

The Development of Scientific Learning Model Based on Local Wisdom of "Piil Pesenggiri" to Improve Process Skills and Character Values of Elementary School Students

Fitri April Yanti^{1*}, Moh. Irma Sukarelawan², M. Anas Thohir³, Ryzal Perdana⁴

¹ Department of Education, Universitas Bengkulu, Bengkulu, Indonesia

² Postgraduate Program of Physics Education, Universitas Ahmad Dahlan, Yogyakarta, Indonesia

³ Department of Elementary and Preschool Education, Universitas Negeri Malang, Malang, Indonesia

⁴ Department of Education, Universitas Lampung, Lampung, Indonesia

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Abstract: This study aims: to produce a learning model based on Local Wisdom Piil Pesenggiri knowledge that has characteristics that can improve the process skills and values of elementary school characters, produce a science learning model based on Piil Pesenggiri Local Wisdom based on appropriate knowledge to improve process skills and values of elementary school character, produce a model of science learning based on Piil Pesenggiri Local Wisdom which is effective for improving the process skills and characters values of elementary school. This research using the ADDIE step of the Research and Development method. The trial subjects included elementary school grade IV students in Lampung Province. Need assessment data is collected by interview, questionnaire, and observation. The feasibility data of the learning model were collected using a validation sheet questionnaire. Data were analyzed descriptively and statistically. This study's results are expected to make the model of learning science-based on local wisdom Piil Pesenggiri can lead to the development of a learning science model on local wisdom in other regions throughout Indonesia. This development is expected to help students be more interested in learning, understanding their own culture, and becoming students who have good character values.

Keywords: Local wisdom; Process skills; Character values; Piil pesenggiri

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Introduction

Indonesia has national education goals. The purpose of national education is contained in the 1945 Constitution, which is to educate the life of the nation and develop the whole human being, that is, people who have faith, are devoted to God Almighty, and are virtuous, possessing knowledge and skills, as well as a social and national responsibility. The purpose of national education is also explained in the National Education System Law No. 20 of 2003 article 3 that

national education aims to develop the potential of students to become human beings who believe in and fear God Almighty, have noble, healthy, knowledgeable, capable, creative, independent, and become citizens of a democratic and responsible country. Other national education goals are defined as a form of effort toward good citizenship (Aziizu, 2015).

The Program for International Student Assessment (PISA) in 2012 ranked Indonesia 64th out of 65 countries with an average score of 375, while the average international score was 500 (OECD, 2014). This

* Corresponding Author: fapriyanti@unib.ac.id

shows Indonesian students' ability to solve problems that require very little analytical, evaluation, creativity, and logic and reasoning abilities (Kurniati et al., 2016). Other data shows that students in Indonesia apparently cannot work on questions at level 5, level 4 only two students can work, and at level 3, only 50% of students (Rahmawati et al., 2013). This shows that the students' process skills are relatively low. This fact informs us that primary education needs serious attention from education practitioners (Nurhasanah et al., 2021).

The Ministry of Education and Culture (Permendikbud No.65 Tentang Standar Proses Pendidikan Dasar Dan Menengah, 2013) states the progress of student learning needs to be improved through process skills, which are implemented through a scientific approach, including encouraging critical thinking, analytical, and problem-solving, and applying learning material. Process skills can encourage students to think hypothetically, classify, apply, and develop rational thinking patterns. Other problems that occur to students are concerning conditions related to SARA-related riots, student brawls between students (Hutagalung, 2018; Minandar, 2019), motor vehicle theft (Riswanto, 2019), violations of religious freedom, and drug abuse (Murtiwidayanti, 2018). Data from the National Narcotics Agency revealed that drug abuse among students in 2018 (from 13 provincial capitals in Indonesia) reached 2.29 million people. One group of people prone to drug abuse exposure is the millennial generation (Santoso, 2019). These cases show that the Indonesian nation has experienced a crisis of character. The quality of education in Indonesia needs to be improved in terms of mastery of science and technology and children's character. The main thing that needs to be improved from the essential character is that which comes from the mind, which is positive thinking; sourced from words, which are words that are good and true (speak politely); and which comes from good and right actions (discipline and responsibility) (Stiawan et al., 2020).

