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# Effectiveness of the Scientific Inquiry Learning Model Based on Local Malay Cultural Wisdom on Student Learning Interests

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• ×	ABSTRACT
	The aim to be achieved through research is to see the effect of
	implementing the Malay Culture-based scientific inquiry learning
	model on increasing student interest in learning. This study employed
<b>ARTICLE INFO</b>	a quantitative approach and included 55 students in their third
Article history:	semester, divided into two sample groups. The experimental class
Received	(Class A) consisted of 27 students, while the control class (Class B)
22 January 2024	comprised 28 students This research was conducted in the context of the Hydrology course. Data was collected through tests and analyzed
Revised	using IBM SPSS 23. After implementing the scientific inquiry learning
31 January 2024	model based on Malay culture and conventional learning, the average
Accepted	pretest score for student interest in learning in the experimental class
10 February 2024	was 59.77 and after being given treatment using the scientific inquiry
5	learning model, The student's posttest score was 80.55. The results of
	the independent sample-test showed a significant value of 0.000, where
	the value was <0.05. Thus, it can be deduced that the use of the Malay
	Culture-based scientific inquiry learning model has a positive impact
Key Word	in increasing students' interest in learning. Effectiveness, Scientific Inquiry, Malay Culture, Interest in Learning
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## INTRODUCTION

Education refers to the teaching and learning process which aims to transfer knowledge, skills, values and norms to individuals (Pamungkas, Subali, and Lunuwih., 2017). Education also plays a role in changing a person's attitudes and values. Apart from teaching facts and concepts, education also aims to form a view of life and moral values. Education stimulates creative and innovative thinking (Budiman, 2014). Educated individuals tend to be better able to contribute to the development of knowledge and technology, advancing society as a whole. Education has a broad and deep impact in improving various aspects of individual and societal life. Considering the quality and access of education is a key step to achieving sustainable progress in various fields.

The hydrology course is a scientific discipline that studies the distribution, circulation and water resources on the earth's surface (Khotimah, 2008). The primary focus is on the hydrologic cycle, which includes evaporation, transpiration, precipitation, infiltration, surface flow, and reactions of water with soil and rock. In general, hydrology courses discuss various aspects related to water and its impact on the environment (Salsabila and Nungraheni, 2020). Hydrology courses have several links to educational progress, especially in the context of developing knowledge and skills that support sustainable development and understanding of the environment. Understanding hydrology can make a significant contribution to educational progress by equipping students with relevant knowledge and skills in facing global challenges, such as the water crisis and climate change. This helps create a generation that is better able to overcome complex problems in the fields of water resources and the environment.

However, the current learning process shows that student scores in the hydrology course are still low. This can be influenced by students' low interest in learning. According to Juliani & Harahap (2014) Ineffectiveness in the learning process is the main factor that reduces the quality of education, which then has a negative impact on student learning achievement. Based on the results of interviews with students, it was found that students had difficulty understanding the terms in the Hydrology Course. Difficulty in understanding these terms makes students less likely to understand what the lecturer is saying. This makes the main course material incomprehensible to students. Students appear disinterested and disinterested in the learning process. For this reason, it is necessary to find solutions to deal with existing problems.

Ketapang State Polytechnic students, Road and Bridge Engineering Technology Study Program, especially semester 3 classes A and B, it is known that 80% of the students are of Malay ethnicity. Culture is very synonymous with students' daily lives. This can be seen from the way students communicate in lectures, they still often use Malay. Students often use Malay in both formal and non-formal situations. Therefore, the author tries to combine the scientific inquiry learning model with Malay culture to increase student interest in learning.

Interest in learning is the desire and deliberate involvement in thinking activities which have a crucial role in the learning process (Sughiarti, 2016). The desire to learn influences the selection of material to be studied and the extent to which understanding of the information received can be effective (Klassen, 2014). In summary, interest in learning can be interpreted as a determining factor in student motivation in the learning process, which arises from interest, enjoyment and desire to learn. This can also be seen as part of the motivation that develops through social interaction and student participation in learning activities (Ricardo and Meilani, 2017). High interest in a subject or topic can increase the level of student involvement in learning. This engagement can deepen their understanding and improve learning outcomes. Therefore, implementing a scientific inquiry learning model based on Malay cultural values is the right solution to increase student interest in learning.

