



# Nurturing Pre-Service and In-Service Education as The Pathway to Fostering The Teacher Leadership Skills

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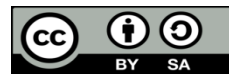
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## ABSTRAK

Pengembangan profesi diklaim guru mendesak, mengingat profesi itu sendiri mengacu pada wujud nyata dari perpaduan antara perundang-undangan pendidikan, teori pedagogik, dan praktik di sekolah. Tujuan penelitian ini yaitu menganalisis pengaruh pendidikan prajabatan dan pendidikan dalam jabatan terhadap profesionalisme guru. Jenis penelitian ini yaitu kualitatif. Penelitian ini menggunakan pendekatan metode campuran dengan model strategi transformatif konkuren. Populasinya melibatkan 251 kepala sekolah. Teknik pengambilan sampel yang digunakan adalah convenience sampling, dengan menyebarkan kuesioner sebanyak 202 sekolah yang kembali. Pengumpulan data dilakukan melalui kuesioner, tes tertulis, wawancara dan studi dokumen. Analisis data menggunakan Structural Equation Modeling (SEM) dan model deskriptif interpretatif. Hasil analisis data yaitu pertama, pengaruh pendidikan prajabatan yang ditemukan signifikan dan positif terhadap kepemimpinan guru. Demikian pula, pengaruhnya terhadap profesionalisme juga ditemukan signifikan dan positif. Kedua, in-service education diketahui berpengaruh signifikan dan positif terhadap kepemimpinan guru, serta profesionalisme guru. Ketiga, kepemimpinan guru ditemukan berpengaruh signifikan dan positif terhadap profesionalisme. Disimpulkan bahwa pendidikan pra dan dinas berpengaruh positif dan signifikan terhadap profesionalisme melalui kepemimpinan guru. Hasil penelitian ini diharapkan dapat dijadikan pedoman untuk meningkatkan profesionalisme guru dalam hal kepemimpinan.

## ABSTRACT

Professional development is claimed by teachers as urgent, considering that the profession itself refers to a concrete manifestation of a combination of educational legislation, pedagogical theory, and practice in schools. This research aims to analyze the effect of pre-service and in-service education on teacher professionalism. This type of research is qualitative. This study uses a mixed methods approach with a concurrent transformative strategy model. The population includes 251 school principals. The sampling technique used was convenience sampling by distributing questionnaires to 202 returning schools. Data was collected through questionnaires, written tests, interviews, and document studies. Data analysis used Structural Equation Modeling (SEM) and interpretive descriptive models. The results of the data analysis are; first, the influence of pre-service education is significant and positive on teacher leadership. Likewise, the effect on professionalism was also substantial and positive. Second, in-service education is known to significantly and positively impact teacher leadership and professionalism. Third, teacher leadership was found to significantly and positively affect professionalism. It was concluded that pre and service education completely and significantly affected professionalism through teacher leadership. The results of this study can be used as a guideline for increasing teacher professionalism in terms of leadership.

## 1. INTRODUCTION

The teacher profession is certainly inseparable from the demands for continuous professional development, where in the long run, this professionalism will have an impact on the quality of education

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(Suhartini et al., 2021; Susanto et al., 2021). Professionalism itself is reflected as a positive behavior identical to certain standards for teachers. Professionalism is defined as a field of professional work aimed in achieving the highest standards, ideals, and expectations in the teaching profession based on knowledge, skills, and professional values (Amrulloh & Galushasti, 2022; Demirkasımođlu, 2010). Professional development is claimed to be urgent, seeing that the professional itself refers to the real form of the combination of educational legislation, pedagogical theory, and practice in schools. Professionalism has also an impact on several points, including; teacher performance, student involvement in the classroom, and results in learning from learners (J.M. Gore et al., 2021; Tufail & Farooq, 2021). That is, with the aim on the growth and development of teacher professionalism alone, educational institutions can improve several things at once, as listed above (Demirkasımođlu, 2010; Rahmatullah et al., 2022). Although, it is undeniable that along with the development of the teaching world, the professional development of teachers must also be dynamic, creative, and innovative to adapt to these developments, in addition to adhering to the principle of lifelong learning (Duđă & Rafailă, 2014; Potolea & Toma, 2015; Supriyono, 2019).

