Prisma Sains: Journal of the Study of Science and Mathematics and Science Learning at IKIP Mataram
http://ojs.ikipmataram.ac.id/index.php/prismasains/index
e-mail: prismasains.pkpsm@gmail.com

Month Year. Vol. x, No. y
p-ISSN: 2338-4530
e-ISSN: 2540-7899
pp. xx-yy

Ethnomathematics-Based Pancasila Student Profile Strengthening Project Module in the Merdeka Curriculum Phase A in Elementary Schools

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Received :……..; Revised:……; Published: ……..

Abstract

The transformation of education in Indonesia after Covid-19 has experienced quite significant changes, namely the latest Merdeka Belajar curriculum. The Merdeka Curriculum develops learning according to interests, learning styles and abilities that are connected to the competence of teachers and students. The independent curriculum is implemented through a project to strengthen the profile of Pancasila students. There are six competencies in Pancasila students formulated as key dimensions that are interrelated and strengthen each other, namely 1) faith, devotion to God Almighty and noble character, 2) global diversity, 3) mutual cooperation, 4) independence, 5) critical reasoning , and 6) creative. These dimensions are important and must be embedded in students in learning, so they are important in developing modules. The module developed is based on ethnomathematics which is used as an integration of curriculum, pedagogy and mathematics. The use of local wisdom as an integrated module for the project to strengthen the profile of Pancasila students makes students trained and able to explore mathematical concepts that exist in their cultural environment. Local wisdom will make it easier for students to learn because this culture exists in the student's environment. In this research, the context is local wisdom in Tuban Regency, East Java. This research aims to produce a product, namely a project module to strengthen the profile of Pancasila students which contains ethnomathematics. The product is obtained from research results using Research And Development (R&D) research with a 4D model. The 4D model design consists of four paths, namely Define, Design, Develop, and Desseminase. The validation results from design validation were 88%, language validators were 94%, and material validators were 90%. Thus the percentage of the average value of 90.6%. The average pretest result of trial 1 was 62.75 then in trial 2 was 63.75. The posttest results from trial 1 were continued, namely 90.33 and trial 2, namely 91.58. After carrying out the pre-test and post-test at the trial stage, the researcher calculated the N-Gain Score value, namely N-Gain trial 1, namely getting a score of 0.76 which means high and getting an interpretation of N-Gain effectiveness of 76.78% which means effective. Then the students filled out a student response questionnaire, and obtained a presentation of 85% in the very satisfied category.

Keywords: *Module Development; Project Module; Pancasila Student Profile; Ethnomathematics; Independent Curriculum*

How to Cite: First author., Second author., & Third author . (20xx). The title . *Prisma Sains: Journal of the Study of Science and Learning Mathematics and Science IKIP Mataram, vol* (no), xx-yy . doi: https://doi.org/10.33394/j-ps.v xx i yy

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INTRODUCTION

The teaching and learning process that occurs in education takes place effectively and efficiently. Urgency education is a very important element in the dignity of social and state life [1] [2]. When the Covid-19 pandemic took place there were many problems in education [3] [4] especially the process of teaching and learning activities in schools, so teachers used online and offline learning systems [5] [6] [7]. The transformation of education in Indonesia after Covid-19 has experienced quite significant changes. The change that occurs is that there is a new curriculum, namely the Merdeka Belajar curriculum [8].

The Independent Curriculum develops learning according to the interests, learning styles and abilities of students which are connected to the competence of teachers and students [9]. In this period, the Minister of Education applied the independent curriculum at all levels of schools/educational units. There are 3 phases of the independent curriculum in elementary schools, namely Phase A, Phase, and Phase C. The application of the curriculum in elementary schools will bring a changing effect for teachers, education staff, learning administration, learning strategies, learning methods, and learning evaluation [10] . Curriculum changes occur with the aim of improving the quality of education. The independent curriculum in addition to improving the quality of education is also to produce human resources [11]. The independent curriculum applies to primary and secondary education. In the independent curriculum that is applied is project learning to strengthen the profile of Pancasila students [12] [13].

