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The effect of teacher leadership and school climate on students' learning outcomes

Carolus Patampang^{1*)}, Patrio Tandianga¹, Frans Fandy Palinoan¹, Yohanis Salama²

¹STIKPAR Toraja, Indonesia

²Saint Louis University Philippines, Philippines

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ABSTRACT

Student learning outcomes can be influenced by several factors. Some of them are teacher leadership and school climate factors. This study aims to determine the significance of teacher leadership and school climate on student learning outcomes. The method used in this research is a survey research method. The population from this research includes all class X students at Cenderawasih Catholic High School. There are 106 students in class X and consisting of 46 female students and 60 male students. Sampling in this study was carried out by means of simple random sampling. The sample size was determined using Issac & Michael's table. Sampling of this study were 84 and consisting of 38 female students and 46 male students. Data collection techniques in this study were questionnaires and documentation. The data obtained were then analyzed using the Multiple Linear Regression analysis technique. The results of this study indicate that teacher leadership and school climate simultaneously have a positive and significant influence on the learning achievement of Class X Cenderawasih Catholic High School students in the subject of Catholic Religious Education as indicated by the values of the regression coefficients and correlation coefficients which are positive. The implication of this research is to provide enlightenment to all teachers and everyone involved in the world of education that creating a positive school climate and good teacher leadership will have a very good impact on student learning outcomes.



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Corresponding Author:

Carolus Patampang,
STIKPAR Toraja
Email: tandianga@gmail.com

Introduction

The form of management referred to is contained in Law no. 20 of 2003 concerning the National Education System in article 1 states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble morals and skills (Sujana, 2019). What is needed by students, the community, is to develop all the potential that students have through the learning process available in certain pathways, levels and types of education. One of the management efforts in the education sector that can be done to produce quality human resources is by getting used to forming a culture of high-level thinking in students in the learning process (Magdalena et al., 2020; Renwick et al., 2013). Education is a conscious effort to develop the potential of human resources through teaching activities carried out in schools as formal institutions. Meanwhile, school education is a mandate to develop human resources which has been carried out systematically, practically and

in stages. Examples of factors that determine success or failure in the teaching and learning process are teacher leadership and school climate.

Educational institutions play an essential role in achieving students' learning success. Implementing education aims to help students develop their potential (Widiana, 2022). Education is defined as a conscious effort made by a person to become an adult human being in achieving a higher level of life or livelihood in a mental sense. Education is an effort to build and improve the quality of human resources towards an era of globalization which is full of challenges, in this case education is something that is very fundamental for every individual because education is very important to ensure the development and continuity of the nation's life (Irmayani et al., 2018; Tobari et al., 2018). In the Constitution of Republic Indonesia No. 20 of 2003 concerning the National Education System in article 1, education is defined as a fundamental and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious, spiritual strength, self-control, personality, intelligence, noble morality, and skills needed by students and society. Furthermore, the learning process is also intended to develop all the students' potential through the learning process available at specific paths, levels, and types of education.

Qualified education is education that can guide and develop students' personalities (Nawahdani et al., 2022). The ability of educational institutions to guide and develop these students' personalities can be seen from the learning outcomes. Learning outcomes are students' achievement after following and doing tasks and learning activities at school, which are evidenced or shown through grades or numbers from teacher evaluations on student assignments and exams (Yu & Jiang, 2022). Through the learning outcomes, students can observe and measure knowledge, attitudes, and skills obtained after experiencing the teaching and learning process in studying certain subjects. Studies show that students' learning success is determined by internal factors and external factors (Harun et al., 2021). Internal factors are related to psychological factors that influence students to be involved in the learning process, such as perspectives or attitudes (Harun et al., 2021), motivation, self-confidence, and the anxiety level of students (Liu & Luo, 2021). Motivation is the primary support for students to achieve specific goals in their learning activities. Confidence greatly impacts students' beliefs in reaching a certain point in each learning activity. Participants with above-average confidence levels will have good learning achievement (Ariati et al., 2022). Students' learning achievement can also be affected by their level of anxiety. The higher the students' anxiety in learning activities, the more difficult it is for them to show good achievement.

