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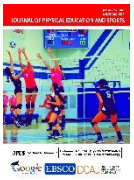

Differences in the Effect of Learning Methods and Intelligence Quotient on Handball Learning Outcomes of Students at Public Senior High School 8 Semarang

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Abstract

Success in a learning process cannot be separated from the good role and the learning methods used. Educators need to create a pleasant atmosphere so that learning goes as expected. The purpose of this study was to evaluate the differences between inquiry learning methods and directly on student handball learning outcomes at Public Senior High School 8 Semarang, evaluating the differences between high and low levels of intelligence quotient on student handball learning outcomes at Public Senior High School 8 Semarang, and evaluating the interaction between learning methods and intelligence quotient on student handball learning outcomes at Public Senior High School 8 Semarang. This study used an experimental method with a 2x2 factorial design. The subjects in this study were students of class X at Public Senior High School 8 Semarang. This study uses to test and measurement techniques. The instruments used the intelligence quotient test and handball basic ability test. The data analysis technique used two-way Anova statistics, and hypothesis testing with the calculation of the F-test at a significant level of 5%. The results of the study were the distribution of handball learning outcomes of class X students at Public Senior High School 8 Semarang with the inquiry learning method in groups with high intelligence quotient amounting to 73.3% categorized as good, 20% categorized as good enough, and equal to 6.7% categorized as very good. The distribution of handball learning outcomes of class X students at Public Senior High School 8 Semarang with the inquiry learning method in groups with low intelligence quotient is 73.3% categorized as good, and 13.3% categorized as very good and quite good.

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INTRODUCTION

Physical education are areas of study provided by schools ranging from elementary, junior high school to senior high school. Achievement of the goals of Physical Education is closely related to the ability of teachers to manage learning activities (Eko Prasetyo, 2017). In learning activities, exciting strategies and methods are needed to make it easier for students to master the teacher's subject matter. It is hoped that the material received can be stored for a relatively long time in students' memories (Kiumars et al., 2017). One of the problems related to education is the need to think about learning methods for student learning outcomes in schools through various creative ways by educators or teachers. According to Suprijono (2012), educators must also create an atmosphere of comfort, safety, joy, and freedom, but order and discipline. Success in a learning process cannot be separated from the useful role of a teacher (Suyatno, 2009).

Teaching is the teacher's effort to provide stimulation, guidance, direction, and encouragement to students so that the learning process occurs (Hemphill et al., 2015). Teachers have to make every effort to organize the learning environment and material planning so that the learning process occurs both inside and outside the classroom (Andartari et al. 2013). Study and learning are central factors in achieving teaching and education goals in schools (Husdarta, 2000). The inquiry learning method is a learning method capable of creating smart and insightful students (Naim Bey, 2012). This method aims to train students' abilities in researching, explaining phenomena, and solving problems scientifically (Suwondo and Wulandari, 2013). According to Metzler (2000) describing the inquiry method can be useful for all grade levels, if only the level of cognitive and psychomotor problems that have been given to students is following their developmental readiness.

Intellectual intelligence also supports the process. Intellectual intelligence determines student success in developing the potential that exists in each student. Academic intelligence is the ability to learn from experience, think using metacognitive processes, and adapt to the surrounding environment (Sternberg, 2008). Intelligence or intelligence is one of the factors that are quite influential because it is a person's thinking capacity which then determines the person's way of thinking (Khumaidi and Tarsis Tarmudji, 2014).

Based on researchers' observations at Public Senior High School 8 Semarang, physical education learning is carried out monotonously so that students tend to be silent and only obey the teacher's orders. This is due to the lack of teacher supervision in assigning motion tasks to students. Therefore, a learning method is needed to change learning that was once monotonous into engaging learning with learning delivered by the teacher and feeling the difference afterward, especially in physical education learning (Tite Juliantine, 2019). The learning method applied at Public Senior High School 8 Semarang generally uses the direct learning method, which focuses on the mastery of techniques. Students' role in this learning method is only as implementers of what is assigned by the teacher. Students are not given the freedom to express themselves because everything goes under the control of the teacher.

