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A Decision Support System for Assessing High School Students' Soft Skills Using the Analytical Hierarchy Process

Yuwono Wisudo Pramono[1], Berlilana[2], Azhari Shouni Barkah[3]

[1] Faculty of Computer Science, Universitas Amikom Purwokerto, Purwokerto, Indonesia

[2,3]Department of Computer Science, Universitas Amikom Purwokerto, Purwokerto, Indonesia

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Corresponding Author:
Author Name*:
Yuwono Wisudo Pramono
Email*:
yuwonowisudopramono@gmail.com

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Abstract. Assessing students' soft skills in educational settings is often challenging due to the subjectivity and inconsistency inherent in evaluating qualitative traits. This study employs the Analytical Hierarchy Process (AHP) as a decision support tool to provide a more systematic, consistent, and objective method for evaluating students' soft skills. The assessment model is based on four key criteria—critical thinking, communication, collaboration, and creativity—each further broken down into measurable subcriteria. The study was conducted at MA Mu'allimin Sruweng Kebumen, where evaluations were carried out by a guidance and counseling teacher acting as an expert evaluator, using a numerical scale ranging from 1 to 100. Pairwise comparison matrices were developed using Saaty's fundamental scale to determine the weights for both criteria and subcriteria, followed by consistency testing using the Consistency Ratio (CR). The findings reveal that critical thinking and collaboration were assigned the highest priority weights, with all comparison matrices meeting the acceptable consistency threshold. The resulting global preference values offer a more objective, proportional representation of students' soft skills achievements. This AHP-based model enables fairer, more consistent evaluations and provides quantitative outputs that can be utilized for student ranking and structured feedback in educational decision-making.

Keywords: Analytical Hierarchy Process, Decision Support System, Soft Skills, Education Evaluation, Multi-Criteria Decision Making

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1. INTRODUCTION

High-quality education plays a pivotal role in human resource development, contributing directly to the advancement and independence of nations [1]. The educational evaluation process serves as a key tool for assessing students' academic and non-academic capabilities [2]. While hard skills are linked to academic performance, soft skills pertain to personal and social attributes that influence how individuals interact, collaborate, and adapt in their environments [3]. For students to be fully prepared for the workforce, a balanced development of both hard and soft skills is essential [4]. Furthermore, the assessment of soft skills provides a valuable foundation for encouraging students to expand their potential beyond academic achievement [5]. Core soft skills, including critical thinking, communication, collaboration, and creativity, are commonly highlighted in educational assessments [6].

However, assessing soft skills presents significant challenges due to the inherent subjectivity of the evaluation process. Teacher bias can significantly skew results, particularly when student performance levels are similar [7], [8]. As a result, there is a growing need for more objective and reliable evaluation methods. Decision support systems (DSS) offer a potential solution by minimizing bias and facilitating faster, more consistent assessments [9], [10]. These systems enable robust data management and allow decision-makers to simultaneously analyze multiple possibilities [11].

The Analytical Hierarchy Process (AHP), introduced by Thomas L. Saaty in 1970, is a widely-used method in decision support systems. AHP's flexibility allows for integration with other approaches or its standalone use, and it is particularly effective in structuring evaluations through pairwise comparisons that produce consistent and logical weights for criteria [12], [13], [14]. By converting subjective evaluations into structured, quantitative values, AHP has proven effective in addressing evaluation challenges involving qualitative factors, such as soft skills [15], [16]. However, when assessments rely on natural language or subjective criteria, AHP faces potential issues of ambiguity in the interpretation of results [17], [18].

Despite the strengths of AHP, there remains a significant research gap in its application to soft skill evaluation, especially in high school settings. Previous studies have

predominantly explored AHP in conjunction with other techniques, such as the AHP-TOPSIS integration [19], [20], yet there is limited research on AHP as an independent method for evaluating soft skills like critical thinking, communication, collaboration, and creativity. This gap underscores the need for further exploration of AHP in developing more effective models for soft skill assessment.