The urgency of the project to strengthen the Pancasila student profile is cross-disciplinary learning to observe and solve surrounding problems. There are six competencies in Pancasila students formulated as key dimensions that are interrelated and mutually reinforcing, namely 1) having faith, fearing God Almighty and having noble character, 2) global diversity, 3) working together, 4) independent, 5) critical thinking , and 6) creative [14]. These dimensions are important and must be embedded in students in learning, so they are important in developing modules. The chart of these competencies can be seen as follows:

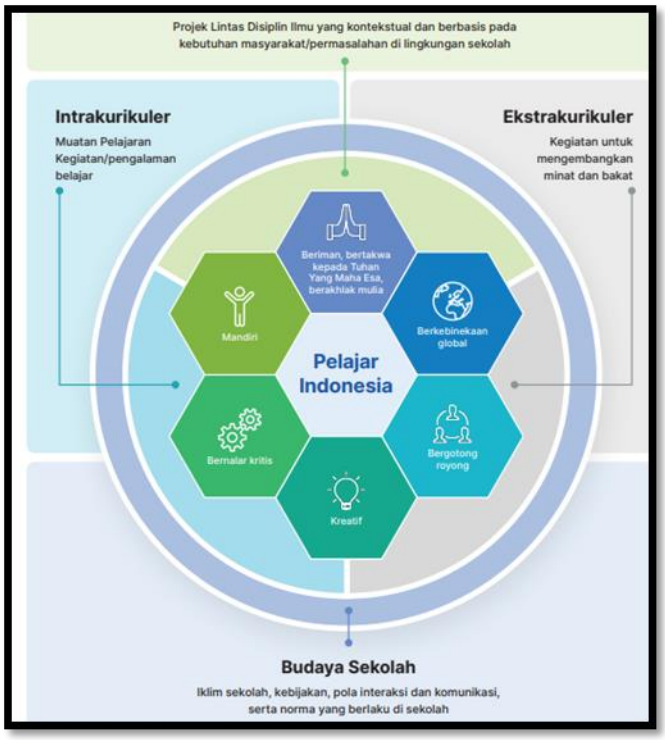


Figure 1. Interrelated key dimension competencies

This research focuses on developing a project module to strengthen the profile of Pancasila students based on ethnomathematics in the independent curriculum phase A in elementary schools. Ethnomatematics is used as an integration of curriculum, pedagogy, and mathematics [15]. The use of local wisdom as an integration project module to strengthen the profile of Pancasila students makes students trained and able to explore mathematical concepts that exist in their cultural environment [16] [17]. Local wisdom will make it easier for students to learn because this culture exists in the students' environment [18] [19] [20]. In this research, the context is local wisdom in Tuban Regency, East Java. The use of modules in learning has a major effect on student achievement [21] [22], especially in dealing with an independent curriculum, new teachers and students must develop independent learning [23]. This means learning naturally to achieve independence. In essence, modules are needed to explore the

greatest potential of teachers and students to innovate and improve the quality of independent learning.

Previous research that has been carried out regarding the project module for strengthening the profile of Pancasila students was carried out with variables that are still common, namely, it has produced research results including regarding student character [24], strengthening strategies [25], Pancasila character [26], emerging values. [27], as well as its application in the profile of Pancasila students [28]. However, it has not added ethnomathematics. This is important because students are trained and able to explore mathematical concepts that exist in their cultural environment. This makes it easier for them to learn because the culture exists in the students' environment. Mathematics is a science related to the study of abstract structural forms [29]. The learning developed meets the effective criteria in developing the Ethomathematics module [30]. Mathematics learning is important in developing an independent learning curriculum .

METHOD

1. Development Model

This research is Research and Development (R&D). Development is carried out using a 4-D model with the Define, Design, Develop, and Desseminase stages [33] [34].

a. Define Stage (Definition)

The define stage is carried out by field observation with curriculum analysis, student analysis, task analysis, concept analysis, and learning objectives.

b . Design Stage (Designing)

The design stage is carried out by selecting the design and format of the project module for strengthening the profile of Pancasila students based on ethnomathematics which is prepared based on curriculum references with the coverage in it of the title, objectives, material presented in the form of a module that matches the students' experience in comics, evaluation. The comic teaching materials themselves contain characters, characters, subject matter, conversation balloons, ethnomathematics storylines that suit the students' experiences, as well as colors that the students like.

c . Development Stage (Development)