Pre-service education or known as pre-service education is the phase of training and preparing education individual to obtain the knowledge, skills, and attitudes required before serving or serving in a position. Likewise, in the scope of education, teachers are included in professions that require pre-service education. Previous study state that *pre-service* teacher education is a study that is required to become a teacher, which has historically been formed from several courses taken in universities by providing field experience designed to accept high school graduates or equivalent to join the teaching profession (Syaiful, 2020). Previous research related to pre-service education, of which examines the behavior of teachers who are in the education period, the effect of pre-service on distance learning, and factors affecting pre-service education (Tarchi et al., 2022; Walker et al., 2022). In the pre-service teacher education program in Australia, there are five main areas of concern; curriculum content, teaching and learning methodologies (pedagogy, professional studies; elective subjects according to interests and talents, teaching practice in schools. However, no one has directly examined the effect of this pre-service education on the leadership and professionalism of teachers, both singularly and when one of them becomes the moderator.

There is a keyword that catches our attention, namely in-service is a word derived from English that is interpreted as training in tasks. In-service education can also be referred to as training during service or carrying out duties. In-service education is an educational process aimed at permanent status employees, to improve the skills and abilities of teachers in the fields they are engaged in and the needs of increasingly advanced science and technology developments, requiring teachers to follow them (Blumberg & Fisch, 2013; Freeman et al., 2017). In-service education for the profession of teachers or educators refers to improving (upgrading) academic and professional abilities to get certain tasks in a position by the development of science, especially in the field of education (Baharin et al., 2016; Mahmuda, 2016; Ridho, 2014). In-service education/training programs for teachers can include various activities such as: courses, applications, lectures, workshops, seminars, studying the curriculum, community surveys, demonstrations, field trips and visits to schools outside the area.

Teacher leadership is a strength and powerful ability to make schools work for everyone in and around the school environment. As teacher leadership develops and strengthens, greater responsibility is delegated to teacher in order to develop themselves as teacher leaders. Teachers are given the opportunity to work as leaders, they can display a powerful figure, both for school improvement and capacity building and personal existence as a professional teacher. Leadership skills refer to the abilities demonstrated by teachers who continue to teach students, while also extending their influence to others within and outside of the classroom (Dinh et al., 2014; Wenner & Campbell, 2017). The goal is to improve the school's teaching and learning performance by mobilizing and energizing others. Teacher leadership requires a steady passion for the school's main mission and courage to face obstacles to achieve that mission (Jacobs et al., 2016; Subandi, 2018). Teacher leadership is seen as an ability and readiness of teachers to make something in order to achieve learning goals in schools. Teacher leadership is essential in providing services, the needs of students, schools and surrounding communities in order to develop, modify and promote and support various innovations to change schools to meet 21st century learning needs (Cook, 2014; Warren, 2021).

Referring to the description, educational institutions seek to improve or develop the professionalism of these teachers through pre-service education policies and in-service education. The assumption is that the policy can be maximized and directly affect the professionalism of teachers if there is good leadership in it. However, based on surveys in the field, the professionalism of teachers has not changed much, although many teachers have received educator certificates and financial benefits. In order to maximize this professionalism, a model of professionalism and efficient leadership is needed to be able to form qualified educators. This study shows that 1) pre-service and in-service education systems indirectly affect professionalism through leadership; 2) the educational background is one of the components of the pre-service education system, while for the in-service education system, the components

are more focused on training, both types, methods, and materials presented; 3) the intensity of the training that teachers participated in still did not reach the proportional category, and 4) the model of education through leadership was found ideal to shape professionalism. This study aims to analyze the effect of pre-service and in-service education on teacher professionalism.

