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Khombouw in Science Learning: Development of Teaching Materials based on Local Wisdom Guided Inquiry Model to Improve Students' Interpersonal Skills

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Abstract

This research aims to develop teaching materials based on local wisdom to improve the interpersonal skills of prospective elementary school teachers. The background of this research is based on the low interpersonal skills of prospective students of Elementary School Teachers at the Faculty of Teacher Training (FKIP) Cenderawasih University (Uncen) Papua. The strategy used to improve students' interpersonal skills is to integrate Khombouw into the teaching materials of the Basic Concepts of Science Elementary School. Khombouw is a local wisdom made of bark from red khombow trees (Ficus nodosa teijsm & Binn) and white khombow (Ficus variegata Blume), which grow in Sentani, Papua. This research is a research development (R&D) of the ADDIE (Analyze, Design, Development, Implementation) design model. Data collection was carried out through observation, interviews, and questionnaires. Data analysis uses descriptive and inferential analysis. The results of the study showed that the assessment of the feasibility test of the material aspect with a validity of 87.45% with very valid criteria, in the media aspect obtained a validity of 93.75% with very valid criteria used. The results of student self-assessment on the implementation of teaching materials based on Khombouw Local Wisdom Model Guided Inquiry on interpersonal skills were 69.5% in the "good" criterion, 28.2% in the "very good" criterion, and 5.1% in the "quite good" criterion. Lecturers' observations of interpersonal skills showed results that were not much different, namely 74.3% on the good criteria, 25.6% on the very good criteria, and 7.6% on the good criteria. The value of N < g> obtained was 0.27 and was included in the low criteria. A thorough evaluation and in-depth analysis of the factors that affect the low N-Gain value is required.

Kata kunci:
Keterampilan Interpersonal, Inkuiri Terbimbing, Kearifan Lokal, Khombouw

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Abstrak

Penelitian ini bertujuan untuk mengembangkan bahan ajar berbasis kearifan local untuk meningkatkan interpersonal skills mahasiswa calon guru SD. Latar belakang penelitian ini berdasarkan rendahnya kemampuan interpersonal skills mahasiswa calon Guru Sekolah Dasar di Fakultas Keguruan Ilmu Pendidikan (FKIP) Universitas Cenderawasih (Uncen) Papua. Strategi yang digunakan untuk meningkatkan interpersonal skills mahasiswa adalah mengintegrasikan Khombouw ke dalam bahan ajar mata Kuliah Konsep dasar IPA SD. Khombouw merupakan kearifan lokal berbahan kulit kayu dari pohon khombow merah (Ficus nodosa teijsm & Binn) dan khombow putih (Ficus variegata Blume), yang tumbuh di Sentani Papua. Penelitian ini merupakan penelitian pengembangan (R&D) model desain ADDIE (Analyze, Design, Development, Implementation). Pengumpulan data dilakukan melalui observasi, wawancara, dan angket. Analisis data menggunakan analisis deskriptif dan inferensial. Hasil penelitian menunjukkan bahwa penilaian uji kelayakan aspek materi dengan validitas 87,45% dengan kriteria sangat valid, pada aspek media diperoleh validitas 93,75% dengan kriteria sangat valid digunakan. Hasil self asessmen mahasiswa pada implementasi bahan ajar berbasis Kearifan Lokal Khombouw Model Inquiry Terbimbing terhadap interpersonal skills adalah 69.5% berada pada kriteria "baik" dan 28.2% berada pada kriteria "sangat baik" dan 5,1% berada pada kriteria "cukup baik". Observasi dosen terhadap interpersonal skills menujukkan hasil yang tidak jauh berbeda yaitu 74.3% pada kriteria baik, 25.6%

sangat baik dan 7.6% pada kriteria cukup baik. Nilai N < g> yang diperoleh sebesar 0,27 dan termasuk dalam kriteria rendah. Perlu evaluasi menyeluruh dan analisis mendalam terhadap faktor-faktor yang mempengaruhi rendahnya nilai N-Gain.

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INTRODUCTION

The condition of education in Indonesia is currently still faced with several major challenges. The 2022 Programme for International Student Assessment (PISA) report from the Organization for Economic Co-operation and Development (OECD) shows that Indonesia's performance in literacy, numeracy, and science has declined (Widi, 2023). This problem is exacerbated by the results of the Minimum Competency Assessment (AKM) in the 2021 National Assessment, which shows the state of the literacy emergency in Indonesia (Hutapea, 2023). He further explained that the literacy deficit in Papua requires urgent attention. This condition is important in the context of learning. This can affect students' ability to understand and apply scientific concepts related to Science competencies. Literacy measures reading and writing competence, comprehension, analysis, evaluation, and use of information to solve problems, think critically and communicate effectively (Koesoema et al., 2017). Based on this description, competencies are needed to improve students' literacy skills.

