

Decision-making model for cadet selection using the AHP TOPSIS method

Tazky Khumaira Tsany¹, Jonson Manurung², M. Azhar Prabukusumo³

^{1,2,3} Informatics, Faculty of Defense Technology and Engineering, Indonesia Defense University, Bogor, Indonesia

ARTICLE INFO

Article history:

Received Dec 10, 2025

Revised Dec 24, 2025

Accepted Jan 10, 2026

Keywords:

AHP;
Cadet selection;
Criteria weighting;
Multi Criteria Decision Making;
TOPSIS.

ABSTRACT

Cadet selection in defense institutions requires a comprehensive assessment process because it must cover the academic, psychological, health, physical, and ideological integrity aspects of prospective participants. This multidimensional complexity poses challenges in producing decisions that are objective, consistent, and free from assessor bias. Therefore, a quantitative approach-based evaluation model is needed that can integrate all assessment components in a measurable manner. This study developed a cadet selection decision-making model using a combination of the Analytical Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) methods. AHP is used to determine the weight of importance of the seven main criteria: Academic Potential Test, Academic Interview, Psychological Test, Ideological Mental Test, Ideological Mental Interview, Health Test, and Physical Test, while TOPSIS is used to determine the ranking of candidates based on their proximity to the ideal profile of a cadet. The results of the study show that the integration of AHP–TOPSIS is able to provide evaluation results that are more objective, transparent, and accountable than conventional assessments. In addition to formulating a selection model, this study also discusses alternative methods in multi-criteria decision making as material for developing a selection system in the future. Overall, this model is expected to become a scientific basis for defense institutions in improving the quality and accuracy of the cadet selection process.

This is an open access article under the [CC BY-NC](#) license.



Corresponding Author:

Tazky Khumaira Tsany
Informatics,
Indonesia Defense University,
Kawasan IPSC Sentul, Sukahati, Kec. Citeureup, Kabupaten Bogor, Jawa Barat 16810, Indonesia.
Email: tazkykhumaira15@gmail.com

1. INTRODUCTION

Cadet selection is a strategic process in determining the quality of human resources to be trained in military, semi-military, and civil service-oriented educational environments. In defense institutions, the selection stage serves as the main gateway to screen candidates who will be trained through discipline, mastery of knowledge, and the instillation of national ideology values (Robaetal A'la, 2022). Unlike general education selection, the cadet selection process requires a much more comprehensive assessment because it involves academic, psychological, health, physical, and ideological understanding elements (Alfianto, 2024).

This multidimensional complexity requires an evaluation mechanism that is objective, measurable, and scientifically accountable. The absence of a structured evaluation model has the potential to cause assessment bias, interviewer subjectivity, and inconsistency in setting priorities between criteria (Samsudin et al., 2025). In situations like this, a quantitative approach is important because it can minimize subjective errors and improve accuracy in processing selection data. The

multi-criteria decision-making (MCDM) method offers a solution because it can integrate various assessment indicators into a logical and transparent system (Popović, 2021).

This is particularly relevant given that cadet selection requires not only technical assessment but also predictions about the cadet candidates' readiness to undergo education with high pressure and discipline. In practice, cadet selection is carried out through a series of assessments designed to measure the academic and psychological readiness of prospective participants. Academic potential tests are used to measure logical, numerical, and verbal abilities, while academic interviews assess learning motivation, communication skills, and decisiveness (Sesa et al., 2025). At the same time, psychological tests are used to evaluate emotional stability, leadership potential, and the ability to adapt to environmental pressures (Fau, 2024).

This assessment provides an important basis for defense institutions to ensure that prospective cadets have adequate cognitive and psychological abilities. In addition to academic and mental aspects, cadet selection also involves important assessments of physical and ideological aspects. Ideological mental tests and ideological interviews are conducted to assess participants' understanding of national values, morality, ideological commitment, and attitude compatibility with military values (Fatahillah et al., 2023) (Laswaniyah, 2021). Health tests are used to ensure physical fitness and the absence of medical conditions that could interfere with the education process. Meanwhile, physical tests assess physical strength, endurance, agility, and overall fitness (Aprilianto & Fahrizqi, 2020). This series of tests provides a comprehensive picture of the academic, physical, mental, and ideological abilities of prospective cadets, so that the selection process can produce participants who are truly suited to the demands of defense education (Bandono, 2020).