## 2. METHOD

This research uses a mixed-method type with the development of a concurrent transformative strategy model. The population targeted by the study was 251 elementary school principals in 3 (three) provinces, namely Gorontalo, East Java, and West Sumatra. The sample in this study used convenience sampling techniques, where information collection was focused on informants' willingness to respond, accessibility of researchers, and several criteria predetermined. Figure 1 shows the proposed research model.

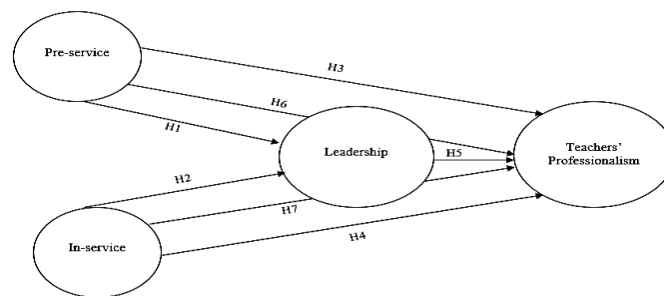


Figure 1. Research Model

Data collection was carried out through (1) questionnaires, (2) written tests, (3) interviews (*focus group discussions, zoom meetings, and WhatsApp groups*), and (4) document studies. From the entire population, 202 principals were obtained who were willing to be respondents, with characteristics of; 1) gender (P > L), 2) staffing status (ASN > Non-ASN), 3) Primary School Teacher Education Department (PGSD > Non-PGSD), 4) certification (Already > Not Yet), and 5) group (IV > III). In detail, the number of respondents and their characteristics can be seen in Table 1.

Table 1. Number of Respondents per Province Based on Characteristics

No.	Characteristics of Respondents		Province						Total	
			Gorontalo		East java		West Sumatra		Σ	%
			Fri	%	Fri	%	Fri	%		
1	Gender	L	14	26.42	19	20.21	8	14.55	41	20.30
		P	39	73.58	75	79.79	47	85.45	161	79.70
	<b>Sum</b>		<b>53</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>55</b>	<b>100</b>	<b>202</b>	<b>100</b>
2	Employment Status	ASN	48	90.57	80	85.11	48	87.27	176	87.13
		Non ASN	5	9.43	14	14.89	7	12.73	26	12.97
	<b>Sum</b>		<b>53</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>55</b>	<b>100</b>	<b>202</b>	<b>100</b>
3	Education	PGSD	24	45.28	80	85.11	36	65.45	140	69.31
		Non PGSD	29	54.72	14	14.89	19	34.55	62	30.69
	<b>Sum</b>		<b>53</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>55</b>	<b>100</b>	<b>202</b>	<b>100</b>
4	Certification	Already	45	84.91	85	90.43	46	83.64	176	87.13
		Not yet	8	15.09	9	9.57	9	16.36	26	12.87
	<b>Sum</b>		<b>53</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>55</b>	<b>100</b>	<b>202</b>	<b>100</b>
5	Groups	III	10	18.9	15	15.96	7	12.72	31	15.9
		IV	38	71.7	65	69.14	41	74.54	144	74.54
	<b>Sum</b>		<b>53</b>	<b>100</b>	<b>94</b>	<b>100</b>	<b>55</b>	<b>100</b>	<b>202</b>	<b>100</b>

In this study, the variables were calculated using the items outlined in the questionnaire with the following details. Variable pre-service is measured with 4 items and in-service education is measured by 5 items. Next, the variable of leadership is poured into 20 items. Finally, the professionalism variable was measured using 38 items. The analysis of data used Partial Least Square (PLS) with the following stages. Test outer model: Outer models are interpreted through several things.

