Multidisciplinary Output Research For Actual and International Issue (MORFAI Journal) ISSN (e): 2808-6635
Volumes 5 No 5 (2025)

SENTIMENT ANALYSIS OF TEACHER PERFORMANCE ASSESSMENT (SMKS HASSINA SUKABUMI)

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Received	: 01 August 2025	Published	: 28 September 2025
Revised	: 15 August 2025	DOI	: https://doi.org/10.54443/morfai.v5i5.4181
Accepted	: 20 September 2025	Publish Link	: https://radjapublika.com/index.php/MORFAI/article/view/4181

Abstract

Teacher performance assessment is an important instrument in improving the quality of education, especially at the Vocational High School (SMK) level. This study aims to analyze sentiment towards teacher performance assessment at SMKS Hassina Sukabumi using a sentiment analysis approach. Research data were obtained through surveys and reviews from students, colleagues, and school management who provided assessments of teacher performance based on pedagogical, professional, personality, and social indicators. The method used was text mining-based sentiment analysis with Orange software on qualitative data in the form of open responses, comments, and testimonials collected through interviews. The results showed that most assessments had positive sentiment, reflecting appreciation for teacher competence and dedication. However, negative sentiment was also found, indicating the need for improvements in aspects of learning innovation and technology utilization. These findings are expected to serve as a basis for school management in formulating more effective teacher professional development strategies, as well as input in the ongoing evaluation process to improve the quality of learning at SMKS Hassina Sukabumi.

Keywords: ***sentiment analysis; teacher performance assessment; vocational school; education.***

INTRODUCTION

Teacher performance assessment is an integral part of efforts to improve the quality of education at the Vocational High School (SMK) level. Every feedback received, whether from students, colleagues, or school administrators, contains important information regarding the effectiveness of teaching methods, interpersonal relationships, pedagogical and professional competencies of teachers. However, much of this data is in the form of open-ended, qualitative responses and requires in-depth analysis to uncover their sentiment orientation. In this context, text mining-based sentiment analysis is a highly appropriate method for exploring patterns of feelings regarding teacher performance assessments. Sentiment analysis can efficiently classify text into positive, negative, or neutral sentiments and identify dominant themes within each classification. Orange is open-source software that provides a wide range of text mining and sentiment analysis features. It allows users to perform text preprocessing, tokenization, sentiment classification, and visualization of results without the need for extensive coding—while still allowing for model customization and the use of lexicons like VADER or LiuHu. Previous research using Orange for analyzing public and educational reviews found a significant proportion of positive sentiment, supported by good classification accuracy, and the identification of dominant emotions and themes based on reviews..

Additionally, a study in a virtual learning environment investigated student sentiment toward instructor performance using Python-based text mining and sentiment analysis. The results showed a predominance of positive sentiment at approximately 57%, with a small portion of negative sentiment (approximately 15%) highlighting technical issues such as the use of laboratory diagrams or simulations. The study emphasized that the text mining approach not only quantifies sentiment orientation but also uncovers specific factors contributing to satisfaction or dissatisfaction, such as the use of simulation tools in engineering learning. Based on the theoretical framework and related findings, this study adapts a text mining-based sentiment analysis approach, specifically using Orange software, to analyze open-ended responses from students, colleagues, and management in teacher performance assessments at SMKS Hassina Sukabumi. With the aim of understanding subjective perceptions more systematically

and in-depth, this study is expected to provide evidence-based recommendations for teacher professional development and school strategies in improving the quality of learning.

Based on the background of the problem, the problem formulation is described as follows:

1. What are the results of teacher sentiment regarding teacher performance assessment at SMKS Hassina Sukabumi?
2. What topics or words are most discussed regarding teacher performance assessments at SMKS Hassina Sukabumi?

LITERATURE REVIEW

In this study, the literature review focused on teacher performance assessment, encompassing theory, implementation in schools, and the use of technologies such as text mining and sentiment analysis in the evaluation process. This study provides an important foundation for developing a deeper understanding and strengthening the research direction to ensure its relevance to current educational needs.

