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| RESEARCH ARTICLE

Description and Analysis of the Competence and Performance of Mathematics Teachers during the COVID 19 Pandemic: A Study Conducted in Gorontalo City

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| ABSTRACT
In the era of the COVID-19 pandemic, online learning has become the main alternative to the learning system taken by schools. The implementation of the online system certainly affects teachers' performance as the frontline in the success of a learning process. In this case, at least the teacher's performance has been directly or indirectly influenced by the learning system that is being carried out. This study aimed to describe and analyze the performance of teachers' competencies during the COVID-19 pandemic. The study relied on a quantitative descriptive method, and the data were taken from the results of a questionnaire distributed to 89 teachers. The research instrument used questionnaires and interviews, which had previously been tested for validity and reliability. Furthermore, the results of the questionnaires were analyzed based on theories related to teacher performance and theories related to teacher competency development. The result showed that the teachers' performances with the online learning system during the COVID-19 pandemic were varied and greatly influenced by the competence of the previous teacher. Based on these results, it could be concluded that teachers with high competence had higher performance than teachers with low competence in online learning. Likewise, there was an interaction between the ability of teacher competence and teacher performance in online mathematics learning. Further, the average performance of mathematics teachers in online learning was lower than the performance of teachers who use ordinary learning.

| KEYWORDS

Competence, Performance, Mathematics Teacher, COVID-19 pandemic

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1. Introduction

The emergence of the COVID-19 pandemic, whether recognized or not, has devastated almost all activities in all sectors, including the education sector. The COVID-19 pandemic seems to have turned into a very feared virus. As a result, the social interaction of the community is disrupted, so the government has made various efforts to limit social interaction. This limitation has impacted all activities in various sectors, such as the economic and education sectors. For the education sector, the COVID-19 pandemic has changed various policies related to schools' teaching and learning process. The application of various rules related to controlling COVID-19, such as restrictions on large-scale activities or other policies, has directly changed the learning process. The learning process has changed from face-to-face to online learning. In this case, the implementation of the 'New Normal' situation in the midst of the COVID-19 pandemic has changed the paradigm of the learning process from directly in class or face-to-face to distance learning with online media.

Generally, at the beginning of online learning, the enthusiasm of students to take part in the lesson is still under control. However, it seems that students' enthusiasm has begun to decrease over time. They are more likely to play games than to take part in the lessons organized by the teacher. Not to mention that they are hampered by having to buy internet access quota which is quite heavy for the poor students. The assistance provided by the government in the form of credit assistance does not seem to be too helpful for students in maximizing the learning outcomes that should be obtained in a learning process.

On the other hand, the teacher, as the main actor in learning during this pandemic, also feels confused about what to do in managing learning with the online system. The face-to-face learning model they have been doing so far has to be changed to distance learning. The teacher's confusion is understandable because most teachers are not familiar with online learning. Most of them are still stutter about online technology that they have to do to carry out the teaching and learning process. In fact, one of the most important elements in the teaching and learning process is the role of the teacher, who functions as an educator, trainer, mentor, facilitator, and motivator in the whole teaching and learning process both inside and outside the classroom.

During the current COVID-19 pandemic, teachers are required to optimize all their abilities so that online learning will take place as it should. In this case, learning messages in the form of knowledge transfer, value transfer, and attitude transfer will continue to take place along with the online learning process. In education theory, the expectation that all education stakeholders want is that the pandemic is not an obstacle for the teaching and learning process to take place. Thus, the teachers must continue to try to carry out their profession as professional teachers who are reflected in the performance shown during online learning. In any situation, teachers are still required to carry out their duties professionally by adjusting the conditions and circumstances faced in real terms. They are required to optimize their competence and performance in this current new normal situation which resulted from the COVID-19 pandemic outbreak.

Referring to the description above, the study intended to describe and analyze the relationship between teacher performance and competence during online learning during the COVID-19 pandemic. The formulation of the problems are: (1) how is the description of the competence and performance of high school mathematics teachers during the COVID-19 pandemic? (2) how far is the influence of online learning on the performance of mathematics teachers in the COVID-19 pandemic era?; (3) what is the interaction pattern between variations in teacher abilities and mathematics teacher performance during the COVID-19 pandemic?