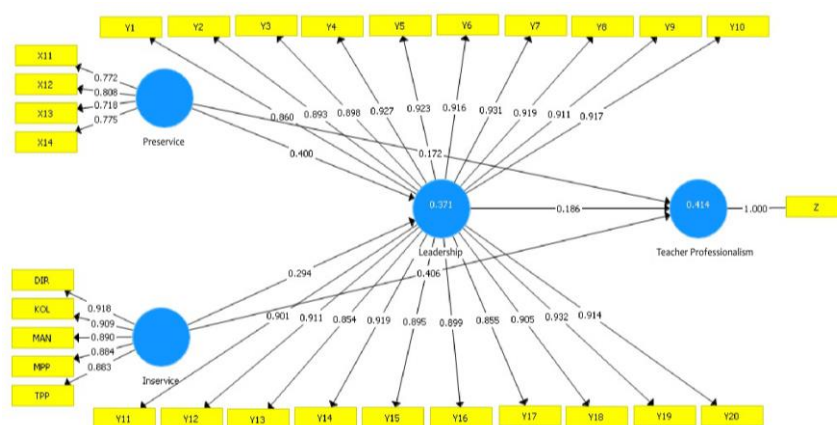
### 3. RESULT AND DISCUSSION

#### Result

The recommended loading factor value in this test is above 0.70 with an acceptance limit above 0.60. That is, the loading factor showing values above 0.60, is still tolerated. Referring to the measurement results, it is known that the loading factor of each indicator per construct shows a number > 0.70, so each indicator is declared valid to represent the construct. The loading factor values for each of these indicators can be seen in Table 2. Furthermore, the PLS Algorithm model and its loading factor value, it is presented in Figure 2.

**Table 2.** Loading Factor Measurement Results Per Indicator of Each Construct

Indicator	In-service	Leadership	Pre-service	Teacher Professionalism
YOU	0.918			
UNTIL	0.909			
ONE	0.890			
MPP	0.884			
TPP	0.883			
X11			0.772	
X12			0.808	
X13			0.718	
X14			0.775	
Y1		0.860		
Y2		0.893		
Y3		0.898		
Y4		0.927		
Y5		0.923		
Y6		0.916		
Y7		0.931		
Y8		0.919		
Y9		0.911		
Y10		0.917		
Y11		0.901		
Y12		0.911		
Y13		0.854		
Y14		0.919		
Y15		0.895		
Y16		0.899		
Y17		0.855		
Y18		0.905		
Y19		0.932		
Y20		0.914		
With				1.000



**Figure 2.** PLS Algorithm Model

**Requirements Analysis**

The second stage is the discriminant of validity. The acceptance criteria in this test are if the correlation value of the indicator in one construct is higher than the correlation of the indicator with another construct, then the variable is stated to have high validity discriminant value. Based on the measurement results, it is known that each indicator value on the pre-service construct is higher compared to other constructs. Likewise, the indicators on the pre-service construct, leadership, and teacher professionalism also show a higher correlation value in their respective constructs compared to constructs outside constituent indicators. For more details, the correlation values can be seen in [Table 3](#).

**Table 3. Results of Measuring the Value of Loading Factor Correlation of Indicators with Constructs**

Indicator	In-service	Leadership	Pre-service	Teacher Professionalism
YOU	0.918	0.479	0.493	0.539
UNTIL	0.909	0.489	0.545	0.613
ONE	0.890	0.417	0.450	0.525
MPP	0.884	0.412	0.412	0.473
TPP	0.883	0.462	0.459	0.481
X11	0.365	0.410	0.772	0.336
X12	0.430	0.492	0.808	0.389
X13	0.461	0.367	0.718	0.426
X14	0.368	0.432	0.775	0.353
Y1	0.462	0.860	0.496	0.463
Y2	0.424	0.893	0.506	0.465
Y3	0.453	0.898	0.514	0.436
Y4	0.472	0.927	0.519	0.446
Y5	0.453	0.923	0.535	0.446
Y6	0.438	0.916	0.501	0.432
Y7	0.455	0.931	0.502	0.432
Y8	0.471	0.919	0.531	0.492
Y9	0.435	0.911	0.504	0.406
Y10	0.452	0.917	0.519	0.435
Y11	0.497	0.901	0.522	0.471
Y12	0.491	0.911	0.526	0.465
Y13	0.449	0.854	0.454	0.396
Y14	0.461	0.919	0.507	0.420
Y15	0.395	0.895	0.463	0.393
Y16	0.425	0.899	0.467	0.430
Y17	0.489	0.855	0.426	0.407
Y18	0.442	0.905	0.520	0.451
Y19	0.489	0.932	0.497	0.477
Y20	0.480	0.914	0.525	0.414
With	0.591	0.486	0.490	1.000