Following are some theoretical reviews that are relevant to research on teacher performance assessment:

- Ramadhan et al. (2024) found that teacher performance assessment management is significantly influenced by the quality of planning, outreach, and supervision. Structured evaluations can improve teacher professionalism, while purely administrative evaluations do not significantly impact learning quality.
- Arvianto et al. (2024) emphasize the importance of using multifactorial methods to produce more objective performance assessments. By considering various aspects such as pedagogy, professionalism, and learning outcomes, evaluations are more comprehensive than relying solely on a single indicator.
- Wahyudin (2023) found that teacher performance assessments had a positive impact on improving learning quality when the results were followed up with training. However, if they were merely a formality, their impact on improving education quality was very limited.
- Fernandez (2023) demonstrated that sentiment analysis can be an effective tool in evaluating student perceptions of teacher performance. This technique can identify emotional patterns in student comments and help institutions understand areas of need.

Previous research generally uses conventional evaluation methods such as observation and manual assessment. Few studies utilize modern data analysis technologies such as text mining, topic modeling, or sentiment analysis to extract deeper insights from text data. This gap forms the basis of this research. By leveraging text and sentiment analysis to analyze existing perceptions, this study aims to present a new approach to teacher performance assessment at SMKS Hassina Sukabumi, resulting in more comprehensive, relevant, and beneficial evaluation results for improving the quality of learning.

METHOD

The method used is text mining-based sentiment analysis with Orange software on qualitative data in the form of open responses, comments, and testimonials collected through interviews.

Text Mining

*Text mining*is a specialized branch of data mining that focuses on extracting information from text-based data, generally sourced from various documents. This process aims to find words that represent the contents of a document, thus enabling analysis of the relationships between documents (Mooney, 2006).

Text Preprocessing

*Text preprocessing*is the initial stage in the text mining process. This step aims to eliminate noise or interference in the data so that the data becomes more concise, organized and well structured (Rani & Arora, 2016).

Sentiment Analysis

Sentiment analysis is a field of study that focuses on examining individual opinions, evaluations, assessments, attitudes, and emotions toward an object, organization, event, issue, or party (Liu, 2012). This term, also known as opinion mining, refers to the automated process of understanding, extracting, and processing textual data to identify the sentiment information contained within a statement or opinion. Through sentiment analysis, one can determine the tendency of a person's views or opinions toward an issue or object, whether they are positive or negative (Liu, 2010).

Valence Aware Dictionary and Sentiment Reasoner (VADER)

Valence Aware Dictionary and Sentiment Reasoner(VADER) is a lexicon-based sentiment analysis method that utilizes a collection of sentiment-related words. In this approach, each word in the lexicon is evaluated to determine its tendency, whether it is positive or negative. The higher the positive value assigned to a word, the stronger the positive sentiment. Conversely, the lower or negative the value, the greater the tendency for negative sentiment (Sagala & Toba, 2021).

Topic Modeling

*Topic modeling*is a generative document model that uses probabilistic procedures to generate document representations. The result of this process is a collection of words that form clusters or topics, which are obtained based on the probability distribution of words in a collection of documents (Y et al., 2016).

LDA (Latent Dirichlet Allocation)

LatentDirichlet Allocation (LDA) is a generative probabilistic model of a corpus. The basic idea is that documents can be represented as a mixture of topics, also called latent topics, where each topic is characterized by a word (Zulhanif, 2016).

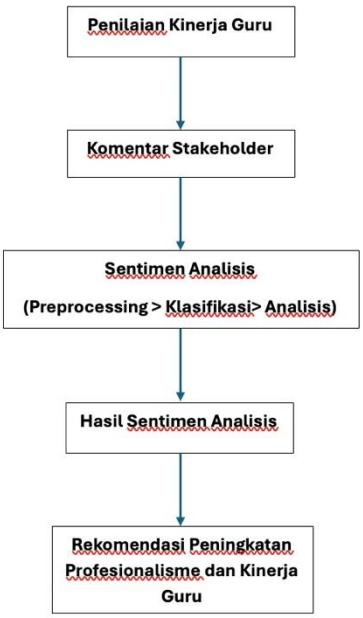


Figure 1. Framework of Thought

Stages of Data Analysis Method:

b. Teacher Performance Assessment
   Analyzing the topic of the phenomenon being researched is to find out whether the assessment of teacher performance at SMKS Hassina Sukabumi in terms of pedagogical competence, professional competence, social competence, and personality competence has been realized.
c. Stakeholder Comments
   Analyze open comments from parties directly involved, such as teachers, to find out what assessments have been carried out at SMKS Hassina Sukabumi.
d. Sentiment Analysis
   Text analysis techniques use artificial intelligence to identify emotions and opinions in a statement using data mining.

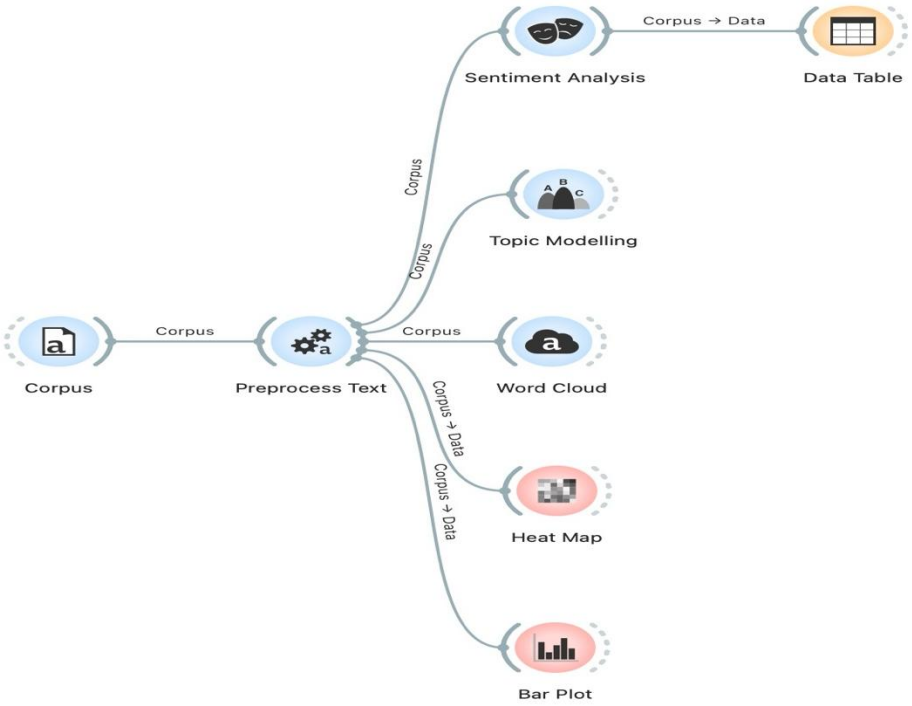
Stages of Data Processing Method:

a. Interview
   The data collection method used was by interviewing teachers directly at SMKS Hassina Sukabumi to dig up in-depth information, both factual data and opinions, according to research needs.
b. Orange Data Mining
   Orange data mining is an open-source data analysis platform designed to allow users to intuitively explore, model, and visualize data through a drag-and-drop interface. The application can handle various types of data, including text data from interviews, which can be analyzed using text mining features for purposes

such as sentiment analysis and word visualization. Orange also supports various machine learning algorithms and presents analysis results in easy-to-understand visuals. With its ease of use and interactive interface, Orange is a practical and effective solution for anyone looking for a lightweight, visual, and quick-to-learn analysis tool.