From the problems in Public Senior High School 8 Semarang, it takes a learning method that can be applied in schools integrated into the teaching and learning process, namely the inquiry method, because teachers do not dominate learning. The main goal is for students at SMA Negeri 8 Semarang to develop attitudes and skills that allow each student to solve problems independently (Aswar, 2018). Especially in physical education learning, which is more practical in the field, it requires student activeness in following the lesson. Therefore, based on the above background, it is necessary to research the difference in the effect of learning methods and intelligence quotient on handball learning outcomes in students at Public Senior High School 8 Semarang. Because intelligence is a factor among other factors, students ultimately fail in learning if other factors inhibit or harm learning. Students who have an average level of intelligence can succeed in education if they study

well. It means learning by applying efficient learning methods and the factors that affect their learning outcomes (Muhamad Fauzi et al., 2017).

METHODS

This research is a quantitative approach with experimental methods with a 2 x 2 factorial design. This study's factorial design involved two factors as independent variables, namely the learning approach and intelligence quotient. The learning approach is divided into two types. The inquiry learning approach and the direct learning approach and intelligence quotient are divided into high intelligence quotient, and low intelligence quotient as the dependent variable is the result of learning handball. In this study, controlling the research design's internal and external validity was carried out to maintain the quality of the research results.

This study's population was students of class X of Public Senior High School 8 Semarang, Academic Year 2019/2020, with 150 students. The sample in this study is the sampling technique used is purposive random sampling. The samples taken were students with a high intelligence quotient level and students with a low level of intelligence quotient. In contrast, students with a moderate intelligence quotient (in the middle) were not taken as samples. This study uses to test and measurement techniques, namely the measurement of student handball learning outcomes. The instruments used were the intelligence quotient test and the handball basic ability test. The data analysis technique uses two-way Anova statistics and hypothesis testing to calculate the F-test at a significant 5% level.

RESULTS AND DISCUSSION

Based on this study's results, data related to the difference in the effect of learning methods and intelligence quotient on handball learning outcomes of Public Senior High School 8 Semarang students can be seen in Table 1.

Table 1. Summary of Research Data

Learning approaches (B)	Intelligence quotient		Difference
	High (A_1)	Low (A_2)	
Inquiry learning (B_1)	ΣX_b = 1356 $\bar{X}$ = 90.3 Min = 77 Max = 98 SD = 6.1 n = 30	ΣX_b = 1205 $\bar{X}$ = 80 Min = 69 Max = 90 SD = 5.3 n = 30	ΣX_{b1} = 2560 $\bar{X}_b$= 85 Difference = 151 n_{B1} = 60
Direct learning (B_2)	ΣX_3 = 1169 $\bar{X}$ = 78.1 Min = 73 Max = 86 SD = 4 n = 30	ΣX_4 = 1082 $\bar{X}$ = 73.9 Min = 70 Max = 78 SD = 2.5 N = 30	ΣX_{b2} = 2251 $\bar{X}_b$ =76 Difference = 59 n_{B2} = 60
Difference	ΣX_k = 2525 $\bar{X}_k$ = 85 Difference = 186 n_{A1} = 60	ΣX_k = 2286 $\bar{X}_k$ = 76 Difference = 59 n_{A2} = 60	

The data on handball learning outcomes using the inquiry learning method in groups with high intelligence quotient for class X students at Public Senior High School 8 Semarang amounted to 73.3% of students had learning outcomes in the good category, 20% in the fairly good category, and at 6.7 % in the very good category. The results of learning handball using the inquiry learning method in a group with a low intelligence quotient of class X students at Public Senior High School 8 Semarang amounted to 73.3% of students having learning outcomes of handball in the good category, and 13.3% of students having learning outcomes handball in the very good category, and quite good. The handball learning outcomes of class X students at Public Senior High School 8 Semarang in the group with direct learning methods and high intelligence quotient were 66.7% of students had handball learning outcomes in the good category and 20% the fairly good category, and 13.3% in the very good category. The learning outcomes of class X students at Public Senior High School 8 Semarang in the group with direct learning methods and low intelligence quotient were 60%

of students had handball learning outcomes in the good category, 20% in the very good category, and 20% in the not good category.

