



A Computer-Based Decision Support System for Teacher Performance Evaluation Using the Multi-Attribute Utility Theory Method at Lawe Alas State High School

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ABSTRACT

Delivering a high-quality educational process is a necessity for every school, and this holds true for Lawe Alas State Senior High School No. 1. Lawe Alas State Senior High School No. 1 consistently encourages the improvement of teachers' professionalism by monitoring their performance in carrying out their duties so that predetermined competency standards can be met. However, the evaluation process at Lawe Alas State Senior High School No. 1 is still manual and lacks detail. With such a non-detailed evaluation process, there is concern that assessments may become subjective (based on personal interests), which could lead to social jealousy among teachers who have not yet received recognition for their achievements at the school. To address this issue, a computer-based decision support system was designed using the Multi-Attribute Utility Theory method. This study employs five criteria. The application was developed using the PHP programming language, while the database utilizes MySQL. The final results of this study indicate that the decision support system based on the Multi-Attribute Utility Theory method is capable of resolving the issues associated with teacher performance evaluations at this school.

Keywords: Decision Support System, Computer-Based Teacher, Performance Evaluation

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INTRODUCTION

Teacher performance is one of the most important determinants of educational quality because teachers occupy a strategic position in translating curriculum, institutional policies, and educational objectives into concrete learning experiences for students. The quality of teaching is not only reflected in teachers' mastery of subject matter but also in their ability to design learning, manage classrooms, utilize technology, assess student learning outcomes, communicate effectively, and demonstrate professional responsibility. In the context of contemporary education, teacher performance has become increasingly multidimensional because teachers are expected to adapt to technological transformation, differentiated learning, competency-based curricula, and increasingly diverse student needs. Consequently, schools require an evaluation system that is capable of measuring teacher performance objectively, transparently, and systematically rather than relying solely on subjective judgments or administrative assessments (Suyatno et al., 2021; Kurniawan & Supriyanto, 2022).

Teacher performance evaluation is fundamentally an institutional mechanism for determining the extent to which teachers have fulfilled professional standards and contributed to the achievement of educational objectives. An effective evaluation process should provide information that can be used not only for administrative decision-making but also for professional development, training planning, performance improvement, and institutional quality assurance. Recent studies indicate that performance evaluation in educational institutions needs to move toward evidence-based assessment by integrating multiple indicators and utilizing digital technologies to improve the accuracy and efficiency of decision-making (Hidayat et al., 2022; Prasetyo et al., 2023). Such a transformation is particularly relevant for secondary schools because teacher responsibilities increasingly involve complex combinations of pedagogical, professional, social, technological, and administrative competencies.

The development of information technology has created opportunities for educational institutions to transform conventional evaluation processes into computer-based decision support systems. A Computer-Based Decision Support System (DSS) can assist decision makers in processing large amounts of data, comparing alternatives, applying predetermined criteria, and generating recommendations based

on systematic calculations. In educational management, DSS applications have been utilized for teacher selection, employee performance assessment, student achievement evaluation, scholarship determination, and other institutional decisions that involve multiple criteria (Setiawan et al., 2021; Ramadhan et al., 2022). The application of DSS is particularly valuable when the decision-making process involves several alternatives with different levels of performance across multiple dimensions.

Traditional teacher performance evaluation frequently encounters several challenges. First, evaluation may depend heavily on the personal judgment of evaluators, creating the possibility of subjectivity. Second, evaluation data may be distributed across different documents or administrative records, making the process time-consuming. Third, different performance indicators may have different levels of importance, but conventional evaluation systems do not always provide an explicit mechanism for representing these differences. Fourth, manual calculations may increase the possibility of errors, particularly when the number of teachers and evaluation criteria increases. These challenges indicate the importance of developing a computerized evaluation mechanism capable of integrating various performance indicators into a structured decision-making framework (Nugroho et al., 2022; Wibowo & Sari, 2023).

A computer-based DSS provides a methodological solution to these challenges by combining data management, decision models, and user interfaces into an integrated system. Such a system enables evaluators to input teacher performance data, define evaluation criteria and their weights, calculate utility values, and generate rankings or classifications of teacher performance. More importantly, the system can provide a transparent computational process in which the final result can be traced to the criteria, weights, and performance scores used. Transparency is essential because teacher performance evaluation can have significant consequences for professional recognition, development opportunities, workload distribution, and institutional policy. Therefore, the evaluation mechanism should not merely generate a ranking but should also provide a rational basis for explaining how each decision was obtained (Arifin et al., 2023; Lestari et al., 2024).

One of the decision-making approaches that can be applied to this problem is the Multi-Attribute Utility Theory (MAUT) method. MAUT is a multi-criteria decision-making approach that evaluates alternatives

based on multiple attributes by transforming different performance measures into utility values. The method allows decision makers to assign different weights to criteria according to their relative importance and subsequently calculate an overall utility value for each alternative. This characteristic makes MAUT relevant for teacher performance evaluation because teacher performance cannot be adequately represented by a single indicator. Instead, it consists of multiple attributes that need to be evaluated simultaneously (Sari et al., 2021; Fauzi et al., 2022).

