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Professional competence of educators with learning outcomes in online learning in elementary schools

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Abstract: The problem in this research is the low learning outcomes of some students. This study aims to determine the positive and significant relationship between professional competence of educators and learning outcomes of grade IV students. The type of this research is correlation research with quantitative approach using ex post facto correlation method. The population is 75 educators, and the entire population was used as the research sample. Data collection instrument in the form of a questionnaire that has previously been tested for validity and reliability. Data analysed using product-moment correlation. The results of the data analysis indicate that there is a positive and significant relationship between professional competence of educators and the learning outcomes of grade IV students as indicated by a correlation coefficient at the "Strong Enough" level.

Keywords: Learning outcomes, Professional competence of educators

INTRODUCTION

Education is one of the basic aspects to develop human resources that have high quality and competitiveness, both nationally and internationally. Education is one of the main factors for the progress of a nation. The progress of a nation can be seen from the quality and education system used. Education can be said to be successful if the learning objectives that have been determined is achieved.

The current level of education in Indonesia can be said to be in a worrisome condition. According to the United Nations Development Program (UNDP) 2019 in the Human Development Report data which contains data on life expectancy and education, it is known that Indonesia's Human Development Index (HDI) is 0.707, education level is 12.9, and 2 is ranked 111 out of 189 countries. The backwardness of the education system in Indonesia is caused by several factors, including the lack of teacher competence and student learning outcomes. Indonesia has begun to improve its education system by implementing the 2013 curriculum which requires an educational process that provides opportunities for students to be able to develop all aspects they have been including, namely the aspects of attitude (affective), knowledge (cognitive), and skills (psychomotor) in the hope of improving quality of educator competence and student learning outcomes.

Learning outcomes is an indicator of the success of learning activities carried out by educators and students. According to Susanto (2016: 5) learning, outcomes are changes that occur in students, both concerning aware, affective, and psychomotor aspects as a result of learning activities. In this study, researchers carried out research by focusing on students' cognitive learning outcomes with the source of the value of science subjects as a result of odd mid-semester assessments, because specifically high-grade students at SD Muhammadiyah Metro Pusat used a subject-by-subject approach.

The existence of a good professional competence of educators will affect the learning outcomes of students who will improve as well. Professional competence of educators is very important for an educator in conveying learning to students. Educators must understand the subject matter, scientific concepts and methods, and technology broadly and deeply so that the subject matter delivered can be well received by students. This is in line with the opinion of Pianda (2018: 49) which states that professional competence is the ability to master learning material

broadly and deeply, which is likely to guide students to meet the competency standards set out in the Standar Nasional Pendidikan.

The COVID-19 pandemic has caused many aspects of life to change in order to minimize the spread of the virus. One aspect that is also affected by the pandemic is the learning system. The learning system that is usually carried out face-to-face must be changed to a distance learning system commonly referred to as online learning to minimize the possibility of the spread of the virus, therefore student learning outcomes cannot be as optimal as when implementing face-to-face learning. on-line learning is also implemented in Indonesia considering the increasing number of patients infected with COVID-19. According to Law Number 20 of 2003 concerning the Sistem Pendidikan Nasional Article 31 Paragraphs 2 which reads, "Distance education has the function of providing educational services to community groups who cannot attend personally or regular education."

The implementation of online learning requires educators to further improve their professional competencies as educators, especially the ability to master technology, so that learning activities can continue as usual and learning objectives can still be achieved. Educators are important factors in learning activities in the network. A good educator must have four educator competencies, which are divided into pedagogic competence, personality competence, social competence, and professional competence. If educators do not have competence as good educators, they will not be able to carry out their professional duties to the fullest. The existence of a good quality of educator competence is expected that students can understand learning material more easily and have good learning outcomes.

In delivering science subject matter during online learning, good professional competence of educators is needed, because in addition to requiring a broad and deep understanding of science, educators who master technology and have high creativity are needed so that learning can be accepted by participants by Students having great interest, thus the material presented is also easier to understand.