Several prior studies have integrated AHP with other methods to assess teacher and student performance. For instance, a study by [18] combined AHP with the TOPSIS method to assess honorary teacher performance. While effective in providing an objective ranking of teacher performance, this study did not focus on soft skills assessment. Similarly, [21] utilized AHP and TOPSIS to objectively select outstanding teachers and students, yet the focus remained on overall achievement rather than soft skill competencies. Additionally, [22] employed AHP to evaluate performance factors among civil servants, reinforcing AHP's potential in managing both qualitative and quantitative data but not specifically addressing soft skills. Lastly, the study by Izzati et al. [23] highlighted the importance of soft skills in internship success, demonstrating that AHP can effectively prioritize soft skill factors despite their qualitative nature.

This research aims to address the identified gap by using AHP to evaluate the soft skills of high school students, focusing on key competencies such as critical thinking, communication, collaboration, and creativity. The contributions of this study are twofold. Theoretically, it extends the application of AHP in educational evaluation by specifically targeting non-academic soft skills. Practically, it provides educators with a method to streamline assessment processes, reduce subjective bias, and enhance the accuracy of evaluations that support students' holistic development before entering the workforce. This study conceptualizes a decision support system centered on an AHP-based evaluation model, emphasizing structured decision-making and objective weighting of soft skills criteria rather than developing a fully implemented software solution. This study provides a novel application of AHP to the evaluation of soft skills, offering a more objective, consistent, and structured approach to assessment that can help reduce teacher subjectivity and enhance the effectiveness of feedback in the educational process.

2. METHODS

The methodology employed in this study is designed to address the challenges identified in the soft skills assessment process, aiming to provide a more objective, systematic, and structured evaluation framework using the Analytical Hierarchy Process (AHP). The research flow, from problem identification to final evaluation, is depicted in Figure 1.

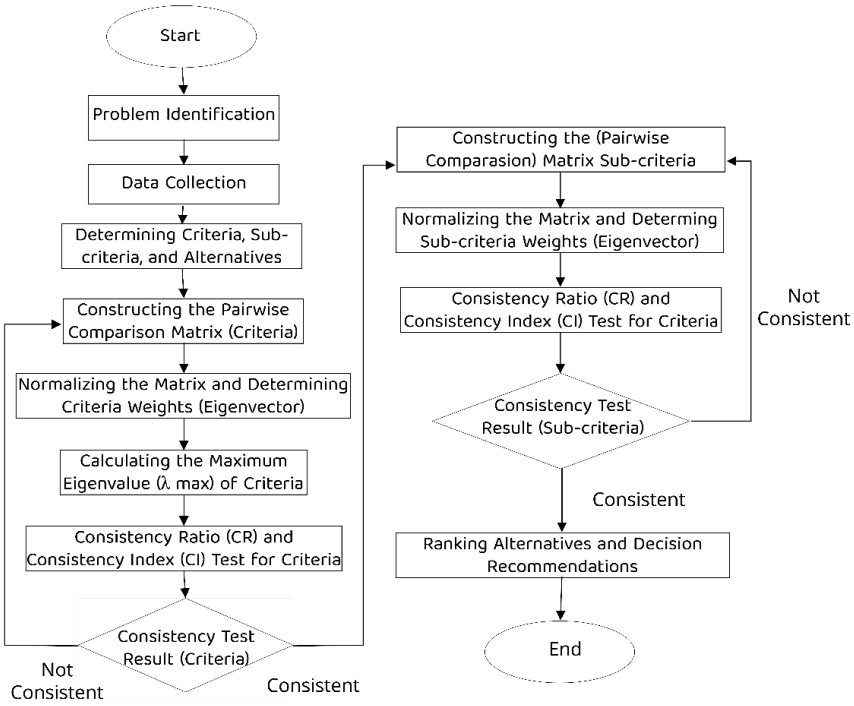

Figure 1. Research Flow

The methodology is broken down into the following stages:

2.1. Problem Identification

This stage involved identifying the core issue in the soft skills assessment process at MA Mu'allimin Sruweng Kebumen, where evaluations were found to be subjective and lacking standardization. This highlighted the need for a more objective, systematic approach to assess students' soft skills competencies.

2.2. Data Collection

Once the research problem was established, an observational study was conducted to understand the current practices used to assess students' soft skills at MA Mu'allimin

Sruweng Kebumen. This provided insight into the real-world application of soft skill evaluations in educational settings. In parallel, a comprehensive literature review was performed to identify key soft skill criteria relevant to the study, forming the theoretical foundation for the research. To ensure that the criteria were both suitable and grounded in educational theory, an in-depth interview was conducted with a guidance and counseling (BK) teacher. The BK teacher, an expert in assessing students' behavioral and interpersonal competencies, provided critical insights into the most relevant criteria and subcriteria for evaluating soft skills.