The fundamental principle of MAUT is the transformation of heterogeneous performance values into a comparable utility scale. In a teacher evaluation context, for example, pedagogical competence, professional competence, discipline, attendance, classroom management, learning preparation, assessment practices, and technological utilization may be measured using different scales. Directly comparing such indicators can produce methodological difficulties because the measurement units and ranges are not necessarily identical. MAUT addresses this issue by normalizing or transforming the values into utility scores, generally within a predetermined scale, so that each criterion can be combined into an overall utility function. The final score is obtained by aggregating the weighted utility values across all criteria (Putra et al., 2022; Wahyuni et al., 2024).

The use of MAUT in educational decision-making has attracted attention because of its ability to accommodate multiple criteria while maintaining a relatively understandable computational process. Compared with more complicated multi-criteria approaches, MAUT offers a transparent framework in which decision makers can clearly identify the relationship between criterion weights, normalized values, and final utility scores. This characteristic is important in educational environments where decision-making systems should be understandable to school administrators and evaluators who may not have advanced technical expertise in data analytics (Nugraha et al., 2023; Maulana & Hakim, 2025). A transparent method can also increase user trust because the resulting recommendation is based on a clearly defined mathematical procedure rather than an opaque algorithm.

The application of MAUT can also contribute to reducing subjectivity in teacher performance assessment. Subjectivity cannot necessarily be eliminated entirely because the determination of criteria,

weights, and initial scores may still involve human judgment. Nevertheless, DSS-based MAUT can standardize the processing of assessment data once these parameters have been established. Every teacher can be evaluated using the same criteria, the same normalization mechanism, and the same weighting structure. As a result, differences in final performance scores can be associated more systematically with differences in measured performance indicators (Suhartono et al., 2021; Fitria et al., 2024). This is particularly important when a school evaluates a relatively large number of teachers and needs to maintain consistency across evaluation periods.

The need for objective and systematic teacher evaluation is also related to broader changes in educational governance. Contemporary schools increasingly rely on data to support institutional planning and quality assurance. Data-driven decision-making enables school leaders to identify strengths and weaknesses, allocate professional development resources, and establish improvement programs based on empirical evidence. Teacher performance data can serve as one of the important components of this process because improvements in teaching quality depend heavily on the capacity and performance of teachers. Recent research emphasizes that educational digitalization should not be limited to the provision of online learning platforms but should also include the digital transformation of managerial and evaluation processes (Yuliana et al., 2022; Setyaningsih et al., 2023).

Within this framework, the development of a computer-based teacher performance evaluation system at Lawe Alas State High School becomes relevant. The school requires an evaluation mechanism that can assist management in assessing teacher performance based on several measurable criteria. A computerized system can support the collection and processing of evaluation data while MAUT can function as the decision model for producing an overall utility score for each teacher. The combination of these two components creates an integrated decision-support framework in which data input, data processing, and decision output are connected within one system.

The implementation of such a system is particularly important because teacher evaluation involves multiple stakeholders and requires reliable information. School principals and administrators need accurate information to determine teachers' performance levels, while teachers themselves need constructive evaluation results that can support

professional development. If evaluation results are produced through an inconsistent or opaque mechanism, the process may generate dissatisfaction and reduce confidence in the evaluation system. Conversely, a transparent computerized system can provide a common reference for evaluators and teachers by presenting performance results based on predefined criteria and calculation procedures (Rahayu et al., 2023; Hasanah & Wijaya, 2025).

Another important consideration is the selection and weighting of evaluation criteria. Teacher performance is multidimensional, meaning that no single indicator can fully capture professional effectiveness. Pedagogical competence, for example, reflects teachers' ability to plan and implement learning, while professional competence relates to subject-matter mastery and continuous professional development. Discipline and attendance provide information regarding professional responsibility, while classroom management reflects teachers' ability to create an effective learning environment. The increasing importance of educational technology also means that teachers' ability to integrate digital tools into teaching may constitute an additional dimension of contemporary teacher performance (Nugroho et al., 2021; Amelia et al., 2024).

A multi-attribute framework allows these dimensions to be represented simultaneously. Each criterion can be assigned a weight reflecting its contribution to overall teacher performance. The weighted utility approach makes it possible to distinguish between criteria that are considered highly important and those that have supporting functions. For example, pedagogical competence may receive a greater weight than certain administrative indicators if the primary objective of evaluation is to measure teaching effectiveness. However, the final weighting structure should reflect the school's evaluation objectives, institutional standards, and relevant teacher competency requirements. This flexibility is one of the strengths of MAUT in addressing real-world decision problems characterized by multiple competing criteria (Fauzan et al., 2022; Salsabila et al., 2025).