Based on the results of interviews between researchers and educators, data were obtained that specifically in SD Muhammadiyah implementing a subject-by-subject approach in learning activities for high-grade students, for that reason researchers decided to choose science subjects for which data on learning outcomes would be seen. In addition, educators often use same strategies and learning media, so that it seems monotonous and boring for students as they always use learning media in the form of videos without being interspersed with the use of interactive learning media. Sometimes When students are given evaluation questions by educators, students do not fill in the evaluation questions so it is difficult for educators to know whether students understand or not regarding the subject matter given.

In addition, the researcher also conducted a documentation study and obtained data on the latest education of educators and data on the value of the odd semester mid-semester assessment results in the fourth-grade science subjects at SD Muhammadiyah Metro Pusat for the 2020/2021 school year, which are presented in the following table.

Table 1. Last Educational Qualifications of Educators at SD Muhammadiyah Metro Pusat.

No	Gender	Education Level			Amount of educators	Educators Who Have Certificate
		D2	S1	S2		
1.	Man	-	22	1	23	10
2.	Woman	1	47	6	54	18
	Sum	**1**	**69**	**7**	**77**	**28**

Sumber: Dokumen profil SD Muhammadiyah Metro Pusat.

Based on table 1, it is known that the last educational level of educators at SD Muhammadiyah Metro Pusat consists of D2, S1, and S2 graduates. Educators who already have an educator certificate are 21.56%, while seven educators who do not have an educator certificate are 78.44%. For educators, the existence of an educator certificate is one of the physical evidence that proves that educators have professional competence as good educators, especially professional competence.

Table 2. Recapitulation of Mid Semester Odd Semester Grade IV Science Learning for the 2020/2021 Academic Year.

No	Class	Completeness				∑
		Achieve (≥ 80)		Fail (< 80)		
		Number	Percentage(%)	Number	Percentage(%)	
1.	Daud As	22	62,86	13	37,14	35
2.	Ilyas As	24	70,56	10	29,41	34
3.	Sulaiman As	21	61,76	13	38,24	34
4.	Harun As	21	63,64	12	36,36	33
5.	Yunus As	20	60,61	13	39,39	33
6.	Ilyasa As	22	64,71	12	35,29	34
7.	Zulkifli As	22	64,71	12	35,29	34
Sum		**152**	**64,14**	**85**	**35,86**	**237**

Source: Documents of fourth-grade educators at SD Muhammadiyah Metro Pusat for the academic year 2020/2021

Based on table 2, there are still students who have not achieved the Minimum Completeness Criteria (KKM), the number of students who have completed is 64.14% and students who have not completed are 35.86%. This is thought to be caused by educators who do not fully have the professional competence of educators, especially the lack of application of technology in the delivery of science learning. The lack of professional competence of educators is also evidenced by the fourth-grade science subject educators at SD Muhammadiyah Metro Pusat, who does not yet have an educator certificate. Mulyasa in Lestari (2018: 24) states that learning is said to be successful if there are at least 75% of students who experience positive changes and high-quality output. In the data above, only 64.14% of students who completed the class IV of SD Muhammadiyah Metro Pusat.

The background of the problem is the reason for researchers to conduct research with the title " Professional Competence of Educators with Learning Outcomes of Class IV Students in Learning in SD Muhammadiyah Metro Pusat.".

METHOD

Types of Research

The type of research used is correlation research with a quantitative approach. The method used in this research is ex post facto correlation. Musfiqon in Alfianita (2018: 147) states that correlational research is research to find out the relationship between two or more variables by measuring coefficients or significance using statistics. It can be concluded that ex post facto correlational research is research to determine the relationship between two or more variables about an event that has occurred using statistics.