Subsequent data were collected using assessment instruments completed by the BK teacher based on systematic observations of student behavior during various learning sessions. These assessments were scored numerically on a scale from 1 to 100, with scores reflecting the students' performance on each subcriterion. This empirical data represented the results of both observations and the teacher's evaluations, while adhering to the AHP methodology for determining the relative weights of criteria and subcriteria. In this study, the decision-making process was carried out by a single expert evaluator (the BK teacher), which minimized inter-teacher bias and ensured consistency in the application of the assessment standards. The use of a single evaluator also avoided variability arising from different evaluative perspectives.

2.3. Determination of Criteria, Subcriteria, and Alternatives

The study focused on evaluating four key soft skills competencies that are integral to student development: critical thinking, communication, collaboration, and creativity. These criteria were selected based on their relevance to character development and alignment with both soft skills frameworks and 21st-century learning standards [24]. Critical thinking was included to assess students' ability to analyze problems, apply logical reasoning, evaluate information, and consider alternative perspectives. The corresponding subcriteria were problem analysis, logic and evidence, evaluation and solution, and openness of thought. Communication focused on students' ability to express ideas clearly, listen actively, and communicate respectfully. This was assessed through verbal clarity, active listening, and speaking ethics. Collaboration measured students' ability to work effectively in groups, manage interpersonal relationships, and contribute to team goals. Subcriteria included role and contribution, team support, and conflict resolution. Creativity aimed to evaluate students' capacity to generate original

ideas, implement innovations, and adapt flexibly to learning situations. Subcriteria were originality of ideas, innovation implementation, and flexibility of thought. The selection and validation of these criteria and subcriteria were performed through expert judgment, ensuring their relevance and contextual appropriateness in the specific educational setting of MA Mu'allimin Sruweng Kebumen.

2.4. Weight Determination Using the AHP Method

The AHP method was employed to determine the relative importance of each criterion and subcriterion. This process began with constructing pairwise comparison matrices for the main criteria, using Saaty's fundamental scale to express their relative significance. The comparison matrices were then normalized to calculate the priority weights (eigenvectors). The consistency of the judgments was assessed through the Consistency Index (CI) and Consistency Ratio (CR). A comparison matrix was considered consistent if the CR value did not exceed 0.1. Since only one expert (the BK teacher) provided the pairwise comparisons, the CR value of 0 indicated perfect internal consistency, ensuring reliable and coherent judgments without conflicting expert opinions. This procedure was replicated for the subcriteria under each main criterion to determine the local weights. These local weights were subsequently combined with the main criteria weights to calculate global weights, which were used in the final evaluation process.

2.5. Alternative Ranking and Decision Recommendations

In this study, the global preference values for each alternative were derived using the Analytical Hierarchy Process (AHP), and these values were used to rank the alternatives and provide recommendations. The calculation process involved several key steps: First, pairwise comparison matrices were constructed for both the criteria and subcriteria, using Saaty's fundamental scale. Each element of the matrix was compared relative to others to determine their importance, with the diagonal elements set to 1 (indicating equal importance) and reciprocal values used for the off-diagonal elements. These matrices were then normalized by dividing each element by the sum of its respective column, ensuring that each column sums to 1.

Once the matrices were normalized, the priority weights (or eigenvectors) for each criterion and subcriterion were calculated by averaging the values in each row of the normalized matrix. These weights represented the relative importance of each element

in the decision hierarchy. For example, the priority weight for each criterion was computed by averaging the normalized values across all subcriteria.