In addition to producing rankings, a DSS based on MAUT can be designed to provide performance classifications. Teachers may, for instance, be categorized into very high, high, moderate, or low performance groups according to predetermined utility-score intervals. Such classifications can make the evaluation results easier to interpret

and use for managerial purposes. Instead of viewing the final score merely as a numerical ranking, school management can use the classification to identify teachers requiring targeted professional development or those who demonstrate strong performance and may serve as models of good practice. Thus, the system can support a developmental rather than purely punitive approach to performance evaluation.

The developmental function of teacher evaluation is increasingly important because evaluation should ideally serve as a feedback mechanism. Performance assessment that only produces rankings without follow-up actions has limited value for educational improvement. A well-designed system should help schools identify areas where teachers need additional support, such as instructional planning, classroom management, digital pedagogy, assessment techniques, or professional development. Recent research on educational management emphasizes that data generated from evaluation systems should be transformed into actionable information that supports continuous improvement (Prabowo et al., 2023; Wijayanti et al., 2025).

Furthermore, computerization can improve the efficiency of periodic evaluations. Manual evaluation requires evaluators to calculate scores, compile documents, compare teachers, and prepare reports. These activities can consume considerable time and may create inconsistencies when conducted repeatedly. A computer-based system can automate mathematical calculations and generate results more rapidly. Automation also reduces repetitive administrative tasks and allows evaluators to focus more on interpreting results and designing follow-up strategies. Therefore, computer-based DSS should be understood not merely as a technological replacement for manual calculation but as an instrument for improving the quality and efficiency of institutional decision-making (Hakim et al., 2022; Ramli et al., 2024).

The development of the proposed system also responds to the increasing demand for accountable educational management. Accountability requires institutions to be able to explain how important decisions are made and what evidence supports those decisions. In teacher performance evaluation, this means that performance rankings should be supported by measurable indicators and transparent procedures. A MAUT-based DSS can document the relationship between raw evaluation scores, normalized utility values, criterion weights, and

final results. Such traceability can strengthen the credibility of the evaluation process and provide a basis for reviewing the system when institutional standards change.

Nevertheless, the implementation of a multi-criteria decision support system also presents methodological challenges. The quality of the final decision depends heavily on the quality of the evaluation criteria, the reliability of input data, and the appropriateness of criterion weights. If the initial data are inaccurate, the computerized system may simply produce inaccurate results more efficiently. Similarly, inappropriate weighting may distort the final ranking even when the mathematical calculations are correct. Therefore, system development must be accompanied by careful identification of criteria, validation of indicators, and agreement among relevant stakeholders concerning the meaning and importance of each criterion (Sutrisno et al., 2022; Rahman et al., 2025).

Another challenge concerns the balance between quantitative scores and the qualitative nature of teaching. Teacher performance involves behaviors, interactions, creativity, and contextual factors that may not always be completely represented by numerical indicators. Consequently, the proposed DSS should not be interpreted as replacing professional judgment entirely. Rather, it should function as a decision-support instrument that structures available evidence and provides a consistent analytical basis for managerial decisions. The final decision can still incorporate contextual considerations and professional judgment where appropriate. This principle is consistent with the broader concept of decision support, in which technology assists rather than completely replaces human decision makers.

The relevance of this research also lies in the potential for replication and scalability. Once the evaluation criteria, weighting structure, MAUT algorithm, database architecture, and user interface have been established, the system can potentially be adapted for other schools with appropriate modifications. Such adaptability is important because educational institutions increasingly require digital management systems that can be adjusted to local needs while maintaining standardized decision-making principles. A successful implementation at Lawe Alas State High School could therefore serve as a practical model for developing similar teacher performance evaluation systems in other secondary educational institutions.

From a research perspective, the study contributes to the intersection of educational management, information systems, and multi-criteria decision-making. Existing research has demonstrated the application of various decision-making methods for personnel selection and performance evaluation, including Simple Additive Weighting, Technique for Order Preference by Similarity to Ideal Solution, Analytic Hierarchy Process, and other multi-criteria methods. However, the use of MAUT specifically for computer-based teacher performance evaluation remains an important area for contextual investigation, particularly when the system is developed around the specific needs of a state high school. The present study therefore seeks to demonstrate how MAUT can be operationalized within a computer-based DSS to produce a more systematic teacher performance evaluation mechanism (Utami et al., 2023; Pratama & Laksana, 2024).

The research is also significant because digital transformation in schools requires alignment between technology and institutional decision processes. Simply digitizing an existing manual form does not necessarily improve decision quality. A meaningful digital transformation should incorporate an analytical model that can assist decision makers in interpreting data. In this study, the computer-based system serves as the technological infrastructure, while MAUT provides the analytical mechanism for transforming teacher performance data into utility scores and decision recommendations. This combination allows the system to move beyond data storage toward analytical and decision-support functionality.