RESULTS AND DISCUSSION

Figure 2. Setiment Analysis and Topic Modeling



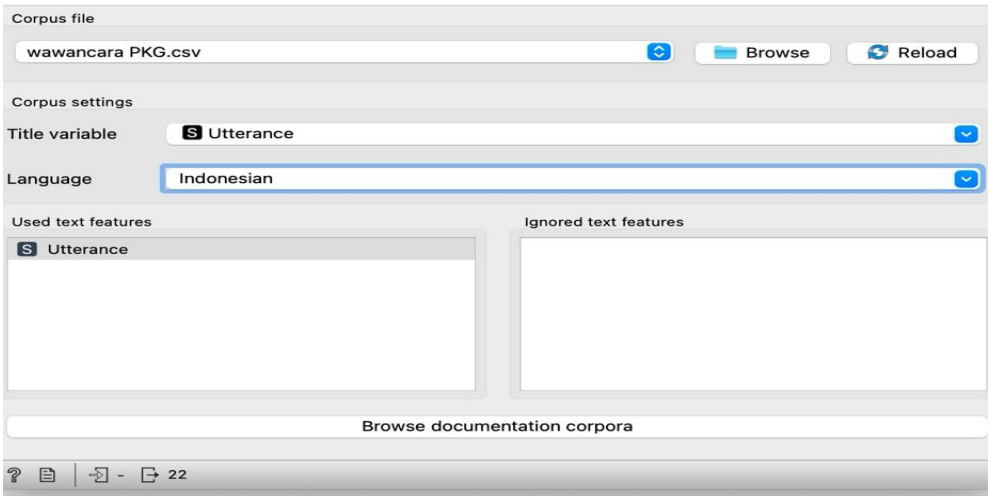
Source: Orange Data Mining Software

Research Scenario

a. *Corpus*(Text Data Source)

The corpus widget serves as the initial step in the text data analysis process, namely as a place to load a collection of previously prepared texts in CSV or TXT format, such as exported interview results that have been cleaned of irrelevant parts. At this stage, the Corpus becomes the main container for text data that will be analyzed further, both from a linguistic aspect and statistically. Through this process, researchers can explore the meaning, patterns, and sentiments contained in the text in more depth and systematically.

Figure 3. Corpus

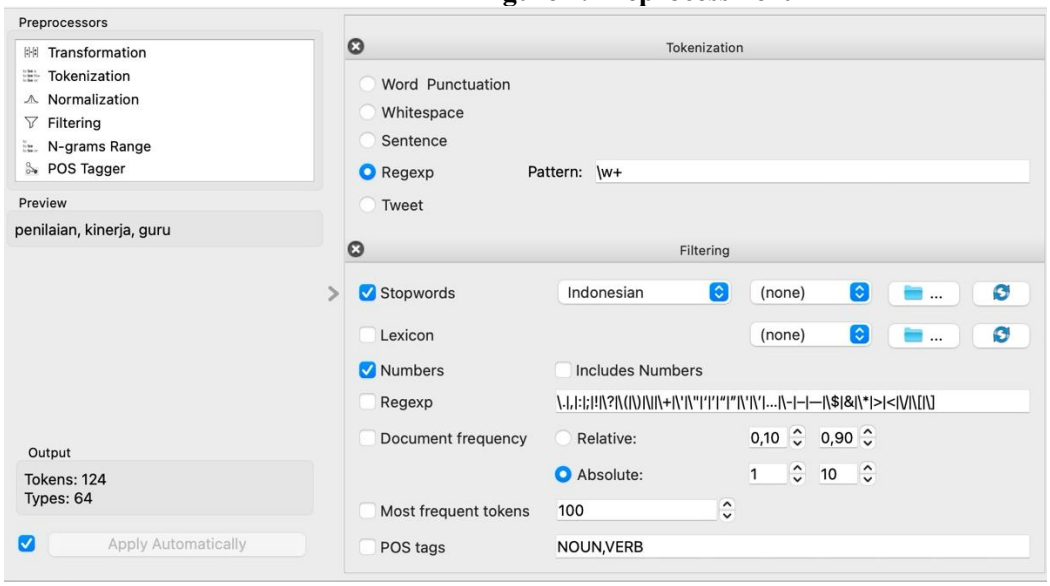


Source: Orange Data Mining Software

b. *Text Preprocessing*

This widget plays a crucial role in preparing text data for analysis. The process includes lowercase letters, removing common words that lack analytical significance, and removing unnecessary punctuation. The text is then broken down into chunks (tokenization) and simplified to its basic form through stemming or lemmatization. These steps make the text data cleaner, more structured, and easier to process in subsequent analysis stages.