The next critical step was to calculate the maximum eigenvalue (λ_max) to assess the consistency of the pairwise judgments. The maximum eigenvalue was calculated by multiplying the original pairwise comparison matrix by the corresponding eigenvector, then dividing the resulting vector element-wise by the eigenvector. The average of these values was taken as λ_max, which helps evaluate the consistency of the matrix. The consistency index (CI) was then calculated using the Equation 1.

$$CI = \frac{(\lambda_{max} - n)}{(n-1)} \quad (1)$$

where $n$is the number of criteria or subcriteria being compared. This index measures the degree of consistency in the pairwise judgments. To further assess the consistency of the judgments, the consistency ratio (CR) was calculated using the Equation 2.

$$CR = \frac{CI}{RI} \quad (2)$$

where RI is the Random Index, which depends on the matrix size. A CR value of 0.10 or less is considered acceptable, indicating that the pairwise comparisons are sufficiently consistent for further calculations. Once the consistency tests confirmed the reliability of the judgments, the global preference values for each alternative were computed. This was done by multiplying the global weight of each subcriterion by the performance score of each alternative (measured on a scale of 1–100) for that subcriterion. The weighted scores for each subcriterion were then summed across all criteria to generate the total preference score for each alternative. The total preference score for each alternative was calculated as shown in Equation 3.

Global Preference Value=∑(Weight of Subcriterion×Performance Score of Alternative) (3)

This process allowed for the calculation of a final preference value for each alternative, which was then used to rank the alternatives from highest to lowest based on their global preference value. The alternative with the highest preference value was identified

as the most suitable option according to the decision criteria applied in this study. By following these AHP procedures, including normalization, priority weight calculation, consistency testing, and global preference value computation, this study was able to provide an objective and systematic method for evaluating and ranking the soft skills of students, reducing subjectivity and enhancing the reliability of the assessment process.

3. RESULTS AND DISCUSSION

3.1. Determination of Criteria Weights and Subcriteria Priorities

In this study, critical thinking, communication, collaboration, and creativity were identified as the four main soft skills assessed, each divided into relevant subcriteria for more granular evaluation. The purpose of this section is to present the results of the Analytical Hierarchy Process (AHP) in determining the relative weights of these criteria and their subcriteria.

1) Criteria and Subcriteria Weighting

The values for each criterion and subcriterion were initially derived from discussions and expert panel consensus, serving as a conceptual reference for pairwise comparisons rather than final weights. These values were subsequently used to construct a pairwise comparison matrix based on Saaty's fundamental scale, which enabled the weighting process. Table 1 provides the values of the criteria and their associated subcriteria.

Table 1. Criteria and Subcriteria Values

Criteria	Subcriteria	Symbol	Subcriteria	Criteria
Critical Thinking (K1)	Problem Analysis	C11	4	4
	Logic and Evidence	C12	3	
	Evaluation and Solution	C13	2	
	Openness of Thought	C14	1	
Communication (K2)	Verbal Clarity	C21	5	2
	Active Listening	C22	3	
	Speaking Ethics	C23	2	
Collaboration (K3)	Role and Contribution	C31	2	4
	Team Support	C32	5	

Criteria	Subcriteria	Symbol	Subcriteria	Criteria
	Conflict Resolution	C33	5	
Creativity (K4)	Originality of Ideas	C41	2	3
	Innovation Implementation	C42	5	
	Flexibility of Thought	C43	3	

These values were used to prepare a pairwise comparison matrix, as shown in Table 2, which compares the criteria in relation to each other. This matrix helps in understanding the relative importance of each criterion when evaluating students' soft skills.

Table 2. Inter Criteria Comparison Matrix Results

Criteria	Critical Thinking (K1)	Communication (K2)	Collaboration (K3)	Creativity (K4)
Critical Thinking (K1)	1	2	1	1,33
Communication (K2)	0,5	1	0,5	0,67
Collaboration (K3)	1	2	1	1,33
Creativity (K4)	0,75	1,5	0,75	1
Total	3,25	6,5	3,25	4,33

From the matrix, we observe that Critical Thinking (K1) holds the highest relative importance compared to other criteria, with a comparison value of 2 when compared to Communication (K2), indicating that critical thinking is viewed as a more decisive aspect of students' soft skills competencies. This pattern continues for other pairs, with Creativity (K4) being the least dominant in comparison to the other criteria.

2) Normalization of Comparison Matrix

The next step involved normalizing the comparison matrix by dividing each element in the matrix by the sum of the values in its respective column. Table 3 shows the results of this normalization, which are crucial for calculating the priority weights of the criteria.