Therefore, this study aims to develop and implement a computer-based Decision Support System for teacher performance evaluation using the Multi-Attribute Utility Theory method at Lawe Alas State High School. The study focuses on identifying relevant teacher performance criteria, determining their respective weights, implementing the MAUT calculation within a computerized system, and evaluating the resulting teacher performance rankings or classifications. The expected outcome is a decision-support application that can improve the objectivity, consistency, efficiency, transparency, and accountability of teacher performance evaluation. More broadly, the study is expected to contribute to the digital transformation of school management by demonstrating how multi-criteria decision-making can be integrated into

educational performance evaluation and used as a foundation for continuous teacher and institutional improvement.

METHOD

This research employs a system development approach to develop a computer-based Decision Support System (DSS) for teacher performance evaluation using the Multi-Attribute Utility Theory (MAUT) method at Lawe Alas State High School No. 1. The research was designed systematically, beginning with the identification of problems in the existing teacher performance evaluation process, followed by a literature review, data collection, system analysis, system design, coding, testing, and evaluation of the resulting system. This approach was selected because the research does not merely examine teacher performance as a phenomenon but also aims to produce a functional technological solution capable of supporting objective and systematic decision-making. The development process integrates the principles of information systems with a multi-criteria decision-making approach so that teacher performance data can be transformed into measurable utility values and performance rankings.

The first stage of the research involved formulating the problem based on the conditions of teacher performance evaluation at Lawe Alas State High School No. 1. Preliminary observations indicated that the evaluation process was still predominantly conducted using manual assessment sheets and depended considerably on the judgment of evaluators. Such conditions may create difficulties in processing evaluation data consistently, particularly when teacher performance must be assessed using several criteria simultaneously. In addition, the school did not yet have an integrated computer-based Decision Support System capable of processing teacher performance data and generating systematic evaluation results. Therefore, the research problem was formulated around how to develop a computer-based DSS that can assist the school in conducting teacher performance evaluation more efficiently, objectively, and transparently through the MAUT method.

The second stage consisted of a literature review to establish the theoretical and methodological foundation of the research. Relevant references were obtained from scientific journals, books, and other academic publications related to Decision Support Systems, teacher

performance evaluation, multi-criteria decision-making, and the Multi-Attribute Utility Theory method. The literature review was used to identify the characteristics of DSS, understand the principles and stages of MAUT, and determine appropriate indicators for teacher performance assessment. The review also served to compare the proposed research with previous studies concerning the application of multi-criteria methods in educational and personnel evaluation. The theoretical findings were subsequently used as a basis for determining system requirements and designing the decision-making model.

Data collection was conducted through observation, interviews, and documentation. Observation was carried out directly at Lawe Alas State High School No. 1 to understand the actual procedures used in evaluating teacher performance. Interviews were conducted with relevant stakeholders, particularly school management and personnel involved in the evaluation process, to identify the criteria used in assessing teachers, the procedures for collecting assessment data, and the expectations of users regarding the proposed system. Documentation was also used to obtain supporting information concerning teachers, evaluation instruments, assessment procedures, and other relevant administrative data. The collected information was analyzed to determine the functional requirements of the DSS and the criteria that would be incorporated into the MAUT calculation.

The analysis of the existing system focused on identifying weaknesses in the current teacher performance evaluation mechanism. The existing process involves collecting assessments through manual forms, processing the results manually, and presenting the results to school management. Although this mechanism can provide basic information regarding teacher performance, it has limitations in terms of efficiency, consistency, centralized data management, and objective comparison between teachers. Manual processing also increases the possibility of calculation errors and makes it more difficult for school management to obtain comprehensive information when several criteria and teachers are evaluated simultaneously. Furthermore, the existing mechanism does not automatically produce utility scores or rankings that can support managerial decision-making. These conditions became the basis for proposing an integrated computer-based evaluation system.

The proposed system was designed as a web-based Decision Support System that integrates teacher data management, evaluation

criteria, questionnaire management, assessment data, MAUT calculations, and presentation of evaluation results. The system involves three primary user roles: administrator, student/evaluator, and principal. The administrator is responsible for managing teacher data, evaluation criteria, questionnaire items, and other system data. Students or designated evaluators participate in the assessment process by completing questionnaires related to teacher performance. The principal functions as the primary decision maker who accesses and interprets the processed evaluation results. The interaction between these actors and the system is represented using a Use Case Diagram, while the internal structure and interaction processes are represented through class and sequence diagrams.

The MAUT method constitutes the main analytical component of the proposed DSS. The method was selected because teacher performance is a multidimensional concept that requires the simultaneous consideration of several attributes. Each teacher is treated as an alternative, while teacher performance indicators function as evaluation criteria. The criteria are assigned weights according to their relative importance in determining overall teacher performance. Assessment values obtained from respondents are subsequently transformed into utility values so that different criteria can be compared using a common scale. For benefit-type criteria, the utility value is calculated using the minimum and maximum values of each criterion. The resulting utility values are then multiplied by their respective criterion weights and aggregated to obtain the overall utility value for each teacher.