Factors that influence education quality, including teachers, curriculum (material, methods, media, learning resources, evaluation), facilities and infrastructure, and leading factors in education. Character is developed when students are in elementary school. Therefore, the appropriate science learning model must be applied in elementary school (Ansori, 2020). Based on preliminary studies conducted through observation, interviews, document studies, and literature reviews related to elementary school learning, Lampung's quality of learning is not optimal (Kharizmi, 2015). Almost all elementary school students' evidence this. So far, more students get memorization lessons than practice.

The results of interviews and observations show that: (1) learning in elementary schools tends not to pay

attention to the affective aspects, learning is focused on cognitive aspects, (2) the focus of learning is on the mastery of the material because the facilities available are inadequate, (3) the learning model used is not yet integrating the values of local wisdom, (4) limited time for teachers in developing learning in the classroom, (5) teaching materials, lesson plans, student practice sheets have not integrated the local wisdom of the local community. Based on these problems, the importance of integrating local wisdom with learning needs to be realized in the form of developing learning models. The learning model developed also needs to be adjusted to the implementation of the 2013 curriculum. Value and character education are applied to science courses because one of the Indonesian national education goals stated in the 1945 Constitution is to have noble character and skills. According to the 2013 Curriculum Characteristics applied in Indonesia, balancing attitudes, knowledge, and skills to build soft skills and hard skills from elementary, junior high, high school/vocational school, and tertiary education levels. Disclosed (Brunner, 1960), at the primary school level, the domain of attitude must be more dominant introduced, taught, or exemplified to children, followed by the realm of skills, and the domain of knowledge taught less to children. Based on the problems revealed, this research develops a science learning model based on local wisdom Piiil Pesenggiri, allowing students to learn in their cultural ways. The development of science learning models based on local wisdom Piiil Pesenggiri is intended to develop elementary school students' process skills and character values.

Method

This research is a research and development model. The development model used as the basis for development results from adopting the ADDIE model (Branch, 2009), namely: covering the stages of Analysis, Design, Development, Implementation, and Evaluation. The targets in this study were students and grade IV teachers in East Lampung. In East Lampung, School was chosen because East Lampung was included in an area with suboptimal levels of quality of learning, high violence cases against children, and high poverty levels in East Lampung residents. The limited trial was carried out on 25 grade IV students. The broad test was carried out on fourth-grade students in three elementary schools with the criteria of high, medium, and low schools. School criteria are determined by the school accreditation score, the length of the school's standing, and the value of student input. The number of students involved in the extensive test was 78 students (53 girls and 25 boys), and three teachers.

A large trial's goal is to see the viability of the learning model and tools and the model's efficacy in

enhancing students' process skills and character values. After validation, restricted trials, and comprehensive trials, we can get efficient learning models and evaluate both substance and methodology. This aims to determine whether the Scientific learning model based on the Local Wisdom Piil Passenger developed is feasible to use or not. The t-test is used to test differences in the value of initial process skills and final process skills and initial character values and final character scores.

Data collection tools used were observation sheets and questionnaire sheets. The observation sheet of process skills and character values uses 5 criteria, ranging from poor to excellent. Three expert assessments and three practitioners carried out the scientific learning model's validity based on Local Wisdom Piil Pesenggiri. Data analysis uses inferential statistics. Inferential statistics used in limited trials are t-tests. The t-test is used to determine the effectiveness of learning products in improving process skills and character values.

In contrast, the product effectiveness test is analyzed using MANOVA (Multivariate Analysis of Variance) with a significance level of 5%. Before conducting the research, the researcher gave a research permit to the research location. The research location then provided a reply letter regarding the willingness to be used as the research location. Researchers maintain the identity of respondents, schools, and teachers.

Result and Discussion

Results

The Scientific Learning Model based on Local Wisdom Piil Pesenggiri consists of a model

implementation manual, a theory book and model application, and a learning tool (lesson plan, student practice sheet, textbooks, and evaluation tools). This model was developed for grade IV elementary school students on the material of living things and their environment, the nature and changes in the appearance of objects, styles, energy, changes in the appearance of the earth and celestial bodies, and physical changes and their effects on the environment.