Figure 4. Preprocess Text

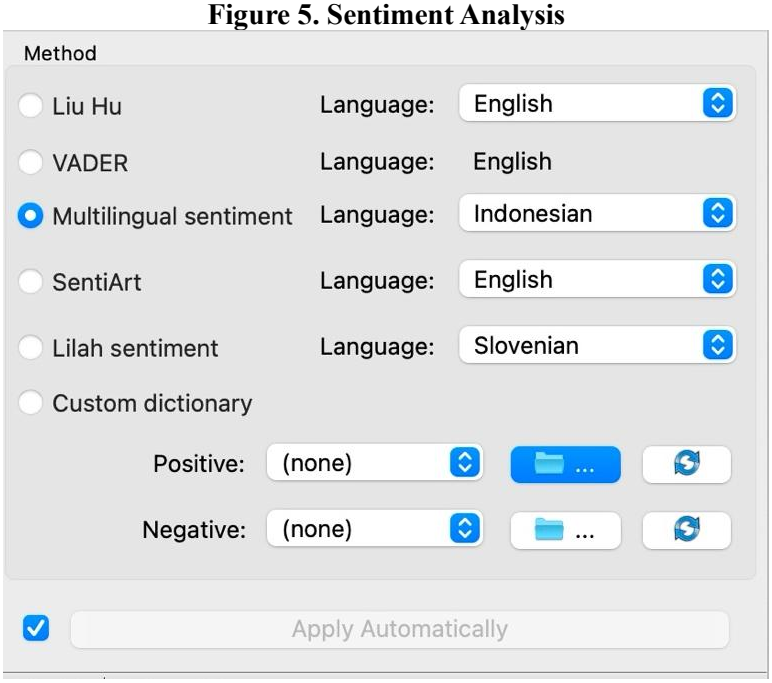


Source: Orange Data Mining Software

c. *Sentiment Analysis*

The sentiment analysis widget is used to identify and categorize emotions or attitudes in text into positive, negative, or neutral categories. In Orange, this process typically uses the default English language model. Therefore, if the text being analyzed is in Indonesian, additional steps such as manual labeling or the use of an appropriate model are required. After preprocessing, the text data is analyzed with this widget, and the classification results are displayed clearly and structured in a data table widget.

Figure 5. Sentiment Analysis



Source: Orange Data Mining Software

d. Data Table

This widget presents analysis results in an easy-to-understand table. This display allows users to view the original text, the remaining words after pre-processing, and the sentiment classification, whether positive, negative, or neutral. Furthermore, the table can contain additional information such as word frequency or specific score values, making the analysis more comprehensive and informative.

Figure 6. Data Table

include title	Utterance True True	ID	sentiment
1	Disini belum ada penilaian kinerja guru	1	0
2	Belum ada PKG, kalau PKKS disini udah ada	2	0
3	Ada tapi ya gitu paling di cek absensinya aja	3	0
4	Gak tau deh soalnya belum pernah ngerasa di nilai kecuali kehadiran	4	14.2857
5	Ada tapi belum pake sistem gitu jadi ada guru piket keliling ke kelas buat lihat gurunya ngajar atau engga	5	-9.09091
6	Ada ya tapi yang di nilai baru sebagian aja paling dari kehadiran	6	25
7	belum ada, PKG itu apa? Gak ada kayanya	7	0
8	ada tapi itu bagian lpmp yang nilainya	8	0
9	Gak tau tapi selama ini yang udah berjalan penilaian kehadiran guru kalo lagi upacara	9	0
10	Pernah ada waktu ngajar di awasi dari pagi sampai selesai dilihat sesuai RPP atau ngga	10	14.2857
11	Gak tau itu penilaian ada gak ya sejauh ini paling absensi aja	11	0
12	Paling penilaian kehadiran sama pakaian aja	12	0
13	Ada, salah satunya jangan terlalu dekat dengan siswa juga itu biasanya di nilai	13	0
14	Belum tau tapi kadang ada guru piket yang keliling ke kelas cek kehadiran guru dikelas	14	-10
15	Ada, kalau hari senin selalu di data siapa aja guru yang ikut upacara kayanya itu juga buat bahan evaluasi	15	0
16	penilaian kerja guru kayanya belum ada, sejauh ini baru absensi sama pakaian aja yang di nilai	16	25
17	Ada tim kedisplinan namanya lpmp untuk menilai kedisiplinan guru	17	0
18	Belum ada kalau yang pakai kuisioner paling dilihat dari absensi aja	18	0
19	Ada penilaian saat pembelajaran nanti ada yang ngawas tapi pasti di kasih tau dari sebelumnya	19	20
20	Pernah waktu ngajar di lihatin tapi itu juga baru sekali tahun lalu	20	0
21	Ada tapi baru absensi dan kedisplinan seragam yang dipakai aja	21	0
22	Belum ada yang kuisioner gitu paling ada guru piket aja yang keliling	22	-16.6667

