Improvement of Student Learning Outcomes through the Role of Teachers Performance in the Learning Process

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Abstract. Teachers have the responsibility to teach and guide students in understanding subject matter, developing skills, and helping students grow as better individuals. This research uses a quantitative research approach with quasi-experiments. The design of this study is factorial. Junior High School Negeri 1 Langke Rembong has a research population of 430 students spread across 12 classes. Determination of research samples using random sampling techniques. The technique of collecting learning outcome data uses test instruments and one-way analysis of variance for statistical analysis. The findings showed no difference in the learning outcomes learned by teachers A, B, and C. This proves that the cooperation of cognate teachers in preparing for learning is extremely helpful in improving teacher competence.

Keywords: Learning outcomes; teacher role; learning; teacher competence

1 Introduction

Education is an important investment in individual development and the progress of society as a whole [1], [2]. Education is not just about acquiring knowledge but also about preparing individuals to face challenges and opportunities in life [3]. Awareness of the importance of education makes students try to study hard to obtain maximum learning results. Learning outcomes can be measured in many ways, depending on the educational context and learning goals. Learning outcomes reflect the extent to which a person has understood and mastered the subject matter or skill taught [4]. Learning outcomes are important in the educational process because they assist teachers, students, and educational institutions in evaluating the effectiveness of teaching and learning [5]. By understanding learning outcomes, students can reflect, evaluate, and monitor their learning effectively, and students need clear guidance, such as that from a teacher [6]. By understanding the expected outcomes, students can better focus their efforts, engage in deeper learning, and develop a sense of purpose [7].

The effectiveness of the learning process is also greatly influenced by teacher performance. The teacher plays a multifaceted role in the learning process, going beyond the dissemination of knowledge. Teachers are responsible for teaching and guiding students in understanding the subject matter, developing skills, and helping students grow as better individuals [8]. The impact of teacher performance extends beyond the classroom, influencing students' attitudes, values, and aspirations.

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The role of performance and the main responsibilities of a teacher can be described as follows: a) teachers as educators are key in the classroom and are responsible for planning, teaching, and are key in all forms of educational reform [9]; b) teachers as motivators have an important role in motivating students to learn and creating an environment that supports the spirit of learning and curiosity [10]; c) teachers as assessors in evaluating student progress by giving assignments, exams, and other assessments [11], [12]; d) teachers serve as guides in assisting students in solving problems, overcoming learning difficulties, and providing guidance in the development of social and emotional skills [13]; e) teachers as models of good behavior for students by showing attitudes, values, and ethics expected of students [14]; f) teachers as creators of learning environments that are safe, inclusive, and ensure that students feel comfortable to learn [15]; g) teachers as collaborators in working closely with fellow teachers, parents, and other school staff [16]; h) teachers as material makers must adjust to the character of students, so as to create shared content design, joint teaching, the creation of shared learning experiences and outcomes, and embedded shared learning [17]. In addition, teachers also play an important role in improving students' digital literacy [9].

Thus, teachers have a huge impact on the lives of students and play a key role in shaping the future of the younger generation through improving student learning outcomes. In addition, to improve student learning outcomes through teacher performance roles, it is important to implement effective strategies. Professional development programs can enhance teachers' pedagogical skills, keep them updated with the latest teaching methodologies, and provide them with the necessary support to meet diverse learning needs. Mentoring programs and collaborative learning communities can also create a culture of continuous improvement among teachers.

The results of the study [18] explain that teacher competence has a direct and indirect impact on academic performance through student engagement. The interpretation of equity in this study is to equate student learning outcomes with the basis of emerging from equal opportunities. This refers to the idea that unequal learning outcomes may be acceptable if they arise from equal opportunities [19].

However, unequal student learning outcomes tend to arise from unequal learning opportunities. Previous findings explain that the quality of learning outcomes is still very poor, and significant effort is needed until most learning outcomes can achieve internationally accepted best practices [20]. In addition, students who experience math difficulties also experience growth over time in math problems, so they have to struggle in subsequent classes [21]. Low student math learning outcomes tend to lead to cognitive problems such as computation (calculation), fact retrieval, number concepts (quantity processing), quantity connections, number relations, and short-term visuospatial storage [22]. The role of teachers who are incompetent or less concerned with student development also affects student learning outcomes. Other findings also explain that teacher expectations may also increase, or exacerbate, present success variations amongst college students with the aid of using expectations greater from high-reaching college students and much less from low-reaching college students [23].

