Effectiveness of Project Based Learning Model Based on Local Wisdom of Naposo Nauli Bulung

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Article Info	Abstract
	Current developments in science and technology not only have positive impacts but also negative impacts. This can be seen in the phenomenon of moral degradation that occurs in society involving school-age children, starting with the erosion of the sense of nationalism, the leadership of narcotics, alcoholism, and involvement in acts of violence. These various things pose a big threat to the future of the nation and the younger generation. In order to anticipate this, education has an important role because, through education the formation of national character with noble character can be realized. One method that can be used by teachers in the process of forming student character is implementing the Project Based Learning (PjBL) learning model in schools which contains values and character so this research is very important and urgent to be carried out immediately. Naposo Nauli Bulung local wisdom is local wisdom in the South Tapanuli area, North Sumatra which contains many good character values that are preserved by the people of South Tapanuli.This local wisdom is specifically for young people so they can work together to solve problems in society. For this reason, this research aims to analyze the influence of the Project Based Learning (PjBL) learning model based on local wisdom on the formation of student character at SMKN 4 Padang Sidempuan City.

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INTRODUCTION

Current developments in science and technology not only have a positive impact but also have a negative impact on school-age children, starting from erosion of the sense of nationalism, abuse of narcotics, alcohol and involvement in acts of violence. This can be seen from the phenomenon of moral degradation that occurs in society involving school-aged children. And the best way to avoid the negative impacts caused by the development of science and technology is through education (Guo et al. 2020). Education is a learning process in the form of teaching and learning activities, where interaction occurs between students and teachers. In the field of education, teachers act as educators who guide students to be able to develop knowledge and can change the condition of students from not knowing to knowing (Pedroza-toscano and L 2023). The quality of education can be determined from two things, namely the quality of the process and the product. Education is said to be of quality if effective and efficient learning occurs involving all educational components, such as including teaching objectives, teachers and students, learning materials, teaching and learning strategies or methods, learning tools and resources and evaluation (Rio and Rodriguez 2022). The success of implementing education can be influenced by several factors, one of which is the learning model used by teachers in the teaching and learning process (Memon et al. 2022).

Teachers must be able to create a conducive and enjoyable learning atmosphere for students so that learning objectives can be achieved properly. Responding to this reality, teachers are required to make improvements and learning practices in the classroom, one of which is by using the Project Based Learning (PjBL) model (Colim et al. 2022)(Santos, Rybska, Klichowski, and Jankowiak 2023). Project Based Learning is "a learning process that directly involves students to produce a project. Basically, this learning model further develops solving skills in working on a project that can produce something (Moure, Aiouache, and Moreno-mediavilla 2023). In its implementation, this model provides ample opportunities for students to make decisions in choosing topics, conducting research, and completing a particular project (Wu and Wu 2020). Learning using projects as a learning method. Students work in a real way, as if they exist in the real world and can produce products realistically (Goyal, Gupta, and Gupta 2022). Based on this, the problem formulation is how does the Project Based Learning (PjBL) learning model based on local wisdom influence the character formation of students at SMKN 4 Padangsidempuan City? The problem solving approach in this research is to use the Project Based Learning learning model based on the local wisdom of Naposo Nauli Bulung which contains meaning (Tolerance, Discipline, Hard Work, Creativity, Independence, Democracy and Curiosity) which has an impact on character formation. Local wisdom Naposo Nauli Bulung is an association of young men and women based on the customs and norms that apply in the southern Tapanuli area. This local wisdom really upholds the norms of politeness so that it has a big influence on character formation. The local wisdom of Naposo Nauli Bulung is combined with the Project Based Learning learning model. The state of the art in this research is the combination of the local wisdom with the Project Based Learning (PjBL) learning model, where in previous research there has never been a combination of the Project Based Learning (PjBL) model based on the local wisdom of Naposo Nauli Bulung.

METHODS

This research uses a quantitative type of research with a classroom action research approach with Pretest-Posttest Control Group design with quasi-experimental research.. The choice of this approach is based on the reason that what will be studied is not only the product (learning outcomes), but also the process (activity) and character that is not measured momentarily, but takes time. Naposo Nauli Bulung's local wisdom-based character measurements that he wants to achieve are tolerance, discipline, hard work, creativity, independence, democracy, curiosity, and it takes

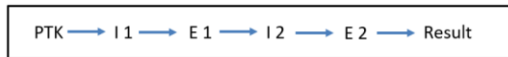time to be seen. The description of the research scheme is as follows:

Figure 1. Research Scheme

Information
PTK: Classroom action research
I1: Intervention 1 (Pretest)
E1: Monitoring and evaluation 1
I2: Intervention 2 (Posttest)
E2: Monitoring and evaluation 2
Result: Processing and research results

a)   Research Setting

This research was conducted at Vocational High School SMKN 4 Padangsidimpuan City, North Sumatra Province. The subjects in this research were all students in class XI MMD 1 and XI MMD 2 with multimedia skills competencies. With a total of 30 students in each class. This quasi-experimental research uses tests that are given in stages before and after being given different treatments in the two classes. Researchers used class XI MMD 1 by applying the PjBL model based on the local wisdom of Naposo Nauli Bulung and class XI MMD 2 by applying PjBL methods. Data was obtained in the odd semester of the 2023/2024 academic year which took place from July to August 2023. The instruments used were observation, questionnaires and documentation.

b)   Research Data Sources

The data sources in this research are students' words, actions and attitudes, the rest is additional data such as documents and others. Linked to words, actions, attitudes, written data sources, photos as documentation. In this study researchers used two data sources :
1.   Primary Data Source
Primary data is data in verbal form or spoken words. The primary data sources are spoken orally, movements or behavior carried out by trustworthy subjects, namely research subjects or informants relating to the variables studied or data obtained from respondents directly. In this research, the primary data sources used were the results of

observations, questionnaires and documentation from research informants
2.   Secondary Data Sources
Secondary data is data in the form of documents obtained from class and school teachers. Secondary data is used to support the primary data that has been obtained

c)   Data Analysis Technique

Data collection techniques use observation research instruments, questionnaires and documentation to measure student character development. After the instrument testing stage, it continues with data analysis, namely prerequisite tests which include normality tests and homogeneity tests, and hypothesis testing using t-tests in the form of independent sample t-tests. Followed by hypothesis testing to answer the problem formulation in the research using the t-test in the Independent sample t-test section.

The researcher carried out a prerequisite test as an initial stage, then a t-test was carried out to determine the effect of the PjBL model based on the local wisdom of Naposo Nauli Bulung in this research. Data to measure student character is analyzed by giving grades to questionnaires containing student answers and reducing data from observations and documentation that have been carried out. The following are the character level criteria described in table 1 (Lidyasari 2014)(Kamugisha et al. 2021).

Table 1. Criteria For Student Character Level

Percentage (%)	Category
Under 55	Less
55 – 64	Not Enough
65 - 79	Enough
80 - 89	Good
90 - 100	Very Good

RESULTS

Values for determining student character (Tolerance, Discipline, Hard Work, Creativity, Independence, Democracy and Curiosity) were obtained from questionnaires filled out by students in both classes. The following is the conclusion in the form of the average scores

obtained in both classes. Described in the following table

Table 2. Student Tolerance Results

Class	Mean (%)
Control	73.40
Experiment	81.27

It can be concluded in table 2 that the control class mean is 73.40, while the experimental class mean is 81.27. This means that

in the control class students have sufficient tolerance character and in the experimental class students have good tolerance character. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL model based on local wisdom Naposo Nauli Bulung is able to increase student tolerance. The results of these calculations are explained in table 3

Table 3. T – Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Tolerance	Equal variances assumed	.332	.567	9.642	58	.000

Table 4. Student Discipline Results

Class	Mean (%)
Control	71.83
Experiment	81.57

It can be concluded in table 4 that the control class mean is 71.83, while the experimental class mean is 81.57. This means that in the control class students have sufficient

discipline and in the experimental class students have good discipline. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL model based on local wisdom Naposo Nauli Bulung is able to improve student discipline. The results of these calculations are explained in table 5

Table 5. T – Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Discipline	Equal variances assumed	.662	.419	12.115	58	.000

Table 6. Student Hard Work Results

Class	Mean (%)
Control	72.20
Experiment	80.87

It can be concluded in table 6 that the control class mean is 72.20 while the experimental class mean is 80.87. This means that in the control class students have a fairly hard

working character and in the experimental class students have a good hard working character. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL model based on local wisdom Naposo Nauli Bulung is able to improve students' hard working character. The results of these calculations are explained in table 7

Table 7. T- Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Hard Work	Equal variances assumed	.060	.808	7.749	58	.000

Table 8. Student Creativity Results

Class	Mean (%)
Control	71.87
Experiment	81.27

It can be concluded in table 8 that the control class mean is 71.87 while the experimental class mean is 81.27. This means that in the control class students have sufficient creative character and in the experimental class students have good creative character. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL model based on local wisdom Naposo Nauli Bulung is able to improve students' creative character. The results of these calculations are explained in table 9

Table 9. T-Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Creativity	Equal variances assumed	.175	.678	13.875	58	.000

Table 10. Student Independence Results

Class	Mean (%)
Control	72.13
Experiment	81.60

It can be concluded in table 10 that the control class mean is 72.13 while the experimental class mean is 81.60. This means that in the control class students have sufficient independent character and in the experimental class students have good independent character. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL model based on local wisdom Naposo Nauli Bulung is able to improve students' independent character. The results of these calculations are explained in table 11.