Various studies show that assessments based on human judgment are often influenced by the personal preferences and experiences of the assessors, thus potentially resulting in bias. The absence of a mathematical mechanism in determining the weight between criteria also makes the selection results prone to change according to internal policies. To overcome this problem, the Analytical Hierarchy Process (AHP) method is used because it is able to determine the weight of importance between criteria through a hierarchical structure and (Pratiwi et al., 2020). AHP also provides consistency testing so that the weights produced are more accurate and reliable (Aulia et al., 2024). After the weights are obtained, determining the candidate rankings requires a method that can measure the proximity of each alternative to the ideal profile. In this context, the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) was chosen because it can determine the best alternative based on the closest distance from the ideal solution and the furthest from the negative solution (Çelikbilek & Tüysüz, 2020). TOPSIS is capable of processing values from various scales, both quantitative and qualitative, and producing stable and objective rankings (Utama & Ikhwan, 2025). Studies such as prove that the integration of AHP–TOPSIS can improve accuracy and transparency in multidimensional selection processes (Bunga & Wahyudi, 2025a).

The cadet selection process essentially requires an evaluation approach that not only measures academic and physical abilities but also assesses the mental strength, character, and ideological integrity of a candidate (Inaya et al., 2024). A manual approach that relies entirely on human judgment is often unable to accommodate this complexity comprehensively (Yaqin et al., 2025). When faced with numerous criteria of varying importance, evaluators may struggle to establish priorities objectively. This condition is in line with the findings by (Hamid et al., 2024), which state that complex selection processes require decision making tools to avoid assessment bias in multi-attribute evaluations. Therefore, an evaluation system is needed that can provide an analytical basis and ensure that each aspect of the assessment is given equal weight in the cadet selection process. In the context of multi-criteria decision making, a number of studies have proven that analytical methods such as the Analytical Hierarchy Process (AHP) are effective in determining criteria weights through a mechanism of pairwise comparisons (Salma & Natsir, 2025) (Inaya et al., 2024). From (Suri, 2024) spanning (Suri, 2020) shows that AHP successfully improves the weighting structure accurately in the selection of exemplary students so that decisions do not depend on the evaluator's intuition.

A similar finding was also demonstrated by (Gustian et al., 2019), who found that AHP provides a consistent weighting basis in the workforce selection process in the industrial sector. These findings show that the quantitative weighting approach is highly suitable for application in the cadet selection process, which has multidimensional characteristics and involves many aspects of assessment. In addition to the ability to determine criterion weights, candidate ranking also requires a mathematical method that can objectively assess the proximity of alternatives to ideal conditions.

The Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) has been widely used in various professional selection studies due to its ability to measure candidate performance based on proximity to the ideal solution and distance from negative solutions (R. A. Hermawan, 2021)(M. S. Hermawan et al., 2020). Yudhistira & Widodo, (2024) show that TOPSIS is capable of accurately ranking candidates in a study of selecting the best accountants. With its ability to integrate various assessment indicators, TOPSIS is a relevant method for use in cadet selection, which requires a comprehensive evaluation of academic, psychological, health, ideological, and physical aspects. Based on the need for an objective, measurable, and accountable selection system, this study developed an AHP–TOPSIS integration model as a decision-making tool in cadet selection during the quarantine stage. This model is expected to reduce the subjectivity of assessment, improve consistency among assessors, and produce candidate rankings that truly reflect their quality and readiness to undergo education at defense institutions. In addition to providing theoretical contributions, this model also provides practical benefits for institutions to improve the quality of recruitment and ensure that selected cadet candidates meet the established standards.

Despite the widespread use of AHP, TOPSIS, and their integration in various selection and evaluation studies, most previous research has focused on civilian personnel recruitment, employee performance assessment, student selection, or industrial decision-making contexts. Existing AHP–TOPSIS studies generally do not address the unique characteristics of defense institutions, where selection criteria are not only technical and physical but also strongly influenced by psychological resilience and ideological integrity. Moreover, previous studies typically treat the selection process as a single-stage evaluation and rarely examine the quarantine stage, which represents a critical phase in cadet selection where candidates are subjected to intensive assessment, discipline, and psychological pressure.