The scientific inquiry learning model, or also called scientific inquiry learning, is a learning approach that emphasizes exploration, investigation and problem solving (Rofiah & Permana, 2020). This model is designed to stimulate students' critical thinking, creativity and discovery abilities. The use of the scientific inquiry learning model can encourage students to think and work on their own initiative, be objective, honest and open (Harahap, 2022). Inquiry relates to active activities and skills that focus on achieving knowledge or understanding to satisfy curiosity (Pratiwi, 2015). Inquiry is a sequence of educational tasks that fully engage all students' capabilities to systematically, critically, logically, and analytically explore and investigate. This enables them to confidently articulate their own discoveries.

The utilization of the scientific inquiry learning model can be tailored to fit the cultural context of the Malay community, resulting in a learning experience that is more pertinent and meaningful for students within that cultural setting. Malay culture generally values social values and cooperation. The scientific inquiry model which emphasizes group work and collaboration is in accordance with these values (Syafitri, M., Sahyar & Derlina, 2017). Students can be given assignments to work together in groups, discuss and appreciate the contributions of each member. Culture provides a framework of values and norms that shape individual attitudes (Sela, et.al, 2018). The respected values and norms applied in a culture can influence how individuals form their views on certain things (Wijayanti and Sudrajat, 2018). Through education based on local wisdom, the diversity of a region's potential can be developed, so that children in an area can understand the culture and values of that region (Halik, 2021).

This culture-based learning process does not just introduce culture and cultural elements themselves, but also uses culture as a means (Warigan, 2011). These facilities can help students develop a deeper understanding of the subjects they study, and encourage them to think creatively and create new meaning (Siahaan, 2018). The use of local languages or dialects in teaching and

discussions can help students more easily understand scientific concepts and feel connected to the subject matter (Prayogi & Danial, 2016). Lecturers can combine scientific terms with Malay to facilitate student understanding. By paying attention to the Malay cultural context, the scientific inquiry learning model can be more meaningful and relevant for students. It can also help maintain and appreciate local wisdom, while providing students with a strong scientific foundation.

According to previous research conducted by Harahap, Sani, and Simanjuntak (2017), the application of the scientific inquiry learning model can increase the value of students' generic science skills. Apart from that, the inquiry learning model has also been proven to increase interest and learning outcomes, as found in research by Karlina, Susilowati, & Miriam (2019). This is also in line with Rosalina's (2016) research, the average learning interest of students who use a scientific approach is higher than the average learning interest of students who use an expository approach.

## **RESEARCH METHODE**

The research was conducted in the odd semester of 2023/2024, namely in August - October 2023. The experimental class was given different treatment with the hope that this treatment would produce significant differences, namely having a significantly higher interest in learning than classes that did not receive treatment is related to the variable being tested, namely the control class. All students in the TRKJJ Study Program semesters 1, 3, 5, and 7 are the research population. Meanwhile, the sample used consisted of 55 third semester students who were divided into two classes. Class A receives learning using a scientific inquiry approach based on Malay culture, where aspects of Malay culture are emphasized in the presentation of problems, lecture material and example questions so that students can understand them more easily. Class B, on the other hand, received learning. The independent variable is related to the implementation of the scientific inquiry learning model based on Malay culture, while the dependent variable is interest in learning. The instrument used was a learning interest questionnaire. Evaluation of increasing interest in learning is carried out by comparing data before and after implementing the learning model.