Table 3. Results of Paired Matrix Normalization

Criteria	Critical Thinking (K1)	Communication (K2)	Collaboration (K3)	Creativity (K4)	Total
K1	0,3077	0,3077	0,3077	0,3077	1,2308
K2	0,1538	0,1538	0,1538	0,1538	0,6154
K3	0,3077	0,3077	0,3077	0,3077	1,2308
K4	0,2308	0,2308	0,2308	0,2308	0,9231
Total	1	1	1	1	4

These normalized values are used to calculate the priority weights for each criterion. For instance, Critical Thinking (K1) and Collaboration (K3) share the highest weight of 0.3077, indicating their dominant importance in the overall evaluation of students' soft skills.

3) Priority Weight Calculation

The priority weight for each criterion was obtained by averaging the normalized values in each row. The resulting weights, shown in Table 4, reflect the relative importance of each criterion in the overall assessment.

Table 4. Priority Weights for Criteria

Criteria	Priority Weight (w)
Critical Thinking (K1)	0.3077
Communication (K2)	0.1538
Collaboration (K3)	0.3077
Creativity (K4)	0.2308

These weights are critical as they form the foundation for further evaluation and decision-making, guiding educators in prioritizing key aspects of students' soft skills development.

4) Consistency Testing

To ensure the validity of the AHP model, consistency testing was performed. The Consistency Vector was calculated by multiplying the initial pairwise comparison matrix

by the priority weight vector. The consistency ratio for each criterion was then calculated by dividing the Consistency Vector by the priority weight. The calculated consistency ratio of 0 for all criteria indicated high consistency in the assessments, confirming the reliability of the results.

5) Subcriterion Analysis

An in-depth analysis of the subcriteria was conducted for the two most important criteria, Critical Thinking (K1) and Collaboration (K3). The process involved creating separate pairwise comparison matrices for the subcriteria, followed by normalization and weight calculation. The resulting subcriteria weights for Critical Thinking and Collaboration are as follows:

a) Critical Thinking (K1): Problem Analysis (C11) = 0.4, Logic and Evidence (C12) = 0.3, Solution Evaluation (C13) = 0.2, Openness of Thought (C14) = 0.1
b) Collaboration (K3): Role and Contribution (C31) = 0.222, Team Support (C32) = 0.444, Conflict Resolution (C33) = 0.333

These subcriteria weights reflect the relative importance of specific behaviors and skills within each criterion and provide a detailed breakdown of students' performance in these areas.

6) Teacher Assessment and Global Preference Calculation

Teacher assessments of student behavior during the learning process were integrated with the AHP-derived weights to generate weighted scores for each subcriterion. Table 5 presents a sample calculation for Critical Thinking (K1), with subcriteria scores from teacher evaluations and their respective weighted values.

Table 5. Soft Skills Assessment Case Study

Criteria	Sub-criteria	Teacher Score	AHP Weight	Weighted Value
Critical Thinking (K1)	Problem Analysis	80	0.4	32
	Logic and Evidence	75	0.3	22.5
	Solution Evaluation	70	0.2	14
	Openness of Thought	65	0.1	6.5
Criterion K1 Score				**75.00**

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This scoring method allows for a balanced and consistent assessment of each student's soft skills performance, incorporating both teacher judgment and AHP-derived weights. The final score for each criterion is calculated by summing the weighted values across subcriteria, providing a comprehensive and objective measure of student achievement in soft skills. Through this process, teachers can offer more accurate feedback, reduce subjectivity in evaluation, and ensure fair and consistent assessment standards across students.

3.2. Discussions

The findings of this study highlight the effectiveness of the Analytical Hierarchy Process (AHP) as a tool for assessing students' soft skills in educational settings. The method proved valuable in transforming subjective teacher judgments into structured, quantitative data, ensuring that the assessment process is more consistent, transparent, and goal-oriented. This approach addresses the challenge of soft skills evaluation, which is often plagued by teacher bias and a lack of standardization, as evidenced in previous research [7], [8]. By using AHP to evaluate key competencies such as critical thinking, communication, collaboration, and creativity, the study ensures that the assessment outcomes are not only reliable but also justifiable, forming a solid foundation for educational decision-making.

The results also emphasize the practical advantages of this AHP-based method in enhancing the learning process. Teachers can use the detailed, systematic evaluation to gain a deeper understanding of each student's soft skills. This allows for more targeted and specific feedback, which can guide students in their personal development. The findings align with previous studies that underscore the importance of using multi-criteria decision-making approaches for evaluating non-academic traits, where AHP has been successfully applied in various contexts, such as performance assessments for both students and teachers [18], [21].