Therefore, there remains a research gap in the development of a systematic, quantitative decision-making model specifically designed for cadet selection in defense institutions at the quarantine stage. To address this gap, the objective of this study is to develop an integrated AHP–TOPSIS-based decision-making model that determines criteria weights and ranks cadet candidates objectively during the quarantine selection stage. The novelty of this study lies in its application of the AHP–TOPSIS method to the defense cadet selection context, its explicit focus on the quarantine stage as a distinct and underexplored phase of the selection process, and the use of comprehensive criteria encompassing academic, psychological, ideological, health, and physical dimensions. This contribution is expected to enhance the objectivity, consistency, and accountability of cadet selection decisions in defense institutions

2. RESEARCH METHOD

2.1 Research Design

This study uses a quantitative approach with the Multi-Criteria Decision Making (MCDM) method. This method was chosen because it is capable of processing cadet selection data that is multidimensional and involves objective and subjective elements. The model used is an integration of the Analytical Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS). This research is descriptive-analytical in nature, analyzing the cadet selection process and formulating an objective, structured, and replicable decision-making model.

2.2 Data and Data Sources

The research data was collected from the cadet quarantine selection process at a defense institution. There were seven assessment criteria, namely:

Criteria
TPA
Wawancara Akademik
Psikologi
Mental Ideologi
Wawancara Mental Ideologi
Kesehatan
Jasmani

The data used in this study were obtained from the cadet selection process conducted during the quarantine stage at a defense institution. The sample consisted of four cadet candidates

(A1–A4) who passed the initial administrative screening and were evaluated comprehensively during the quarantine phase. The selection data were collected within a single selection period, ensuring that all candidates were assessed under the same conditions and evaluation standards.

The AHP weighting process involved subject-matter experts, including selection officers and instructors with direct experience in cadet recruitment and education. These experts were responsible for conducting pairwise comparisons among the seven selection criteria based on their professional judgment and institutional standards. This expert-based assessment ensures that the resulting criteria weights reflect practical priorities in defense cadet selection.