## **RESULT AND DISCUSSION**

#### Result

The data described includes data on students' learning interest in class A and class B, which was obtained by administering an instrument in the form of a learning interest questionnaire with 20 statements.

riequ	Frequency Distribution of mittai Data on Student interest in Learning											
E	xperimenta	s (A)		Control C	Elass (B	)						
Number	Grade	f		Number	Grade	f						
1	40 - 45	1		1	51 - 54	2	-					
2	41 - 46	1	$\overline{X} = 59,77$	2	55 – 58	7	$\overline{X} = 61,11$					
3	47 – 52	2		3	59 - 62	5	-					
4	53 - 58	9	S = 8,33	4	63 - 66	13	S = 5,13					
5	59 - 64	3		5	67 – 70	0	-					
6	65 - 71	10		6	71 - 74	1	-					
7	72 – 77	1					-					
Total		27		Total		28	-					

Table 1.
Frequency Distribution of Initial Data on Student Interest in Learning

According to the provided table, it is evident that the mean score for student interest in learning within Class A, consisting of 27 students, is 59.77 with a standard deviation of 8.33. Meanwhile, the average learning interest score for students in Class B (the control class) with a total of 28 students is 61.11, and the standard deviation is 5.13.

Subsequently, a normality test was conducted to assess the distribution of the data. The Kolmogorov-Smirnov test, with a significance level of 0.05, was employed for both classes using IBM SPSS 23. The test condition dictates that if the significance value in the Kolmogorov-Smirnov column exceeds 0.05, the data is deemed to be normally distributed. The outcomes of the normality test for student learning interest are presented in the following table.

	Normality Test of Initial Data on Student Interest in Learning											
	Tests of Normality											
	Kolmogorov-Smirnov <sup>a</sup> Shapiro-Wilk											
	Class	Statistic	df	Sig.	Statistic	df	Sig.					
Result	Experimental	.142	27	.173	.961	27	.385					
	Control	.150	28	.105	.942	28	.123					

Table 2.Normality Test of Initial Data on Student Interest in Learning

\*. This is a lower bound of the true significance.

Based on Table 2, it can be seen that the pretest significance value in the control class taught using conventional learning is 0.105, where 0.105 is greater

than 0.05, which means it has a normal distribution. The pretest significance value in the experimental class which was taught using the Malay culture-based scientific inquiry learning model was 0.173, where 0.173 was greater than 0.05, which means it had a normal distribution.

Following that, a homogeneity test for the data was conducted to ascertain whether the sample exhibited homogeneity. The initial data on students' learning interest underwent testing using the Levene test with assistance from IBM SPSS 23. The criterion for the test is that if the significance value surpasses 0.05, the data is deemed homogeneous. The outcomes of the homogeneity test are presented in the subsequent table.

	Table 3.												
	Initial Data Homogeneity Test												
	Test of Homogeneity of Variance												
	Levene												
		Statistic	df1	df2	Sig.								
Interest	toBased on Mean	.012	1	53	.214								
learn	Based on Median	.068	1	53	.196								
	Based on Median a with adjusted df	nd .068	1	51.410	.196								
	Based on trimm mean	ed .016	1	53	.201								

Next, a post-test was carried out to see the value of students' learning interest after being given the treatment. Analysis of post-test data involves the utilization of the independent sample t-test. This is contingent upon the condition that the data originates from a normally distributed population, and the groups under comparison exhibit homogeneity. Consequently, the independent sample t-test necessitates conducting both normality and homogeneity tests on the data. The frequency distribution of post-test data on students' interest in learning for class A (experimental class) and class B (control) can be seen in the following table.

Table 4.
Frequency Distribution of Post-Test Data on Student Interest in Learning

Ex	perimenta	l Clas	s (A)		Control C	lass (B)	
Number	Grade	f		Number	Grade	f	
1	65 – 69	2	-	1	58 - 62	5	
2	70 - 74	5	$\overline{X} = 80,55$	2	63 – 67	5	$\overline{X} = 71,11$
3	75 – 79	4	-	3	68 – 72	5	
4	80 - 84	8	-	4	73 – 77	7	

5	85 - 89	5	S = 7,58	5	78 - 82	4	S = 7,78
6	90 - 94	3	_	6	83 - 87	2	
Total		27		Total		28	

Based on the table above, it can be seen that the average value of student interest in learning in class A is 80.55 and the standard deviation is 7.58. The average value of interest in learning for class B students is 71.11 and the standard deviation is 7.78.

Next, a normality test was carried out to see whether the data used was normally distributed. The results of testing the normality of student learning interest can be seen in the following table.

