

## Conference Paper

# Analysing Teacher Training Participants' Feedback Using Natural Language Processing

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**Abstract.**

To assess the quality-of-service PGRI Jawa Tengah provided to its community through its teacher training programs, it needed to understand the input from the community itself. However, analysing and gaining insight from thousands of written feedback is hard and tedious. This research aimed to extract information from training participants' feedback using Natural Language Processing techniques. The result showed that the most recurring theme for participant feedback is "very beneficial", "very helpful", "satisfactory", "thank you", "adding insights", and "more training like this". This means that most participants are satisfied with the training held by PGRI Jawa Tengah and expect more of this training to be held in the future. Based on these findings, PGRI Jawa Tengah should hold more teacher training programs in the future that are similar or greater in quality than the already established training.

**Keywords:** teacher training; participants feedback; text mining; natural language processing

## 1. Introduction

Teachers' roles in the classroom is seen in several perspectives. They help students to develop a positive attitude in learning, evoke curiosity, and enhance independence character and accuracy of intellectual logic. Teachers' important role is very helpful in managing the classroom and creating an effective teaching and learning process. Teachers' competence and performance play the prior responsibility in students' transformation from ignorance to make sense the world around, from dependence to independence character, from unskilled to skilled. Currently, the learning methods are no longer preparing passive students but the one who are actively participate in the teaching and learning process. Those students are expected to be able to absorb and

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adjust the newest information by exploring, thinking, asking, creating, and developing alternative ways of solving problems related to their daily activities. Teachers must be involved in most cases when everyone is questioning the issues of the education system in the world. It is because of the students spend most of the time in the school with their teachers, the rest is at home and in their local community (1). Therefore, the government always makes improvements in terms of quality and quantity, such as the curriculum which is a teacher's guideline in teaching.

Those facts reveal that teachers' role are important to raise the better education system in the world. Teachers are one of the school members who have a role as instructors to enhance the quality of education. Furthermore, teachers are responsible for providing guidance that will produce the expected excellent graduates. Hence, teacher performance must be improved periodically. Some efforts have carried out to engage teachers' performance by providing incentives, providing teacher training programs, and other relevant efforts.

Meanwhile, teacher performance can be improved if the person concerned knows what is expected and when he can set expectations that are recognized by the results of his work (2). Further, in improving teachers' performance in their teaching competence and soft-skills, the school needs to focus on the prior factors that affect the teachers' teaching and learning process. The prior factors are such as attending seminars, workshops, and other teacher training programs provided by the third parties in education department (3). Those activities can foster teachers' motivation to carry out their job. However, many cases still talk about bad teacher performance who cannot be responsible and professional in teaching their students in the classroom (4).

Education and training provide opportunities for teachers to gain new knowledge, skills, and attitudes that change their behaviour which will ultimately improve performance and will also have an impact on improving student learning achievement. People's performance in their jobs will improve as a result of teacher improvement training. In order to implement the teacher training program to improve teachers' performance, some aspects should be considered. For instance, school-based management should be implemented in a good way, giving instructions and guidance from the school principals and their supervisors so that the teaching skills performance can be achieved directly. Teachers must have some educational background and provisions in delivering the materials to their students. For example, the school can provide pre-teaching training, seminars and workshop with the topic related.

Next, the most important part in supporting the creation of an effective learning process is grounded in the teachers' performance (5). By joining those kind of teacher

training programs, teachers can implement the materials and teaching methods to their students during the teaching and learning process. If these teachers carry out the principles of professionalism in carrying out their roles and responsibilities, it will produce an excellent performance. The efficacy of the teacher in the learning process is rely on the teacher's performance as an educator role in the classroom. Teacher performance is the ability of a teacher to carry out learning tasks at school and is responsible for students under his guidance by improving student learning achievement. Teachers are also required to have a well-academic qualifications, educator profession certification, soft-skills competence, physical and spiritual health, and the capabilities to understand national education goals. Carrying out the obligations responsibly and appropriately is also a part of teacher competence (6).

Teacher performance or work achievement as an educator rely on their teaching proficiency, experiences, and sincerity as well as the use of time. If a teacher has demonstrated the following qualities, their performance will be good: loyalty and high commitment to their teaching duties; mastery of and development of lesson materials; discipline in teaching and other tasks; creativity in the implementation of teaching; cooperation with all school residents; leadership that is an example for students; a positive disposition; honesty and objectivity in student guidance; and responsibility for their duties (7). In doing their duties as an educator, the teacher is not working in a vacuum. It is obligated to follow nationally determined signposts of what it should perform because it is a component of the "great machine" of the successful national education system. Everywhere though, things go on as usual, but in the setting of teacher professionalism, where teaching is viewed as a professional occupation, instructors are expected to be professional in doing their roles. In essence, there are a number of duties that teachers must perform in connection with their profession as educators, including the following: (1) tasks in the professional field include educating, teaching, and training students; (2) tasks in the field of humanity require teachers in schools to be second parents, be able to understand students, and assist students in transforming and identifying the participants themselves; (3) tasks in the community sector include assisting the underprivileged (8).