Interpersonal skills have an important role in supporting a person's literacy skills. Interpersonal skills are essential basic skills for students in this global era, where the ability to communicate and collaborate effectively is the key to success in many aspects of life (Basri & Novia, 2021). Critical literacy involves the ability to critically analyze and evaluate information, and this can be strengthened through active communication in a learning environment. Good social interaction allows students to exchange information, explain elusive concepts, and deepen their understanding through discussion. In addition, collaboration in study groups can strengthen reading, writing, and critical thinking skills, all of which are important parts of functional literacy (Gaur, 2020). Research shows that students with good interpersonal skills are more effective in resolving conflicts, working in teams, and achieving career success (Maharshi & Azzopardi, 2024). Therefore, educational strategies must prioritize the development of interpersonal skills in addition to traditional academic learning. Good interpersonal skills are indispensable to improve social interaction and learning outcomes (Wrench et al., 2020). In the context of education in Papua, this is important where many students come from different cultural backgrounds. Based on this exposure, efforts are needed to develop student interpersonal skills through the learning process. To support the development of these skills, it is necessary to implement appropriate learning strategies, including providing a platform that allows students to practice and strengthen these skills. Existing literature shows the benefits of integrating local wisdom in education. The integration of local knowledge can improve cognitive and social learning outcomes (Sarini & Selamet, 2023). Research shows that culturally responsive

teaching strengthens students' identity, self-confidence, and academic achievement (Ardianti & Raida, 2022). In addition, the guided inquiry learning model, supported by a sociocultural framework, has been shown to encourage problem-solving and critical thinking skills (Doyan et al., 2023; Schwab, 1960). However, research that specifically discusses the impact of local wisdom-based learning on the development of interpersonal skills is still limited, which shows the novelty of this study.

The literature shows that the integration of local wisdom in education has significant benefits, both for cognitive and social learning outcomes. Culturally responsive teaching strengthens students' identity, confidence, and academic achievement (Ardianti & Wanabuliandari, 2021; Eliezanatalie & Deta, 2023). Learning problems that originate from daily life facilitate understanding (Bektiarso et al., 2021, 2022). In addition, the guided inquiry learning model supported by a sociocultural framework is able to encourage problem-solving skills, critical thinking, and increase confidence in social interactions (Fabiola, 2023; Fathonah & Subali, 2020; Hansen, 2002). However, although the benefits of local wisdom have been proven in the context of cognitive learning, research exploring its impact on the development of interpersonal skills, especially in multicultural contexts such as in Papua, is still limited, making this research new.

Papua is one of the provinces in Indonesia that has a unique cultural and local wisdom richness. Khombouw is one of the local wisdom in the form of artworks of the Sentani tribe made from the bark of red Khombouw (Ficus nodosa teijsm & Binn) and white Khombouw (Ficus variegata Blume) (Manik et al., 2022). Khombouw's picture is shown in figure 1.

Figure (1). Khombouw (painting on bark), (2) Khombouw bark painting material. Source (Indrayati, 2021)

Teaching materials based on local wisdom are expected to help students build a strong sense of identity and provide a solid foundation to build confidence so as to improve learning outcomes (Handayani et al., 2019). This condition is supported by research that shows that a science learning environment that is integrated with local wisdom makes a significant contribution to learning outcomes, and student attitudes (Ardianti et al., 2023; Elsera, 2019; Nuralita, 2020). Students of the Elementary School

Teacher Education Study Program (PGSD) of the Faculty of Teacher Training and Education (FKIP) Cenderawasih University (Uncen) have a multicultural background. As many as 47% of students come from the 3T (Disadvantaged, Frontier and Outermost) areas of Papua. Papuan people are communal, have very strong kinship ties, both in the nuclear family and the wider family. The concept of "tribe" or "clan" is very important in the social structure of Papuan society (Kadir, 2017). In multicultural groups such as in lecture classes, the communal nature can be a factor that affects group dynamics. Based on the results of general learning observations in even semester lectures in 2023-2024, 46.4% of students' interpersonal skills are in the criteria of "less to good enough". By understanding and feeling familiar with learning materials that reflect their culture, students will feel more confident to participate in discussions and interact with peers. This confidence not only strengthens their ability to communicate and work together, but also helps them apply interpersonal skills more effectively in a multicultural context