Source: Orange Data Mining Software

Figure 6. Data table containing 22 interview statements that have undergone sentiment analysis. Each row shows the respondent's statement quote, data ID, and the detected sentiment value.

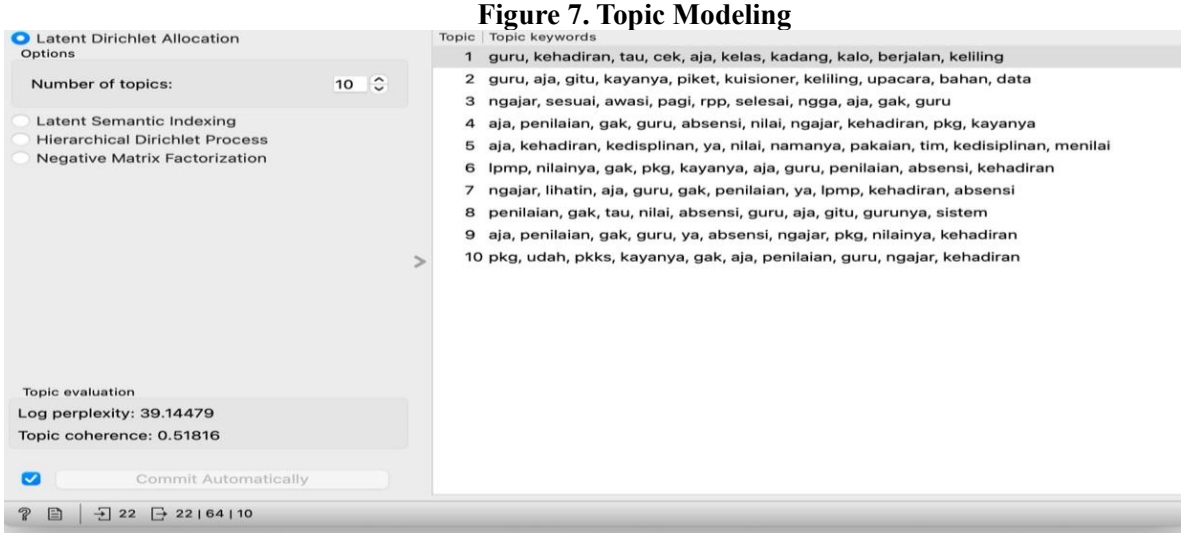
Sentiment Classification is divided into three categories:

1) Positive: marked with a sentiment value of more than 0. Statements 6 and 16 have a value of 25 each, indicating a positive attitude or perception towards the topic of teacher performance assessment at SMKS Hassina Sukabumi.
2) Negative: marked with a sentiment value of less than 0. ID 5 (-9.9091) and ID 22 (-16.6667) indicate dissatisfaction or a critical view of the assessment process.
3) Neutral: marked with a value of 0, indicating an informative statement without any clear emotional expression. The majority of data (approximately more than 50%) falls into this neutral category.

e. Topic Modeling

Topic modeling is a feature used to identify key themes hidden within a collection of text. Using algorithms such as Latent Dirichlet Allocation (LDA), this feature groups frequently occurring words into specific topics. The result is a list of topics along with keywords representing the content of each topic, making it easier to understand conversation patterns and the main focus of the information, especially when dealing with large and diverse data sets.