Meanwhile, external factors that affect students refer to things beyond the control of students that impact their learning achievement (Harun et al., 2021). One external factor that most influences student learning achievement is the teacher. Teachers' ability can be seen in their skills in facilitating the learning process (Ofiaza, 2023) or in the character of leadership (Castellane, 2019). The teacher's ability to direct the learning process is a determining factor in the success of student learning. Meanwhile, teacher leadership demonstrates personal qualities in positively impacting students' development (Erdel & Takkac, 2020). The teachers' leadership is closely related to the following factors: a positive view of students, a willingness to develop themselves, and their skills in assisting students (Schmid, 2018). The quality of leadership is owned by a teacher, considering that they are the determining factor in the direction of student development and the transformation of learning in the classroom. Everything said, done, or reflected by a teacher becomes a daily menu that students absorb, impacting personal development, including learning achievement.

Schwab (2018) is of the view that school climate is a collective concept of a series of factors that are considered to influence the success of inclusive implementation. School climate is a set of cultures, values, attitudes, and beliefs that are reflected through teaching practices, and the dynamics of relationships between school personnel (Sharma et al., 2022). These overall goals guide how schools should function not only in educational aspects, but also socially. This supports that the implementation of inclusive education does not only talk about the technical level of changes in philosophy but also in looking at students with special needs who are held by all elements of the school, starting from school leaders, teachers, to staff. Xue, Chai, Yao, and Fu are of the view that the characteristics of an inclusive school climate include, among other things, the participation of children with special needs in school activities, the support provided by teachers, and the provision of facilities and infrastructure to meet the needs of students with special needs (Xue et al., 2023).

School climate is another external factor that determines student achievement. School climate can be in the form of physical or non-physical things. Physical things are closely related to various facilities owned by schools, while non-physical things can be in the form of various situations created as a concretization of values, norms, and beliefs embodied in school learning activities (Jessiman et al., 2022). A good school climate allows for a healthy learning environment and has a positive impact on students both in the short term and in the long term (Jessiman et al., 2022; Longobardi et al., 2022; Smith, 2020; Yu & Jiang, 2022). The school climate is created through policies by the school, for example, the application of discipline (Longobardi et al., 2022) or systems that are created either in the school environment or based on local government policies (Yu & Jiang, 2022). The

school climate is also created through the quality of the relationship between teachers and their students (Smith, 2020). Basically, the study results above show that the school climate will develop parallel to students' learning achievements. The more positive the school climate is the better student achievement.

This research needs to be carried out as a follow-up to several previous studies. Previous research shows that the two variables, namely school climate and teacher leadership, have an influence on student learning outcomes. (Bojulaia & Pleasants, 2021). Unfortunately, previous research has not examined whether these two factors have a simultaneous or concurrent influence on student learning outcomes. Or in other words, previous research only focused on the influence of school climate on student learning outcomes (Goddard et al., 2019; Zhao & Zhang, 2022) and the influence of teacher leadership on student learning outcomes. (Rizzotto & França, 2022). This research focuses on testing the hypothesis of the influence of teacher leadership and school climate on student learning outcomes. This research aims to explore the school climate and teacher leadership at Cenderawasih Catholic High School. Researchers want to see whether school climate and teacher leadership have an influence or significance on student learning outcomes. It is hoped that the results of this research can be a valuable contribution to the management of educational institutions, especially Cenderawasih Catholic High School.

Method

The method used in this research is a survey research method. Survey research is a quantitative study using a questionnaire to collect data (Sugiyono, 2013). The goal is to obtain information about some respondents who represent a particular population (Kriyantono, 2018). This study looked for the effect of teacher leadership and school climate simultaneously on students' learning outcomes. This research was carried out at Cenderawasih Catholic High School. The population from this research includes all class X students at Cenderawasih Catholic High School. There are 106 students in class X and consisting of 46 female students and 60 male students. Sampling in this study was carried out by means of simple random sampling. The sample size was determined using Issac & Michael's table. Sampling of this study were 84 and consisting of 38 female students and 46 male students.

The research procedure uses the Dick and Carey model. Several stages can be carried out simultaneously, including the first stage is planning which consists of a survey, literature review and preparation of instruments. After the first stage, it is then continued with the second stage, namely the development stage which consists of preliminary research and development. And the third stage is the Field Test stage which consists of the field trial stage. The research instrument is a test used to analyze multiple linear regression of two independent variables on one dependent variable. Researchers will measure teacher leadership and school climate through questionnaires and researchers will measure student learning outcomes through Catholic religious education exam results data for Cenderawasi Catholic High School students.