This study explores the integration of Khombouw's local wisdom in the development of teaching materials for the guided inquiry learning model, with a focus on the development of students' interpersonal skills. Previous studies have explored local wisdom in learning, but few have discussed its impact on the development of interpersonal skills, especially in multicultural contexts such as Papua. This research aims to develop teaching materials based on Khombouw local wisdom with a guided inquiry model and examine its effectiveness in improving the interpersonal skills of prospective elementary school teachers.

RESEARCH METHOD

This research is a research and development (R&D) of the ADDIE model. The stages of the ADDIE Model include: 1) Analysis, 2) Design, 3) Development, 4) Implementation, 5) Evaluation (Branch, 2009). The ADDIE development model was chosen because it was considered simple, systematic, clear, and easy in its work procedures. This model allows developers to continuously evaluate and revise at each stage, so that the resulting product can be valid and reliable. An overview of the research stages using the ADDIE model presented in figure 2.

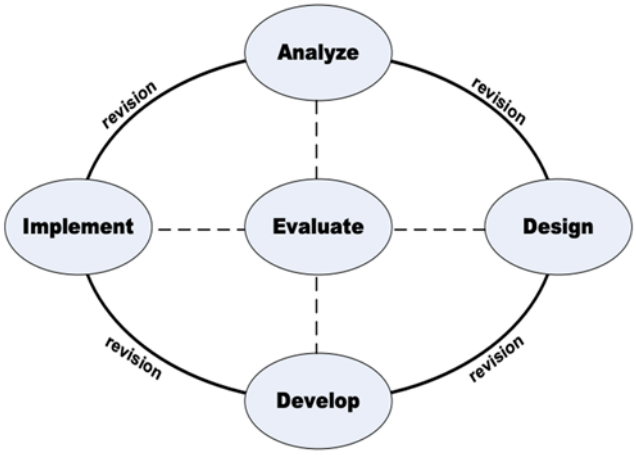

Figure 2. ADDIE Model Stages (Branch, 2009)

The subject of this research is in the form of teaching materials based on Khombouw local wisdom. The teaching materials are used in the Ecosystem Management material in the Basic Concepts of Elementary Science course with a guided Inquiry model to improve the interpersonal skills of prospective elementary school teachers. Validation is carried out by material experts, learning media experts and learning design experts. The research subjects were selected based on purposive sampling, consisting of 39 PGSD FKIP Uncen students. The object of this research is the development of teaching materials based on local wisdom with a guided inquiry model, in relation to student interpersonal skills.

The data in this study was collected through two sources, namely secondary data and primary data. The data collection methods used include observation, interviews, questionnaires/questionnaires. The instrument used in this study uses the Likert scale. The research trial uses a used trial that is carried out simultaneously with the implementation of research activities. The instrument was tested by using it directly on the research subject to obtain the required data (Habib et al., 2020).

The results of the validation test are concluded based on the validity criteria as contained in Table 1.

Table 1. Validity Criteria

Value Achievement (%)	Validity Category	Information
25.00 – 40.00	Invalid	Cannot be used
41.00 – 55.00	Less valid	Cannot be used
56.00 – 70.00	Quite valid	Can be used after major revisions
71.00 - 85.00	Valid	Can be used after minor revisions
86.00 – 100.00	Highly Valid	Excellent to use without revision

Source: (Akbar, 2022)

The practicality of teaching material products is assessed using a perception questionnaire, then the data obtained is converted to the Likert scale. This questionnaire aims to find out the response of students' perceptions to the teaching materials developed. Analysis of user response questionnaires with score interpretation criteria is shown in table 2.

Table 2. Criteria for the Practicality of Teaching Materials

Achievement Score (percentage)	Category
0 - 54	Impractical
55 - 59	Less practical
60 - 75	Quite practical
76 - 85	Practical
86 - 100	Very Practical

Source: (Riders, 2010)

The measurement of *interpersonal skills* uses two methods, as used to measure the affective realm, namely the observation method and *self-assessment* (Andersen, 2018) . *Interpersonal skills* are one of the domains in the affective realm, which is related to

individual attitudes, feelings, and emotions. The instrument for measuring *interpersonal skills* refers to the grid found in table 3.