2.3 Stages of the AHP-TOPSIS Model

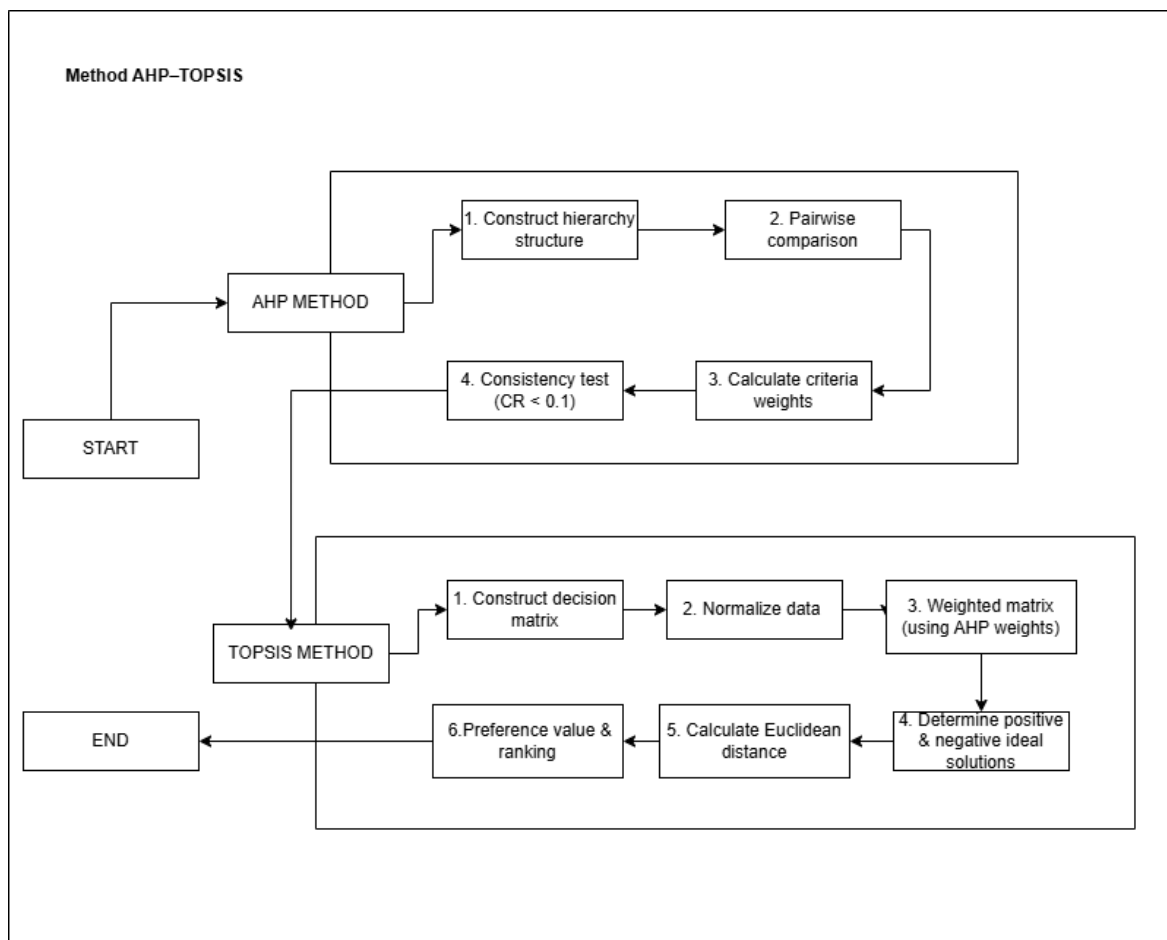


Figure 1 AHP-TOPSIS Model

The diagram in Figure 1 explains the complete research flow, which is divided into two main parts: the AHP stage and the TOPSIS stage.

A. AHP Stage – Determination of Criteria Weights

The Analytical Hierarchy Process (AHP) method is used to determine the relative importance of the seven criteria used in cadet selection. AHP works by converting the subjective assessments of experts into measurable numerical weights so that they can be used in the ranking stage. The AHP stage in this study consists of the following steps:

1. Developing a Hierarchical Structure

The first stage is to build a decision hierarchy structure that describes the relationship between elements in the selection process. This structure consists of three levels, namely:

- a. Level 1: Objective, which is to determine the best cadet candidates.
- b. Level 2: Criteria, consisting of seven selection components (TPA, academic interview, psychology, ideological mentality, ideological interview, health, physical fitness).

- c. Level 3: Alternatives, namely all selected candidates.

This hierarchy is important to ensure that each assessment component contributes to the main objective in a structured manner and does not overlap.

2. Pairwise Comparison

At this stage, each criterion is compared one by one (pairwise) using the Saaty fundamental scale (1–9). This scale is used to represent how much more important one criterion is compared to another. For example:

- a. A value of "1" means that two criteria are equally important
- b. A value of "3" means that one criterion is slightly more important
- c. A value of "9" means that one criterion is very dominant

This comparison is carried out by selection experts who understand cadet education design. The result is a pairwise comparison matrix which will later become the basis for calculating priority weights.

3. Calculating Criterion Weights

The paired comparison values are then processed to produce the weight of each criterion.

This process involves

- a. Normalizing the comparison matrix
- b. Calculating the eigenvector values
- c. Determining the final weight as the priority of each criterion

These weights describe the level of influence of each assessment component on the final decision. For example, a high psychology weight indicates that this aspect is considered the most decisive in the success of cadet candidates.

4. Consistency Test ($CR < 0.1$)

AHP not only calculates weights, but also tests whether expert assessments are logically consistent. If paired comparisons are not harmonious (e.g., $K1 > K2$, $K2 > K3$, but $K3 > K1$), then the weights become invalid. Therefore, the following calculation is performed:

- a. Consistency Index (CI)
- b. Consistency Ratio (CR)

If $CR \leq 0.1$, the assessment matrix is acceptable and the weights are considered consistent. If CR exceeds this threshold, the assessment must be repeated. The AHP stage ends with an output in the form of criteria weights, which are then used as TOPSIS input. After confirming the consistency of the criteria weights through the Consistency Ratio (CR), additional methodological clarification was conducted to ensure the robustness of the proposed decision-making model. In this study, all selection criteria were classified as benefit criteria, meaning that higher values indicate better candidate performance. This classification is appropriate because each criterion academic performance, psychological assessment, ideological evaluation, health condition, and physical fitness represents a positive attribute that contributes to the overall quality of a cadet candidate.

To ensure the reliability and validity of the proposed model, consistency testing was conducted during the AHP stage using the Consistency Ratio (CR). The resulting CR value for the pairwise comparison matrix was less than 0.10, indicating that the expert judgments were logically consistent and acceptable for decision-making purposes. To further strengthen the scientific justification of the proposed model, a sensitivity analysis was conducted by observing the effect of minor variations in criteria weights on the final TOPSIS ranking results. This analysis was performed by applying small adjustments to the weights of dominant criteria, particularly psychological and ideological aspects, while maintaining the overall weight normalization.

The results indicate that minor changes in criteria weights do not significantly alter the overall ranking order of candidates. Candidates with consistently strong psychological and ideological performance remain in the top positions, demonstrating that the integrated AHP–TOPSIS model is robust and not sensitive to slight weighting fluctuations. This confirms the reliability of the model for supporting cadet selection decisions in defense institutions.