The elements of each research variable are as follows: (1) elementary school students' process skills include: observation, classification, measurement, and communication, (2) student character values include: hard work, honesty, tolerance, curiosity, creativity, patriotism. (3) Piil Pesenggiri local wisdom, including: (1) *Nemui Nyimah*; (2) *Nengah Nyappur*; (3) *Sakai Sambaian*.

Table 1. The Relationship between Piil Pesenggiri Values and National Character Values

Piil Pesenggiri Values	National character values
Nemui Nyimah is interpreted as polite, generous, openhanded, like to give and take in the material sense according to ability.	Hard work, honesty
Nengah Nyappur illustrates that sociability, friendliness, and tolerance among people.	Tolerance, curiosity, creativity
Sakai Sambaian means giving something to someone, a group of people, or for the public interest in the form of social goods and services without expecting anything in return.	Love the motherland

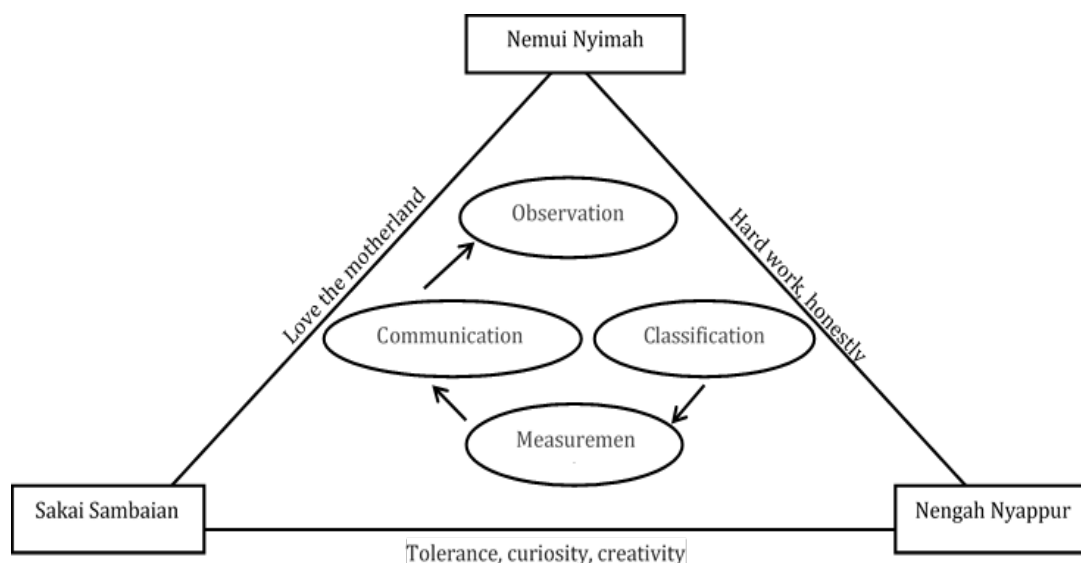


Figure 1. Relationship between Process Skills and Character Values

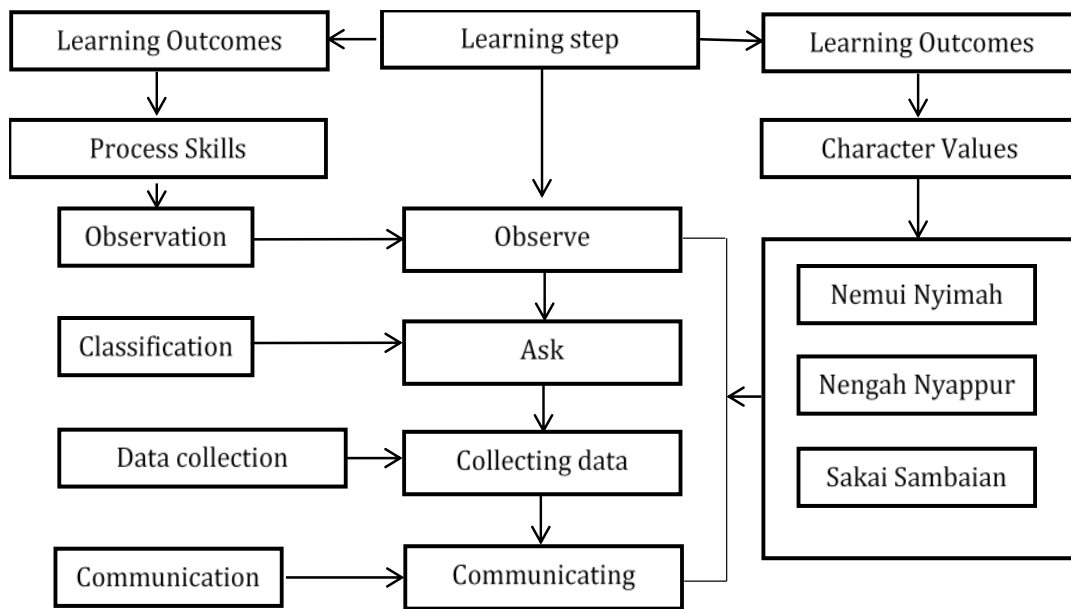


Figure 2. Scientific Learning Model Matrix Based on Local Wisdom Piil Pesenggiri to Improve Process Skills and Character Values

The validation results that the aspects assessed by expert judgment or the appropriateness of content, construction, and language. The average rating for the model guide book, semester learning plan, student worksheets, and textbooks is 3.9. This shows that all model components have very strong parameters, so it

can be assumed that the Pesenggiri Piil learning model and learning tools show valid results.

The model improvement was carried out based on the validator's suggestion so that a draft II of the model, which was ready to be tested in a small group of 20 class IV students, was obtained. The complete t-test results are in Table 2 and Table 3.

Table 2. T-test results of process skill

Pair Mean	Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
				End process skills - initial process skills	10.46			

Table 3. T-test Results of Character Values

Pair Mean	Paired Differences			95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper			
				Final character values - initial character values	18.20			