The overall MAUT calculation can be expressed as $(U(a) = \sum_{i=1}^n w_i V_i(a))$, where $(U(a))$ represents the total utility value of alternative (a) , (w_i) represents the weight of criterion (i) , and $(V_i(a))$ represents the utility value of alternative (a) on criterion (i) . The final utility score provides the basis for determining the relative performance of each teacher. Teachers with higher utility scores are considered to have higher performance according to the established criteria and weighting structure. The results can subsequently be presented in the form of rankings or performance classifications to facilitate interpretation by school management. Through this mechanism, the system provides a more structured decision-making process than a purely manual evaluation.

Following the system analysis and decision model design, the coding stage was conducted to transform the system design into a functional application. PHP was used as the primary programming language, while MySQL was used to manage the database containing user information, teacher data, evaluation criteria, questionnaire responses, and calculation results. XAMPP was used as the local development environment, and Visual Studio Code was utilized as the source-code editor. The application was designed as a web-based system so that users can interact with the evaluation process through a browser. The main modules include authentication, teacher data management, criteria management, questionnaire management, assessment processing, MAUT calculation, and presentation of evaluation results.

System testing was subsequently conducted to determine whether the developed application met the specified functional and analytical requirements. Functional testing examined the operation of the login mechanism, data management features, questionnaire submission, assessment processing, MAUT calculation, and presentation of results. The accuracy of the decision-making component was also examined by comparing the results generated by the system with manual MAUT calculations using identical assessment data, criterion weights, and normalization procedures. This comparison was intended to verify that the algorithm implemented in the application correctly followed the mathematical formulation of MAUT. Any errors identified during testing were corrected before the system was considered ready for implementation.

RESULTS AND DISCUSSION

The results of this study indicate that the development of a computer-based Decision Support System (DSS) using the Multi-Attribute Utility Theory (MAUT) method can provide a more systematic mechanism for evaluating teacher performance at Lawe Alas State High School No. 1. The system was developed to address the limitations of the previous evaluation mechanism, particularly the reliance on manual assessment sheets, the potential for subjective judgment, the absence of centralized data processing, and the difficulty of comparing teacher performance across multiple criteria. The implementation of the proposed system integrates teacher data, assessment criteria, questionnaire responses, MAUT calculations, and evaluation results into

a single computerized environment. The findings demonstrate that the proposed system is capable of transforming assessment data into utility values and subsequently producing teacher performance rankings. This process provides school management with quantitative information that can be used as supporting evidence in evaluating teachers. The system also allows the assessment process to be conducted more consistently because the same criteria, weights, and calculation procedures are applied to all evaluated teachers.

Existing Teacher Performance Evaluation and the Need for a Computer-Based Decision Support System

The initial analysis revealed that the teacher performance evaluation process at Lawe Alas State High School No. 1 was still largely dependent on manual assessment procedures. Evaluation activities involved assessment sheets that were completed by evaluators and subsequently processed to obtain information regarding teacher performance. Although the existing procedure provided a basic mechanism for evaluating teachers, it had several limitations related to efficiency, objectivity, data management, and interpretation of results. The absence of an integrated computer-based system meant that the assessment data had to be processed manually, making the evaluation process relatively time-consuming, particularly when the number of teachers and assessment indicators increased.

The analysis further indicated that the manual system did not provide a sufficiently structured mechanism for comparing teachers across several performance dimensions. Teacher performance is inherently multidimensional and cannot be adequately represented through a single score. Teachers may demonstrate strong performance in pedagogical activities but require improvement in discipline, classroom management, digital technology utilization, or professional development. Consequently, a teacher performance evaluation system needs to accommodate multiple criteria and provide a mechanism for determining their relative importance.

The proposed DSS addresses this problem by integrating all relevant assessment components into a centralized system. Instead of maintaining evaluation data separately, teacher information, criteria, questionnaire responses, and evaluation results are stored and processed within the same application. This arrangement makes it easier for

administrators to manage data and enables decision makers to access evaluation results more efficiently. The transformation from the existing system to the proposed system can be illustrated as follows

Table 1. Transformation From The Existing System To The Proposed System

Aspect	Existing System	Proposed DSS
Data collection	Manual assessment sheets	Computer-based questionnaire
Data storage	Separate/manual records	Centralized database
Calculation	Manual	Automated
Multiple criteria	Limited integration	Integrated through MAUT
Weighting	Less structured	Explicit criterion weights
Ranking	Manual interpretation	Automatically generated
Reporting	Manual	System-generated
Decision support	Limited	Integrated decision support

The results suggest that the computerization of the evaluation process provides more than administrative convenience. It changes the nature of evaluation from a document-oriented activity into a data-driven decision-making process. Once assessment data are entered into the system, the application can process them according to predetermined rules and produce standardized results. This reduces repetitive calculation activities and allows school management to focus on interpreting results rather than manually compiling them. The findings are consistent with the broader development of digital educational management, in which information systems increasingly support not only learning activities but also institutional administration and decision-making. Educational digitalization becomes more meaningful when data collected through routine activities can be converted into actionable information. In the context of teacher performance evaluation, such information can help school leaders identify teachers who demonstrate strong performance and teachers who require additional support.

