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New Student Admission Selection Using the Weight Product Method as a Decision Support System at Permata Mulia Integrated Islamic School

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ABSTRACT

This study aims to determine prospective new students through the weight product method as a decision support system at Permata Mulia Integrated Islamic School. This descriptive study uses data analysis techniques, including the weighted products method, as a decision support system. The steps taken include: determining the criteria in advance such as: age, independence, learning readiness, parental income, alum status, and the presence of siblings at the school; determining the weight of each criterion and normalizing the weight, the normalized weight values sequentially from each criterion include: 0.26, 0.21, 0.16, 0.16, 0.11, and 0.11; determining the suitability rating between criteria and alternatives, calculating the S value by multiplying all the normalized weighted values, calculating the V value as an alternative preference which is then used to determine the ranking of each alternative. Based on the calculation results and ranking, A8 is the most recommended alternative because it meets all the proposed criteria. Meanwhile, A10 is in last place because it has the lowest score on the top priority criteria: age. Therefore, the selection of new students can be seen from the ranking results.

Keywords: *Weight Product, New Student Admission Selection, Decision Support System*

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INTRODUCTION

Education management standards are national education standards that cover planning, implementation, and supervision at the district/city, provincial, and national levels. Management of educational units is the responsibility of the head of the educational unit. Education management standards aim to achieve efficiency and effectiveness in implementing education. Education management standards are regulated in Law No. 20 of 2003 concerning the National Education System. One of the education management standards is the management of new student admissions. (Nasser, Arifudin, Barlian, & Sauri, 2021).

The new student admission process is the first step toward education(Driantama & Fryonanda, 2021). Each school's new student admission process requires several indicators to ensure the learning process runs smoothly. A less-than-optimal admission system will impact the quality of education itself. Therefore, schools must develop appropriate strategies to attract qualified prospective students (Putra, Mahendra, & Mulyadi, 2022).

Schools are places where students receive formal education. Choosing the best school is the right of every individual to receive a decent education. The government also grants every citizen the same right to pursue a quality education regardless of social and economic background. One alternative the government offers to equalize learning opportunities for prospective students at the elementary school level is through a zoning system for public schools. The zoning system is the government's effort to achieve equal learning opportunities,

especially at the elementary school level. The zoning system can minimize the perspective of superior schools in elementary schools because access to educational services can be equalized. The zoning system also benefits parents by facilitating supervision of elementary school-aged children. Furthermore, the short distance does not increase transportation costs. (Ningrum, 2022).

However, the zoning system prevents many students from getting the opportunity to attend their desired school. The facts prove that many parents still believe in the perspective of superior schools. Differences in educational quality between schools and even between regions demonstrate that students' numeracy and literacy skills also differ. Therefore, as a solution, they will seek out other educational institutions rather than send their children to the nearest public school, which is considered lower quality (Salim & Nora, 2022).

Low public trust and satisfaction with public school services have made parents highly selective. Coupled with the influence of globalization and the massive development of information technology, cultural assimilation has made it easier to shift students' character values through non-educational viewing. It will undoubtedly impact students' social interactions within the school environment. Even though some schools are very close to their homes, middle-income parents prefer their children to attend private schools, even if they have to pay. Private schools are believed to offer a more controlled environment and high-quality services and facilities. Because private schools have a reputation for being more expensive than public schools, private educational institutions are continually striving to improve this image (Perwita & Widuri, 2023).

One of the most popular private schools today is the integrated Islamic school. Integrated Islamic schools are designed to achieve academic goals and integrate Islamic values into their education. Parents' decisions to enroll their children in integrated Islamic schools are not merely ideological but also based on pragmatic and rational considerations. Parents' hopes are not simply to raise children who excel academically, but also to develop strong faith and character, capable of facing the challenges of the times, grounded in knowledge, morals, and Islamic values. Therefore, integrated Islamic schools exist in response to the Muslim community's need for competent religious character education and academic competence amidst globalization and technological advancement. They are a solution to the need for holistic education that does not separate this world from the afterlife (NH & Setiawan, 2025).

One of the integrated Islamic schools chosen by parents is SIT Permata Mulia. This integrated Islamic school offers early kindergarten through junior high school in Mojokero, East Java. It is a popular choice for parents because it offers academic learning based on Islamic values at an affordable cost. Previously, the selection process for new student admissions used only forms provided by the committee. These forms are then summarized. The school limits admissions to two classes per elementary school year. Therefore, a strict selection process is necessary. Schools must determine the criteria to assess whether prospective students are accepted or rejected. While admissions are based solely on the average score of all specified criteria, this study proposes criteria weighting. Each criterion can have a higher or lower weighting according to priority. The solution proposed in this study is to use the product weighting method as a decision support system in the selection process for new student admissions. This study aims to determine prospective new students using the product weighting method. This research benefits schools by making it easier for new student admissions committees to determine selection results based on weighted criteria.