Mangkunegara (2011) in his research journal (9) In order to ensure that the educational goals that have been set are properly achieved through a learning activity carried out by teachers in accordance with targets and objectives, it has been explained that teacher performance is a learning process as an effort to develop existing activities into better activities. Additionally, according to Rusyan (2016), a teacher's role includes facilitating learning inside and outside the classroom, working on other tasks like managing school

administration and learning administration, providing student guidance and services, and conducting assessments (10). Gaining insight from thousands of textual feedback is a hard and tedious task. PGRI Jawa Tengah had held numerous teacher training sessions in the past two years. This research aims to extract important information from training participants' feedback as the base of how PGRI Jawa Tengah can further improve its services to their community. The text analysis will use Natural Language Processing (NLP) / Text Mining techniques which are part of Data Mining / Machine Learning technology.

Word Cloud is one of the techniques in NLP which helps to highlight important insight in the form of keywords from a collection of textual document data. The techniques had been used to analyze the public's opinion toward a particular issue (11), product reviews (12), bibliometric analysis (13), speech (14), etc.

## 2. Method

The research method is shown in Figure 1. Data is collected from training participants by using Google Forms from numerous (46) training held between June 2021 and May 2022. The total feedback consists of 11477 rows of data. The data is prepared in a CSV file. In principle, the word cloud creation process works by listing all unique keywords (terms) from the documents and counting the frequency of each term. Then, the n top most frequent terms will be visualized on the word cloud. The size of each term represents its corresponding relative frequencies. The wordcloud generation is facilitated by using Python 3.7, Jupyter Notebook (15), and wordcloud (16), and matplotlib (17) libraries. The result of the word cloud is then interpreted and discussion is made.

## 3. Result and Discussion

The text analysis results are shown in Table 2 and Figure 2. These results showed that most people are satisfied with the training held by PGRI Jawa Tengah. The most recurring theme for participant feedback is "very beneficial", "very helpful", "satisfactory", "thank you", "adding insights", and "more training like this". These results mean that the participants are satisfied with the training, consider the training beneficial to them, and expect other such training to be held again in the future. Based on these findings, therefore, PGRI Jawa Tengah should hold more teacher training programs with a quality similar to or greater than the already established training in the future to improve their services to their community. Future research may add topic clustering technique such

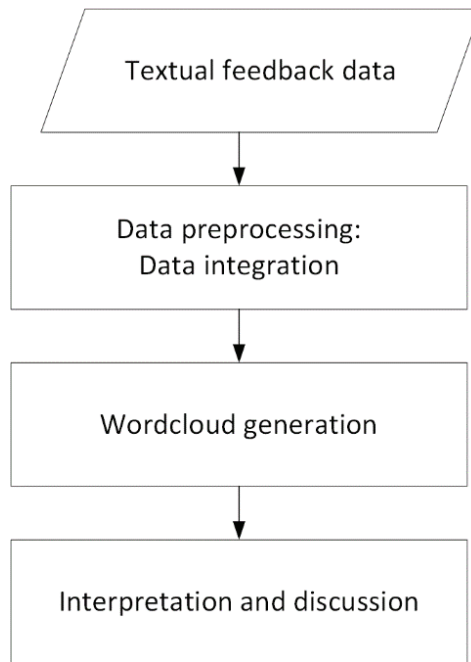


Figure 1: The research method.

as Latent Dirichlet Allocation to identify the most recurring topics in the participants' feedback (18).



Figure 2: The word cloud for participants' feedback.

TABLE 1: The top 50 recurring phrases in participant's feedback.

keywords	count
sangat bermanfaat	1386
materi	711
untuk	680
sangat membantu	616
Sudah bagus	444
dan	417
Terima kasih	358
seperti ini	355
lagi	341
Sangat bagus	304
Mohon	299
Lanjutkan	281
Lebih sering	277
ini sangat	268
Terimakasih	238
Seminar Kamisan	234
sering diadakan	233
bisa	225
Sudah baik	223
seminar ini	220
lebih banyak	217
bagus dan	204
materi yang	201
bermanfaat bagi	199
agar	197
dengan	194
saya	190
karena	186
terus	175
materinya	174
menambah wawasan	165
di	164
bermanfaat untuk	158
dapat	158
waktu	154
dan bermanfaat	151
soal soal	148
yang	147
tes PPPK	147
yg	144
sangat baik	144
ada	143
lebih baik	140
Semoga	140
bermanfaat dan	139
pak	135
bermanfaat sekali	130
bagus Sangat	128
Sudah sangat	126
untuk menambah	126

## 4. Conclusion

This research aims to extract important information from training participants' feedback as the base of how PGRI Jawa Tengah can further improve its services to their community. The text analysis uses Natural Language Processing (NLP) / text mining techniques as part of Data Mining / Machine Learning. The result showed that the most recurring theme for participant feedback is "very beneficial", "very helpful", "satisfactory", "thank you", "adding insights", and "more training like this". This means that most people are satisfied with the training held by PGRI Jawa Tengah and expect more of this training to be held. Based on these findings, therefore, PGRI Jawa Tengah should hold more teacher training programs with a quality similar to or greater than the already established training in the future to improve their services to their community.

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