The subjects of this study were all class X students of Cenderawasih Catholic High School. The population in this study was 106 students of class X in Cenderawasih Catholic High School. The sampling in this study was carried out through simple random selection. Data collection techniques in this study were observation, questionnaires, and documentation. Researchers directly carried out observations as an initial reflection. Furthermore, the researcher distributed a questionnaire containing several questions related to teacher leadership and school climate. In addition, to obtain data on student learning outcomes, the researcher asked the teacher of Catholic Religious Education for a list of student grades. The data obtained were then analyzed using the Percentage and Multiple Linear Regression descriptive analysis technique.

The questionnaire used in this research was in the form of a number of written statements provided with alternative answers. The form of questionnaire used is a closed form with five alternative answers, where the respondent just has to choose one answer which according to the respondent is appropriate to the conditions faced or experienced by the respondent. (Muri, 2016) After the data was collected, analysis was carried out using the SSPS application. The analysis carried out was a simultaneous test (F test), partial test (t test), and calculation of the coefficient of simultaneous determination, as well as calculation of the coefficient of partial determination (r). (Sukestiyarno, 2020).

Reliability testing is carried out to measure the accuracy of the instrument or the accuracy of students in answering the evaluation tool. An evaluation tool (instrument) performs well if its reliability is high. To find out whether an evaluation tool (instrument) is carried out well if its reliability is high. The calculation results are then consulted with the r table values at the 5% significance level. If the calculated r price > r table then the instrument is said to be reliable. To determine the reliability of the questionnaire instrument, the author used the Cronbach's alpha correlation technique. If one of the question items is found to be unreliable, it will be

replaced with another question item, after which the questionnaire will be tested again on the research sample. (Sugiyono, 2013).

Results and Discussions

The test instrument is carried out using an assessment scale consisting of a score of 1-5. Trials are carried out to determine the effectiveness of the test. Validity in this research can be determined by analyzing factors, namely by correlating the instrument score with the total score. This is done with product moment correlation. The calculation results are then consulted with the Product Moment critical price provided that $r_{xy} > r$ table with a significance level = 5%, then the instrument is said to be valid. If one of the question items is found to be invalid, it will be replaced with another question item, after which the questionnaire will be tested again on the research sample. In this study, multiple linear regression analysis was used to see how much the influence teacher leadership (X1) and school climate (X2) had on learning achievement (Y) in the subject of Catholic Religious Education in Class X in the first semester of the 2022/2023 academic year. The researcher used multiple linear regression analysis using the calculations of the IBM SPSS Statistics program for Windows.

Tabel 1. Coefficientsts Dependent Variable: Student Achievement

Model	Unstandardized B	Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	44.863	3.139		14.291	<.001
Teacher Leadership	.446	.152	.410	2.933	.004
School Climate	.479	.147	.456	3.264	.002

Based on Table 1, the multiple linear regression analysis above shows the multiple regression equation: $Y = 44,863 + 0,446X1 + 0,479X2$. The regression equation has the following meaning: Constant = 44.863, If the teacher leadership and school climate variables get a score of 0, then the student achievement variable will be obtained for 44,863. Coefficient $X1 = 0,446$. If the teacher leadership variable increases by one point while the school climate variable remains the same, it will cause an increase in student achievement by 0,446. Coefficient $X2 = 0,479$. If the school climate variable increases by one point while the teacher leadership variable remains constant, it will cause an increase in student learning achievement by 0,479.

Simultaneous Test (F Test)

The simultaneous test in this study was calculated using the help of the IBM SPSS Statistics program for windows. Hasil analisis uji simultan dapat dilihat berdasarkan tabel berikut ini:

Tabel 2. ANOVA Result

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1585.910	2	792.955	100.249	<.001b
Residual	632.789	80	7.910		
Total	2218.699	82			

Based on the ANOVA table above, it points out that $F_{count} = 100.249$ with a significance of $0,001 < 0,05$. This result indicates that F_{count} is significant, so H_0 is rejected, and H_a is accepted. Based on these results, the working hypothesis (H_a) is in $H1$ in the study, which reads, "There is a positive influence between teacher leadership and school climate on learning achievement of Class X Cenderawasih Catholic High School students in the subject of Catholic Religious Education in the first semester of the 2022/2023 school year", is accepted.