Figure 7. Topic Modeling



Source: Software Orang Data Mining

Figure 7. Topic Modeling, based on the results of the topic using the Latent Dirichlet Allocation (LDA) algorithm on interview data related to teacher performance assessment, identified 10 main themes that frequently emerged from the conversation. These themes reflect the main focus in the assessment process, including: Teacher presence and supervision in class, the role of teachers on duty and data collection, the suitability of learning with the RPP, attendance as a basis for assessment, discipline and compliance with rules, the role of LPMP and the evaluation process, observation of teaching activities, the general teacher performance assessment system, PKG and work indicators, PKKS and comprehensive evaluation.

The analysis shows that current teacher performance assessments still focus on administrative aspects such as absences, discipline, and attendance. Meanwhile, aspects related to the quality of the learning process and pedagogical outcomes have not yet received full attention. This finding indicates the need to develop a more comprehensive assessment system oriented toward learning quality.

f. *Word Cloud*

Word clouds are a simple yet informative visualization method for text analysis. This technique displays the most frequently occurring words from data such as interview results, comments, or feedback in the form of a word cloud image. This display allows users to quickly understand the main themes or topics most frequently discussed by respondents without having to read each sentence in detail.

Figure 8. Word Cloud

Source: Orange Data Mining Software

Figure 8. The word cloud above shows that words such as teacher, assessment, absence, duty grades, and teaching appear most prominently. This indicates that respondents mostly discussed teacher presence and absence, teaching activities, and the role of duty teachers as part of the performance assessment process.

Overall, these results indicate that current teacher performance assessments still focus on administrative aspects such as attendance, absenteeism, and discipline. Meanwhile, other aspects, such as the quality of the learning process and student learning outcomes, have received little attention in respondents' responses.

g. *Heat Map*

A heat map is a visualization that displays the level of perception intensity based on the results of text data analysis using Orange Data Mining. The colors on the heat map, ranging from blue (low intensity) to yellow (high intensity), make it easier to see the most prominent, frequently occurring, or important statements within the classification or topic being analyzed. This visualization helps understand data patterns more quickly and deeply.