B. TOPSIS stage – Determination of Candidate Rankings

1. Compiling the Decision Matrix

The decision matrix is obtained by entering the performance values of each candidate for each criterion. Each row represents a candidate, while each column represents a criterion. This matrix is an initial representation of the objective conditions of the candidates before standardization.

2. Data Normalization

Since each criterion has different units and scales, the next step is normalization. This process converts all values to a comparative scale (0–1) so that they can be processed fairly. Normalization is performed using the formula:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum x_{ij}^2}} \quad (1)$$

Normalization ensures that criteria such as health tests (scale 1–5) can be compared proportionally with physical tests (values 1–100).

3. Forming a Weighted Matrix

The normalization matrix is then multiplied by the weights generated from AHP. The result is called the weighted normalized matrix, which is the candidate's performance score adjusted to the importance value of each criterion. This stage illustrates the actual contribution of each criterion to the final decision.

4. Determining Positive and Negative Ideal Solutions

- The positive ideal solution (A+) is the best value for each criterion, the maximum value for the benefit criterion.
- The negative ideal solution (A-) is the worst value—the minimum value for the benefit criterion.

These ideal solutions serve as reference points that describe the profile of a perfect cadet and an unqualified cadet.

5. Calculating Euclidean Distance

TOPSIS calculates the distance of each candidate from A+ and A- using the Euclidean distance formula:

$$D_i^+ = \sqrt{\sum (v_{ij} - A_j^+)^2} \quad (2)$$

$$D_i^- = \sqrt{\sum (v_{ij} - A_j^-)^2} \quad (3)$$

Here, the following principle applies:

- The smaller the distance to A+ → the better
- The greater the distance from A- → the better

This stage provides a geometric representation of the performance position of each candidate.

6. Calculating Preference Values and Determining Rankings

Preference values are calculated based on the comparison of the distance to the ideal negative solution to the total distance:

$$C_i = \frac{D_i^-}{D_i^+ + D_i^-} \quad (4)$$

The C_i value is in the range 0–1:

Values close to 1 → most ideal candidate b. Value close to 0 → candidate far from the ideal profile, Candidates are then sorted from highest to lowest value to determine the final ranking.

3. RESULTS AND DISCUSSIONS

3.1 Cadet Selection Hierarchy Structure

In the initial stage, the study developed a decision hierarchy structure that formed the basis for applying the AHP and TOPSIS methods. Objective: To determine the best candidate.

Criteria: C1 = TPA, C2 = Academic Interview, C3 = Psychological Test, C4 = Ideological Mental Test, C5 = Ideological Mental Interview, C6 = Health, C7 = Physical

This hierarchical structure integrates cognitive, physical, psychological, and ideological aspects, all of which are comprehensive elements in the selection of defense cadet candidates.

3.2 Determination of AHP Weights

Based on expert analysis and pairwise comparisons, the following weights were obtained:

Criteria	Weight
Academic Potential Test (APT)	0.12
Academic Interview	0.10
Psychology	0.20
Ideology Mental Test	0.17
Ideology Interview	0.15
Health	0.13
Physical Fitness	0.13

These results show that the Psychological Test (C3) has the greatest weight compared to other criteria. This indicates that mental and emotional aspects, personality stability, and the candidate's ability to cope with pressure are the main determining factors for success in military education. Ideological aspects are next in line, emphasizing the importance of moral integrity and national orientation as the basic character of a cadet.

3.3 Application of TOPSIS

After the weights were obtained, further calculations were performed using the TOPSIS method to determine the candidate rankings, using average unhan scores ranging from 80 to 95, which represent realistic cadet selection scores.

3.3.1 Decision Matrix

Candidate	APT	Academic Interview	Psychology	Ideology Mental Test	Ideology Interview	Health	Physical Fitness
A1	92.99	94.26	90.98	88.98	82.34	82.34	80.87
A2	92.99	90.62	80.31	94.55	94.55	92.49	83.19
A3	82.73	82.75	84.56	87.87	86.48	84.37	89.18
A4	82.09	84.38	85.50	86.84	91.78	83.00	87.71

3.3.2 Matrix Normalization

Normalization is performed using:

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum x_{ij}^2}} \quad (5)$$

Normalization is necessary so that all values are on the same comparative scale.

3.3.3 Weighted Normalization Matrix

After normalization, each value is multiplied by the AHP weight:

$$v_{ij} = w_j \cdot r_{ij} \quad (6)$$

This results in a matrix that shows the contribution of each criterion based on its level of importance.

