



## **Student Literacy Skills Through The Implementation of Assisted by Student Worksheets Based on Local Wisdom "Bau Nyale"**

**Ika Nurani Dewi<sup>1\*</sup>, Septiana Dwi Utami<sup>2</sup>, Siti Rabiatal Adawiyah<sup>3</sup>**

<sup>1,2</sup>Biology Education, Faculty of Sains, Engineering, and Applied

<sup>3</sup>Sports Education, Faculty of Sports Science and Public Health  
Universitas Pendidikan Mandalika, Indonesia.

\*Corresponding Author. Email: [ikanuranidewi@undikma.ac.id](mailto:ikanuranidewi@undikma.ac.id)

**Abstract:** This research aims to analyze the effect of guided inquiry learning models assisted by student worksheets (LKPD) based on local wisdom on students' literacy skills. The research used a pre-experimental method with a design employing the one-group pretest-posttest design. The sample in this study consisted of 58 students from the 10th-grade science class at SMAN 1 Lembar. Instruments included tests and non-tests, with data analysis techniques such as LKPD validation analysis, N-gain, and hypothesis testing. The findings of this study indicated that the N-gain for class X MIPA 1 was 0.53 (moderate), while the N-gain for class X MIPA 2 was 0.57 (moderate). The t-test result yielded a significance value of  $0.000 < 0.05$ , indicating that using the guided inquiry learning model assisted by LKPD based on local wisdom significantly affects the literacy skills of SMAN 1 Lembar students. Using local wisdom in science learning can make students feel more connected to the learning material because it is relevant to the context of their daily lives. It can increase their involvement in literacy activities in the learning process because more material is taught so that students can understand concepts better.

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## **Introduction**

Education is one of the key indicators of building the quality of human resources. Education is a strategic process in national development because it plays a crucial role in the progress of a nation. The rapid advancement of knowledge demands that every student has better reading and writing skills to provide students with sufficient insight and knowledge to compete and keep up with the times (Cencelj et al., 2017). Reading skills contribute significantly to an individual's success since all access to information and knowledge is closely related to reading activities (Rohman, 2017). Good literacy skills are essential for the success of the younger generation, helping them understand information both orally and in written form. Mastery of literacy skills in young individuals is crucial in supporting their competencies. Competencies can complement each other when young individuals master literacy skills (Irianto & Febrianti, 2017). Additionally, Magdalena et al., (2019) added that without improving literacy skills, it would be challenging for Indonesia to reduce poverty and inequality rates.

A survey conducted at the beginning of 2000 by IEA (International Education Achievement) revealed that Indonesian children ranked 29th out of 31 countries regarding reading quality (Rohman, 2017). Unsurprisingly, Indonesia's human resources quality index needs to be higher than neighboring countries like Malaysia, Singapore, and Thailand. The PISA 2009 results indicated that Indonesian students were ranked 57th with a score of 396,



while the average OECD score was 493. In the PISA 2012 results, Indonesian students were ranked 64th with a score of 396, compared to the average OECD score of 496, with 65 participating countries (Hidayah, 2017). Based on this data, educational practices in Indonesia have not effectively established schools as learning organizations aiming to develop lifelong learning skills for all students. This data is supported by initial observations at SMAN 1 Lembar West Nusa Tenggara in July, involving ten students in class X with student observation sheets as instruments, which revealed that students' low reading interest is also influenced by their lack of interest in visiting the library and the absence of supportive facilities that can increase students' reading interest, such as literacy corners or magazines. This is because students do not want to allocate time for reading books in the library; they prefer playing outside the classroom with their friends, chatting in the classroom or school cafeteria, and some are even seen working on homework that should be done at home. SMAN 1 Lembar was chosen as the research location because the school has relevant resources, including libraries, educational technology, laboratory facilities, and gardens. Besides that, SMAN 1 Lembar is unique in the context of traditional culture, namely cultural Saturday.