	Normality Test of Post-Test Data on Student Learning Interest											
Tests of Normality												
	Kolmogorov-Smirnov <sup>a</sup> Shapiro-Wilk											
	Class	Statistic	df	Sig.	Statistic	df	Sig.					
Result	Experimental	.145	27	.152	.961	27	.381					
	Control	.192	28	.200	.973	28	.658					

Table 5.

In Table 5 it can be seen that the post-test significance value in the control class taught with conventional learning is 0.200, where 0.200 > 0.05, which means the control class has a normal distribution. The post-test significance value in the experimental class which was taught using the Malay culture-based scientific inquiry learning model was 0.152, where 0.152 > 0.05, which means the experimental class had a normal distribution.

Next, a homogeneity test is carried out to determine whether the sample is homogeneous or not. The results of the homogeneity test can be seen in the following table.

Table 6. Homogeneity Test of Post-Test Data for Student Interest in Learning

	Test of Homogeneity									
		Levene								
		Statistic	df1	df2	Sig.					
Interest	toMean	.012	1	53	.914					
learn	Median	.068	1	53	.796					
	Median and with	.068	1	51.410	.796					
	adjusted df	.000	1	51.410	.790					
	trimmed mean	.016	1	53	.901					

Next, a difference test was carried out using the paired sample t test to find out whether there was a difference between the means of two paired samples. The paired sample t test was carried out in the experimental class and control class respectively. The paired sample t test uses SPSS 23. The results of processing test data between experimental classes and control classes are presented in the following table.

Table 7.

	Test of Differences in Learning Interest												
Paired Samples Test													
	2												
	Paired	Differen	nces			t	df	tailed)					
				95%									
				Confid	ence								
		Std.	Std.	Interva	l of the								
		Deviati	Error	Differe	nce								
	Mean	on	Mean	Lower	Upper								
Pair 1 pre_ex -	-20 77	4 069	.78325	-22 38	-1916	-26 52	26	.000					
post_ex	20.77	1.009	.70020	22.00	17.10	20.02	20	.000					
Pair 2 pre_con -	-10.00	5.708	1.07890	-12.21	-7.78	-9.26	27	.000					
post_con	10.00	000	2.07.070	12:21			_,						

Table 7 explains that the significant value (2-way sig) is 0.000, because the significant value is <0.05, it can be deduced that there is a difference in the average value of students' learning interest for the pretest and posttest in the experimental class. In the pre-test, interest in learning was 59.77 and in the posttest, interest in learning was 80.55. Based on the results in the control class, the significant value (2-way sig) is 0.000, because the significant value is <0.05, it can be deduced that there is a difference in the average value of student learning interest for the pretest and posttest in the control class. The pretest interest in learning interest for the pretest and posttest in the average value of student learning interest for the pretest and posttest in the control class. The pretest interest in learning score was 61.11 and the posttest interest in learning was 71.11.

Then an independent sample t test was carried out to find out whether there was a difference in the average of two unpaired samples. This test was carried out to determine the difference in post-test scores on students' interest in learning in both classes after being given different treatment. The experimental class uses a scientific inquiry learning model based on Malay culture and the control class uses conventional learning. The independent sample t test uses SPSS 23 with the assumption that the two variances are homogeneous with a significance level of 0.05.

Independent Sample T Test Posttest Interest in Learning										
Independent Samples Test										
	Lev	rene's		+	-test for	Equal	ity of I	Moone		
	T	est		L	-test 101	Lquar	Ity Of I	vicalis		
								95%		
							Std.	Confid	lence	
					Sig.	Mean	Error	Interva	l of the	
					(2-	Differ	Diffe	Differe	ence	
	F	Sig.	t	df	tailed)	ence	ence	Lower	Upper	
InterestEqual										
to learnvariances	.012	.914	4.55	53	.000	9.448	2.073	5.290	13.607	
assumed										
Equal										
variances	not		4.56	52.9	.000	9.448	2.072	5.292	13.605	
assumed										

Table 8.
Independent Sample T Test Posttest Interest in Learning
Independent Complex Test