One of the novel contributions of this research lies in demonstrating the application of AHP as an independent method for soft skills assessment. While previous studies have combined AHP with other decision-making techniques, such as AHP-TOPSIS [19], [20], this study showcases the potential of using AHP in its standalone form to structure and interpret soft skills assessments. This method's flexibility and consistency offer an

alternative to more complex models, making it a viable option for educators looking for a streamlined and easily interpretable evaluation tool.

Although the study is based on a specific case study in MA Mu'allimin Sruweng Kebumen, the AHP model demonstrates considerable potential for broader adoption. The model's simplicity allows for easy adaptation to different educational contexts by adjusting criteria and ensuring inter-teacher agreement, which is crucial for standardizing the soft skills assessment process. In this way, the AHP-based method can be scaled and implemented at both classroom and school levels, providing educators with a standardized yet flexible framework to assess soft skills across various student groups.

While the results from this study offer compelling evidence for the utility of AHP in soft skills assessment, there are several areas for further development. For instance, incorporating multiple evaluators or employing additional decision-making methods could further refine the model's accuracy and reduce potential subjectivity. Additionally, the implementation of this system in diverse educational settings would help validate the approach and demonstrate its generalizability across different cultures, age groups, and educational systems.

The study confirms that AHP offers a powerful and practical tool for assessing students' soft skills in a way that minimizes bias and enhances the objectivity of evaluations. By focusing on key competencies such as critical thinking, communication, collaboration, and creativity, AHP provides a structured approach to measuring student development in these non-academic areas, thereby supporting educators in providing fair, consistent, and actionable feedback that is vital for student growth. This approach offers a balanced solution to the ongoing challenge of assessing soft skills and holds promise for broader application in educational practice.

4. CONCLUSION

This study demonstrates that the Analytical Hierarchy Process (AHP) is an effective and reliable method for assessing students' soft skills, offering a structured and objective approach to evaluation. By addressing the inherent subjectivity and lack of standardization in traditional soft skills assessments, AHP enables more consistent,

transparent, and actionable results. The findings underscore the potential of AHP to support educators in providing targeted feedback that fosters students' personal and professional development. While this research is based on a specific case study, the AHP model's flexibility suggests it could be adapted for broader use in educational settings, enhancing soft skills assessment across different contexts and contributing to the overall quality of education.

REFERENCES

[1] D. Satrio, R. Adriyana, S. Surendra, and W. Arsyida, "Analytical Network Process as a Decision Support System for Determining Outstanding Students," *sudo J. Tek. Inform.*, vol. 1, no. 3, pp. 108–115, 2022, doi: 10.56211/sudo.v1i3.81. (Analytical Network Process sebagai Sistem Pendukung Keputusan Penentuan Mahasiswa Berprestasi)

[2] M. Wijana and I. M. Ahmad, "Design and Development of a Decision Support System for Evaluating Outstanding Students Using the MFEP Method," *Intern. (Information Syst. J.)*, vol. 8, no. 1, pp. 10–23, 2025.

[3] D. T. Manullang, D. Sinaga, S. Tampubolon, and A. A. Sinaga, "The Influence of Students' Soft Skills on Their Job Readiness in SMK Negeri 1 Sidikalang for the 2022/2023 Academic Year," *Innov. J. Soc. Sci. Res.*, vol. 3, no. 2, pp. 6160–6174, 2023. (Pengaruh Soft Skill Siswa Terhadap Kesiapan Kerja Siswa SMK Negeri 1 Sidikalang Tahun Ajaran 2022 / 2023)

[4] Warisman, Karyanto, and E. Sulistiyorini, "Evaluation of the Superior School Program Based on Soft Skills (Case Study at SMA Negeri 1 Sidoarjo)," *Kelola J. Manaj. Pendidik.*, vol. 9, no. 2, pp. 179–188, 2022, doi: 10.24246/j.jk.2022.v9.i2.p179-188. (Evaluasi Program Sekolah Unggul Berbasis Soft Skills (Studi Kasus di SMA Negeri 1 Sidoarjo))

[5] F. Adiba, A. R. Wadjidi, and A. M. Sumardi, "Optimization of the Selection of Outstanding Students Using the Web-Based Weighted Product (WP) Method in a Decision Support System," *J. Tek. Inform. Aceh*, vol. 9, no. 1, pp. 1–10, 2024.