Table 3. *Interpersonal skills measurement grid*

Indicator	Sub Indicators	Item No
1. Personal	Self-disclosure	1,2,3,4
	Perception	4,5,6, 7
2. Skills	Conversation	8,9, 10, 11
	Listen	12, 13, 14
3. Relationship	Emotional control	15, 16,17
	Conflict management.	18,19,20

Source: (Yusri et al., 2017)

The criteria for assessing *Interpersonal skills* follow the reference for affective assessment as stated in Permedikbud No. 81A of 2013, the description of which can be seen in table 4.

Table 4. Assessment criteria for the achievement of *interpersonal skills*

Score	Criterion
3.33 < ≤ score 4.00	Excellent
2.33 < ≤ score 3.32	Good
1.33 < ≤ score 2.32	Enough
≤ score 1.32	Less

Source : Permendikbud No. 81A of 2013

One Group Pretest-Postest Design is used to determine the effectiveness of teaching material products. Pretest is given to measure the initial ability of students. The treatment design was given using *a pre-experimental design*. The Paired Sample t-test will be performed if the data is normally distributed, and the Wilcokson non-parametric test will be performed if the data is not normally distributed. The Shapiro wilk test was used to determine normality in this study with a significance level of 0.05 or 5%. The Shapiro-Wilk test was chosen because it was considered more sensitive in detecting normality, especially for small samples (n<50). Data testing using the help of the SPSS 26 for windows program with the following decision-making basis: (Irma et al., 2024)

a. If the normality test value is greater than 0.05 (>0.05), the data can be said to be normal.
b. If the normality test value is less than 0.05 (<0.05), the data can be said to be abnormal.

Tabel 5. Desain *One Group Pre-test Post-test*

Pre-test	**Treatment**	***Post-test***
O1	*X*	*O2*

Information:

O1	: Initial test score. (before using the developed teaching material product)
O2	: Final test score (after using the developed teaching material product)
X	: Treatment in the form of implementation of teaching material products that have been developed

The Paired Sample t-test is used as a hypothesis testing strategy to determine the mean difference between the two results of the Pretest and Posttest. The significance level used in this study is 0.05 or 5%, while the basis for decision-making is

a. If the value of sig. (2-tailed) > 0.05, H_0 is accepted and H_a is rejected, meaning that the use of thematic teaching materials integrated with local wisdom khombow is not effective in improving students' interpersonal skills.
b. If the value of sig. (2-tailed) < 0.05, then H_0 is rejected and H_a is accepted, meaning that the use of thematic teaching materials integrated with local wisdom khombow is effective in improving students' interpersonal skills.

The analysis of interpersonal skills improvement was carried out based on the increase in indicator scores in the pretest and posttest using the N-Gain value. The N-Gain assessment criteria can be seen in table 6.

Table 6. N-Gain value criteria

Score	Criterion
0.70 < N-Gain	Tall
0.30 < N-Gain ≤ 070	Keep
N-Gain < 0.30	Low

Source: (Hake, 1999)

RESULT AND DISCUSSION

This research was conducted to produce teaching materials based on local Khombouw wisdom, which is local wisdom from the Sentani ethnic group of Asei village, Jayapura Regency, Papua. Khombouw is a painting done on the bark by following a procedure according to tradition that has been passed down from generation to generation.

Khombouw is one of the local wisdom in the form of artworks of the Sentani tribe made from the bark of red Khombouw (Ficus nodosa teijsm & Binn) and white Khombouw (Ficus variegata Blume) (Manik et al., 2022). Khombouw bark management is carried out by cutting down trees in the forest at certain times in accordance with customary rules. The trees that have been cut down are then taken to the village, and then the bark is removed to be processed as needed. Khombouw logs that have been peeled are then used as firewood (Ramadhan, 2021). Unfortunately, the rejuvenation rate of the Khombouw wood species in nature is very limited (Manik et al., 2022). Khombouw bark paintings are in great demand by locals and tourists alike. This

condition shows the importance of attention from various parties, including students, who have the potential to analyze this phenomenon through a learning approach. Ecosystem Management in the creation of Khombouw focuses on the development of teaching materials using a guided inquiry model. Students will seek information related to local Khombouw wisdom, translating the information into scientific knowledge that is important in the wise and sustainable use of natural resources.