Figure 9. Heat Map

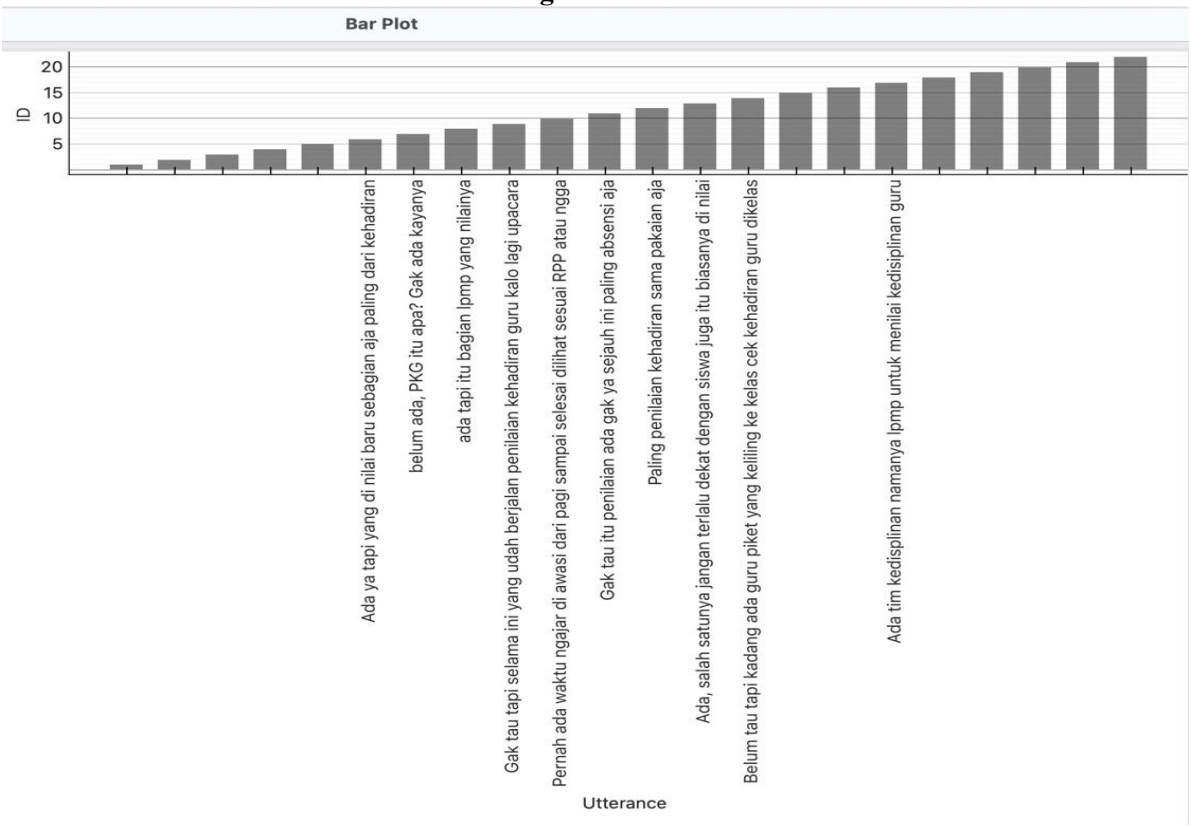
Source: Orange Data Mining Software

Figure 9. The heat map shows that most respondents feel that current teacher performance assessments are not running optimally. Assessments are still limited to basic aspects such as absence, attendance, and discipline, while other important aspects such as the quality of the teaching process and learning outcomes have received little attention. Furthermore, terms and assessment instruments such as PKS, PKKS, and LPMP have emerged. These findings indicate the need for a more comprehensive, targeted, and easily understood evaluation system so that teacher assessments reflect the true situation.

h. Bar Plot

A bar plot is a visualization of processed text data using Orange Data Mining, displaying respondents' statements or comments in bar format. Each bar represents a single comment, displayed sequentially based on the data ID. The length of the bar does not indicate the number of words or sentiment, but rather the position of each statement within the dataset. This visualization makes it easier to see the structured and organized arrangement of respondents' comments.

Figure 10. Bar Plot



Source: Orange Data Mining Software

Figure 10. The bar plot shows that respondents' comments most frequently focused on teacher attendance and absenteeism, suboptimal performance assessments, and discipline and dress codes. Furthermore, there was also concern about the lack of PKG (Community Development Planning) and the role of LPMP (Regional Leadership Development Institute) in the evaluation process. This visualization helps to succinctly and structuredly highlight the main focus of respondents' perceptions.

CONCLUSION

Based on the results of text data analysis using a text mining approach with the help of Orange Data Mining through the Topic Modeling, Word Cloud, Heat Map, and Bar Plot methods, it shows that teacher performance assessments at SMKS Hassina Sukabumi still focus on aspects of discipline and compliance with school rules. The main themes that emerged were mostly related to attendance, punctuality, and administrative responsibilities, which indicates that the performance assessment dimensions do not fully cover all teacher competencies. The Word Cloud visualization shows the dominance of words related to discipline and attendance, while other important aspects such as pedagogical, professional, social, and teacher personality competencies have received less attention. This is reinforced by the Heat Map results, which indicate that respondents' perceptions remain focused on administrative aspects. Meanwhile, the Bar Plot demonstrates the consistency of respondents' perceptions, with a tendency toward similar themes. Overall, the results of this study indicate that the teacher performance assessment mechanism at SMKS Hassina Sukabumi is still partial and does not reflect a comprehensive assessment of teachers' roles and contributions. Therefore, the development of a more holistic and integrated evaluation instrument is needed, one that not only assesses discipline but also encompasses various dimensions of teacher competency in accordance with professional standards. This step is expected to provide a more objective picture and support improvements in the quality of learning and the optimal achievement of educational goals.

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