Based on these facts, applying a guided inquiry learning model is one way to improve literacy skills. The guided inquiry learning model involves guidance from the teacher (Irwanto, 2023). The guided inquiry learning model applies contextual learning by presenting the real world, allowing students to absorb the learning easily. When students can effectively receive the instruction, their literacy skills see improvement (Thi et al., 2021). The development of science and technology has led to cultural erosion in various forms (Dewi et al., 2020a). A prominent issue is the degradation of moral and social-cultural values (Ramdiah et al., 2020). The causes of moral degradation include the fading of indigenous cultures, the influx of foreign cultures that do not align with the local culture, and the lack of community support and enthusiasm to preserve, sustain, maintain, and develop local wisdom (Hartini et al., 2018).

Local wisdom is a unique and distinctive characteristic of a particular region or area, possessing cultural values or elements and passed down from generation to generation (Fisher, 2020). Local wisdom can also be defined as human experience using intellect and reasoning to achieve wisdom related to a custom or habit in a community or environment (Zahara & Ernawati, 2017). Local wisdom is believed to develop character and values due to the learning process (Pamungkas et al., 2017). Therefore, incorporating local wisdom into school education is significant for students (Purnamasari & Hanifah, 2021).

The local wisdom of the Sasak people that is still maintained to this day is the tradition of "Bau Nyale." The word "Bau" comes from the Sasak language, meaning to catch, while "Nyale" refers to a type of sea worm that inhabits the holes in coral rocks. According to legend, Nyale is believed to be the transformation of a princess in the Lombok Kingdom, Princess Mandalika. She willingly sacrificed herself by throwing herself into the sea to maintain peace in the kingdom and transformed into Nyale (Bachtiar et al., 2020). Therefore, the tradition of catching Nyale has instilled a belief among the local population that Nyale can bring prosperity. According to (Hikmawati et al., 2021), Nyale only appears once a year, specifically five days after the first full moon in February. Nyale emerges in the early hours, rolling in with the waves, disappearing from the sea surface as the sun rises. The miracle of Nyale is seen as a form of togetherness within the Sasak community to support their traditional culture.

Recognizing the importance of integrating local wisdom into education, innovative teaching innovations are needed to develop students' literacy skills while preserving national

cultural values. Integrating local wisdom into the guided inquiry learning model is an innovation that allows students to interact directly with local culture and explore scientific knowledge embedded in that culture. Rahmawati et al., (2016) added that a guided inquiry learning model based on local wisdom makes students more capable of grasping concepts and understanding the subject matter effectively.

Local wisdom can be incorporated into learning through instructional materials known as Student Worksheets (LKPD). LKPD is one of the teaching materials consisting of activity sheets completed by students and includes step-by-step instructions to achieve the desired competencies (Khatimah et al., 2018). LKPD can stimulate students' interest, build self-confidence, enhance learning motivation, and spark curiosity (Sari & Suprihatin, 2018). Based on empirical studies and observation findings, this research aims to analyze the effectiveness of a guided inquiry learning model assisted by student worksheets based on local wisdom in improving students' literacy skills at SMAN 1 Lembar. The local wisdom incorporated into this learning approach is the local tradition of the Lombok Island community, "Bau Nyale." Local wisdom-based LKPD in education is an innovation that allows students to interact directly with local culture and explore scientific knowledge embedded in that culture, hoping to enhance students' literacy skills.

## Research Method

This research method used a pre-experimental method with a pretest and posttest design (O1 X O2) (Fraenkel & Wallen, 2012). Before implementing guided inquiry-based local wisdom learning, students were assessed using a pretest (O1). The student groups were then instructed on biodiversity through the 'Bau Nyale' tradition using the guided inquiry-based local wisdom learning model (X), along with instructional materials such as teaching modules and student worksheets that had been validated and deemed reliable. After completing the learning process (posttest), all student groups underwent a posttest (O2).