This teaching material was developed referring to CPL, CPMK and subCPMK which contain material supplements along with student worksheets (MFIs) developed using a guided inqury model. The development of the material in this teaching material refers to the Basic Concepts of Science Elementary School material on Ecosystem and Natural Resource Management. CPMK and sub-CPMK can be seen in the following table 7:

Table 7. Course Achievements and Sub-Achievements of Basic Concepts of Science Elementary School
Ecosystem Materials and Natural Resources Management

CPMK	Sub CPMK
CPMK 1: Understanding the basic concepts of ecosystems and their components	1.1 Explain the definition of ecosystems and their components (biotic and abiotic).
	1.3 Describe the role of each ecosystem component in maintaining the balance of the ecosystem.
	1.4 Identify local wisdom related to ecosystem conservation.
CPMK 2: Describes the interaction between biotic and abiotic components in an ecosystem.	2.1 Identify patterns of interaction (predation, symbiosis, competition, etc.) in the ecosystem.
	2.2 Analyze the impact of changes in one component on other components in the ecosystem.
	2.3 Explain the role of local wisdom in maintaining the balance of ecosystem interactions.
CPMK 3: Analyze the impact of human activities on the ecosystem and the role of local wisdom in its mitigation.	3.2 Analyze changes in ecosystems due to human activities.
	3.3 Develop solutions to minimize the negative impact of human activities on ecosystems.
	3.4 Explain local wisdom practices that contribute to mitigating the negative impacts of human activities.
CPMK 4: Understand the principles of sustainable natural resource management and the role of local wisdom.	4.1 Explain the concept of sustainable natural resource management.
	4.3 Outlining regulations and policies related to sustainable natural resource management.
	4.4 Identify the role of local wisdom in sustainable natural resource management.

CPMK 5: Develop a critical attitude and responsibility towards sustainable natural resource management and respect local wisdom.	5.1 Develop a proactive attitude in environmental conservation programs based on local wisdom.
	5.2 Apply ecosystem knowledge and local wisdom in daily decision-making related to resource use.

Teaching materials based on Khombouw local wisdom were developed by following the design of ADDIE's development which consisted of five stages. In the **first** stage is analysis, which is carried out through the process of analyzing the curriculum, student characteristics, competencies, learning activities, and learning facilities. Analysis of student conditions and needs is in the form of collecting information about learning objectives, student objectives, and learning contexts. Preliminary analysis related to student competencies based on secondary data in previous learning includes assessing students' knowledge, skills, and needs. Content analysis is carried out by analyzing the learning material to be taught. Next, conduct a task analysis, namely understanding the tasks or skills that students want to master. Resource analysis is needed to identify facilities that support the development of teaching materials. The final part at this stage. is to conduct evaluations and revisions. This is done to help the design process and explore the limitations that exist in the field. The results of this analysis are then used as material for material development. The results of the analysis obtained through interviews, observations and questionnaires on students and lecturers in the PGSD Study Program show that 96.7% consider it important to develop teaching materials based on local wisdom. In addition, the importance of teaching materials based on local wisdom is in accordance with Uncen's Vision, which is to produce graduates with cultural character and environmental insight. Curriculum analysis shows that there are CPL, CPMK and subCPMK that need to be facilitated with teaching materials based on local wisdom as presented in table 10.

The second **stage,** which is the design or design stage, is the activity of designing product development based on the results of the analysis. The design carried out includes the formulation of learning objectives (Sub-CPMK) which can be seen in table 7, learning strategies, and teaching material design. Learning objectives are arranged with a specific, measurable, achievable, and relevant formulation. The learning strategy chosen is to use a guided inquiry model based on local Khombouw wisdom. Teaching material design is carried out by creating a material framework using a concept map, selecting and designing teaching material components such as text, images, and others. The next step at this stage is the preparation of evaluation instruments to measure learning achievement and the quality of teaching materials. Evaluation and revision are carried out for improvement. The evaluation and revision carried out on this teaching material is contained in images that are still sourced from search results on the internet so that improvements are made using images obtained directly.

In the **third stage**, which is the development stage, it enters the production and validation stage of teaching materials. The production of teaching materials is developed

according to the design that has been made with content in the form of local Khombouw wisdom from the village of Asei Sentani, Papua. Furthermore, the integration of the components of the teaching materials into a single unit is carried out according to the demands of the curriculum and the model used in the teaching materials developed to facilitate the development of interpersonal skills. Validation is carried out through the assessment of material experts, media experts, and practitioners. Validation is performed against content validation and construct validation. Content validation is carried out by 3 experts, namely material experts, learning design experts and learning media experts. The results of the validation of material experts are shown in table 8, and the results of the validation of media experts are shown in table 9, and the results of the validation of learning design experts are shown in table 10. The validity criteria used are as contained in table 1.

