phase, the hierarchy structure of the six factors (criteria) contributing to determining student eligibility for zakat assistance was constructed, as illustrated in Figure 1.

Table 1: Number of Applications According to Factors

Factors	Semester		
	Mar – Aug 2020	Oct 2020 – Feb 2021	Mar – Aug 2021
Less capable Affected by Covid-19	340 0	311 39	274 31
Losing a source of income	32	42	44
Single parents	32	27	35
Orphans	66	82	69
Learning purpose	26	32	43
Total	496	533	496

Source: (Unit Zakat, Sedakah, and Wakaf (ZAWAF) of UiTM Cawangan Perlis)

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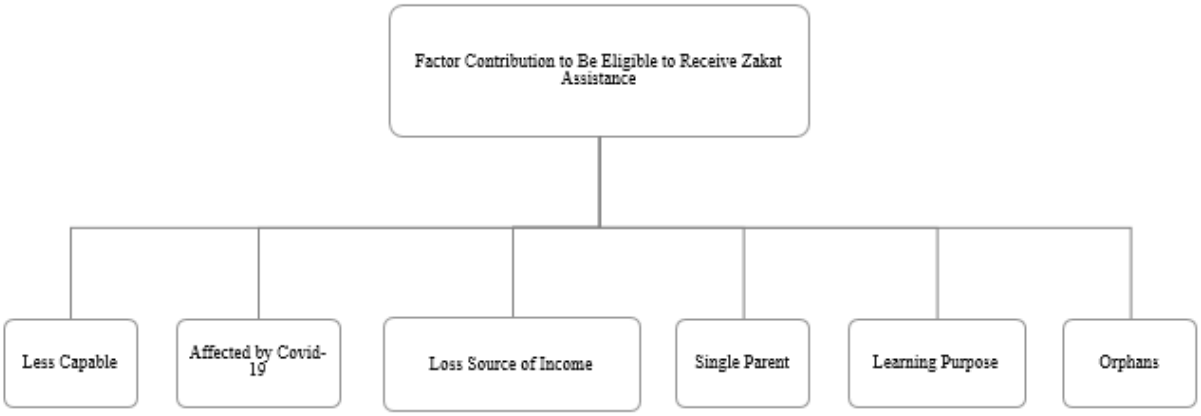

Figure 1: Hierarchy Structure of The Factor

In the third phase, a structured questionnaire was developed and distributed to three experts who are ZAWAF's experienced interviewers. The experts must provide their opinions on factors contributing to students' eligibility for zakat assistance using a preference scale (Saaty, 1987), as shown in Table 2.

Table 2: Preference Scale for Pairwise Comparison

Intensity of Importance	Definition
1	Equal importance
3	Moderate importance of one over another
5	Strong more importance
7	Very strong importance
9	Extremely importance
2,4,6,8	Intermediate scores between the two judgments
Intensities values 1.1, 1.2, 1.3, etc. can be used for an element very close to the importance.	

The pairwise comparison matrix for the factors was developed where each n denotes the number of factors (criteria) compared, and weights for the i and j are the criterion for the ratio of the weight shown as follows:

$$\begin{bmatrix} 1 & \frac{w_i}{w_j} & \frac{w_i}{w_j} & \frac{w_i}{w_j} \\ 1 & \frac{w_i}{w_j} & \frac{w_i}{w_j} & \frac{w_i}{w_j} \\ 1 \end{bmatrix}$$

$$where\ a_{ij} = \frac{w_i}{w_j}, \qquad i,j = 1,2,3,\ldots,n$$

Normalizing the pairwise comparison matrix in phase four ensures that the sum of each column equals 1. The following equation is to obtain the normalized pairwise matrix:

$$a_{ij} = \frac{a_{ij}}{a_{ij}}, \forall i,j$$

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In phase five, to determine the priorities for six factors, the weighted value of the factors is calculated as follows. The eigenvector w_i obtained by the sum of the matrix normalization values $\hat{a}_i$ is divided by the number of factors (n).

$$w_i = \frac{\hat{a}_i}{n}, \forall i$$

The consistency ratio (CR) is computed to make sure that expert evaluations are consistent and is calculated as follows (Norddin et al., 2012):

1. The weighted sum vector is computed by taking the average of each row of the normalized matrix, as shown below:

$$w_i = \sum_{j=1}^{n} a_{ij} c_{j1}$$

2. The consistency vector is then calculated by dividing the weighted sum vector by the previously determined priority value.
3. Lamda, λ is calculated which, is the average value of the consistency vector.
4. The consistency index (CI) is calculated with n as the number of factors in each pairwise comparison matrix. The CI equation is as follows:

$$CI = \frac{\lambda - n}{n - 1}$$

5. Find the consistency ratio using the formula CR = CI/RI. The standard index derived from Table 3 is the random number index (RI). Higher values in the consistency ratio indicate that the evaluation is less consistent than lower values, which show greater consistency. The consistency ratio is 0.10 or less, proving that the experts' evaluations in the study are consistent (Wijayanto, Napitupulu, Adiyarta, & Windarto, 2019).

Table 3: Random Number Index

n	1	2	3	4	5	6	7	8	9	10
RI	0	0	0	0.90	1.12	1.24	1.32	1.41	1.45	1.49

The last phase is to determine the average priorities for each factor. The priority values were obtained after dividing the average weighted with the number of comparisons of six factors. The priority values will be ranked from the highest to the lowest to get the most important factors contributing to student eligibility to receive zakat.