Based on Table 8, it is shown that the significant value (2-way sig) is 0.000 because the significant value is smaller than 0.05, then Ha is accepted or the learning interest value of students in the experimental class and control class in the posttest is significantly different, which means that the students' interest in learning in the experimental class higher than the control class. Based on these data, it can be concluded that there is an influence of the Malay culture-based scientific inquiry learning model in increasing students' interest in learning. Discussion

The results obtained in this research indicate that students' learning interest taught using the scientific inquiry learning model is better than conventional learning. The indication of this is evident in the mean pre-test score of students' interest in learning within the experimental class, which stands at 59.77. Following the implementation of the scientific inquiry learning model as a treatment, the post-test score for the students significantly rises to 80.55. The initial phase of the scientific inquiry learning model involves introducing the problem to students, encompassing the steps employed in examining the issue. The problem presented is an example of the application of MK Hydrology related to Malay culture. Lecturers present problems to students to explore curiosity about what the lecturer is saying. The second stage is that students formulate the problem presented by the lecturer so that students can identify difficulties in the investigation. These difficulties include data interpretation, data generalization, experimental control or making

conclusions. The third stage is that students identify the problem. Problems are identified through investigation, so that problems can be resolved based on rules. The fourth stage is that students obtain and analyze efforts to minimize the difficulties experienced in order to generate enthusiasm and interest in learning.

The scientific inquiry learning model based on Malay culture can increase students' interest in learning by integrating cultural values, traditions and local context into the learning experience. This model can emphasize the link between scientific concepts and Malay cultural values. For example, linking scientific principles with local wisdom in Malay-based traditional medicine or agriculture can make learning more relevant and interesting for students. Scientific inquiry learning based on Malay culture can help students see the relationship between scientific concepts and their daily lives. This emphasis on contextual learning can enrich the learning experience and increase student interest. This model can promote inclusivity and diversity by accommodating various aspects of Malay culture. By paying attention to cultural diversity, learning models can create an inclusive environment and motivate students from various backgrounds to be involved in learning. Initiating research projects related to local problems or Malay traditions can increase students' interest in learning. They can feel more connected to the learning material and see the positive impact it has on their community. The integration of traditional Malay stories that have scientific elements or scientific concepts can make learning more interesting and provide a cultural context.

This is in line with the research results of Berie, et.al (2022) on the development of learning theory, current societal needs, and positive empirical findings in relevant literature supporting the thesis that inquiry-based learning is promising for the teaching and learning process, and is worthy of further development. Scientific inquiry learning was also researched by Ellis (2014). It was found that an inquiry-oriented approach to science teaching was proven to be effective and successful for children with disabilities. This research shows that students with disabilities appear to thrive in inquiry-oriented learning environments. The research results of Sahyar and Nasution (2017) showed that the science process skills of students who used a scientific learning model based on conceptual change were better than those using conventional learning. Igboanugo (2023) in his study findings said that the implications made for students, chemistry teachers, policy makers, and government include confirmation that years of teacher experience can influence teacher performance. Effectiveness of using the inquiry learning model to improve students' ability to be interested in chemistry. Through a sufficient number of

years of experience, teachers acquire the necessary skills and knowledge necessary to use guided inquiry effectively as a way of teaching in increasing student interest.

Therefore, implementing a scientific inquiry learning model based on Malay culture can open up space for students' learning interests by integrating local values, traditional wisdom and cultural diversity. Through an emphasis on contextual learning, inclusivity and local research projects, this model not only creates learning experiences that are relevant to students' daily lives, but also increases students' interest, engagement and understanding of scientific concepts.

#### CONCLUSION

The application of the scientific inquiry learning model based on Malay culture has an influence in increasing students' interest in learning. It can be seen that there is a significant difference in interest in learning between the experimental group which applies the scientific inquiry learning model based on Malay culture and the control group which uses the conventional learning model. The application of the scientific inquiry learning model based on Malay culture creates a more meaningful learning environment. Explanations of concepts and example questions related to Malay culture provide additional motivation for students to be more creative in solving problems.

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