The population in this study was class X SMAN 1 Lembar students, totaling 115 people. The research sample consisted of 58 tenth-grade students at SMAN 1 Lembar. The sample was selected using cluster random sampling techniques (Sugiyono, 2019). Students in each school were divided into Group 1 (MIPA1 consisting of 30 students) and Group 2 (MIPA2 consisting of 28 students). The data analysis of the effectiveness of the guided inquiry-based local wisdom learning model included (a) paired t-test and (b) the calculation of the mean n-gain using the formula:  $n\text{-gain} = (\text{posttest score} - \text{pretest score}) / (\text{maximum score} - \text{pretest score})$ . According to Hake with the following categories (1) high if  $n\text{-gain} \geq .70$ ; (2) medium if  $.70 > n\text{-gain} \geq .30$ ; and (3) low if  $n\text{-gain} < .30$  (Dewi et al., 2020b)

## Results and Discussion

The research results include the Student worksheet (LKPD) validation and students' literacy skills. The complete research results are presented below.

### Validity of LKPD

The aspects assessed in validating LKPD include format, content, language, presentation, and how LKPD supports innovations and improves the Teaching and Learning Activities (KBM). Before implementation, the developed LKPD must be validated by experts in Focus Group Discussion (FGD) activities. Validation was carried out by three experts in educational evaluation, biodiversity biology material, and language. The validation results by experts show that the model validation sheet developed was valid or suitable for use. The validation results of LKPD are listed in Table 1 below:

**Table 1. LKPD Validation Results Data**

Aspects assessed	Validator			Average	Description
	1	2	3		
Format	3,00	3,50	3,83	3,44	Valid
Content	3,28	4,00	3,28	3,52	Very Valid
Language	3,00	4,00	3,33	3,43	Valid
Presentation	3,00	3,25	3,00	3,08	Valid
The LKPD supports innovation and the improvement of KBM quality.	3,37	3,50	3,50	3,45	Valid
<b>Average</b>	3,13	3,65	3,38	3,38	Valid

Based on Table 1, it is known that the aspects assessed in LKPD by three validators have the following values: format with an average score of 3.44, content with a score of 3.52, language with a score of 3.43, presentation with a score of 3.08, and LKPD supporting innovation and the improvement of the Teaching and Learning Activities (KBM) with an average score of 3.45. Some assessment aspects in LKPD fall into the valid category, and one aspect fall into the very valid criteria. LKPD was declared valid, whereas according to Rahmawati (2016), if the validator's score was 2.5 SV 3.4, then LKPD was considered suitable for use with slight revisions. The LKPD prepared has undergone revision stages based on input and expert opinions.

The validity is achieved because the developed LKPD is based on the components of the guided inquiry learning model. Regarding the format component, there is a theme/title of the activity that corresponds to the material that students will master, and there are goals that students aim to achieve in line with the indicators. The activities included in the LKPD describe the actions performed by students. These activities serve to train students' literacy skills. From the content component perspective, the LKPD contains the potential of Lombok Island juxtaposed with teaching materials and the steps and instructions for solving problems that integrate local wisdom. This is also supported by Lubis et al., (2020), stating that worksheets help students discuss and understand the material and solve problems. LKPD should be able to guide students in carrying out specific activities so that by the end of the activity, students can master one or more basic competencies. It is reinforced by the scaffolding theory, where students are given complex and difficult tasks and provided with sufficient assistance to complete those tasks (Eggen & Kauchak, 2013)

Three validators were used to endorse this LKPD; each played a role as a content expert, a language expert, and a design expert. The content expert validator provided input and suggestions regarding incorporating elements of the local tradition "Bau Nyale" to enhance students' knowledge of the local wisdom in Lombok. The language expert provided suggestions regarding the appropriateness of the language structure used in the LKPD. Meanwhile, the design expert provided feedback on making the graphics and templates more appealing and creative, considering that teaching biodiversity topics would be clearer when supported by images and videos. Based on the guidance of these three validators, the researcher made revisions before using the LKPD in the data collection phase, and as a result, the LKPD was deemed suitable for classroom use.