Research Place & Time

The place of research is SD Muhammadiyah Metro Pusat Campus 1 and 2, which is located on Jln. KH. A. Dahlan No. 1 Metro, Imopuro Village, Metro Pusat District, Metro City, Lampung in the even semester of the 2020/2021 school year.

Population and Sample

The population in this study were all educators at SD Muhammadiyah Metro Pusat, except 2 science educators in class IV. Payadnya and Jayantika (2018:26) state that saturated sampling is a sampling technique when all members of the population are used as samples. This is often done when the population is relatively small, less than 30 people. The sample in this study amounted to 75 educators at SD Muhammadiyah Metro Pusat.

Data collection technique

The research procedure carried out by researchers to conduct research consists of several stages, namely, 1) Determining the research subject (educators at SD Muhammadiyah Metro Pusat. 2) Develop grids and data collection instruments in the form of questionnaires. 3) Testing the data collection instrument on the research trial subject. 4) Analyzing the data from the test results of the instrument to find out whether the instrument made was valid and reliable. 5) Conducting research by distributing a questionnaire instrument of professional competence of

educators (X) to the research sample. 6) Calculating the obtained data to determine the relationship between professional competence of educators and the learning outcomes of fourth-grade students in learning in the SD Muhammadiyah Metro Pusat. 7) Interpretation of data calculation results.

Data Collection Technique

Data collection techniques in this study are interviews, documentation studies and questionnaires (questionnaires) that have been tested.

Data Analysis Technique

The data (in this reasearch) analysed by quantitative data analysis technique. The data analyzed in the form of numbers specified in the score of the respondents' answers from the questionnaire containing the items. There are 3 data analysis techniques in this study. The first is the normality test. The normality test is intended to show that the sample data comes from a normally distributed population. The normality test in this study uses the Chi-Square Test method ($\chi 2$) with a decision rule if 2count < χ2table, meaning that the data distribution is normal, and if 2count > 2table, it means that the data distribution is not normal.

The next test is a linearity test. Linearity test aims to determine whether the dependent variable, and the independent variable have a linear relationship or not. The test is used as a prerequisite in correlation analysis or linear regression. The main formula in the linearity test is the F-Test if Fcount < Ftable, meaning that the data is linearly patterned, and if Fcount > Ftable, it means that the data has a non-linear pattern.

The last test is a hypothesis test, a hypothesis test that functions to find the relationship between the variable's X to Y, then the results of the correlation are tested using the Product-Moment Correlation formula with the decision rule if tcount > ttable, it means that there is a significant relationship or the research hypothesis is accepted, and if tcount < ttable, meaning that there is no significant relationship or the research hypothesis is rejected.

RESULT AND DISCUSSION

Result

Based on the results of the questionnaire instrument given to the educators of SD Muhammadiyah Metro Pusat on March 1, 2021 and the results of learning science subjects for class IV students of SD Muhammadiyah Metro Pusat obtained from the odd semester final scores are as follows:

Table 3. Variable Data X and Y

Data	Variable	
	X	Y
N	75	75
Highest score	112	93
Lowest score	78	45
∑	7105	5393
Average	95,07	72,17
S (Standard deviation)	8,12	10,75

Sumber: Data angket dan studi dokumentasi.

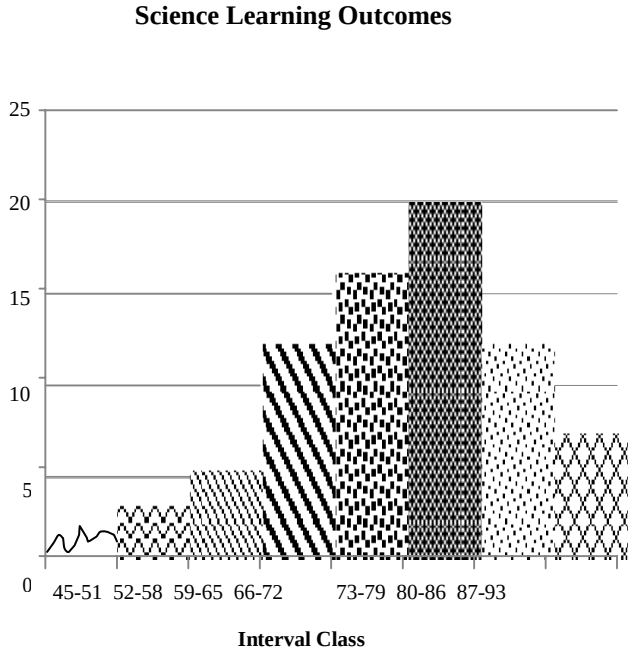
The Students Learning Outcomes Data (Y)