Partial Test (t Test)

The results of the partial test analysis in this study can be seen based on the following table:

Tabel 3. (t) Test Results for Teacher Leadership and School Climate

Model	t	Sig.
1 (Constant)	14.291	<.001
Teacher Leadership	2.933	.004
School Climate	3.264	.002

Based on the coefficients table, the t test results for teacher leadership (X1) are obtained by $t_{count} = 2.933 > t_{table} 1.664$ with significance $0,004 < 0,05$. This result establishes a significant tcount, so H_0 is rejected, and H_a is accepted. Based on these results, the working hypothesis (H_a), namely H_2 , which reads, "There is a positive influence between teacher leadership on the learning achievement of Class X Cenderawasih Catholic High School students in the Catholic Religious Education subject in the first semester of the 2022/2023 school year", is accepted. The t test results for school climate (X2) obtained $t_{count} = 2.785 > t_{table} 1.664$ with significance $0,002 < 0,05$. These results show a significant tcount, so H_0 is rejected, and H_a is accepted. Based on these results, the working hypothesis (H_a), namely H_3 which reads, "There is a positive influence between school climate on learning achievement of Class X Cenderawasih Catholic High School students in the subject of Catholic Religious Education in the first semester of the 2022/2023 school year", is accepted.

Calculation Result of Simultaneous Determination Coefficient (R^2)

Simultaneous determination coefficient analysis is used to determine the magnitude of the contribution of the independent variables as a whole. The results of calculating the simultaneous determination coefficient (R^2) can be seen based on the following table:

Tabel 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.845a	.715	.708	2.81245

a. Predictors: (Constant), School Climate, Teacher Leadership

Based on the model summary, the table above reveals the value Adjusted $R^2 = 0,708 = 70,8\%$ ($0,708 \times 100\%$). These results indicate that the independent variables of teacher leadership and school climate jointly influence the dependent variable of student achievement by 70.8%, and the remaining 29.2% are influenced by other variables not included in this study.

Coefficient of Partial Determination Calculation Results (r^2)

The magnitude of the influence of each independent variable on the dependent variable can be seen from the magnitude of the partial determination coefficient (r^2) of each variable. Partial determination results are summarized in the following table:

Tabel 5. Partial Determination Calculation Results (r^2)

Model		Correlations		
		Zero-order	Partial	Part
1	(Constant)			
	Teacher Leadership	.823	.312	.175
	School Climate	.827	.343	.195

The magnitude of the contribution made by the teacher leadership variable to the learning achievement of Class X students of Cenderawasih Catholic High School in the subject of Catholic Religious Education is shown above. Based on the table, the partial value obtained for the teacher leadership variable (X1) is 0.312, then squared (r^2), $0,3122 = 0,097344 = 9,7\%$. This means that the teacher leadership variable contributes 9.7%. The magnitude of the contribution made by the school climate variable to the learning achievement of Class X Cenderawasih Catholic High School students in the Catholic Religious Education subject is also exposed. Based on the table, the partial value obtained for the school climate variable (X2) is 0.343 then squared (r^2), namely $0,3432 = 0,117649 = 11,7\%$. This means that the school climate variable contributes 11.7%.

Teacher leadership and school climate simultaneously have a positive and significant influence on the learning achievement of Class X of Cenderawasih Catholic High School students in Catholic Religious Education subject as indicated by the values of the regression coefficients and correlation coefficients, which are positive. The adjusted coefficient of determination (R^2) is 70.8%. In other words, the study's results show that teacher leadership and school climate affect student achievement by 70.8%, while 29.2% are influenced by other factors not examined in this study. Other factors related to teacher leadership that have an impact on learner achievement may arise for a number of reasons. (Xue et al., 2023) The teacher's ability to build good relationships with students is one of the most obvious examples that can improve student achievement. When a teacher can present themselves as a figure who is close to students but still with authority as an educator, students will have a greater willingness to learn and improve their abilities. Another thing that has an impact on students' learning achievement is a sense of pride in the school. (Sharma et al., 2022) This is only possible when school decision-makers, teachers and education personnel succeed in building a positive image that encourages learners to

maintain the good name of their school, one of which is through good academic achievement. This is one of the best strategies considering that teenagers are very strong in group pride. (Langdon Warren, 2021)