METHOD

This descriptive study uses data analysis techniques, using the weighted product method as a decision support system. A decision support system can solve problems or communicate problems in structured and unstructured conditions. The resulting decision is a calculation per the proposed requirements (Mardian, Neneng, Puspaningrum, Hasibuan, & Tinambunan, 2023). The weighted product is one method in multi-criteria decision making, with multiplication to connect the attribute ratings that must be presented first with the relevant weights. This method uses the search for the weighted sum of the criteria carried out

on each alternative (Rizky et al., 2023). The steps in the weight product method are as follows: determine the criteria first, determine the weight of each criterion and normalize the weights with equation 1, determine the match rating between the criteria and alternatives, calculate the S value by multiplying all the normalized weighted values by equation 2, calculate the V value as the alternative preference by equation 3 which is then used to determine the ranking of each alternative. (Dewi, Andriani, & Atmaja, 2022).

$$W_j = \frac{W(initial)_j}{\sum W(initial)_j} \quad \text{... (1)}$$

Information :

W : attribute weight

$\sum W$: attribute weight summation

$$S_i = \prod_{j=i}^{n} X_{ij}{}^{W_j} \quad \text{... (2)}$$

Information:

S_i : The score of each alternative

X_{ij} : Alternative rating per attribute

W_j : Corrected attribute weights

i : Alternative

j : Attribute

n : Many criteria

$$Vi = \frac{Si}{S1+S2+\cdots} \quad \text{... (3)}$$

Information :

Vi : stating the preference for the i-th alternative

RESULTS AND DISCUSSION

Result

The first step in creating a decision system using the weighted product method is determining the assessment criteria (Guswandi, Syahputra, Hafizh, & Kartika, 2022). The study's criteria are used as a reference. After all criteria are determined, each criterion is assigned a weight and an attribute. Weighting is done according to the level of importance (F. A. Lubis & Hendrik, 2023). The weighting should reflect the relative priority of each criterion in decision-making. Thus, the more important criteria will influence the final result (F. A. S. Lubis, Nurcahyo, & Sovia, 2024). In the weighted product method, each criterion has an attribute that can be a benefit or a cost (Manuhutu et al., 2023). Benefits in preference calculations will give a positive rank, while costs will give a negative rank(Wardhani, Triyanto, & Supriyono, 2025). The initial weighting of each criterion is presented in Table 1 below.

Table 1. Initial Weighting of Criteria and Attributes

Assessment Criteria	Initial Weighting	Attribute
Age (C1)	5	Benefit
Independence (C2)	4	Benefit
Readiness to Learn (C3)	3	Benefit
Parental Income (C4)	3	Benefit
Alumni (C5)	2	Benefit
Siblings (C6)	2	Benefit

Table 1 above shows that the initial total weight of the six criteria is 19. These weights must be corrected using equation 1. After the initial weights are corrected and before being labeled with attributes, the total weight must be equal to 1 (Mugiarso, 2023). The normalized weights for each criterion are shown in Table 2 below. The weight values in Table 2 below are

the actual weight values for each criterion. Because all criteria have benefit attributes, each corrected weight is multiplied by 1, so the normalized W result is positive (Syarifudin & Mujiyono, 2024).

Table 2. Normalized Weights

Weight of Each Criterion	Weight Value
W1	0.26
W2	0.21
W3	0.16
W4	0.16
W5	0.11
W6	0.11

After correcting the weights, the next step is to rate the suitability between the criteria and alternatives. This study calculates the child's age in years from birth to enrollment. The independence score is obtained from interviews and observations of prospective students. The number and letter recognition test results are used to obtain the learning readiness score. The parental income score is obtained based on the monthly income of both parents. However, specifically for the parental income criterion, the maximum nominal input must be limited to IDR 5,000,000.00 to avoid an unlimited nominal. Prospective students who are alumni of SIT Permata Mulia kindergarten receive a score of 100, and non-alumni receive a score of 50.

Meanwhile, if the prospective student has a sibling attending the school, they receive 100 points; if no siblings attend the school, they receive 50 points. The suitability rating of each alternative for each criterion is shown in Table 3. For the research simulation, the alternatives used in this study consisted of only 10 alternatives. However, if there are more than 100 samples, they can still be used similarly.

Table 3. Suitability Rating of Each Alternative for Each Criterion

Alternative	Criteria					
	C1	C2	C3	C4	C5	C6
A1	6.5	70	80	4000000	100	50
A2	6.3	70	70	4200000	100	50
A3	7	85	85	5000000	50	50
A4	5.9	70	80	4900000	50	50
A5	6.5	78	78	4500000	50	50
A6	7.5	90	90	3500000	50	50
A7	6.3	70	80	4500000	100	50
A8	7.1	90	95	5000000	100	100
A9	7	90	85	4800000	50	100
A10	5.8	70	80	5000000	50	50

The next step is to calculate the S value for each alternative by multiplying all the criteria values raised to the power of each normalized weight. This step is done with equation 2. The results of the S value are used to calculate the V value for each alternative as a preference using equation 3. The result of the total sum of all V values must be equal to 1. The final stage of the weight product method is to rank the V value as the final decision. The results of the calculation of preferences and ranking are presented in Table 4.