3.3.4 Determination of Positive (A⁺) and Negative (A⁻) Ideal Solutions

Since all criteria are benefits, then:

- A⁺ = the largest value in each column of the weighted matrix
- A⁻ = the smallest value in each column of the weighted matrix

These ideal solutions represent the most ideal and least ideal cadet profiles.

3.3.5 Distance to Ideal Solution

$$D_i^+ = \sqrt{\sum (v_{ij} - v_j^+)^2} \quad (7)$$

$$D_i^- = \sqrt{\sum (v_{ij} - v_j^-)^2} \quad (8)$$

Candidate	Ci	Rank
A2	0.624949	1
A1	0.465328	2
A4	0.455902	3
A3	0.407878	4

3.4 In-Depth Analysis by Criteria

To gain a comprehensive understanding, each criterion is analyzed for its contribution to the final ranking.

1. Academic Potential Test (TPA)

The TPA serves as an indicator of basic cognitive abilities such as logic, verbal, and numerical skills. Although its weight is not as high as psychology, the TPA score still influences the academic readiness of candidates. Candidates with high TPA scores tend to adapt more easily to the defense informatics curriculum. Low TPA scores can increase the distance from the ideal TOPSIS solution, especially in the rankings of candidates who have different strengths in other aspects.

2. Academic Interview

The academic interview assesses communication skills, motivation, and decisiveness. These criteria complement the cognitive aspects and play an important role in assessing the candidate's seriousness in pursuing discipline based learning. In the TOPSIS process, the academic interview score differentiates candidates with similar psychology and ideology scores.

3. Psychological Test (Highest weight – 0.20)

As the most decisive criterion, the results of the psychological test greatly influence the final ranking. Psychology measures emotional stability, adaptability, resilience to pressure, and leadership potential. Candidates who receive low psychological scores will automatically experience a decrease in preference scores () even if they have high scores in physical or academic criteria.

4. Ideological Mental Test and Ideological Interview

Both of these criteria carry significant weight and are important indicators in defense institutions. The aspects assessed include: nationalistic thinking, morality, ideological commitment, readiness to follow military values and norms. Candidates who are ideologically strong have higher TOPSIS scores because these aspects have a direct influence on integrity and loyalty in cadet education.

5. General Health

Health criteria are the minimum foundation for cadet candidates. Low health scores increase the distance between candidates and the ideal negative solution, thereby lowering their ranking. Candidates such as A1, who have strong physical and health scores, have a significant advantage in the ranking process.

6. Physical Fitness (Physical Condition)

Physical tests show basic physical abilities such as endurance, strength, and agility. Although they carry slightly less weight than mental aspects, physical performance still contributes significantly to preference scores. However, physical scores cannot compensate for major deficiencies in psychology or ideology.

3.5 Synthesis of Discussion

The results of the AHP–TOPSIS integration show that cadet selection must combine various assessment aspects that cannot stand alone. Cadet education is a multidisciplinary education that requires: academic ability, mental discipline, physical endurance, ideological integrity

The AHP–TOPSIS model successfully captures the complexity of this assessment in an objective and measurable manner.

Some important findings:

1. Psychological and ideological aspects are the most decisive factors according to AHP weights.
2. Physical and health aspects remain important, but cannot compensate for mental deficiencies.
3. Academic aspects serve as reinforcers, not primary determinants.
4. The AHP–TOPSIS model produces transparent, bias-free rankings that can be replicated in subsequent selections.

Thus, these results confirm that cadet selection cannot be based on a single indicator. Decisions must consider the candidate's overall profile comprehensively, as provided by the AHP–TOPSIS method. The findings of this study are consistent with previous research that emphasizes the dominant role of psychological and mental factors in multidimensional selection processes. Studies by (Gustian et al., 2019) reported that psychological stability and behavioral consistency play a critical role in determining selection outcomes when AHP-based weighting is applied. Similarly, Bunga & Wahyudi, (2025) demonstrated that the integration of AHP–TOPSIS produces transparent and consistent rankings in complex decision-making contexts, supporting the reliability of the results obtained in this study. However, this study differs from most previous AHP–TOPSIS applications in terms of its contextual focus and selection stage. While earlier studies predominantly examined civilian personnel recruitment, employee performance evaluation, or student selection (Gustian et al., 2019), the present study specifically addresses cadet selection in defense institutions during the quarantine stage. This stage is characterized by high physical, psychological, and ideological pressure, making psychological and ideological criteria more influential than purely academic or physical factors. The higher weights assigned to psychological and ideological criteria in this study therefore reflect the unique demands of defense education and confirm the contextual relevance of the proposed model. In line with the sensitivity analysis conducted, minor variations in criteria weights do not significantly alter the overall ranking order of candidates. Candidates who demonstrate strong psychological resilience and ideological integrity consistently remain in top-ranking positions across different weighting scenarios, indicating that the ranking results are robust and not overly sensitive to small changes in expert judgment. This finding is consistent with robustness observations reported in integrated AHP–TOPSIS studies (Bunga & Wahyudi, 2025b).