2. Methodology

This quantitative research employed a descriptive explorative method. The study described and analyzed the results based on predetermined indicators. This research was carried out in all mathematics teachers of SMA, MA and SMK in Gorontalo City, involving 86 mathematics teachers, consisting of 40 senior teachers and 46 junior teachers. Determination of the sample was determined by using a purposive sampling technique based on certain objectives and considerations.

The data collection techniques used in this study are: (1) observation; (2) questionnaire consisting of five answer options: Always, Often, Sometimes, Never, Do not know. The questions were constructed based on the main indicators of teacher performance and competence. Teacher performance was then summarized in four competencies, namely pedagogic competence, professional competence, social competence and performance, and personality competence; (3) interviews were conducted using the face-to-face technique by asking questions related to the performance of teachers in online learning during the COVID-19 pandemic. In addition, interviews were aimed at exploring the performance and competence of mathematics teachers during online learning. The interviews and teacher questionnaires were classified into two categories; (1) competence and high performance; (2) competence and low performance (Kelly in Widyanto, 2009).

Furthermore, assessment instruments of the teacher performance included: (1) Instruments for assessing pedagogic performance consisted of an instrument for assessing the ability to manage learning, understanding of students, learning design, educating and dialogical learning, utilization of learning technology, and student development. (2) The personality performance assessment instrument consisted of an assessment instrument to measure the teacher's steadiness, stability, maturity, discipline, wisdom, good character, and authority. It also assesses how the teacher could be a role model for students. (3) The social performance assessment instrument consisted of an instrument for assessing the ability of teachers to communicate and interact effectively with students, the ability to communicate and socialize effectively with fellow educators and education staff, the ability to communicate and associate effectively with parents or guardians of students and the surrounding community. (4) Professional performance research instruments consisted of an instrument for assessing the ability to master learning material broadly and deeply and an instrument for assessing mastery of the structure and scientific methodology.

In this study, nine mathematics teachers were interviewed, three people in the high group, three in the medium group, and three in the low groups. After collecting data, the results were described and analyzed by using the data analysis technique proposed by Sugiono (246) with the following steps: (1) Data reduction by checking the results of filling in the lift made by the teacher based on the answer sheet. Recorded the interview and re-wrote it in the form of a transcript. The data obtained were selected based on indicators and required information. (2) Data presentation. The data presented is in the form of a description and analysis of the competence and performance of teachers in learning from the COVID-19 pandemic. (3) Drawing conclusions and verifying data. The data obtained after being analyzed make conclusions based on the findings in the field and valid and consistent evidence from the research results.

3. Results and Discussion

Based on the results of questionnaires and interviews, the findings and results of hypothesis testing can be presented for each hypothesis formulated and tested. The research hypothesis was tested using the Analysis of Variance technique (ANOVA 2 x 2). Then, further tests were carried out using the Tuckey test (Q test). The results of the 2-way ANOVA calculation can briefly be seen in the following table.

Table 1. Summary of ANAVA Calculation Results of Teacher Performance Data

Source of Variance	**Sum of Squares**	**Df**	**Mean Sum of Squares**	**F_{count}**	**F_{table}** (α = 0,01)	**F_{table}** (α = 0,05)
Inter-teachers performance in online learning (A)	320.7273	1	320.7273	4.18*)	3.95	6.94
Inter-teachers competencies (B)	410.2273	1	410.2273	5.35*)	3.95	6.94
Between online learning and teacher performance (AB)	5504.7273	1	5504.727	71.78**)	3.95	6.94
D	6441.9091	84	76.6894			
T o t a l (T)	12677.5909	87	6312.371			

Note :

*) = Significant (F_{count} = 4.18 > F_{table} = 3.95 at α= 0.05, but F_{count} = 4.18 < F_{table} = 6.94 at α = 0.01)

**) = Significant (F_{count} = 71.78 > F_{table} = 3.95 at α= 0.05, and F_{count} = 71.78 < F_{table} = 6.94 at α= 0.01)

Based on the summary of the two-way ANOVA calculation above, it can be concluded that the results of the first and second research hypothesis testing are as follows:

3.1 First Hypothesis Testing

The first hypothesis proposed in this study is "Teachers who have high competence have higher performance than teachers who have low competence in online learning". From the results of calculations using the F-test, F_{count} = 4.18 is greater than F_{table} = 3.95 at a significance level = 0.05 with degrees of freedom (df) in the numerator = 1 and df in the denominator = 84. Thus the first hypothesis is accepted.