The results of the small class trial were then revised so that a draft III model was obtained. In the next draft, the III model is tested in large classes. Large class trials involved fourth-grade students in 3 different schools. The three selected schools have high, medium, and low-quality schools. This extensive class test was conducted to determine the effectiveness of applying

the scientific learning model based on Piil Pesenggiri Local Wisdom.

The learning model's effect is focused on developing process skills and values of elementary school students by Piil Pesenggiri. At each meeting, the evaluation of process skills and character values of students is performed. An observation sheet is used in this evaluation. The analysis results of the influence

between the learning model variables on the process skills and elementary school students' character values are listed in Table 4.

Table 4. Summary of inter-subject effect test results

Dependent variable	Model	Mean	F	Sig.
Process skills	Piil Pesenggiri	13.566	9.670	0.000
	Conventional	4.680		
	Discussion	6.257		
Character Values	Piil Pesenggiri	83.866	112.651	0.000
	Conventional	70.465		
	Discussion	71.250		

Table 4 shows the influence of the learning model on process skills and student character values. The F value is 9.670 at a significance level of 0.005, which means that elementary school students' process skills with Piil Pesenggiri-based learning models, conventional models, and different discussion models. Simultaneously, the F value is 112.651 at a significance level of 0.005, which means a significant difference in students' character values who use Piil Pesenggiri-based learning, conventional, and discussion models.

Table 4 shows that the Pesenggiri Piil-Based Learning model group has an average value (M = 13.566) greater than the traditional model group (M = 4.680) and the discussion model (M = 6.257). The character values are the same; The learning model group based on Piil Pesenggiri (M = 83.866) was bigger than the traditional model group (M = 70.465) and the discussion model group (71.250). The Scientific Learning Model based on local wisdom Piil Pesenggiri Development results is as follows:

1. Syntax

Step 1: Observation

Students use the five senses to observe phenomena that are relevant to what is learned. For example, in science subjects, students use their senses to see the relationships between living things. Does it include symbiosis of mutualism, commensalism, or parasitism. In this part, students also instilled Pesenggiri Piil **Nengah Nyappur's values** to maintain relationships between living beings requires a tolerant attitude between people.