4. CONCLUSION

This study demonstrates that integrating the Analytical Hierarchy Process (AHP) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) provides an effective, transparent, and objective decision-support framework for cadet selection at the quarantine stage in defense institutions. By structuring the selection process into seven criteria covering academic, psychological, ideological, health, and physical dimensions, this model theoretically contributes to the development of MCDM-based selection systems by highlighting the dominant role of psychological and ideological factors alongside conventional assessments. Practically, the AHP–TOPSIS model supports policy makers and selection officers by reducing subjectivity, improving consistency, and producing accountable candidate rankings, with candidate A3 identified as the most suitable profile. However, this study is limited by the relatively small number of candidates, the focus on a single defense institution and selection stage, and the use of standardized selection scores that do not yet capture long-term performance outcomes. Future research is therefore encouraged to involve larger samples, multiple institutions, longitudinal performance data, and alternative or hybrid MCDM methods such as VIKOR, PROMETHEE, or fuzzy approaches to further enhance model robustness and applicability.

REFERENCES

- Alfianto, R. (2024). *MERITOKRASI JABATAN LEMBAGA NON STRUKTURAL*. UNS (Sebelas Maret University).
- Aprilianto, M. V., & Fahrizqi, E. B. (2020). Tingkat kebugaran jasmani anggota ukm futsal universitas teknokrat indonesia. *J. Phys. Educ*, 1(1), 1–9.
- Aulia, S., Al-Fa'ih, N. R., Nugraha, D., Ilham, M. F. N., & Arbansyah, A. (2024). Penerapan Metode Analytic Hierarchy Process (AHP) dalam Penentuan Nilai Akhir Mahasiswa. *Jurnal Informatika Dan Teknologi Pendidikan*, 4(2), 109–118.
- Bandono, A. (2020). *Model Pembelajaran Naval Collaboration Flexible Learning (Ncfl)*.
- Bunga, H., & Wahyudi, W. (2025a). Design of an Environmental-Friendly Supplier Selection DSS Model using AHP-TOPSIS. *Jurnal Ilmiah Sistem Informasi*, 4(1), 86–99.
- Bunga, H., & Wahyudi, W. (2025b). *Design of an Environmentally Friendly Supplier Selection DSS Model using AHP-TOPSIS*. 4(1), 86–99.
- Çelikkilek, Y., & Tüysüz, F. (2020). An in-depth review of theory of the TOPSIS method: An experimental analysis. *Journal of Management Analytics*, 7(2), 281–300.
- Fatahillah, F., Rohmawati, A., Hendayani, S., & Kurniawan, A. (2023). Analisis Pemahaman Mahasiswa Calon Guru Sekolah Dasar Tentang Kedudukan Pancasila Sebagai Ideologi Negara. *Journal Of Elementary School Education (Jouese)*, 3(1), 222–231.