Departing from the above problems and awareness of the importance of the role of teachers, this research needs to be conducted. The research aims to find whether there is a difference in student learning outcomes when different teachers teach. This research is important because differences in teacher roles caused by differences in teacher competence and motivation have an impact on differences in student learning outcomes.

2 Method

This study used a quantitative posttest only control group research approach with a quasi-experimental design. The design of this study is factorial. The type of research conducted is experimental research. The population of this study was 430 students at Junior High School Negeri 1 Langke Rembong, East Nusa Tenggara, spread across twelve classes. There are three teachers teaching in this study population, with the following distribution:

Table 1. Dispersal of Residents of Class VII Junior High School Negeri 1 Langke Rembong Basic Teacher's Duty

Teacher A		Teacher B		Teacher C	
Class	Amount	Class	Amount	Class	Amount
VII A	36	VII F	36	VII K	36
VII B	35	VII G	37	VII L	36
VII C	35	VII H	36		
VII D	35	VII I	36		
VII E	36	VII J	36		
Amount	177		181		72

Determination of research samples using random sampling techniques to obtain three classes. Sampling in this study was carried out following Roscoe's advice [24], where the feasibility of the sample size of the study ranged from 30 to 500 and samples in categories, with the number of sample members in each category being at least 30. The following table presents the distribution data for the research sample.

Table 2. The Distribution of Research Samples of Junior High School Negeri 1 Langke Rembong

Teacher A		Teacher B		Teacher C	
Class	Amount	Class	Amount	Class	Amount
VII B	35 persons	VII F	36 persons	VII K	36 persons

Data collection using description test instruments that meet the criteria of item validity and instrument reliability. The data collection is based on mathematics learning outcomes in grade VII junior high school material with the subject of lines and angles, triangles, and quadrilaterals in the even semester of 2021 and 2022.

Analysis techniques use descriptive statistical analysis and inferential statistical analysis, including prerequisite testing (normality test and homogeneity test) and hypothesis testing. Hypothesis testing using one-way Analysis of variance.

3 Results and Discussion

3.1 Descriptive Analysis

The goal of descriptive analysis is to describe, mention, or decipher data without making general conclusions. The following table presents the output of the descriptive analysis of the data on student learning outcomes.

Table 3. The results of Descriptive Analysis of Mathematics Learning Outcomes Data

Teachers	A	B	C
N Valid	35	36	36
Mean	72,66	71,89	71,5
Median	73	71,5	71,5
Mode	70	70[a]	70
Std. Dev.	4,917	6,177	5,634
Variance	24,173	38,159	31,743
Skewness	0,052	0,534	0,145
Kurtosis	-0,591	0,735	-0,222
Range	20	30	25
Min.	63	60	60
Max.	83	90	85

The table above describes that in the application of mathematics' learning, teacher A obtained a mean learning outcome of 72.66, teacher B obtained a mean learning outcome of 71.89, and teacher C obtained a mean learning outcome of 71.50. Referring to the value range, students' abilities are evenly distributed, namely 20–30. This means that there is no huge gap between the abilities of one student and the ability of other students.

3.2 Inferential Statistical Analysis

3.2.1 Pre-Requisite Testing

Testing of analysis of variance requires normality and homogeneity of data. The normality test uses the Kolmogorov-Smirnov test with the aim of finding the distribution of normally distributed data or not. Table 4 presents the output test of normality.

Table 4. Output Tests of Normality Kolmogorov-Smirnov

	Teachers	Statistic	df	Sig.
Residual for Learning Outcomes	A	,134	35	,113
	B	,120	36	,200*
	C	,105	36	,200*

Table 4 informs that the value of sig. Kolmogorov-Smirnov teachers A, B, C is greater than α:0.05. This means that the distribution of data for mathematics learning outcomes is normal.

In addition, the homogeneity test uses Levene Statistics with the aim of providing confidence that the set of data manipulated in a series of analyses does come from populations that are not much different in diversity [25]. Output of Levene's Test are presented in Table 5.