Table 4. Frequency Distribution of Learning Outcomes (Y)

No.	Interval Class	Frequency	Percentage (%)
1	45 – 51	3	4,000
2	52 – 58	5	6,667
3	59 – 65	12	16,000
4	66 – 72	16	21,333
5	73 – 79	20	26,667
6	80 – 86	12	16,000
7	87 – 93	7	9,333
	Sum	75	100

Source: Data on the results of the end of the odd semester for science subjects for the 2020/2021 school year for fourth grade at SD Muhammadiyah Metro Pusat.

Based on table 4, it indicate that the average student learning outcomes are 72.17 in the class interval 66-72. The research data of variable Y shows that the frequency of learning outcomes. The researchers present more details in the following histogram form.



The histogram above has presented seven classes of intervals and their frequencies. The lowest frequency is in class 45 – 51, which is 3 students, while the highest frequency is in the interval class 73 – 79, which is 20 students.

Educator Professional Competence Data (X)

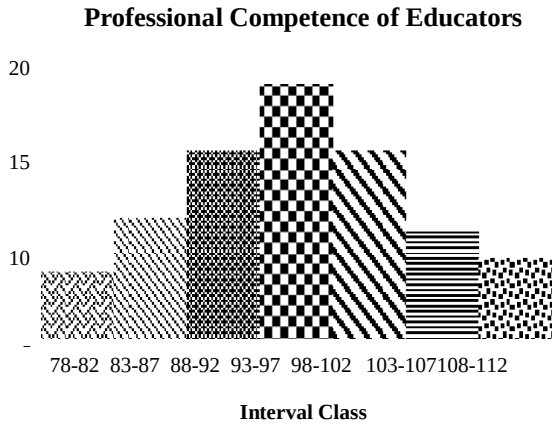
Table 5. Frequency Distribution of Educator Professional Competence (X)

No.	Interval Class	Frequency	Percentage (%)
1	78 – 82	5	7
2	83 – 87	9	12
3	88 – 97	14	19
4	98 – 102	19	25
5	103 – 107	14	19
6	103 – 107	8	11
7	108 – 112	6	8
	Sum	**75**	**100**

Source: Questionnaire data on the professional competence of educators.

Based on table 5, it indicate that the average professional competence of educators is 95.07 in the class interval 93 - 97. Data from the research results of variable X that the frequency of professional competence of educators <95.07 as many as 46 educators with a percentage of 61.33%, while the frequency of professional competence educators 95.07 as many as 29 educators with a percentage of 38.67%. The researchers present more details in the following histogram form.

The histogram b has presented seven classes of intervals and their frequencies. The lowest frequency is in the interval class 78 - 82, which is five educators, while the highest frequency is in the interval class 93 - 97, which is 19 educators.



Data Analysis Prerequisite Test

There are two data that need to be tested for normality in this study, namely data on the variable professional competence of educators (X) and data on student learning outcomes (Y). The interpretation of the calculation results is done by comparing χ^2_{hitung} with χ^2_{tabel} for $\alpha = 0{,}05$ with dk = k – 1.