Table 4. Results of Preference and Ranking Calculations

Alternative	S	V	Ranking
A1	384.6062699	0.097745003	5
A2	377.3539066	0.095901865	7
A3	397.8064114	0.101099727	3

A4	363.7602025	0.092447120	9
A5	371.3490700	0.094375778	8
A6	382.6352042	0.097244070	6
A7	391.0330997	0.099378337	4
A8	474.4759632	0.120584759	1
A9	428.1010446	0.108798897	2
A10	363.6709709	0.092424443	10

Discussion

In previous research, the weighted product method was used in the student admissions selection process using a zoning system at SMP N 5, South Tangerang City, so the distance from home to school was included in the decision-making criteria (Saputra, 2022). However, this study excluded zoning because it was intended to select new students for admission to an integrated Islamic private school. Therefore, the distance between home and school is not a barrier to a child's education. Therefore, it can be an alternative for prospective students who do not fall into the zoning system.

This study places age as the highest criterion. It is based on the theory of students' cognitive development. According to Jean Piaget, children's cognitive development grows according to time and stages, characterized by exceptional intelligence. The ideal age for children to enter elementary school is 7 years old (Adib, 2022). Children have entered the concrete operational stage at this age, which means they can solve problems based on something concrete. One characteristic of the concrete operational stage is that children understand the concept of conservation. In the early stages of entering elementary school, children already understand the concept of conservation of number. Furthermore, at higher grade levels and with a more mature age, children will understand the concepts of conservation of matter, conservation of area, conservation of weight, and finally, they will understand the concept of conservation of content when they are in the formal operational stage (Azzahra, Nurmalasari, Manihuruk, & Dewi, 2023). Children who enter elementary school according to the ideal age are psychologically independent, do not need to be waited for, and are more ready to learn and accept new things..

Meanwhile, children under 7 years old, specifically between 2 and 7, are in the concrete pre-operational stage. Children's thinking is still intuitive at this stage, meaning they do or think about things without reasoning. It can be observed when children at this age do or discuss various things simultaneously. Children can recognize and use symbols or signs to express themselves (Nabila, 2021). Therefore, in the final concrete pre-operational stage, children already know numbers, letters, simple arithmetic, and some can even read. However, children are not yet fully able to reason. Therefore, children who enter elementary school before they are full will have difficulty understanding school lessons. They may be able to read but not understand what they read.

Furthermore, if this is forced, it will affect the child's abilities in higher grades. Therefore, the criteria for learning readiness are only seen from the ability to recognize numbers and letters. Therefore, the ability to read, write, and count is not a primary requirement for school entry. Children with normal intellectual abilities who receive proper guidance will quickly learn to read when they enter elementary school. The government has also banned reading, writing, and arithmetic tests for prospective elementary school students (Asiah, 2018).

Parental income is one of the criteria for new student admissions. It is used to determine the family's economic situation so that it does not have to pay tuition fees and ensure a smooth learning process. Private schools require operational costs and payroll for staff and teachers, which are charged to students. If students encounter difficulties paying their bills, it will undoubtedly disrupt the learning process at school. It includes unpaid water and electricity bills, disrupted activities that should run smoothly, and even delayed teacher and staff honoraria. Another fact from previous research indicates that parents' socioeconomic status also influences children's academic achievement. Parental income has a positive and significant

impact on children's academic achievement. Students with good economic status or parents with sufficient income tend to demonstrate high academic performance. It is because financially stable parents will meet their children's learning needs by providing the best supporting facilities (Hadiyanto, 2014).

Another criterion offered for assessment in this study is alum status at the previous level of education. It could provide special services or priority for alumni who can pursue higher education more easily. Similarly, prospective students with siblings at the same level of education have twice the opportunity. It is expected to make it easier for parents to monitor their children's education at the same school.

Based on a simulation of 10 alternatives, the final results are shown in Table 5. The alternative with the highest score (Sabandar, 2023). It means that in the selection process for new student admissions, decisions can be made by filtering the number of students needed according to their ranking. The product weight method is beneficial in decision-making when faced with multiple criteria used in the assessment (Kaslumin & Purnomo, 2023).

Based on the results of the decision assessment using the product weight method, the most recommended alternative is A8, which is over 7 years old, has good independence and readiness, high parental income, is an alumnus of the previous level of education at the same foundation, and has siblings who attend the school. Meanwhile, although his parents have a high income, A10 is last; his age is lower than the other alternatives. To be clearer, A10 can be compared with A4 and A5, who are not alumni and do not have siblings at the school, even though their parents' income is lower. It is because the weighting of the age criteria is greater than the parents' income. In this study, age level is the main priority in Jean Piaget's cognitive development theory.

CONCLUSION

Based on the research results, it can be concluded that the selection of new student admissions at the Permata Mulia Integrated Islamic School can be carried out using the weighted product method to support decision-making. The steps taken begin by determining the criteria. The normalized weights for each criterion are sequentially: 0.26, 0.21, 0.16, 0.16, 0.11, and 0.11. The preferential value and ranking are obtained after calculating the S and V values. A8 is the most recommended alternative because it meets all the proposed criteria. Meanwhile, A10 is in the last position because it has the lowest value on the priority criterion, namely the age criterion. Thus, the selection of new students can be seen from the ranking results.

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