[6] N. Hidayati, S. Ferazona, and T. Idris, "The 4Cs' (Critical Thinking, Communication, Collaboration, Creativity) in the Industrial Revolution 4.0 Era: The Importance of Introducing These Skills to Teachers of SMPN 1 Kuok (4Cs' (Critical Thinking, Communication, Collaboration, Creativity) pada Era Revolusi Industri 4.0: Pentingnya Mengenalkan Keterampilan ini Bagi Guru SMPN 1 Kuok)," *Community Educ. Engagem. J.*, vol. 3, no. 1, pp. 30–38, 2021, doi: 10.2979/jems.00014.

[7] S. Aziz, M. Harrizi, A. Loutfi, and S. Zaidoune, "Undergraduates' Perspectives on the Significance of Soft Skills for Employment Gender-Based Differences," *J. Educ. Muslim Soc.*, vol. 6, no. 1, pp. 3–31, 2024, doi: 10.2979/jems.00014.

[8] L. Ferreira da Silva, P. S. Gonçalves de Oliveira, G. Grander, R. Penha, and F. S. Bizarrias, "Soft Skills Fuzzy TOPSIS Ranked Multi-Criteria to Select Project Manager," *Int. J. Inf. Decis. Sci.*, vol. 16, no. 1, pp. 19–45, 2024, doi: 10.1504/ijids.2024.10061740.

[9] M. D. Nawar, F. Helmiah, and C. Latiffani, "Application of the Weighted Product (WP) Method for Soft Skill Evaluation of Teachers in Learning at MTs. Hidayatul Ulumiyah Ujung Kubu (Penerapan Metode Weighted Product (WP) Penilaian Soft Skill Guru dalam Belajar di MTs. Hidayatul Ulumiyah Ujung Kubu)," *JIPI (Jurnal Ilm. Penelit. dan Pembelajaran Inform.)*, vol. 10, no. 2, pp. 1022–1030, 2025, doi: 10.29100/jipi.v10i2.6082.

[10] A. S. Chaniago, W. Ramdhan, and S. Sudarmin, "Application of the MFEP Method in Determining the Industrial Internship Location at SMKN SPP Asahan (Penerapan metode MFEP dalam menentukan Lokasi Praktek Kerja Industri (prakerin) pada SMKN SPP Asahan)," *JIPI (Jurnal Ilm. Penelit. dan Pembelajaran Inform.)*, vol. 10, no. 2, pp. 1055–1063, 2025, doi: 10.29100/jipi.v10i2.6005.

[11] D. P. Alam, V. Sihombing, and A. P. Juledi, "Decision Support System for Prioritizing Exchange Students Using the WASPAS Method," *J. TEKINKOM*, vol. 7, no. 2, pp. 990–997, 2024, doi: 10.37600/tekinkom.v7i2.1540.

[12] S. D. Nugroho, "Analysis of PLN UPDL Suralaya's Training Implementation Using AHP TOPSIS (Analisis Penyelenggaraan Diklat PLN UPDL Suralaya Menggunakan AHP TOPSIS)," *CENDEKIA J. Ilmu Pengetah.*, vol. 3, no. 4, pp. 178–188, 2023.

[13] N. Fadlilah, U. D. Rosiani, I. T. Assalam, K. N. Imanda, and M. H. P. Agung, "Comparison of ROC, AHP, and CRITIC Weighting Methods in Determining Priority Criteria: Case Study on Outstanding Student Determination (Perbandingan Metode Pembobotan ROC, AHP, dan CRITIC dalam Menentukan Prioritas Kriteria Studi Kasus Penentuan Mahasiswa Berprestasi)," *J. Ilm. KOMPUTASI*, vol. 23, no. 2, pp. 235–246, 2024, doi: 10.32409/jikstik.23.2.3546.

[14] S. Syam, N. Berutu, and J. Na, "Decision Support System for Employee Performance Evaluation for Promotion Using the Simple Multi-Attribute Rating Technique (SMART)," *J. EKOBISTEK*, vol. 8, no. 1, 2019, doi: 10.35134/ekobistek.v8i1.34.