Step 2: Ask

Students formulate questions about what is unknown or unclear. In this part, students also instilled the values of Pesenggiri Piil **Nemui Nyimah**, that is, a polite attitude towards a group of friends, an open hand in accepting input, and likes to assist other friends who are experiencing difficulties.

Step 3: Collect data.

Students collect data by filling in questions on student practice sheets. Students in groups collaborate on completing assignments, for example, recording what animals are included in the symbiosis of mutualism. In this part, students also instilled the values of Pesenggiri Piil **Nemui Nyimah**, that is, a polite attitude towards a group of friends, an open hand in accepting input, and likes to assist other friends who are experiencing difficulties.

Step 4: Communicate

Students submit answers to observations that have been made. For example, students can convey verbally, write, or display pictures of animals with a symbiotic relationship with materialism. In this part, students also instilled Pesenggiri Piil **Sakai Sambaian** means giving observations without expecting anything in return.

2. Social System

The social system requires a cooperative atmosphere—proactive students in learning activities by contributing to the process skills and achieving the intended character values. The teacher acts as a guide, moderator, facilitator, consultant, and mediator in the learning process to improve process skills and character values.

3. Reaction Principles

The principle of reaction in using the scientific learning model based on Local Wisdom Piil Pesenggiri should remind students to learn through the learning steps on the Student Practice sheet. The teacher also needs to provide feedback, praise, and opportunities for students to ask questions, think, and criticize the learning process.

4. Support System

The support system in the scientific learning model based on Local Wisdom Piil Pesenggiri is a learning tool, teaching material, and research place. Learning tools needed include RPS and instruments for assessing process skills and character values. Teaching Materials are needed to deliver natural science material that is reported with local wisdom Piil Pesenggiri.

5. Instructional Impacts and Accompaniment

The Scientific Learning Model's instructional impact based on Local Wisdom Piil Pesenggiri is students' process skills and character values to increase, while the accompanying impact, namely the students' responses to positive science lessons.

Discussion

National Education Standards Agency, referring to Minister of Regulation No. 22 of 2006 that the curriculum was developed by taking into account the diversity of student characteristics, regional conditions, and levels and types of education, without distinguishing religion, ethnicity, culture, and customs, as well as socioeconomic and gender status. The curriculum includes the substance of compulsory curriculum content components, local content, and self-development in an integrated manner, and arranged in a meaningful and appropriate interconnection and continuity between substances. This regulation is the basis for implementing classroom learning for elementary school students. Curriculum development then leads to the determination of appropriate learning models to be implemented.

The development and validation of the scientific learning model based on local wisdom Piil Pesenggiri are supported by empirical data that the integration of Piil Pesenggiri local wisdom in learning is still minimal to be applied because of the factors which include: learning in elementary schools tends not to pay attention to the affective aspects, learning is focused on cognitive aspects, facilities that are there is not enough available, limited time for teachers to develop classroom learning, teaching materials, lesson plans, student practice sheets that integrate local wisdom of the local community is not yet available. This is one of the less optimal factors in learning science that integrates local wisdom Piil Pesenggiri. The results of preliminary studies in this study also revealed that the process skills and values of students' characters were not optimal. Local wisdom can be integrated with teaching materials as a source of student learning that can optimize the learning process (Kristanto et al., 2019; Ningrum et al., 2018; Uge et al., 2019).

The development of a scientific learning model based on Piil Pesenggiri local wisdom is not possible to be implemented without going through a validation process to get a learning model based on local wisdom Piil Pesenggiri that is feasible to be implemented. The development and validation of the learning model have been carried out by assessing expert judgments and practitioners. The Scientific Learning Model based on local wisdom Piil Pesenggiri as a result of development is realized in a model book and its tools. Learning tools developed include Semester Learning Plans (SLP), Student Practice Sheets (SPS), teaching materials, evaluation tools in observation sets of process skills, and character values. The model book and device are then validated. The results of the model book validation in terms of learning content and media design are declared valid. Practitioners give a good response and provide input for the model's improvement to change according to suggestions.