Table 8. Results of expert validation of Khombouw Integrated Guided Inquiry Learning Model

Assessed aspects	Average Assessment of Teaching Material Validators-(%)			Installment (%)	Category
	1	2	3		
Truth, Concept and facts	87,75	87,65	85, 45	87,70	Highly Valid
Material Originicity	86,74	87,65	86,35	86,91	Highly Valid
Relevance to the Curriculum	86,74	86,67	87,45	86,95	Highly Valid
Conformity with Learner Characteristics	87,45	90,65	86,6	88,23	Highly Valid
Installment (%)	87,17	88,155	86,8	87,45	Highly Valid

The results of the validation test of the material aspect were assessed with a validity of 87.45%, and were declared very good for use.

Table 9. Results of Validation of Learning Media Experts for Khombouw Integrated Guided Inquiry Learning Model

Assessed aspects	Average Assessment of Teaching Material Validators-(%)			Installment (%)	Category
	1	2	3		
Interactivity	94,35	95,15	95,43	94,98	Highly Valid
Ease of Navigation	92,85	92,25	94,43	93,18	Highly Valid

Suitability of Learning Objectives	93,35	94,17	93,15	93,56	Highly Valid
Conformity with Learner Characteristics	94,27	91,25	94,36	93,29	Highly Valid
Installment (%)	93,71	93,21	94,34	93,75	Highly Valid

The results of expert validation on the learning media aspect were obtained with a validity of 93.75%, with very valid criteria.

Table 10. Results of Validation of Learning Design Experts for Khombouw Integrated Guided Inquiry Learning Model

Assessed aspects	Average Assessment of Teaching Material Validators-(%)			Installment (%)	Category
	1	2	3		
Integration of Learning Objectives	90,35	87,15	89,12	88,87	Highly Valid
Suitability of Learning Model	80,68	79,75	81,32	80,58	Valid
Interpersonal Skills Development	82,64	80,35	85	82,66	Valid
Conformity with the cognitive level of students	85,75	78,89	81,25	81,96	Valid
Installment (%)	84,855	81,535	84,1725	83,52	Valid

The results of the validation of the learning design expert showed a validity or feasibility level of 83.52% with a valid category. The results of the qualitative analysis show that the use of learning design is feasible to use but still requires a learning strategy that can accommodate the needs of students according to their characteristics. Based on the results of the expert validation mentioned above, the teaching materials developed are said to be suitable for use with minor revisions

The fourth **stage** is the implementation stage, at this stage a trial of the practicality of teaching materials is carried out through a one-to-one *evaluation* consisting of 6 students. The selected students refer to the criteria of high, medium and low ability based on the results of the pretest. As with the theory put forward by Practicality, teaching materials are analyzed through user responses. The criteria for the practicality of teaching materials as stated by Riduwan (2010) are listed in table 2. The results of the test of the practicality of teaching materials through one (Morrison et al., 2019). *to one evaluation* are presented in table 11.

Table 11. Practicality of Teaching Materials based on One *to One Evaluation Test* Results

Assessed aspects	Results of Student Response Questionnaire-(%)			Installment (%)	Category
	1	2	3		
Facilities. Use	85,62	84,51	87,73	85,95	Very Practical
Attraction	85,23	85,72	86,14	85,70	Practical
Time Efficiency	82,34	83,72	83,21	83,09	Practical
Installment (%)	84,40	84,65	85,69	84,91	Practical

The results of this practicality test show an average result of 84.91% with the practical category used with minor revisions. The analysis of the lecturer's response as a user includes aspects of ease of use, attractiveness, time efficiency, flexibility of use, and ease of delivery. The results of the lecturer's response as a user to the practicality of the teaching materials are presented in table 12.

Table 12. Practicality of Teaching Materials based on the Lecturer's response as a user

Assessed aspects	Lecturer Response Questionnaire Results-(%)			Installment (%)	Category
	1	2	3		
Ease of use	85,25	86,23	85,74	85,74	Practical
Attraction	81,72	82,53	86,23	83,49	Practical
Time Efficiency	83,16	83,24	82,53	82,98	Practical
Flexibility of use	83,56	85,14	84,52	84,41	Practical
Ease of delivery	84,53	81,42	84,56	83,50	Practical
Installment (%)	83,64	83,712	84,716	84,02	Practical

The results of the test of the practicality of teaching materials by lecturers as users showed a score of 84.02 with the category of practical use.