[15] I. Wahyuningsih, M. M. Zakaria, and N. R. Salsabila, "Supplier Selection Strategy for Nayda Craft MSME Using the Analytical Hierarchical Process (AHP) Method (Strategi Pemilihan Supplier Terbaik pada UMKM Nayda Craft menggunakan Metode Analytical Hierarchical Process (AHP))," *SISMATIK (Seminar Nas. Sist. Inf. dan Manaj. Inform.)*, vol. 7, no. September, pp. 1–8, 2024.

[16] N. Nursakinah, Y. Maulita, and L. N. A. Kadim, "Application of AHP Method in Decision-Making for Soft Skill Competency Evaluation of Employees (Penerapan Metode AHP dalam Pengambilan Keputusan untuk Penilaian Kompetensi Soft Skill Karyawan)," *J. Eng. Technol. E-ISSN 2828-0512 Comput.*, vol. 2, no. November, pp. 94–106, 2023.

[17] L. Widayanti, "Implementation of Fuzzy Analytical Hierarchy Process in Student Learning Achievement Ranking (Implementasi fuzzy analytical hierarchy process pada perangkingan pencapaian belajar siswa)," *J. Ilm. Teknol. Inf. Asia*, vol. 19, no. 1, pp. 35–41, 2025, doi: 10.32815/jitika.v19i1.1112.

[18] R. Selvira, M. Putra, H. Tinambunan, and E. Bu, "Implementation of the TOPSIS Method in the Decision Support System for Honorary Teacher Performance Evaluation," *ADA J. Inf. Syst. Res.*, vol. 1, no. 2, pp. 70–78, 2024, doi: 10.64366/adajisr.v1i2.39i.

[19] N. F. Husnaini, "Web-Based Decision Support System with AHP-TOPSIS Method for Measuring Coastal Community Welfare in Pidie Regency (Sistem Pendukung Keputusan Berbasis Web dengan Metode AHP-TOPSIS untuk Pengukuran Tingkat Kesejahteraan Masyarakat Pesisir di Kabupaten Pidie)," *Comput. J.*, vol. 3, no. 2, pp. 51–60, 2025, doi: 10.58477/cj.v3i1.204.

[20] I. Bagus, N. Pascima, I. G. Lanang, A. Raditya, and I. M. E. Listartha, "Group Decision Support System (GDSS) for Determining the Feasibility of Learning Media (Group Decision Support System (GDSS) Penentuan Kelayakan Media Pembelajaran)," *KARMAPATI*, vol. 13, no. 1, pp. 54–62, 2024, doi: 10.23887/karmapati.v13i1.81154.

[21] I. K. A. Wijaya, G. R. Dantes, and I. M. Candiasa, "Implementation of Decision Support System for Selecting Outstanding Teachers and Students Using the Combination of Analytical Hierarchy Process and Technique for Order Preference by Similarity to Ideal Solution (Implementasi Sistem Pendukung Keputusan Pemilihan Guru dan Siswa Berprestasi dengan Kombinasi Metode Analytical Hierarchy Process dan Technique for Order Preference by Similarity to Ideal Solution)," *J. Nas. Pendidik. Tek. Inform.*, vol. 10, no. 2, pp. 77–90, 2021, doi: 10.23887/janapati.v10i2.29386.

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[22] A. Wafi, "Analysis of Factors Affecting the Performance of Civil Servants at the Ministry of Religious Affairs of East Java Using the Analytic Hierarchy Process (AHP) Method (Analisis Faktor yang Mempengaruhi Kinerja Aparatur Sipil Negara (ASN) di Kemenag Jatim Menggunakan Metode Analytic Hierarcy Proces (AHP))," *J. Apl. Teknol. Inf. dan Manaj.*, vol. 3, no. 1, pp. 55–64, 2022, doi: 10.31102/jatim.v3i1.1847.

[23] B. Izzati, K. Umam, M. R. Syarif, and A. Syaugi, "Analysis of Major Factors in the Success of KPI-Based Internship Programs Using the AHP Method (Analisis Faktor Terbesar Dalam Keberhasilan Program Magang Berbasis KPI Menggunakan Metode AHP)," vol. 1, no. 1, pp. 19–25, 2025.

[24] B. Thornhill-Miller et al., "Creativity, Critical Thinking, Communication, and Collaboration: Assessment, Certification, and Promotion of 21st Century Skills for the Future of Work and Education," *J. Intell.*, vol. 11, no. 3, 2023, doi: 10.3390/jintelligence11030054.