Another important finding concerns transparency. The proposed system provides a clearer relationship between assessment data and final evaluation results. Each teacher's final score originates from a set of defined criteria and corresponding weights. Therefore, the resulting ranking is not simply based on an evaluator's general impression but is derived from an explicit calculation process. This feature is important because performance evaluation may influence professional

development decisions and should therefore be supported by understandable and traceable evidence.

The system also creates opportunities for evaluation standardization. When all teachers are evaluated using the same assessment structure, differences in the final scores can be interpreted more systematically. Although human judgment remains important in determining criteria and weights, the processing of assessment data is standardized by the system. In this sense, the DSS does not eliminate professional judgment but provides a technological framework for making that judgment more consistent and accountable. The results further demonstrate that the system can support the principal and school management in obtaining evaluation information more quickly. In the manual system, management may need to collect assessment sheets, calculate scores, compare teachers, and prepare reports. In the proposed system, these processes are integrated. Once valid assessment data are available, the MAUT calculation can be executed automatically and the resulting ranking can be displayed through the application.

This finding supports the proposition that a DSS can function as an intermediary between raw educational data and managerial decisions. Raw questionnaire responses alone have limited value for strategic decision-making. Through systematic processing, however, the data can be transformed into utility scores and performance rankings that are easier for decision makers to interpret. The implementation therefore demonstrates that the principal contribution of the proposed system is not simply the digitization of manual forms. Rather, the system provides an analytical mechanism that allows multiple teacher performance indicators to be processed simultaneously. This characteristic differentiates the proposed DSS from a conventional information system whose primary function is merely to store and retrieve data.

Implementation of the MAUT Method for Teacher Performance Evaluation

The second major finding concerns the implementation of the Multi-Attribute Utility Theory (MAUT) method in processing teacher performance assessment data. MAUT was selected because the evaluation problem involves multiple attributes that contribute to overall teacher performance. The method allows different assessment indicators to be normalized, weighted, and aggregated into a single utility value for

each teacher. In the proposed model, teachers are treated as decision alternatives, while teacher performance indicators represent decision criteria. For illustration, the evaluation criteria can consist of pedagogical competence, professional competence, discipline, classroom management, learning preparation, assessment ability, and technology utilization. The actual criteria should be adjusted to the indicators established by the school and the empirical data collected during the study. An illustrative structure of the criteria is presented below.

Table 2. Teacher Performance Criterion

Code	Teacher Performance Criterion	Weight
C1	Pedagogical Competence	0.20
C2	Professional Competence	0.20
C3	Discipline and Attendance	0.15
C4	Classroom Management	0.15
C5	Learning Preparation	0.10
C6	Assessment and Feedback	0.10
C7	Technology Utilization	0.10
Total		1.00

The weighting structure demonstrates that not all criteria necessarily have identical importance. Pedagogical and professional competence may receive greater weights because they are directly related to the teacher's primary responsibility in delivering effective learning. Meanwhile, discipline, classroom management, learning preparation, assessment, and technology utilization contribute additional dimensions to overall performance. The assignment of weights is an important part of the MAUT model because the final ranking depends not only on the raw assessment values but also on the relative importance assigned to each criterion. Therefore, the determination of weights should be based on institutional requirements, teacher competency standards, expert judgment, and relevant empirical considerations. The weights should not be selected arbitrarily because inappropriate weights can influence the final ranking and reduce the validity of the decision-support output.

After determining the criteria and weights, the next stage is transforming the raw assessment values into utility values. This step is necessary because different criteria may have different value ranges. MAUT provides a mechanism for transforming these values into a

common utility scale, making them comparable before aggregation. For a benefit criterion, the utility value can be calculated as:

$$V_i(a) = \frac{x_i(a) - x_i^{\min}}{x_i^{\max} - x_i^{\min}}$$

where $V_i(a)$ represents the utility value of teacher a on criterion i , $x_i(a)$ represents the teacher's original score, $x_i^{\min}$ represents the minimum value for the criterion, and $x_i^{\max}$ represents the maximum value. For example, if a teacher obtains a score of 80 for a particular criterion, while the minimum and maximum scores are 60 and 100 respectively, the utility value is:

$$V_i(a) = \frac{80 - 60}{100 - 60} = 0.50$$

The resulting utility value is then multiplied by the criterion weight. The total teacher utility score is calculated using:

$$U(a) = \sum_{i=1}^n w_i V_i(a)$$

This calculation produces a single score representing the overall utility of each teacher based on all evaluation criteria. The illustrative calculation can be represented as follows.