- Fau, I. N. B. (2024). Psikologi Ketahanan Membangun Daya Tahan Psikologis. *Circle Archive*, 1(4).
- Gustian, D., Nurhasanah, M., & Arip, M. (2019). Sistem Pendukung Keputusan Seleksi Penerimaan Karyawan Dengan Metode Analytical Hierarchy Process. *Jurnal Komputer Terapan*, 5(2), 1–12.
- Hamid, P. Z., & Sulistiani, H. (2024). Kombinasi Metode Pembobotan Entropy dan Multi-Attribute Utility Theory Dalam Penentuan Karyawan Terbaik. *JUSTINDO (Jurnal Sistem Dan Teknologi Informasi Indonesia)*, 9(2), 121–132.
- Hermawan, M. S., Syamil, A., & Heriyati, P. (2020). *Perspektif Industri Financial Technology di Indonesia Perspektif Industri Financial Technology di Indonesia Authors : Ahmad Syamil , Pantri Heriyati , Marko Hermawan Publication date : 2020 peningkatan eksponensial di Indonesia , termasuk tantangan dan ha (Issue December 2022)*.
- Hermawan, R. A. (2021). *Sistem Penentuan Bobot Pekerjaan Yang Cocok Untuk Karyawan Dengan Penerapan Metode Analytical Hierarchy Process (Ahp) Dan Fuzzy Technique For Order Preference By Similarity To Ideal Solution Method (Fuzzy Topsis)*. Universitas Komputer Indonesia.
- Inaya, S. A., Jannah, P. M. I., Rahayu, W. S., Yusuf, A. M., & Anshori, M. I. (2024). Mengoptimalkan Kinerja Perusahaan Melalui Tes dan Seleksi Karyawan Yang Akurat. *Jurnal Manajemen Dan Ekonomi Kreatif*, 2(3), 31–45.
- Laswanayah, M. (2021). *Implementasi Nilai Karakter Dalam Kegiatan Pembinaan Mental Prajurit Oleh Korem 071/Wijayakusuma*. Institut Agama Islam Negeri Purwokerto (Indonesia).
- Popović, M. (2021). Mcdm Approach for Personnel Selection Using the Cocoso Method. *Journal of Process Management and New Technologies*, 9(3–4), 78–88. <https://doi.org/10.5937/jpmnt9-34876>
- Pratiwi, H. D., Hayuhardhika, W., Putra, N., & Herlambang, A. D. (2020). *Evaluasi Penerapan E-Government Di Pemerintah Kabupaten Sumbawa Besar Menggunakan Kerangka Kerja Sistem Pemerintahan Berbasis Elektronik (SPBE)* (Vol. 4, Issue 11). <http://j-ptiik.ub.ac.id>
- Robaetal A'la. (2022). Strategi Manajemen Penerimaan Peserta Didik Baru Dalam Meningkatkan Mutu Lulusan Di Smk Ponpes Manbaul Ulum Cirebon. In *Strategi Manajemen Penerimaan Peserta Didik Baru Dalam Meningkatkan Mutu Lulusan Di Smk Ponpes Manbaul Ulum Cirebon* (Vol. 9, pp. 356–363). S2 MPI IAIN Syekh Nurjati Cirebon.
- Salma, T., & Natsir, F. (2025). Penerapan Analytical Hierarchy Process (Ahp) Dalam Sistem Pendukung Keputusan Berbasis Web Untuk Pemilihan Ketua Osis. *Jurnal Informatika SIMANTIK*, 10(2), 8–15.
- Samsudin, M., Abidin, Z., & Basaruddin, M. (2025). EVALUASI PENDIDIKAN SEBAGAI DASAR PENGEMBANGAN INSTRUMEN PENILAIAN BERBASIS KOMPETENSI. *Jurnal Akuntansi, Manajemen Dan Ilmu Pendidikan*, 1–12.
- Sesa, J., Hilum, R., Monim, H. O. L., Matulesy, E. R., Randa, T. M., & Lubis, L. A. (2025). Evaluasi Tes Potensi Akademik Siswa SMA Taruna Kasuari Nusantara Manokwari Berbasis CAT Untuk Persiapan Sekolah Kedinasan. *Jurnal Pengabdian Kepada Masyarakat*, 2(2).
- Suri, M. I., & Puspaningrum, A. S. (2020). SISTEM INFORMASI MANAJEMEN BERITA BERBASIS WEB. In *Jurnal Teknologi dan Sistem Informasi (JTSI)* (Vol. 1, Issue 1). <http://jim.teknokrat.ac.id/index.php/sisteminformasi>
- Suri, M. R. (2024). *SISTEM PENDUKUNG KEPUTUSAN PEMILIHAN SISWA BERPRESTASI MENGGUNAKAN METODE KOMBINASI AHP-TOPSIS (STUDI KASUS DI SMAN 1 DUMAI)*. Universitas Putra Indonesia YPTK Padang.
- Utama, A. D., & Ikhwan, A. (2025). Development of a Decision Support System AHP-TOPSIS for Resource Allocation MultiDisaster Management BPBD Deli Serdang. *Journal of Telecommunication Electronics and Control Engineering (JTECE)*, 7(2), 134–149. <https://doi.org/10.20895/jtece.v7i2.1873>
- Yaqin, M. A., Mila, N., & Tirta, izzati angeina. (2025). *Peningkatan otomatisasi proses desain perangkat lunak*. June, 1–10.
- Yudhistira, A., & Widodo, T. (2024). Sistem Pendukung Keputusan untuk Evaluasi Kinerja Menggunakan Metode TOPSIS: Studi Kasus Penilaian Karyawan. *CHAIN: Journal of Computer Technology, Computer Engineering, and Informatics*, 2(3), 120–129.