Base on [Table 3](#), third stage composite reliability. If the value appears > 0.7, it can be stated that the construct has a good internal consistency value. Referring to the measurement results, the consistency value of each construct shows a value above 0.70, so it can be concluded that each construct in this study has a good composite reliability value. In detail, such values are depicted in [Table 4](#).

**Table 4. Composite Reliability Measurement Results**

Constructs	Composite Reliability
In-Service	0.954
Leadership	0.989
Pre-Service	0.852
Teacher Professionalism	1.000

Base on [Table 4](#) it is shown that the average variance extracted, with a value criterion of > 0.50 is to be accepted. Based on the measurement results, the value that appears shows a number above 0.50, so it can be stated that the variance value of each indicator is more than the variance by measurement error. In more classes, these values can be seen in [Table 5](#).



**Table 5. Average Variance Extracted Measurement Results**

Constructs	Average Variance Extracted
In-Service	0.804
Leadership	0.818
Pre-Service	0.591
Teacher Professionalism	1.000

In this study, in addition to these tests, Fornell Larchker testing was also used to see the correlation values between the constructs and roots of The Average Variance Extracted. If the root value of the Average Variance Extracted > the correlation value between the constructs, then that value is acceptable. Referring to the measurement results, it is known that each of the root values of the Average Variance Extracted is higher than the value of the correlation between the constructs. In detail, such emerging values are presented in Table 6.

**Table 6. Fornell Larchker Test Results**

Constructs	In-service	Leadership	Pre-service	Teacher Professionalism
In-Service	0.897			
Leadership	0.506	0.904		
Pre-Service	0.530	0.556	0.769	
Teacher Professionalism	0.591	0.486	0.490	1.000

Reliability test using Cronbach Alpha with the following admission criteria. If the value that appears > 0.70, then the construct in this study is declared reliable. Conversely, if the value that appears < 0.70, it is declared unreliable. Based on calculations, the value of each construct shows a number > 0.70, so it can be stated that the construct of this study is reliable. For more details, these values can be seen in Table 7.

**Table 7. Cronbach Alpha Test Measurement Results**

Constructs	Cronbach Alpha
In-Service	0.939
Leadership	0.988
Pre-Service	0.769
Teacher Professionalism	1.000

**Structural Model Test**

Concluding the structural model in this study was reviewed from 3 (three) values that appeared in the model, namely (1) R square values ( $R^2$ ), (2)  $f^2$  (Effect Size), and (3) GFI (Goodness of Fit Index). Each of the measurement results is deciphered as follows. The first is the R square ( $R^2$ ). As a result of the criteria for concluding this indicator, the model is declared strong if it displays a value of 0.75, a moderate model if it displays a value of 0.50, and a weak model if it displays a value of 0.25. Referring to the calculation results, variations in the leadership construct can be explained by the pre-service and in-service constructs of 0.371, while the remaining 0.629 are explained by the constructs beyond those that were researched. As for the variations in the professionalism construct, it can be explained by the pre-service, in-service, and leadership constructs of 0.414, while the rest is described by other variables outside the research. More clearly, the emerging values for such variations can be seen in Table 8.

**Table 8. R-Square Values Construct Leadership and Professionalism**

Constructs	R-Square
Leadership	0.371
Teacher Professionalism	0.414

The second is the value of  $f^2$  (effect size). The criteria for concluding refer to (1) a small influence when the value of  $f^2$  is 0.02, (2) a medium/medium influence when the value of  $f^2$  is 0.15, and (3) a large influence when the value of  $f^2$  of 0.35. The results of the analysis of this study show that the pre-service construct has a moderate effect on the leadership construct and has a small effect, there is a small influence on the professionalism of the teacher, and the in-service construct has a small effect on leadership and

moderate influence on teacher professionalism, and leadership constructs have little effect on teacher professionalism. In detail, it can be seen in Table 9.