Table 11. T-Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Independence	Equal variances assumed	.049	.825	12.871	58	.000

Table 12. Student Democracy Results

Class	Mean (%)
Control	72.33
Experiment	81.50

It can be concluded in table 12 that the control class mean is 72.33 while the experimental class mean is 81.50. This means that in the control class students have quite democratic character and in the experimental class students have good democratic character. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL

model based on local wisdom, Naposo Nauli Bulung, is able to improve students' democratic

character. The results of these calculations are explained in table 13

Table 13. T- Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Democracy	Equal variances assumed	.200	0.45	10.703	58	.000

Table 14. Student Curiosity Results

Class	Mean (%)
Control	72.60
Experiment	82.70

It can be concluded in table 14 that the control class mean is 72.60 while the experimental class mean is 82.70. This means that in the control class students have sufficient

curiosity and in the experimental class students have good curiosity. Furthermore, for the test results whether or not there is an influence of the PjBL model, a significance value of 0.000 is obtained. The PjBL model based on local wisdom Naposo Nauli Bulung is able to increase students' curious character. The results of these calculations are explained in table 15.

Table 15. T-Test Result

		Levene's Test for Equality Variances		t-Test for Equality of Means		
		F	Sig.	T	Df	Sig (2-tailed)
Student Tolerance	Equal variances assumed	.044	.834	13.198	58	.000

DISCUSSION

Instilling character values in schools can be done by applying the process, through preparing the stages of character education (Rolina 2014). Character education in schools can be done through example, creating an environment and habituation (Kim 2015). Furthermore, character education in schools is designed through a comprehensive approach including learning activities, extracurricular activities, school culture, and through community participation in schools. Character education through classroom learning activities is carried out using an integrated approach in all subjects. So, character education is not the responsibility of just a few lessons such as religion and character, but for all subjects including productive subjects in vocational high schools. This character education can also be obtained through appropriate learning models such as the Project Based Learning model.

Project based learning is learning that involves students in carrying out learning activities both in solving a problem and providing opportunities for students to express student creativity more so that it can improve learning outcomes and student creativity (Marnewick 2023). Changes that occur in students, both changes involving aspects cognitive, affective, psychomotor and character as a result of the learning activities that have been carried out (Santos, Rybska, Klichowski, Jankowiak, et al. 2023).

Through the PjBL learning model based on local wisdom, students can increase their knowledge, ability to make a product and change their character. Changes in student character are obtained during the learning process. Students are set to carry out activities together effectively so that all students are able to work independently and as a group. The most important thing in this learning model is equal rights in working on projects and giving assignments according to each

section. Teachers see the effectiveness of students independently and create work as widely as possible according to students' creativity so that they do not make a fuss themselves or throw tantrums in teaching and learning activities, but students try to complete the project with great curiosity because they are given the opportunity to complete it from the internet.

Project Based Learning based on local wisdom Naposo Nauli Bulung is carried out to see the improvement of student character (Tolerance, Discipline, Hard Work, Creativity, Independence, Democracy and Curiosity). This research was carried out in 2 intervention stages. At each stage of intervention, the local wisdom is first implemented at each initial stage of project based learning. The local wisdom will provide an opportunity for all students to be able to express opinions democratically to achieve learning goals or complete projects that will be determined. Before intervention 1 is carried out, a pretest will be carried out for both classes to obtain data