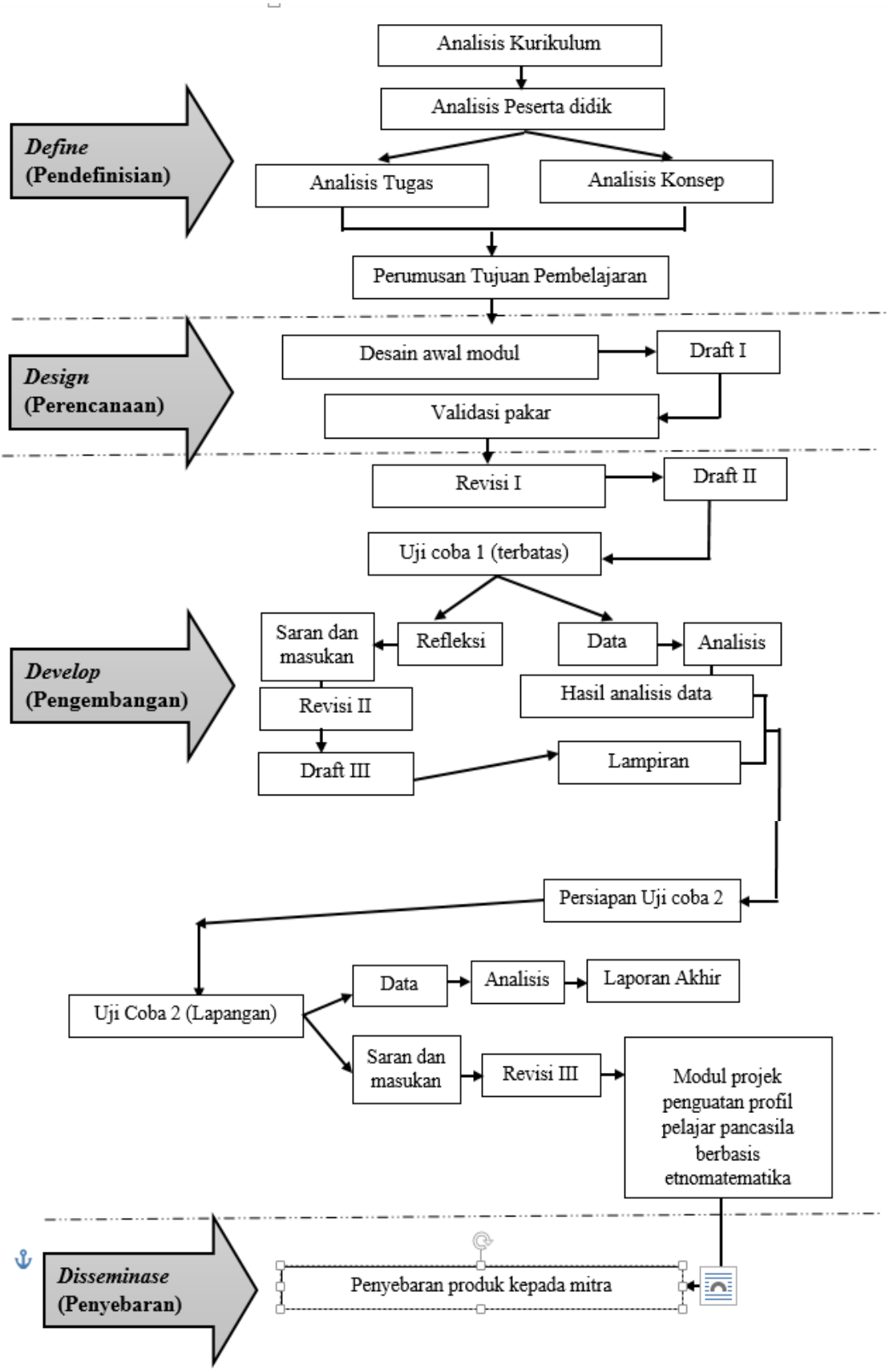
This development stage aims to find a product, namely a project module for strengthening the profile of Pancasila students based on ethnomathematics which has been revised and improved based on input from experts, colleagues, and the results of trial 1 (limited) and trial 2 (field) for students.

d . Dessiminase Stage (Dissemination)

This dissemination stage aims to disseminate the final research product. Products developed and tested for use by others.

The research development procedure is as follows:

Table. 1 4D Research Flow



2. Data and Data Sources

The data in this research is divided into two, namely qualitative and quantitative data. Qualitative data in the form of suggestions for improvement, criticism, comments provided by material experts, design experts, language/module readability experts, students and teachers, both written in questionnaires and expressed during interviews. Quantitative data is data obtained from questionnaires filled out by material experts, design experts, language/module readability experts. In addition, quantitative data is also data derived from students' scores when taking cognitive learning outcomes tests .

3. Data Collection Techniques and Instruments

Data collection was carried out in three ways , namely questionnaires, interviews, and tests. Questionnaires are used to collect data regarding the validity and practicality of the instrument. The questionnaire was addressed to materials, design experts, linguists/student module readability experts and teachers. Interviews were conducted with materials, design experts, language/module readability experts, and teachers to obtain data regarding validity and practicality. The test was used during trial 1 and trial 2 to obtain data which was then analyzed.