Table 5. Output of Levene's Test

	Levene Statistic	df1	df2	Sig.
Learning Outcomes	,686	2	104	,506

The table above informs that the value of sig. Levene's Test of Equality of Error Variances is greater than α:0.05, which is 0.686. This means that the data come from populations with the same variance.

3.2.2. Hypothesis Testing

This analysis used one-way Analysis of Variance in testing the research hypothesis. The goal is to get information on whether teacher differences affect differences in student mathematics learning outcomes. The following Table 6 presents the output tests of Analysis of Variance.

Table 6. Output One-Way Analysis of Variance

Source of variation	Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	24,549[a]	2	12,275	,391	,678
Intercept	554826,591	1	554826,591	17654,276	,000
Teachers	24,549	2	12,275	,391	,678
Error	3268,441	104	31,427		
Amount	558125,000	107			
Corrected Total	3292,991	106			

The output Analysis of Variance informs the value of sig. The teacher variable of 0.678 is greater than α:0.05. Thus, h_0 is accepted, meaning that teacher differences do not affect differences in students' mathematics learning outcomes.

In theory, equality of student learning outcomes is caused by several factors, including: *first*, awareness of the duties and responsibilities of teachers in educating the nation's children. Daga [26] explained that teachers have the same goals and responsibilities as professional teachers in advancing education in Indonesia and educating the nation's children. *Second*, the role of teacher cooperation in developing pedagogical competence greatly affects the equality of students' mathematics learning outcomes. Cooperation through subject-teacher deliberation is able to find solutions to teacher and student difficulties in learning [27] and unite perceptions with teachers of similar subjects to improve teacher competence. The concept of teacher competence is described as teacher subject knowledge that strengthens the quality of delivery, facilitates the success of the learning process, and improves the quality of assessment [18]. Teachers play a significant role in students' skills and greatly influence potentiating hope for a better future [28]. *Third*, supervision also strengthens teacher competence and wealth of knowledge through supervisory advice and criticism. A teacher is said to be effective when the teacher has achieved the necessary competencies in his role and function, such as improvement and planning of classroom management, subject matter knowledge, teacher characteristics, and interpersonal relationships [29]

Empirically, teacher support promotes better student learning outcomes [30]. All sources of teacher authority have a significant relationship with student learning outcomes [29]. The findings of this study are in line with previously conducted research where there was no difference in teacher performance when viewed from educational background [31] and employment status [32]. Equality of teacher performance has an impact on equality in improving student learning outcomes more because teachers work with other teachers in the same or different schools, as well as with other members of the educational community, such as

scientists [33]. Several other studies have also found that high-quality teachers can improve learning outcomes by reducing the gap between high and low SES students [19], [34]. However, the findings of the previous study [31] also differed from the findings of this study, where there are differences in teacher performance based on length of service. This difference was found in the results of the study [35], suggesting that teachers do not always feel comfortable suggesting improvements to their colleagues. In addition, instead of fostering creativity in learning, learning from and with other teachers can lead to the civilization of existing practices [36].

4 Conclusion

The findings of this study emphasize the importance of equality of teacher competence in the learning process. The equality of teacher competence can also affect the equality of student learning outcomes because the role of the teacher greatly determines the direction and goals of student learning outcomes. Understanding the multifaceted nature of teacher responsibility, addressing factors that affect teacher performance, and implementing effective strategies can improve the quality of student learning outcomes and ensure the holistic development of students.

This study holds significance for multiple stakeholders in the field of education. Firstly, it contributes to the growing body of literature on effective teaching practices and strategies by examining the impact of teacher performance roles on student learning outcomes. The findings from this study can inform the development of evidence-based teaching approaches and interventions that prioritize effective teaching practices. Additionally, the study's results can guide educational policymakers in making informed decisions regarding teacher training, professional development, and curriculum design. By emphasizing the importance of teacher performance roles in shaping student achievement, this study aims to improve the quality of education and enhance student learning outcomes.

This study only looked at the role of teachers in general and their impact on student learning outcomes. Therefore, teacher research based on their respective roles and their impact on student learning outcomes can be the next researcher's study in interpreting the learning process.

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