Moreover, the results of testing the hypothesis with the F-Test test are found that $F\text{-count} = 100,249 > F\text{-table} = 3,11$ with significance $0,001 < 0,05$. This result displays that $F\text{-count}$ is significant, so H_0 is rejected, and H_a is accepted. Based on these results, the working hypothesis (H_a) is in H_1 in the study, which reads, "There is a positive influence between teacher leadership and school climate on learning achievement of Class X of Cenderawasih Catholic High School students in the subject of Catholic Religious Education in the first semester of the 2022/2023 school year, is accepted. This further underlines the significant role of teachers in schools and classrooms. Teachers are the directors of learners' success in building learning motivation, improving academic performance, and even convincing learners to build a positive concept of their ability to continue to develop. (Syahril & Hadiyanto, 2018a) The significance of the teacher's role will also have a positive impact on the learning atmosphere in schools. Teachers who have commitment and attention to the development of their pedagogical, personality, professional and social skills will have a positive impact on school culture. On the other hand, a comfortable atmosphere for teachers to create and innovate in the school can be expected to make teachers more motivated to support a positive climate in the school. (Syahril & Hadiyanto, 2018b; Thapa et al., 2013; Zullig et al., 2010) In the end, these two things become a solid foundation for students to show more enthusiasm in learning. (Lestari Ayu Rika et al., 2022)

Based on the results of the regression analysis, it is known that teacher leadership has a positive and significant influence on the learning achievement of Class X of Cenderawasih Catholic High School students in the Catholic Religious Education subject. These results can be seen from the partial determination coefficient (r^2) obtained from the calculation, which is as much as 9.7% ($0,3122 \times 100\%$) based on the coefficients table. Teacher leadership and school climate positively affect student achievement, which means that good teacher leadership and a good school climate are expected to increase student achievement. (Koth et al., 2008; Zullig et al., 2010). The results of this study align with studies that state that teacher leadership's role significantly impacts student achievement (Goddard et al., 2019; Zhao & Zhang, 2022). Good teacher leadership will have a positive impact on students' learning motivation and their academic achievement. This positive impact comes from the teacher's instructional leadership abilities in the learning process (Goddard et al., 2019). One of the determining factors in this instructional leadership is the teacher's creativity in designing learning activities (Bojulaia & Pleasants, 2021).

Furthermore, this study also illustrates that the school climate regression analysis has a positive and significant effect on the learning achievement of Class X Cenderawasih Catholic High School students in Catholic Religious Education subject. These results can be seen from the partial determination coefficient (r^2) obtained from the calculation, which is as much as 11.7% ($0,3432 \times 100\%$) based on the coefficients table. The results of this study reaffirm some of the results of previous studies, which show that the atmosphere and climate in the school environment are determining factors that positively encourage students' learning achievement (Zullig et al., 2010). The atmosphere and climate of the school are basically not only related to physical matters concerning facilities and infrastructure. The teacher's ability to create a learning atmosphere that motivates students (Cone, 2019; Goddard et al., 2019), the atmosphere of discipline in the learning process (Longobardi et al., 2022; Rizzotto & França, 2022), and peer-influence factors among learners (Rizzotto & França, 2022) is a concrete example of a school climate that has a positive impact on improving students' learning abilities. Nevertheless, this study still has some limitations.

Firstly, this study still covers a small homogeneous group of first-year students at the school. (Irah Kasirah et al., 2023a) Obviously, their introduction to the internal conditions of the school, including the teachers, is not as deep as the experience of the learners who have joined earlier. (Irah Kasirah et al., 2023b; Paputungan et al., 2022) These first-year students will be more concerned with the visible and less concerned with the intangible. Secondly, the study would be more complete if it sampled several schools to emphasise how important the role of teacher leadership and the school climate is in enabling learners to have meaningful learning experiences that improve their learning ability. (Patampang et al., 2022) Thirdly, starting from the current trend, the cognitive side is not the be-all and end-all of learner development. Learners' success is also largely determined by their character. The presence of teachers and the school climate are also essential in developing learners' character. This is an opportunity to develop this study in the future. (Zhao & Zhang, 2022).

Conclusions

There is a significant relationship between teacher leadership and school climate on student learning outcomes. The higher the teacher's ability to lead the class and the more positive the school climate, the higher the student learning outcomes. In other words, teacher leadership and school climate simultaneously positively and

significantly influence student achievement. It is recommended to teachers and managers of educational institutions to consistently create good leadership and a positive climate in accompanying students during the learning process to improve student learning outcomes, especially in the Catholic Religious Education subject. Starting from the results of this study, several things need attention. Firstly, school foundations need to prepare certain schemes and scenarios to improve the quality of teachers given that this study has highlighted the importance of teacher leadership factors in improving school learning achievement. Secondly, principals and school development teams also need to be encouraged to create a conducive climate for teachers through various training, development programmes or mentoring teachers to further improve their motivation, expertise and skills. Thirdly, improving the quality of school facilities and various programmes to strengthen the school climate can be implemented by utilising funding facilities that do not only come from foundations or students, but also school operational funds that have been prepared by the government.

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