4. Data Analysis

The qualitative data obtained was analyzed through three stages, namely data condensation, data presentation, and data conclusion [31]. Conclusions regarding suggestions for improvement, criticism and comments are then applied in follow-up module improvements. Quantitative data from the use of the module is analyzed using test theory where the percentage of feasibility is obtained from the following formula:

$$\textbf{Percentage} = \frac{(\textbf{\textit{Nilai yang dicapai}})}{(\textbf{\textit{Jumlah seluruh nilai yang harus dicapai}})} \textbf{ x 100\%}$$

After that, the average score is calculated using the following formula:

$$\textbf{Completeness} = \frac{(\textbf{\textit{Nilai yang dicapai}})}{(\textbf{\textit{Jumlah seluruh nilai yang harus dicapai}})} \textbf{ x Maximum score}$$

The validation eligibility criteria can be seen in the following table:

Table 1 . Validation Eligibility Criteria

Classification	Information
7 6 – 100 %	Valid / Eligible
51 – 75 %	Enough Valid / Decent Enough
26 – 50 %	Less Valid / Less Appropriate
0 – 25 %	Invalid / Ineligible

The division of categories for the acquisition of N-Gain values is as follows:

Table 2 . Validation Eligibility Criteria

N-Gain Value	Category
G > 0.7	Tall
0.3 ≤ G ≤ 0.7	Currently
G < 0.3	Low

Then the category of obtaining the interpretation of the effectiveness of N-Gain in percent (%) is as follows:

Table 3 . Validation Eligibility Criteria

Percentage (%)	Category
< 40	Ineffective
40 – 55	Less effective
56–75	Effective enough

> 76	Effective

Then the categories of acquisition of student response questionnaires are as follows:

Table 4 . Student Response Questionnaire

Classification	Information
7 6 – 100 %	Satisfied
51 – 75 %	Enough Satisfied
26 – 50 %	Less satisfied
0 – 25 %	Dissatisfied _

RESULTS AND DISCUSSION

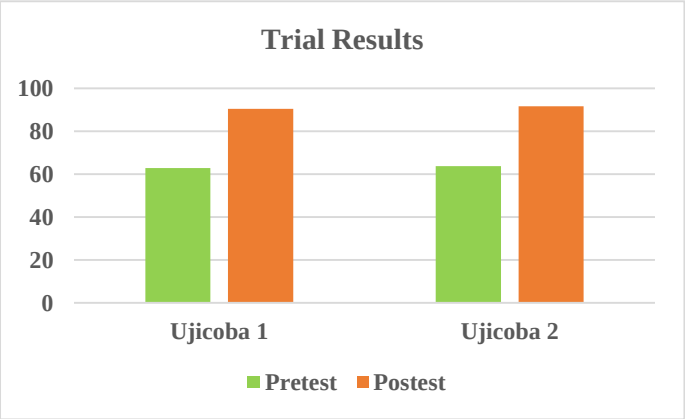
The product was obtained with validation results from design validation of 88%, language validator of 94%, and material validator of 90%. Thus , the average percentage value of 90.6% can be seen in the table as follows:

Table 5 . Validation Results

Validators	Results
Design Validator	88 %
Language Validator	94 %
Material Validators	90 %
Average	**90.6 %**

The average pretest result of trial 1 was 62.75 then in trial 2 was 63.75. The posttest results from trial 1 were continued, namely 90.33 and trial 2, namely 91.58. The following are the results of the trial phase:

Chart 1. Pretest and Posttest Results



After carrying out the pretest and posttest at the trial stage, the researcher calculated the N-Gain Score, namely the N-Gain trial 1, namely obtaining a score of 0.76 which means high and obtaining an interpretation of the effectiveness of N-Gain 76.78% which means effective. This can be seen in the following table:

Table 6. N-Gain Score (Trial 1)

N-Gain Score (Ujicoba 1)							
No.	**NISN**	**Nilai**		**Post-Pre**	**Skor Ideal (100) - Pre**	**N - Gain Score**	**N - Gain Score Persen**
		Pre	**Post**				
1	1149	68	92	24	32	0,75	75
2	1148	48	100	52	52	1	100
3	1150	66	82	16	34	0,470588235	47,05882353
4	1151	72	82	10	28	0,357142857	35,71428571
5	1152	54	70	16	46	0,347826087	34,7826087
6	1153	48	90	42	52	0,807692308	80,76923077
7	1154	46	100	54	54	1	100
8	1155	78	100	22	22	1	100
9	1156	64	98	34	36	0,944444444	94,44444444
10	1157	58	94	36	42	0,857142857	85,71428571
11	1158	58	100	42	42	1	100
12	1159	72	94	22	28	0,785714286	78,57142857
13	1160	54	90	36	46	0,782608696	78,26086957
14	1161	48	98	50	52	0,961538462	96,15384615
15	1162	78	100	22	22	1	100
16	1163	64	82	18	36	0,5	50
17	1164	58	70	12	42	0,285714286	28,57142857
18	1165	64	98	34	36	0,944444444	94,44444444
19	1166	64	94	30	36	0,833333333	83,33333333
20	1167	64	100	36	36	1	100
21	1168	56	82	26	44	0,590909091	59,09090909
22	1169	72	70	-2	28	-0,07142857	-7,142857143
23	1170	78	82	4	22	0,181818182	18,18181818
24	1171	74	100	26	26	1	100
Jumlah		**1506**	**2168**	**662**	**894**	**17,329489**	**1732,9489**
N - Gain Score (Keseluruhan) Ujicoba 1						**0,722062042**	**72,20620415**
Rata - Rata		**62,75**	**90,333**				