Based on this, the model book and the device are declared suitable for use.

The implementation in limited trials and comprehensive trials of the Scientific Learning model based on Local Wisdom Piil Pesenggiri shows that the Scientific Learning model based on Local Wisdom Piil Pesenggiri has a significant impact. Based on restricted tests (t-test results), the processability score (final) is higher than the processability (initial), and the character value score (end) is higher than the character value (initial). It was found that the Scientific Learning Model based on local wisdom Piil Pesenggiri was better than traditional models and discussion in achieving the process skills and character values of elementary school students, based on comprehensive trials with the MANOVA test.

The efficacy of the scientific learning model based on local wisdom Piil Pesenggiri in learning, especially in process skills, is evidence that the local wisdom-based scientific learning model Piil Pesenggiri is practically used for elementary school students. Learners can well do all aspects of process skills. The usefulness of the scientific learning model based on local knowledge Piil Pesenggiri is also confirmed by the advantages of the model itself: (1) this model has a clear theoretical basis and operational learning procedures. Syntax, social and reaction systems, support systems, educational impacts, and accompaniment impacts of organizational learning procedures have (Joyce et al., 2015), (2) This model uses a scientific approach to improve the process skills and character values of the students, (3) The validity and reliability of the model is unquestioned because experts have tested them in their fields, (4) This model is easy to use, (5) This model uses a guide to optimize student learning processes in the form of student practice sheets. This is in line with previous research that showed that learning based on local wisdom could enhance learning outcomes, attitudes, and innovation effectively (Pamungkas et al., 2017; Titin & Rasmawan, 2017). Then strengthened by (Setiawan et al., 2017; Yusa & Jayanegara, 2014), which revealed that learning based on local wisdom with scientific is suitable for primary school student learning. The application of local wisdom in learning can also improve students' higher-order thinking skills (Abidinsyah et al., 2019; Dewi et al., 2017; Wahyuni, 2015).

The scientific learning model's implementation based on local wisdom Piil Pesenggiri enhances process skills and enhances student character values. This is in line with (Mannan, 2015), which shows that integrating character education into learning tools based on local wisdom can also be developed for all characters. Student character values include honesty, hard work, tolerance, curiosity, creativity, and love for the motherland. The results showed that elementary school

students' process skills learning to use the scientific learning model based on local wisdom Piil Pesenggiri, the results were better than conventional models and discussions. The effectiveness of the scientific science learning model based on local wisdom Piil Pesenggiri in enhancing the students' character values was revealed through this study, and at the same time as evidence that integrating the wisdom of Piil Pesenggiri local wisdom in scientific learning can improve the learning process and outcomes. This study's findings are consistent with research conducted by (Siska et al., 2017) about Imsciencetation of local wisdom piil pesenggiri to improve the quality of learning. The results of his research are Piil Pesenggiri integrated into teaching materials that can improve student character values. Overall, the theoretical implications of this study's findings are: (1) Students' initial process skills determine the achievement of learning outcomes through optimal learning processes. The implication is that the students' initial process skills need to be explored to determine the appropriate learning design, (2) integration of local wisdom Piil Pesenggiri can improve elementary school students' character values.

Conclusion

It can be concluded as follows based on the research findings that have been carried out: Create learning models based on Local Wisdom Piil Pesenggiri to enhance the process skills and character values of students based on a needs analysis. The syntax of the model consists of five steps, namely observation, classification, measurement, and communication; a scientific learning model based on Piil Pesenggiri's Local Wisdom to improve the process skills and character values of students declared valid by experts, and based on the evaluation of content, design and media aspects with very good category assessment; The Local Wisdom Piil Pesenggiri-based science learning model is declared efficient in improving the process skills and character values of elementary school students. The efficacy of this model is demonstrated by the presence of substantial gaps in process skills and character values between students who learn to use Local Wisdom Piil Pesenggiri-based science learning models and not.

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