The manual calculation of the X normality test uses the chi square formula. The results of the X normality test found that $\chi^2_{hitung} = 2.724$. The interpretation of the calculation results is carried out by comparing χ^2_{hitung} with χ^2_{tabel} for = 0.05 with dk = k – 1 = 7 – 1 = 6; in the chi square table, it is obtained that χ^2_{tabel} is 12,592 so that in accordance with the rules it states that $\chi^2_{hitung} = 2.724$ $\chi^2_{tabel} = 12{,}592$, which meant that the variable X is normally distributed.

The manual calculation of the Y normality test uses the chi-squared formula. The results of the Y normality test found that $\chi^2_{hitung} = 2{,}375$. The interpretation of the calculation results is carried out by comparing χ^2_{hitung} with χ^2_{tabel} for $\alpha = 0{,}05$ with dk = k – 1 = 7 – 1 = 6, in the chi square table, it is obtained that χ^2_{tabel} is 12,592 so that according to the rule it states that $\chi^2_{hitung} = 2{,}375 \leq \chi^2_{tabel} = 12{,}592$, which means that the variable Y is normally distributed.

Based on the results of the normality test on the X and Y variables which state that each variable is normally distributed, then the linearity test is then carried out. The results of the X and Y linearity tests found that Fcount = 0.35. Interpretation is in accordance with Ftable with dk in the numerator = k – 2 = 29 – 2 = 27 and dk in the denominator = n – k = 75 – 29 = 46 with = 0.05 then, in the distribution table F, it is obtained Ftable = 1.75, which can be means that the data has a linear pattern.

Hypothesis testing

Hypothesis testing was conducted to determine the relationship and significance between the professional competence of educators and the learning outcomes of fourth-grade students at SD Muhammadiyah Metro Pusat. After testing the data analysis prerequisites, namely the normality test and linearity test, then hypothesis testing is carried out using the product-moment correlation test. Decision making is accepted or rejected the proposed hypothesis by referring to the following rules**.**

If $r_{count} > r_{table}$, it means that there is a positive and significant relationship or Ho is rejected and Ha is accepted, while if $r_{count} < r_{table}$, it means that there is no positive and significant relationship or Ho is accepted, and Ha is rejected.

Based on the calculation of the hypothesis test, the correlation coefficient between variable X and variable Y is 0.440, which indicate a positive with the criterion of "strong enough," seen in the interpretation criteria of the correlation coefficient (r).

Furthermore, based on the calculation of the contribution of variable X to variable Y, the results obtained are 19.40% while 80.60% are influenced by other factors outside this study. This indicates that the hypothesis is accepted, which can be concluded that there is a positive and significant relationship between the professional competence of educators and the learning outcomes of fourth-grade students in learning in the SD Muhammadiyah Metro Pusat.

The next calculation looks at the significance or significance of the relationship between variable X and variable Y. Based on the significant test, Fcount = 17.572. The interpretation is in accordance with Ftable with dk in the numerator = k = 1 and dk in the denominator = n – k – 1 = 75 – 1 – 1 = 73 with = 0.05 then, in the distribution table F, it is obtained Ftable = 3.98.

In accordance with the rule which states that Fcount = 17.572 > Ftable = 3.98, which indicate significant. It can be concluded that the relationship between the professional competence of educators and the learning outcomes of fourth-grade students in learning in the Muhammadiyah Metro Pusat SD network is significant.

Based on the results of the calculations that have been carried out, it shows that the hypothesis is accepted, then it can be concluded that there is a positive and significant relationship between the professional competence of educators and the learning outcomes of fourth-grade students in learning in the SD Muhammadiyah Metro Pusat. .

Discussion

Based on the results of the calculation of the hypothesis test, it can be seen that there is a positive and significant relationship between the professional competence of educators and the learning outcomes of fourth-grade students in learning in the SD Muhammadiyah Metro Pusat. Here the researcher provides further explanation.