Table 16. Pretest Results on Student Character Development

Class	Mean (%)
Control	63.2
Experiment	63.8

From table 16 it can be concluded that the overall level of student character is low, namely in the experimental class with an average of 63.8 and in the control class with an average of 63.2. Next, intervention 1 will be carried out in the form of a project based learning model based on the local wisdom of Naposo Nauli Bulung in the experimental class. Project based learning model in the control class. The project carried out in class XI Multimedia was a project for making class profile videos. After intervention 1 is carried out, there will be monitoring and evaluation to see an overview of the research process carried out. Next, intervention 2 will be implemented in each class with a school profile video creation project. Evaluation and monitoring are still carried out after intervention 2. And to measure the level of success in using the project based learning model based on Naposo Nauli Bulung, a

posttest was carried out, with the posttest results as follows

Table 17. Posttest Results on Student Character Development

Class	Mean (%)
Control	72.32
Experiment	81.54

From table 17 it can be concluded that the level of change in student character in the experimental class using the project based learning learning model based on local wisdom is in the good category with an average of 81.54 and the control class using the project based learning learning model is in the fair category with an average of 72. .32. So it can be concluded that the project based learning model based on local wisdom Naposo Nauli Bulung can be applied to increase the character values of tolerance, discipline, hard work, creativity, independence, democracy and curiosity in students.

State of the Art and Novelty of Project Based Learning (PjBL) Learning Model Based on Local Wisdom Naposo Nauli Bulung

Previous research serves to analyze and enrich research discussions, as well as differentiate it from research currently being conducted. This research included five journals that use the project based learning model.

1. Research with title "Efektifitas Model Problem Based Learning dan Model Group nvestigation dalam Meningkatkan Karakter Anti Korupsi". This research was conducted to find out effective learning models in implementing character education in classroom lectures with 50 students for classes E and F. The results of this research are that students show an increase in character in learning both in class E and class F (Trisnawati and Sundari 2020).
2. Research with title "Penerapan Model Pembelajaran Problem Based Learning (PBL) untuk Mengembangkan Karakter Toleransi dan Demokratis Siswa pada Pelajaran PKN Kelas V DI SD Negeri Paya Peunaga". This research was conducted to developing students' tolerant and democratic

character in class V Civics learning at Paya Peunaga Elementary School with 9 male students and 12 female students as a subject research. The total number of students in class V/A is 21 students. The results of this research are tolerance and democratic character of students in Civics learning is completed only until cycle II (Wijaya, Fahreza, and Kistian 2019).

3. Research with title "Pembelajaran Project Based Learning (PJBL) Untuk Penguatan Karakter Kemandirian". This research was conducted to increasing the character of independence in students with 4th grade elementary school student as subject research. The results of this research are increase in independent character (Andy Ariyanto, Sutama 2022).

4. Research with title "Pengaruh Penggunaan Model Problem-Based Learning Terhadap Karakter Kreatif Dan Berpikir Kritis Dalam Pembelajaran Matematika". This research was conducted to knowing the effect of using the Problem-Based Learning model on students' creative character and critical thinking in learning mathematics. The subjects of this research were students class IV at SDN 1 Sokanegara, SDN 2 Sokanegara, and SDN 1 Kranji for the 2014/2015 academic year. This research is a quasi-experiment with a pretest-posttest nonequivalent control group research design. The result of this result is PBL model influences students' creative character and the PBL model influences students' critical thinking character (Ujiati Cahyaningsih 2016)

5. Research with title "Pengaruh Model Problem Based Learning terhadap Kemampuan Karakter". This research was conducted to prove the influence of the problem based learning model on the cooperative character abilities of early childhood. The subjects of this research were 42 children from group B of Pertiwi Taji Kindergarten in Prambanan District with an age range of 5 – 6. This study uses a pre-experimental research design with one experimental group using a pretest and posttest. The result of this research is significant level of 5%, there is an influence of the problem based learning model on the cooperative (Wulandari 2020)

Based on previous research, it can be concluded from 5 previous studies that each research on the project based learning model can improve the character of each student. However, not a single researcher has combined the project based learning model with local wisdom. So the novelty of the research is there and visible, namely the project based learning model based on the local wisdom of Naposo Nauli Bulung.

CONCLUSIONS

Based on the results of the research and discussion previously presented, it can be concluded that (1) Implementing the Project Based Learning Model can increase the implementation of character strengthening to a sufficient level. (2) Implementation of the Project Based Learning Model Based on Naposo Nauli Bulung Local Wisdom can increase the implementation of character strengthening to a good level. (3) The Project Based Learning Model can be combined with existing local wisdom so that the achievements in the Project Based Learning Model become better.

From the results of research on the implementation of project based learning based on local wisdom Naposo Nauli Bulung, the following suggestions can be put forward:

1. Proven to be able to implement character strengthening so that students can freely innovate, so it is recommended that teachers be able to provide this learning model in the teaching and learning process.

2. Provides the opportunity to explore many things when working on projects, so it is recommended that teachers be more strict in supervising students when working on projects.

3. Can improve student learning achievement, therefore it is recommended for teachers to apply and develop learning for different materials

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