**Table 9.** F Value<sup>2</sup> (Effect Size)

Constructs	Leadership	Teacher Professionalism
Pre-Service	0.183	0.031
Leadership		0.037
In-Service	0.099	0.184

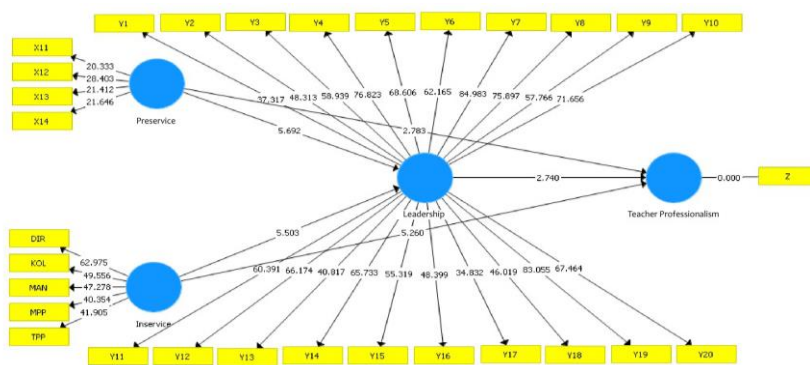
Third, is the Goodness of Fit Index (GFI) value. The criteria for concluding refer to (1) the GFI value is in a small category if it is at 0.10, (2) the GFI value is in the medium category if it is at 0.025, and (3) the value of GFI is declared large when it is at 0.36. The results of the analysis show the number 0.561 for GFI, so it can be stated that this value is in a large category, or in other words, the structural model built is declared fit.

**Significance Test**

This test uses a significance level of 5%. If the t-statistical value >1.96, then the null hypothesis (H<sub>0</sub>) is rejected. In detail, such t-statistical values can be seen in Table 10. For visually, the results of the construction of the PLS Bootstrapping model, as shown in Figure 3.

**Table 10.** Original Sample Coefficient Values, Standard Deviation, T-Statistics, and P-Values

Hypothesis	Original Sample (O)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Conclusion
Leadership Preservice→	0.400	0.070	5.692	0.000	Significant
Preservice Teacher Professionalism→	0.172	0.062	2.783	0.006	Significant
Leadership Inservice→	0.294	0.053	5.503	0.000	Significant
Inservice Teacher Professionalism→	0.406	0.077	5.260	0.000	Significant
Teacher Professionalism Leadership→	0.186	0.068	2.740	0.006	Significant



**Figure 3.** PLS Bootstrapping Model Results

Referring to Table 10, conclusions can be drawn for each of the hypotheses proposed as follows. The first hypothesis is stated that pre-service education has a significant positive effect on leadership ( $t > 1.96$ ). The second hypothesis is stated that in-service education has a significant positive effect on leadership. The third hypothesis, suggests that pre-service education significantly positively affects the professionalism of teachers. The fourth hypothesis is shown that in-service education significantly affects the professionalism of teachers. The fifth hypothesis, it is stated that leadership has a positive and significant effect on the professionalism of teachers.

Furthermore, the drawing of conclusions on the sixth and seventh hypotheses is based on the test results presented in Table 11. The criteria for concluding are if the p values < 0.05, then H<sub>0</sub> is rejected.

Referring to the table, it is shown that in the sixth hypothesis, pre-service education significantly affects the professionalism of teachers through leadership. As for the seventh hypothesis, it is known that in-service education has a significant indirect effect on professionalism through leadership.