Table 7 . N-Gain Score (Trial 2)

N-Gain Score (Ujicoba 2)

No.	NISN	Nilai		Post-Pre	Skor Ideal (100) - Pre	N - Gain Score	N - Gain Score Persen
		Pre	Post				
1	1149	68	96	28	32	0,875	87,5
2	1148	52	78	26	48	0,541666667	54,16666667
3	1150	70	100	30	30	1	100
4	1151	76	88	12	24	0,5	50
5	1152	56	88	32	44	0,727272727	72,72727273
6	1153	52	96	44	48	0,916666667	91,66666667
7	1154	48	90	42	52	0,807692308	80,76923077
8	1155	78	100	22	22	1	100
9	1156	48	68	20	52	0,384615385	38,46153846
10	1157	66	100	34	34	1	100
11	1158	76	92	16	24	0,666666667	66,66666667
12	1159	56	100	44	44	1	100
13	1160	52	82	30	48	0,625	62,5
14	1161	46	96	50	54	0,925925926	92,59259259
15	1162	78	90	12	22	0,545454545	54,54545455
16	1163	64	100	36	36	1	100
17	1164	58	68	10	42	0,238095238	23,80952381
18	1165	64	100	36	36	1	100
19	1166	78	82	4	22	0,181818182	18,18181818
20	1167	64	96	32	36	0,888888889	88,88888889
21	1168	56	96	40	44	0,909090909	90,90909091
22	1169	72	94	22	28	0,785714286	78,57142857
23	1170	78	98	20	22	0,909090909	90,90909091
24	1171	74	100	26	26	1	100
Jumlah		**1530**	**2198**	**668**	**870**	**18,4286593**	**1842,86593**
N - Gain Score (Keseluruhan) Ujicoba 2						0,767860804	76,78608043
Rata - Rata P		**63,75**	**91,583**				

Then students filled out the student response questionnaire, and obtained presentation results of 85% in the very satisfied category as follows:

Rekapitulasi Angket (Siswa)

No	Pernyataan	Skor yang diperoleh																						Jumlah	Rata-Rata	Presentase
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23			
1	Pernyataan-1	0	0	1	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	18	0,782609	78%
2	Pernyataan-2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	22	0,956522	96%
3	Pernyataan-3	1	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	17	0,73913	74%
4	Pernyataan-4	1	1	1	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	18	0,782609	78%
5	Pernyataan-5	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	21	0,913043	91%
6	Pernyataan-6	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	1	19	0,826087	83%
7	Pernyataan-7	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	22	0,956522	96%
TOTAL		**4**	**6**	**6**	**5**	**6**	**5**	**7**	**6**	**7**	**6**	**7**	**6**	**5**	**6**	**6**	**6**	**6**	**7**	**7**	**6**	**6**	**6**	**5**			**596%**
RATA-RATA		**0,6**	**0,9**	**0,9**	**0,7**	**0,9**	**0,7**	**1**	**0,9**	**1**	**0,9**	**1**	**0,9**	**0,7**	**0,9**	**0,9**	**0,9**	**0,9**	**1**	**1**	**0,9**	**0,9**	**0,9**	**0,7**			**85%**

CONCLUSION

In this research, there were obstacles experienced in implementing the research process. This obstacle is the adjustment of hours in activities carried out at school, because it happens to be held in August where schools hold many activities to commemorate the independence day of the Republic of Indonesia. However, this can be handled well by arranging the right time and schedule. Then another obstacle is the need for a definite understanding regarding the understanding of the chosen theme in project learning and this can be overcome well.

RECOMMENDATIONS

Suggestions from researchers to all stakeholders to ensure that project learning in the independent curriculum is very important, especially regarding ethnomathematics with the aim of forming a Pancasila student profile. In addition , all school members must cultivate and familiarize positive behavior in realizing learning goals.

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