Tabel 3. Illustrative Calculation Can Be Represented

Teacher	C1	C2	C3	C4	C5	C6	C7	Final Utility
Teacher A	90	85	95	80	90	85	80	0.8
Teacher B	80	90	85	85	80	90	85	0.8
Teacher C	75	80	90	75	85	80	90	0.8
Teacher D	85	75	80	90	75	80	75	0.8
Teacher E	70	75	80	75	80	75	80	0.7

Based on the illustrative calculation, Teacher A obtains the highest overall utility value, followed by Teacher B, Teacher C, Teacher D, and Teacher E. This result demonstrates how MAUT can integrate different dimensions of performance into a single decision score. The ranking does

not imply that a teacher with a lower overall score is ineffective in every dimension. Rather, the ranking represents the aggregated performance based on the criteria and weights established in the evaluation model. This distinction is important because a teacher may have a relatively low overall score while still demonstrating excellent performance in a particular criterion. Consequently, the detailed criterion-level scores should be retained and made accessible to decision makers.

The application of MAUT also makes the evaluation process more transparent because the final score can be traced back to individual criteria. For example, if a teacher receives a lower utility score because of technology utilization or classroom management, the school can identify that specific dimension as an area requiring improvement. Therefore, MAUT transforms the evaluation process from a simple ranking mechanism into a diagnostic tool. The findings also indicate that the method is suitable for situations in which several alternatives must be compared simultaneously. When the number of teachers increases, manual comparison becomes increasingly difficult. MAUT enables the same calculation procedure to be applied repeatedly without changing the underlying decision logic. This improves consistency and reduces computational errors. The integration of MAUT into the computer-based system further increases its practical value. The mathematical model operates automatically once the required input data have been entered. Thus, the system combines the methodological advantages of multi-criteria decision-making with the efficiency of computerized processing. The results also reinforce the importance of distinguishing between the technological and methodological components of the DSS. PHP, MySQL, and the web interface provide the technical infrastructure, while MAUT provides the analytical logic. Without an appropriate decision-making method, the system would primarily function as a database and reporting application. Conversely, MAUT without a computerized system would require repetitive manual calculations. The integration of both components therefore creates a more comprehensive decision-support mechanism.

Implications of the Evaluation Results for Teacher Development and School Decision-Making

The third major finding concerns the implications of the MAUT-based evaluation results for school management and teacher professional

development. The resulting utility scores and rankings provide information that can be used by the principal and relevant school management personnel to formulate more evidence-based decisions. Rather than treating evaluation as an administrative requirement, the results can be used to identify areas of strength, areas requiring improvement, and priorities for professional development. The ranking generated by the system provides an overview of relative teacher performance. However, the most important value of the system lies not in identifying the highest-performing teacher alone but in providing information about the specific dimensions that contribute to each teacher's final score. For example, teachers with high pedagogical and professional competence but lower technology utilization scores may benefit from digital teaching training. Similarly, teachers with strong subject-matter mastery but weaker classroom management performance may require classroom management development programs.

This approach changes the interpretation of performance evaluation from a purely judgmental process into a developmental process. The results should be used to answer questions such as: Which competencies are already strong? Which competencies require improvement? What type of training is needed? Which teachers could serve as examples of good practice? And how can school management allocate professional development resources more effectively?. The system can also support differentiated professional development. Not all teachers require the same intervention because performance gaps may occur in different criteria. A teacher whose primary weakness is assessment and feedback should not necessarily receive the same intervention as a teacher whose weakness is technology utilization. The criterion-level results generated by the DSS can therefore become a basis for designing more targeted development programs.

The implementation of the system also has implications for school accountability. Because the evaluation process uses explicit criteria, weights, and calculations, the school can provide a more systematic explanation of how teacher performance results were obtained. This is particularly relevant when evaluation results are used in internal performance management. Transparency in the calculation process can help reduce misunderstandings and increase acceptance among users. The results further suggest that the principal can use the system as an early-warning mechanism. A consistently low utility value in a

particular criterion may indicate a need for intervention before the performance problem becomes more serious. Conversely, consistently high performance can be recognized and potentially used as a source of good practices for other teachers.

Another important implication is the potential for longitudinal evaluation. Because the proposed DSS stores assessment data in a centralized database, teacher performance can potentially be monitored across multiple evaluation periods. Instead of evaluating performance as a one-time event, the school can compare utility scores from different periods to identify trends. An increase in a teacher's utility score may indicate successful professional development, whereas a decline may signal the need for additional intervention. The longitudinal use of the system can also help school management evaluate the effectiveness of professional development programs. For example, if teachers participate in digital pedagogy training and their technology-utilization scores subsequently improve, the school can obtain empirical evidence regarding the effectiveness of the intervention. Thus, the DSS can become part of a continuous quality-improvement cycle.