The sample normality test results were carried out using the Kolmogorov-Smirnov test, as shown in Table 2.

Table 2. Summary of Sample Normality Test Results at the Significance Level $\alpha = 0.05$

No	Data group	n	p	α	Conclusion
1	A1B1	15	0.901	0.05	Normal
2	A2B1	15	0.603	0.05	Normal
3	A1B2	15	0.557	0.05	Normal
4	A2B2	15	0.857	0.05	Normal

Based on Table 2, it is known that for all data groups, it is greater than the alpha value or the significance level of 0.05 or probability ($p > 0.05$), so it can be concluded that the data from all sample groups are normally distributed..

The study population's homogeneity was calculated using the Levene test, with the significance level used was 95% ($\alpha = 0.05$), which can be seen in Table 3.

Table 3. Summary of Population Variance Test Results at a Significance Level $\alpha = 0.05$

No	Data group	n	df1	df2	Conclusion
1	A1B1	15	3	56	0.078
2	A2B1	15			
3	A1B2	15			
4	A2B2	15			

Based on Table 3, it is known that the value or significance level or probability value is above 0.05 (0.078 is more significant than 0.05). So it can be said that the data come from populations that have the same variance.

The hypothesis testing results using the two-way Anova analysis technique with a significance level of 95% ($\alpha = 0.05$). The complete calculation can be seen in Table 4.

Table 4. Summary of Two-Way Anova Calculation Results at the Significance Level $\alpha = 0.05$

Variable	F-value	Sig
Learning methods	58.985	0.000
Intelligence quotient	33.814	0.000
Intelligence quotient * Learning methods	5.826	0.019

R Square = 0.670 (Adjusted R squared = 0.652)

Based on Table 4, it is known that the results of the two-way Anova calculation are an F-value of 58.985 with a probability of 0.000. Because the probability is less than 0.05, then H_0, which states that there is a difference in the effect of direct and inquiry learning methods on student handball learning outcomes at Public Senior High School 8 Semarang. The two-way Anova calculation results also show the difference between handball learning outcomes and the intelligence quotient level. It is known that the results of the two-way Anova calculation, namely the F-value = 33.814 with a probability of 0.000. Hence the probability is less than 0.05. Then there are differences in student handball learning outcomes with high and low intelligence quotient levels in class X students at Public Senior High School 8 Semarang. Meanwhile, it is known that the results of the two-way Anova calculation are F-value of 5.826 with a probability of 0.019. Because the probability is less than 0.05, H_0 states that there is an interaction between learning methods (inquiry and direct) and intelligence quotient (high and low) on the handball learning outcomes of class X students at Public Senior High School 8 Semarang.

CONCLUSION

The data from the results of this study were analyzed using the Anova test technique. The conclusion is there is a difference effect of learning methods (inquiry and direct) on handball learning outcomes in class X students at Public Senior High School 8 Semarang. The inquiry learning model has a better effect on handball learning outcomes for students than direct

learning methods. There is a difference in the effect of high and low intelligence quotient on handball learning outcomes in class X students at Public Senior High School 8 Semarang. Students with high intelligence quotient have better handball learning outcomes than students with low intelligence quotient. There is an interaction between learning methods (inquiry and direct) and intelligence quotient (high and low) on handball learning outcomes in class X students at Public Senior High School 8 Semarang. Each group has a difference in the influence of each group that is paired like a group with learning methods with High intelligence quotient has differences in handball learning outcomes with the group given the direct learning method and low and high intelligence quotient.

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