Result and Discussion

This study used the AHP method to identify important factors contributing to a student's eligibility for zakat assistance based on why they apply. Table 4 displays the pairwise comparison of three experts assessed in identifying factors determining whether a student is eligible to receive zakat assistance. The matrix of pairwise comparisons is then transformed into the overall average pairwise comparison.

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Table 4: The Pairwise Comparison of Factors

Variable	Less capable	Affected by Covid	Loss of income	Single parent	Learning purpose	Orphan
Less capable	(1,1,1)	$(\frac{1}{8}, \frac{1}{5}, \frac{1}{8})$	$(8,3, \frac{1}{8})$	$(\frac{1}{8}, \frac{1}{8}, \frac{1}{9})$	$(\frac{1}{8}, \frac{1}{8}, \frac{1}{8})$	$(\frac{1}{3},1, \frac{1}{8},)$
Affected by Covid	(8,5,8)	(1,1,1)	(8,9,1)	(1,1,1)	(1,1,1)	(1,1,1)
Loss of source of income	$(\frac{1}{8}, \frac{1}{3},8)$	$(\frac{1}{8}, \frac{1}{9},1)$	(1,1,1)	$(\frac{1}{8}, \frac{1}{5},3)$	$(\frac{1}{8}, \frac{1}{9}, \frac{1}{3})$	$(\frac{1}{8}, \frac{1}{8},1)$
Single parent	(8,8,9)	(1,1,1)	$(8,5, \frac{1}{3})$	(1,1,1)	$(1, \frac{1}{8}, 3)$	(1,1,1)
Learning purpose	(8,8,8)	(1,1,1)	(8,9,3)	$(1,2, \frac{1}{3})$	(1,1,1)	(1,3,1)
Orphan	(3,1,8)	(1,1,1)	(8.8,1)	(1,1,1)	$(1, \frac{1}{3}, 1)$	(1,1,1)

Once the column total has been determined from the total average of comparison pairwise, the number in the matrix are divided by their respective column totals as a normalized pairwise matrix shown in Table 5. It can see the total value is equal to one after normalizing the pairwise matrix. Table 5 also displays the normalized matrix's weighted value. The priority values will then be calculated using the normalized matrix's weighted value.

Table 5: Normalized Pairwise Matrix for Criteria

Variable	Less capable	Affected by Covid	Loss of income	Single parent	Learning purpose	Orphan	Average weighted
Less capable	0.26	0.22	0.24	0.21	0.22	0.30	0.24
Affected by Covid	0.13	0.22	0.21	0.19	0.17	0.18	0.18
Loss of source of income	0.27	0.22	0.16	0.19	0.32	0.18	0.22
Single parent	0.09	0.09	0.04	0.21	0.04	0.07	0.09
Learning purpose	0.03	0.03	0.12	0.03	0.03	0.09	0.06
Orphan	0.22	0.22	0.22	0.19	0.22	0.18	0.21
Total	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 6 reveals that the obtained CR is 0.0943. According to the values, the consistency level is not greater than 0.1. As a result, the expert's assessment of the factors influencing a student's eligibility for zakat assistance is consistent throughout this process.

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Table 6: Consistency Analysis for Factors

Consistency Analysis	Factor
Number of comparisons	Six factors
Average consistency vector	$\frac{39.5063}{6} = 6.5844$
Consistency Index, CI	$\frac{6.5844 - 6}{6 - 1} = 0.1169$
Random Index, RI	n = 6, RI = 1.24
Consistency ratio, CR	$\frac{0.1169}{1.24} = 0.0943$

The priority weight (vector) for each factor is displayed in Table 7. The expert believes that, in comparison to the other five factors, those who are less capable are found to be significant factors. According to experts, when deciding whether to provide zakat assistance, it is important to consider both orphans and students whose families are struggling financially. Students with single parents are also eligible to receive zakat to support them in continuing their education if their parents cannot work or lose their jobs due to the COVID-19 pandemic.

The number of applications from students who state that they are seeking zakat for educational purposes, such as finishing a final-year project or buying more books for their particular courses, is higher than the number of applications from single parents or those who are affected by COVID 19; however, experts think that this reason is less significant than other considerations. This study found the results through the AHP method are equivalent to the most compelling reason for students to apply for zakat assistance from ZAWAF. As a result, the identified factors can guide the interviewer during the zakat evaluation process.

Table 7. Priority Vector and Ranking for Factors

Factor	Priority Vector	Rank	Total application
Less capable	0.040	1	925
Affected by Covid	0.030	4	70
Loss of source of income	0.036	2	118
Single parent	0.015	5	94
Learning Purpose	0.001	6	101
Orphan	0.035	3	217

Conclusion

The Analytical Hierarchy Process (AHP) method used in this study can help to determine factors influencing student eligibility for zakat assistance. Identifying qualified students and expediting the distribution of zakat to the intended beneficiaries can help ZAWAF by giving interviewers a guide during the zakat evaluation process. This study anticipated that a new zakat distribution model based on the AHP method could be created, which could speed up the zakat distribution process for ZAWAF and also be recommended to the Majlis Agama Islam dan Adat Istiadat Melayu Perlis (MAIPs) for the same purpose. Because it significantly impacts

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the efficiency of zakat management and the nation's economy, research on zakat distribution needs more investigation to identify the precise target zakat recipients.

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