**Table 11.** Value of the Coefficient of Indirect Influence

Hypothesis		Original Sample (O)	Standard Deviation (STDEV)	T Statistics ( O/STDEV )	P Values	Conclusion
Inservice Professionalism Teachers	Leadership →→	0.055	0.023	2.346	0.019	Significant
Preservice Professionalism Teachers	Leadership of →→	0.074	0.032	2.296	0.022	Significant

**Discussion**

This study is aimed at examining the influence of the pre-service and in-service education system on the professionalism of teachers through leadership, as visualized in Figure 1. This study also tested whether the model of the two education systems should idealize if it involved leadership to improve teacher professionalism. The results of this current study emphasize that the pre-service education system has proven to have a significant and positive effect on leadership. These findings are supported by the results of research that shows that pre-service education affects teacher leadership, especially in teacher skills related to learning, starting from planning to evaluation (Purwantiningsih & Suharso, 2019). Referring to some literature, one of the functions of the pre-service education system is to develop the knowledge and skills of teachers in leadership. The development is continuous, meaning that it is not only carried out when pre-service education takes place but also after the education ends (Ferreira et al., 2015; Xu & Patmor, 2012).

Pre-service teacher education which is the duty and authority of 72 educational personnel education institutions (LPTK) throughout Indonesia. As regulated in RI Law No. 14 of 2005 concerning Teachers and Lecturers. LPTK can make strategic leaps, so that prospective teachers become professionals by developing schools for teachers, and adapting the established medical profession. LPTK should also focus on developing capacity, the quality of graduates attending pre-service education on an ongoing basis to continue to encourage them to learn independently (Andina & Arifa, 2021; Leonard, 2016). The program to increase teacher leadership potential through LPTK pre-service education is more adaptable to future challenges. It is thus clear that pre-service education makes a contribution that many teachers expect to take on leadership roles even before formally entering the classroom. It is particularly known as the “hybrid” role that keeps teachers in the classroom (Hasnawati et al., 2021; Reeves & Lowenhaupt, 2016).

Similar to pre-service education, in-service education in this study was also stated to have a significant and positive effect on leadership. These results are in line with previous findings which concluded that in-service education provided to teachers can increase their opportunities related to leadership (Cisneros-Cohernour, 2021). This means that schools can facilitate teachers to attend in-service education, both formal and non-formal, to support or develop leadership. The National Network of State Teachers of the Year (NNSTOY), a teacher leadership training institution that was founded in 1980 based in Los Angeles, United States, focuses on its mission of providing training related to teacher leading. NNSTOY released research results showing the significant effect of in-service education on teacher leadership. Therefore, NNSTOY explains that teacher leadership is in a unique position to develop and strengthen the teaching profession that can initiate important changes in policy, practice and advocacy in the school environment (Jacques et al., 2016).

It was even emphasized by previous study explaining that in-service teacher leadership training is carried out, through the provision of leadership and driving teachers, so that it can be transmitted to other teachers (Coley et al., 2013; Ornstein et al., 2016). The government certainly does not want any teacher to be only good for himself, but also to share his strengths and advantages in his environment. Often the problem of in-service teacher training is the willingness of school principals and colleagues to accept new views from teachers who take part in the training. Finally, the things that were received by the teacher during the training could not be applied optimally in the classroom. Previous study state that this can be minimized by presenting teacher leadership abilities and skills as instructional leaders (Weiss et al., 2018).

Furthermore, in-service education is known to not only have an impact on leadership but also have an impact on teacher knowledge and competence, skills in strategizing, and student learning outcomes (Gupta & Lee, 2022; Veenman et al., 1994). As one of the efforts to develop competencies, in-service education is aimed at improving 4 (four) competencies that must be possessed by teachers, namely; 1)



pedagogical competence, 2) personality competence, 3) social competence, and 4) professional competence, in addition to fostering teacher professionalism (Mahmuda, 2016; Osamwonyi, 2016). This statement, on the one hand, is supported by the results of this study which shows that in-service has a significant and positive effect on the professionalism of teachers. Likewise, the results of this study confirm that pre-service education has a significant and positive effect on teacher professionalism. This is supported by research that states that training education, both in-service and pre-service, which is followed by teachers significantly and positively affects teacher professionalism (Andina & Arifa, 2021; Ekosusilo, 2016). The education and training of prospective teachers pre-service education and in-service education as a continuous professional development (CPD) must be managed in an integrated manner in order to produce professional teachers.