Relationship between Professional Competence of Educators and Student Learning Outcomes

Based on the calculation, the coefficient between variable X and variable Y is 0.440, which indicates the correlation is positive with the criterion of "strong enough". Furthermore, the contribution of variable X to variable Y is 19.40%. This shows that the professional competence of educators has a relationship of 19.40% to student learning outcomes, and 80.60% are influenced by other factors outside this study which may come from within and from outside the students as stated by Slameto in Syahputra (2020: 26) which states that the factors that influence learning, namely internal factors consist of physical factors and psychological factors. External factors consist of family factors, school factors and community factors.

As stated in Permendiknas Nomor 16 Tahun 2007 Tentang Standar Kualifikasi Akademik dan Standar Kompetensi Pendidik, which state that educators must have professional competencies, including mastering material, structure, concepts, and scientific mindsets that support the subjects being taught, mastering competency and competency standards basic subjects/fields of development that are taught, develop subjects that are taught creatively, develop professionalism in a sustainable manner by taking reflective actions, utilizing information and communication technology to communicate and develop themselves.

Based on the data of professional competence of educators, the results of the scores of each indicator of professional competence of educators are as follows.

Table 6. Scores of Professional Competence Indicators for Educators

No	Indicator	Ideal Score	Actual Score	%	Criteria
1	Mastering the material, structure, concept, and scientific mindset that support science subjects	2100	1738	82,76	High
2	Mastering competency standards and basic competencies in science subjects.	1500	1221	81,40	High
3	Develop science learning materials creatively	1500	1232	82,13	High
4	Develop professionalism in a sustainable manner by taking reflective actions	1800	1468	81,56	High
5	Utilize information and communication technology to communicate and develop themselves.	1800	1446	80,33	High

Based on table 5, it can be seen that the indicators of professional competence of educators have an almost equal influence on student learning outcomes, but the indicator that has the greatest influence on student learning outcomes is the first indicator, namely mastering the material, structure, concept, and pattern. Scientific thinking that supports science subjects with a result of 82.76% with the "high" criteria.

Professional competence is a competency that must be possessed by educators in order to be able to carry out the planning and implementation of learning. In addition to having an educator certificate, the level of professional competence can also be proven by the ability of educators to master various skills as stated in the Permendiknas Nomor 16 Tahun 2007 Tentang Standar Kualifikasi Akademik dan Standar Kompetensi Pendidik. Educators with good professional competence and able to plan and implement lessons that are in accordance with the curriculum, are attractive and easy to understand by students will have an impact on good student learning outcomes as well. This is relevant to Ardiawan's research (2017) that there is a significant relationship between professional competence of educators and science learning achievement in elementary schools in Buleleng Regency and in accordance with the hypothesis in this study, namely there is a positive and significant relationship between professional competence of educators and student learning outcomes. Fourth-grade students in learning in the SD Muhammadiyah Metro Pusat.

CONCLUSION

Based on the results of the research and discussion, it is concluded that there is a positive and significant relationship between the professional competence of educators and the learning outcomes of fourth-grade students in learning in the Muhammadiyah Metro Pusat SD. It is known based on the results of data analysis as follows.

The value of the correlation coefficient between variable X (professional competence of educators) and variable Y (student learning outcomes) is 0.440 then the researcher concludes that there is a positive and significant relationship between professional competence of educators and learning outcomes of fourth-grade students in learning in the SD Muhammadiyah Metro Pusat. The results of the hypothesis test of 0.440 when viewed from the interpretation of the correlation coefficient included in the coefficient interval 0.400 - 0.599 were in the "strong enough" level category.

The percentage of the determinant coefficient shows a result of 19.40%, which can be seen that the variable X (professional competence of educators) contributes to the variable Y (student learning outcomes) of 19.40%.

The results of $F_{count} = 17.572 > F_{table} = 3.98$ then it can be concluded that Ho is rejected and Ha is accepted, which means that there is a positive and significant relationship between professional competence of educators and learning outcomes of fourth-grade students in learning in the SD Muhammadiyah Metro Pusat.

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