The effectiveness of the integrated guided inquiry learning design of teaching materials based on Khombouw's local wisdom in improving the interpersonal skills of prospective teacher students was measured through the implementation of learning in the Basic Concepts of Elementary Science course with a total of 39 students. Learning activities were carried out in 5 (five) meetings. Students' interpersonal skills are measured using observation, survey and self-assessment instruments. The results of lecturers' observations on the implementation of teaching materials based on Khombouw Local Wisdom Model Guided Inquiry on *interpersonal skills* showed results of 74.3% on the good criteria, 25.6% on the very good criteria, and 7.6% on the fairly good criteria, and these results were not much different from the results *of student self-assessment* on the implementation of teaching materials based on the Khombouw Local Wisdom Model Guided Inquiry on *interpersonal skills* were 69.5% in the "good" criterion,

28.2% in the "very good" criterion and 5.1% in the "quite good" criterion. The assessment criteria refer to Permendikbud No. 81A of 2013 which is listed in table 4.

The results of the learning design effectiveness test on student interpersonal skills were carried out using the Paired Sample t-test which began with a basic test, namely the normality test. The results of the data normality test show that the data is normally distributed as shown in table 13.

Table. 13. Normality Test Results

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pretest	.114	39	.200*	.963	39	.224
Posttest	.132	39	.082	.958	39	.156

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

a. Lilliefors Significance Correction

In table 13, the analysis of the normality test results shows the Sig value. in Pretest 0.224 and Posttest 0.156, this shows that in both Pretest and Posttest obtained a value of Sig. <0.05, this explains that the data is normally distributed. The significant difference between the pretest and posttest results based on the results of the Paired Sample t-test is shown in table 14.

Table 14. Paired Test Results t-test sample

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper			
Pair 1	Pretest - Posttest	-15.51282	7.12620	1.14111	-17.82287	-13.20277	-13.595	38	.000

In table 14, it shows the value of sig. (2-tailed) of 0.000, where 0.000 has a value smaller than 0.05 (0.000<0.05). The results of the t test show a value of sig. (2-tailad) 0.000<0.05 then it can be said that the use of Khombow Local Wisdom Integrated Learning Design products is effective in improving the interpersonal skills of prospective teacher students. The improvement of interpersonal skills based on test results can be seen in table 15.

Table 15. NGain Test Results

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
NGain_Score	39	.08	.55	.2723	.12525
NGain_Persentase	39	8.33	55.00	27.2273	12.52451
Valid N (listwise)	39				

Based on table 15, students' interpersonal skills have significantly increased with low criteria with an N-Gain value of 0.27 which is at N-Gain < 0.30. The interpretation of NGain values refers to table 6. Based on these criteria, the N-Gain score of students' interpersonal skills is at a low criterion, indicating that even though there is an increase in scores from pre-test to post-test, it is still not optimal. This low N-Gain score indicates an urgent need to improve and develop more effective learning strategies, to significantly improve students' interpersonal skills. This improvement effort includes a thorough evaluation and in-depth analysis of the factors that affect the low N-Gain score, so that a learning strategy can be formulated that is more in accordance with the needs and characteristics of students. This condition shows that the success of the learning process is determined by various factors that interact with each other. This is as explained that the success of learning is influenced by interacting factors such as motivation, attitude and interest in learning, physical and mental health, quality of teaching, learning environment, curriculum, learning facilities, as well as social interaction and cultural background (Slameto, 2013). Therefore, to achieve more optimal results, a holistic approach is needed by considering all these factors.

Based on the results of the research, it was found that the application of teaching materials based on Khombouw local wisdom in learning has not been fully effective in significantly improving students' interpersonal skills. The measurement results showed an N-Gain value of 0.27, which is included in the low category. This indicates that even though the teaching materials have been declared valid by experts, the implementation of guided inquiry-based learning strategies still needs further development.

Although this model is designed to encourage students to work together and solve problems independently (Sulaiman et al., 2024). In inquiry-based learning, students should be more active in searching and processing information, which in turn improves interpersonal skills, as mentioned that the learning model using the inquiry model involves cooperation, communication, and problem-solving activities (Schwab, 1960). However, this has not been fully reflected in this study. Based on the analysis of the results of surveys, observations, and interviews with device users, both lecturers and students, several factors that affect the low N-Gain score are limited time for interaction between students, the learning approach is not fully in accordance with the characteristics of the students involved.