Related to the fifth hypothesis that resulted in the finding that leadership significantly and positively influenced the professionalism of this teacher, it was confirmed to be able to strengthen previous findings that stated something similar (Anwar, 2020; Mohamed et al., 2018; Tyaningsih et al., 2021). The statement was added to findings from the research shows that teacher leadership is one of the predictors of teacher professionalism, or in other words, leadership is stated to affect teacher professionalism (Parlar et al., 2017). So that if schools want to improve teacher leadership, then schools must facilitate teachers with opportunities to develop themselves, especially through training related to. Explicitly, the findings of the current study are collaborated with the thinking reporting from his writings poured on online media, a common thread can be drawn, that teacher leadership in education is very influential in producing output or an outstanding generation. This is because with the spirit of leadership, a teacher can influence and invite students to be able to produce conducive and effective learning, and the teacher's professionalism ability also increases (Cisneros-Cohernour, 2021; Tanang & Abu, 2014).

Based on the description, separately, leadership influences the professionalism of teachers and significantly shows a strong relationship between the two (Kilinç et al., 2015; Lai & Cheung, 2015; Livingston, 2016). However, when combined with pre-service and in-service education, both show the results that the pre-service and in-service education systems do not have a direct effect on the professionalism of teachers through leadership. That is, leadership has an indirect influence on professionalism when juxtaposed with pre-service and in-service education. Although in his education there was indeed a strengthening of leadership as material, it turns out that the leadership point itself has no direct effect on professionalism (Akert & Martin, 2012; Dreer et al., 2017; King et al., 2019). The results of this study have not been found in any literature, which means that these findings still need to be studied further to find out whether other findings are proven to be similar or vice versa.

In general, the role of the principal-and supervisor-is considered important in providing encouragement and strengthening teachers to attend education related to self-development and competence, so that the quality of the school can be improved, seeing that the leadership potential of the teacher is reflected capable of improving the quality of the school (Ado, 2016; Cheng, 2016; Pang & Miao, 2017). That is, the role of the principal is a factor that can hinder or improve the leadership and professionalism of the teacher although it is undeniable, it is also necessary for the teacher's self-motivation factor to be able to achieve these two things (Alexander et al., 2020; Cisneros-Cohernour, 2021).

This research has implications for practitioners, where this research presents a picture of teacher professionalism through leadership obtained from the components of pre-service and in-service systems. It is expected that the results of this current study can be used as a guide for improving teacher professionalism in terms of leadership, pre-service systems, and in-service education. These improvement efforts can be facilitated by teachers, stakeholders, and educational institutions concerned. In this study, the existence of limitations is believed to be able to give rise to further research. Further research is also expected to be able to consider the existence of a larger number of respondents. Considering that studies related to the influence of the pre-service and in-service education systems on teacher professionalism through leadership are still few, further research is expected to be able to examine this. These are at the primary and secondary education levels. Studies at the basic education level can be used as a comparison with the findings of this study, while studies at the secondary education level can be used as a variation of research findings in a similar scope.

#### 4. CONCLUSION

Some of the academic s raised by this study are described as follows. This research presents new findings that can be used as a reference for academics and other researchers who study or study similar things. First, regarding the influence of pre-service education which was found to be significant and positive on teacher leadership. Likewise, its influence on professionalism was also found to be significant and positive. Second, in-service education is known to have a significant and positive effect on teacher

leadership, as well as on teacher professionalism. Third, the teacher leadership was found to have a significant and positive effect on professionalism, as a comparative study with similar findings. Finally, this study assumes that there is an influence of pre-service and in-service education on teacher professionalism through leadership, while the results show that the influence given is indirect.

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