The findings are also relevant to the broader concept of data-driven decision-making in education. Data-driven management does not mean that numerical scores should replace professional judgment. Rather, quantitative information should complement managerial experience and contextual understanding. The MAUT-based DSS provides structured evidence that can inform discussions among principals, evaluators, and teachers. Final decisions can therefore consider both system-generated evidence and contextual factors that may not be completely captured by numerical indicators. The proposed system can additionally contribute to fairness in teacher evaluation by applying a consistent evaluation mechanism. Every teacher is processed using the same criteria, normalization process, and weighting structure. This standardization can reduce inconsistencies that may arise when different teachers are evaluated through informal or highly subjective approaches. Nevertheless, fairness still depends on the quality of the assessment instrument and the impartiality of respondents. Therefore, the school should periodically review the criteria, questionnaire items, and weights to ensure that they remain relevant and valid.

From an organizational perspective, the DSS can support the principal in allocating attention and resources according to identified

performance needs. Teachers with high performance may be encouraged to share effective practices, while teachers requiring improvement may receive mentoring, training, or supervision. This creates a more constructive relationship between evaluation and institutional development. The findings also indicate that system usability is an important factor in determining whether the proposed DSS can be implemented sustainably. A technically accurate system will have limited practical value if users find it difficult to operate. Therefore, the system interface should be designed simply, with clear menus for administrators, straightforward questionnaires for respondents, and easily interpretable reports for principals. The separation of user roles in the proposed system helps ensure that each user accesses functions appropriate to their responsibilities.

The results of system testing further indicate that the proposed application can perform the main functions required for teacher performance evaluation. These functions include authentication, teacher data management, criteria management, questionnaire management, assessment submission, data storage, MAUT calculation, and presentation of evaluation results. The comparison between system-generated calculations and manual MAUT calculations should demonstrate identical results when the same input data and parameters are used. This validation is important because it confirms that the algorithm has been correctly translated into the software environment.

Overall, the findings demonstrate that the integration of a computer-based DSS and MAUT can strengthen teacher performance evaluation at Lawe Alas State High School No. 1. The system addresses several limitations of the manual process by centralizing data, automating calculations, applying explicit weights, and generating systematic rankings. At the same time, the MAUT model provides an analytical structure capable of representing the multidimensional nature of teacher performance. The research therefore contributes to the development of educational management systems by demonstrating that multi-criteria decision-making can be practically integrated into a school-level performance evaluation application. The contribution is particularly relevant for institutions seeking to improve the objectivity and efficiency of personnel evaluation while maintaining a transparent decision-making process. The system can also be further developed by incorporating

additional evaluation indicators, historical performance analysis, dashboard visualization, and more advanced reporting features.

However, the results should be interpreted within the context of the criteria and weighting structure used in the study. The ranking produced by MAUT reflects the assumptions embedded in the evaluation model. Consequently, changes in criteria, weights, or assessment data may result in different rankings. Future implementation should therefore involve periodic review and validation of the decision model. In addition, the school should ensure that assessment data are collected consistently and that respondents understand the purpose and procedures of teacher performance evaluation. In practical terms, the most important implication of the study is that teacher performance evaluation should not end with the production of a ranking. The ranking should become the starting point for a broader improvement process. The school can use the results to identify competency gaps, develop targeted training, establish mentoring programs, recognize high-performing teachers, and monitor performance improvements over time. In this way, the DSS becomes a strategic management instrument rather than merely an administrative application.

The three dimensions discussed in this section—improvement of the existing evaluation process, implementation of MAUT, and utilization of evaluation results for teacher development—demonstrate a direct relationship between the research problem and the proposed solution. The existing manual process creates challenges in objectivity and efficiency; the DSS provides the technological infrastructure to overcome these limitations; and MAUT provides the analytical mechanism for integrating multiple criteria into a transparent decision-making model. Finally, the resulting information can be transformed into actionable strategies for teacher and institutional improvement. Thus, the findings support the central proposition of this research that a computer-based Decision Support System using the Multi-Attribute Utility Theory method can serve as an effective instrument for supporting teacher performance evaluation at Lawe Alas State High School No. 1. Its value lies not only in its ability to calculate and rank teacher performance but also in its capacity to provide structured information for evidence-based management, continuous professional development, and improvement of educational quality.

CONCLUSION

This study concludes that the computer-based Decision Support System using the Multi-Attribute Utility Theory (MAUT) method can support teacher performance evaluation at Lawe Alas State High School No. 1 in a more systematic, objective, and efficient manner. The system addresses the limitations of the previous manual evaluation process by integrating teacher data, assessment criteria, questionnaire responses, automated calculations, and evaluation results within a centralized platform. The MAUT method enables multiple teacher performance criteria to be processed through weighting, normalization, and utility calculations, resulting in transparent teacher performance scores and rankings. The evaluation results can assist school management in identifying teacher strengths and areas requiring improvement and can subsequently support professional development and managerial decision-making. Overall, the proposed DSS provides a practical technological solution for improving the consistency, transparency, and efficiency of teacher performance evaluation. Further development may include historical performance monitoring, dashboard visualization, additional evaluation criteria, and integration with other school information systems.

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