The teaching materials developed have introduced students to the local wisdom of Khombouw, which focuses on sustainable management of natural resources. This finding is important because it provides a foundation for students to understand how local knowledge can be integrated into the teaching of natural sciences (IPA). The management of the ecosystem inherited through local wisdom is in accordance with the concept of ecosystem in the elementary science curriculum. In this context, students have the potential to relate scientific concepts to real practice in their social environment.

Inquiry-based teaching requires a longer time allocation to allow for an in-depth process of exploration and discussion. In this study, learning activities were carried out

in five meetings, which may not be enough to optimize the inquiry-based learning process to improve students' *interpersonal skills*. Based on the results of the practicality test, both students and lecturers gave a positive response to the teaching materials developed. The average practicality score from students is 84.91% with the practical category. This shows that from a technical point of view, the teaching materials are quite easy to use and attract students' interest. However, even though the practicality of teaching materials is considered high, the improvement of learning outcomes, especially in the aspect of *interpersonal skills*, still needs improvement. The response from the lecturer also indicates that this teaching material is flexible and efficient to be used in the teaching process. However, the lecturer also underlined the importance of adjusting learning strategies to be more effective in improving students' interpersonal skills. Although media and content aspects have been validated, implementation strategies may need to be tailored to the specific characteristics and needs of learners.

The validity provided by material experts, media experts, and learning design experts shows that this teaching material is very feasible to use in terms of content, media, and learning strategies. The validity of the material aspect reached 87.45% with the category of very valid, and the validity of the media of 93.75% was also categorized as very valid. However, the validity of the learning design obtained a slightly lower score, namely 83.52%, indicating that there are several aspects of the learning design that need to be improved, especially related to the development of interpersonal skills. From these results, there are several important implications that need to be considered for further development. First, the guided inquiry approach must be better adapted to the local context and students' abilities, especially in helping them connect local wisdom with scientific theories in more depth. Second, a longer time allocation is needed to allow deeper exploration in the inquiry-based learning process. In addition, the results of this study emphasize the importance of using more collaborative learning strategies, where students have more opportunities to work together and interact, to improve their interpersonal skills. The development of additional materials that are more supportive of interaction and discussion can also be considered to increase the effectiveness of these teaching materials. Interactive learning media helps in the acquisition of learning experiences, especially according to the characteristics of students (Ali et al., 2024).

CONCLUSION

This research produced teaching materials based on Khombouw local wisdom developed from the wisdom of the Sentani ethnic community, Asei Village, Jayapura Regency, Papua. The development of teaching materials uses the ADDIE model which aims to improve students' interpersonal skills through guided inquiry-based learning. The main findings of this study show that, although the validity of teaching materials is stated to be very good by material experts, media experts, and learning design experts, the improvement of students' interpersonal skills is in the low category based on an N-Gain value of 0.27. This is an important finding that is only known after the study was

conducted, indicating that the learning strategies applied have not been optimal in achieving more significant results.

However, this study has some limitations, including: 1) The limited number of samples in this case is only 39 students which may affect the generalization of the results. 2) The scope of implementation is limited to one course and at a specific level of education, without looking at variations in other contexts such as gender, age, or educational background. 3) The research method is limited to the One Group Pretest-Posttest approach, which does not provide a more in-depth comparison through control groups or learning variations in different environments.

To achieve a more comprehensive understanding, further research is needed involving: 1) Larger and more diverse samples. 2) Various educational contexts to test the implementation of teaching materials based on local wisdom in other courses or environments. 3) A mixed-method approach that includes control tests or comparison groups to evaluate the effectiveness of more varied learning strategies. With more in-depth and comprehensive research, more effective learning strategies can be formulated to significantly improve the interpersonal skills of prospective elementary school teachers, which can ultimately support more appropriate policy-making in learning based on local wisdom.

Suggestion

Based on the results of the research, it is recommended to conduct further research in the implementation of teaching materials based on Khombouw local wisdom. It is necessary to conduct an in-depth analysis of the profile, learning style, and readiness level of students. In addition, the integration of appropriate learning methods, models, media, and evaluation is also an important factor to support the successful implementation of teaching materials based on Khombouw local wisdom.

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