### **Student Literacy Skills**

Students' literacy skills during the implementation of LKPD were assessed using tests conducted twice, namely the pretest and posttest. Based on the test results, there is an improvement in literacy skills after students undergo the learning process using LKPD based on local wisdom. The increase in literacy skills is presented in Table 2 below:



**Table 2. Data on the Results of Literacy Skills for Students in MIPA 1 and MIPA 2 Classes**

Class	Indicator								Average	
	1		2		3		4			
	U1	U2	U1	U2	U1	U2	U1	U2	U1	U2
MIPA 1 (A)	57,22	80,56	40,56	68,33	46,11	71,67	32,78	75,56	44,16	74,03
N-Gain	0,54		0,47		0,47		0,64		0,53	
MIPA 2 (B)	46,43	82,14	54,76	67,26	56,55	76,79	21,43	79,76	44,79	76,48
N-Gain	0,66		0,27		0,46		0,74		0,57	

Noted: (1) understanding scientific questions, (2) identifying evidence, (3) communicating, and (4) understanding a concept.

Based on Table 2, the literacy skills scores for classes A and B are known. In class A, for the indicator of understanding scientific questions, an N-gain of 0.54 was obtained; for the indicator of evidence identification, an N-gain of 0.47; for the indicator of communication, an N-gain of 0.47; for the indicator of understanding a concept, an N-gain of 0.64, and the average N-gain for class X MIPA 1 was 0.53, categorized as moderate. In class B, for the indicator of understanding scientific questions, an N-gain of 0.66 was obtained; for the indicator of evidence identification, an N-gain of 0.27; for the indicator of communication, an N-gain of 0.46; for the indicator of understanding a concept, an N-gain of 0.74, resulting in an average N-gain for class X MIPA 2 of 0.57, also categorized as moderate. The understanding indicator had the highest score increase in both classes A and B.

For several indicators, 1) understanding scientific questions, 2) identifying evidence, 3) communicating, and 4) understanding a concept, the scores fall into low, moderate, or high categories. It is due to several challenges faced by the researcher during the data collection process, such as inadequate teaching resources, inefficient time allocation during the first data collection meeting, and non-conducive classroom conditions. The N-gain scores for class X MIPA 1 and 2 fall into the moderate category and are not low. Several factors contribute to this. First, guided inquiry learning models include indicators that help students actively seek information or solve problems, analyze issues, and draw conclusions. Murnaka et al., (2019) explain that guided inquiry learning can enhance students' higher-level skills, such as problem-solving and decision-making. Student literacy activities in the learning process are thriving, supported by a pleasant environment due to direct observations in the garden and schoolyard. Asyhari & Putri (2017) suggest that students who gain knowledge through direct experience can improve their cognitive abilities. Using locally based LKPD makes the learning process enjoyable and easily applicable to the learning concept (Zahara & Ernawati, 2017). Therefore, using the guided inquiry model in biodiversity learning, incorporating local wisdom, can motivate and improve student learning achievements (Purnamasari & Hanifah, 2021).

The indicator of understanding a concept is the most influential because it emphasizes the concept of local wisdom, which provides students with the opportunity to actively build their knowledge through various local activities that can be easily understood (Pertiwi & Rusyda Firdausi, 2019). The results of this study are consistent with previous research conducted by Priadi, et all (2021), who applied guided inquiry learning and found improvements in students' cognitive learning outcomes, falling into the moderate category with an N-gain of 0.62.

**Table 3 Results of the Paired Samples T-test**

		Paired Differences							
Class		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
					Lower	Upper			
Pair 1	U1A-U2A	29.44	12.77	2.33	34.21	24.67	-12.63	29	.000
Pair 2	U1B-U2B	-31.56	14.77	2.79	37.28	25.82	-11.30	27	.000

Based on the data in Table 3, the t-test results were obtained, including the Pretest and Posttest values. For class A, the average learning outcome, or Mean, was 29.43; for class B, the Mean was 31.55. Class A and B's standard deviation values were 12.76 and 14.77, respectively—lastly, the Std. The error Mean for class A was 2.33, and for class B, it was 2.79. The decision-making criterion for the t-test is that if the sig. (2-tailed) value is less than 0.05, it can be concluded that the LKPD significantly affects students' literacy. That is because the syntax used in the learning model is easy to understand and supports the learning process for class X students. The students find it enjoyable, interact well with each other, and create a safe learning atmosphere. They are enthusiastic about receiving the lessons, aligning with the opinion of Purnamasari & Hanifah (2021), who explains that in guided inquiry learning, students conduct extensive who explains that in guided inquiry learning, students conduct extensive investigations using various learning resources, stimulating students' literacy skills and maximizing the learning process. Ningsih (2018) also states that students' activeness positively impacts learning outcomes, meaning the more active students are in the learning process, the better their learning outcomes will be.