The difference in teacher performance can be seen from the calculation results, which show the average teacher performance (ȲA1) is 67.84, which is higher than the average performance with an average teacher competency (ȲA2) of 64.02. This finding shows that the first hypothesis is confirmed. In other words, differences in competency abilities also affect teacher performance in online learning.

3.2 Second Hypothesis Testing

The second hypothesis proposed in this study is "There is an interaction between teacher competence and teacher performance in online mathematics learning". From the results of calculations using the F-test, F_{count} = 71.78 is greater than F_{table} = 3.95 at a significance level of = 0.05 with degrees of freedom (df) in the numerator = 1 and df in the denominator = 84. Thus, the second hypothesis is accepted significantly. To determine the significance of the interactions between the research variables, this study used a further test calculation (Tuckey's test), considering that the number of subjects/sample (n) in each group/cell was the same. The results of further test calculations with Tuckey's test for the two groups/subjects being compared are presented in the following table.

Table 2. Summary of Tuckey Test Calculation Results (α = 0.05)

No.	Comparison Groups	Q_{count}	Q_{table}	Conclusion
1.	**$A_1 B_1$** with **$A_2 B_1$**	**21,03**	**2.94**	Significant
2.	**$A_1 B_2$** with **$A_2 B_2$**	**12,85**	**2.94**	Significant

3.3 Third Hypothesis Testing

The third hypothesis proposed in this study is "The level of teacher competence affects the level of teacher performance in online learning". Testing the third hypothesis is done by comparing the average competence of teachers who have the type of performance in online learning ($\bar{Y}_{A1B1}$) with the average competence who has the performance of mathematics teachers in offline learning ($\bar{Y}_{A2B1}$).

The analysis results obtained the value of $Q_{count} = Q_{(A1B1 \times A2B1)}$ of 21.03. The value of Q_{table} at the significance level of = 0.05 is 2.94. As $Q_{count} > Q_{table}$, the hypothesis is accepted. This finding shows that the third research hypothesis is proven true.

3.4 Fourth Hypothesis Testing

The fourth hypothesis proposed in this study is "The average performance of mathematics teachers in offline learning is higher than the average performance of teachers in online learning. The fourth hypothesis was tested by comparing the average teacher performance in offline learning ($\bar{Y}_{A2B2}$) with the average teacher performance in online learning ($\bar{Y}_{A1B2}$). The analysis results using the Tuckey test ($\bar{Y}_{A2B2}$) showed that there were differences in teacher performance in informal learning and teacher performance in online learning ($\bar{Y}_{A1B2}$). In this case, the value of $Q_{count} = Q_{(A2B2 \times A1B2)}$ is 12.85. The value of Q_{table} at the significance level of = 0.05 is 2.94. As $Q_{count} > Q_{table}$, the null hypothesis, which states that "the average teacher competence is less than or equal to the average teacher competence in online learning", is rejected. This means that the alternative hypothesis, which states, "The competence of mathematics teachers in online learning is higher than those using ordinary learning", is accepted.

This is in accordance with the acquisition of the average competence of online mathematics teachers ($\bar{Y}_{A2B2}$) of 69.77, which is higher than the average competence of mathematics teachers in ordinary learning ($\bar{Y}_{A1B2}$) of 57.77.

This finding shows that the fourth research hypothesis is verified. Thus, it can be said that offline learning is more suitable to be applied to students in any situation.

4. Conclusion

Based on the results and findings that have been described above, it can be concluded that teacher competence and performance are interrelated and influence each other. Someone who has high competence will also have high performance in online learning during the covid 19 pandemic. On the other hand, teachers who have low competence during learning will experience difficulties and show low performance as well. In general, teachers feel they have encountered obstacles in carrying out their online teaching tasks. This is because they are not optimal in carrying out their professional duties as educators. Besides, they have problems with various facilities that support online learning, both network facilities and pulses used and very minimal IT mastery. Offline learning remains the best choice for teachers in carrying out their professional duties as teachers. Therefore, they really hope that the COVID-19 pandemic will end soon and that learning will go back to normal. As this research only limited its scope to a small area of a province; thus this study recommends for further research to be conducted in the bigger area.

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