According to previous research on the use of guided inquiry learning models by Nurmayani et al., (2018), it was found that the guided inquiry learning model significantly impacts students' learning outcomes. This can be attributed to several factors, including 1) the effective implementation of learning, 2) the presentation of problems that can stimulate students' interest and curiosity, 3) the use of supportive learning media, and 4) providing students with opportunities to communicate the results of discussions. Another study conducted by Jon-Chao Hong (2019) revealed the effective influence of the guided inquiry learning model on students' learning outcomes and critical thinking abilities. As per Setiawan et al., (2017), effectiveness in learning plays a role in a student's success in achieving specific goals, including maximizing learning outcomes, such as literacy skills. The guided inquiry learning model requires students to plan and conduct experiments, collect, and analyze data, and draw conclusions oriented toward problem-solving. Through this guided inquiry process, students actively solve problems the teacher presents (Budyono & Hartini, 2016). The Learning Activity Sheet (LKPD) that was applied is also based on local wisdom. Learning based on local wisdom strongly supports teachers in the learning process and is beneficial for increasing students' knowledge and understanding. It also serves as an application to instil a sense of love and positive character in line with the noble values of local wisdom, preparing students to face various challenges beyond the school environment (Pingge, 2017).

The presentation of the material is supported using PowerPoint (PPT) and videos during the learning process. A well-executed material presentation positively impacts students' abilities, as supported by research on the application of PowerPoint as a learning medium, which has been proven to improve learning outcomes. It aligns with Ramdiah et al., (2020) perspective on media selection, suggesting the use of concrete media that can be directly operated to make the concept easier to understand and absorb by learners. However, media selection for learning should align with their functions based on the media's ability to



develop students' thinking skills. Tafonao (2018) explains that using instructional media enhances student interest because it offers advantages and benefits, serving as a tool to convey information that stimulates students' thoughts, attention, and interest in participating in the learning process. Sapitri et al., (2020) researched implementing local wisdom in the learning process. The results indicate that the delivered material will be better retained in students' memories, and students' literacy skills will develop further through teaching media based on local wisdom. That is because the steps in the process make students more active in their learning, allowing them to master various aspects of literacy skills. Using local wisdom in science learning can make students feel more connected to the learning material because it is relevant to the context of their daily lives. It can increase their involvement in literacy activities in the learning process because more material is taught so that students can understand concepts better. With worksheets presenting problems based on local wisdom on Lombok Island, students carry out investigative activities to solve problems based on the local community's ethnoscience. Through literacy activities, students who have acquired problem-solving thinking can effectively discuss information to achieve the desired goals. Local wisdom-based worksheets make worksheets more varied.

### Conclusion

The results of the research and discussions presented can be summarized as follows: Biology education on biodiversity using guided inquiry learning models based on conservation leads to the following conclusions: 1) there is a significant increase in literacy scores by 5%, 2) the average n-gain varies for each indicator, including low, moderate, and high categories. Developing student literacy through guided inquiry teaching based on local wisdom is expected to support students in developing analytical skills, making them more prepared for the increasingly competitive job market. The research implications can assist governments and educational institutions in understanding the effectiveness of existing literacy programs, identifying areas that require improvement, and assessing students' literacy levels.

### Recommendation

Based on the research results, several recommendations are made as follows: 1) Future researchers can test LKS based on local wisdom in various schools so that the LKS developed will be more valid, 2) future researchers are expected to involve media experts so that validation or assessment is carried out more objectively, 3) future researchers are expected to develop worksheets equipped with varied media that support learning activities. 4). develop local wisdom-based worksheets using different materials or grade levels. 5). teachers can develop local wisdom-based worksheets independently according to learning needs and learning activities.

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