JPPIPA 11(5) (2025)

Jurnal Penelitian Pendidikan IPA

http://jppipa.unram.ac.id/index.php/jppipa/index

Analysis of Life Skills and Environmental Literacy Oriented to ESD in Elementary School Students

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Received: January 19, 2025
Revised: April 03, 2025
Accepted: May 25, 2025
Published: May 31, 2025

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DOI: 10.29303/jppipa.v11i5.11019

Abstract: This study is to identify the categories of life skills and environmental literacy abilities of fifth grade students of Mangkang Kulon 02 Elementary School, Semarang. This study is included in the type of development research, namely Research and Development (R&D) which refers to the ADDIE model. Data collection through google form, by providing a number of questions that include indicators of life skills abilities (WHO, 1997) and indicators of environmental literacy abilities (McBeth & Volk, 2009). The results of data analysis obtained the highest average percentage of students' life skills abilities in the personal skill indicator with a percentage of 43% in the sufficient category, while the lowest indicator in social skills was 28% in the weak category. In students' environmental literacy abilities, the highest percentage was 50% in the moderate category in the attitude indicator, while the lowest percentage was 32% in the low category in the behavior indicator. Based on the results of research and development, it is concluded that ESD-oriented learning devices are suitable for use in elementary school grade V science learning because they meet the criteria of validity, practicality and effectiveness. So that it can improve students' life skills and environmental literacy.

Keywords: Environmental literacy; ESD; IPAS; Life skills

Introduction

The implementation of science learning in elementary schools that can increase independence and environmental awareness in students is learning based on life skills and environmental literacy. Life skills are "life skills" which can be interpreted as life creativity (Muzaini et al., 2023; Nieman et al., 2023; Ningsih et al., 2024). Cronin et al. (2021), Mofrad et al. (2013), and Shek et al. (2021), argue that life skills encompass various aspects of emotional and social intelligence of the self, which facilitate the acquisition of adaptive behavioral patterns, the ability to evaluate and analyze information for effective decision-making, and competent interpersonal communication. According to Chaiyama et al. (2021) and Shek et al. (2021), indicators that assess students' abilities in life skills are creativity, critical thinking, problem solving, cooperation, negotiation, and decision-making. Thus, students must be taught the entrepreneurial spirit, the goal is that the next generation of the nation will no longer just be a society that relies on employment from other people, but so that they can open up employment opportunities for other people (Dewi, 2021; Munawaroh et al., 2020; Muzaini et al., 2023).

Meanwhile, environmental literacy is a condition of environmental awareness that allows a person to be responsible, caring, and aware of the existence of the environment, and to understand the complex relationships between humans, the environment, and the ecosystem in the surrounding environment (Ariesandy, 2021; Fitri et al., 2022). This ability includes understanding the impact of humans on the environment, sustainability, and skills to make the right

How to Cite:
Utomo, R. K., Roshayanti, F., & Nizaruddin. (2025). Analysis of Life Skills and Environmental Literacy Oriented to ESD in Elementary School Students. *Jurnal Penelitian Pendidikan IPA*, *11*(5), 1006–1011. https://doi.org/10.29303/jppipa.v11i5.11019

decisions in managing natural resources. Based on the description above, it can be concluded that environmental literacy is not only about reading but also involves students' awareness, actions, and responses to issues that occur in the school environment.

Environmental literacy fosters student engagement in taking pro-environmental actions while interacting with nature over time (Fitri et al., 2022; López-Alcarria et al., 2021). Teachers' lack of understanding of strategies and reasons for environmental literacy may have an impact on children's behavior. Improving environmental literacy skills is hampered by obstacles such as limited time, lack of facilities and infrastructure, unprepared preschool facilities, and gaps in understanding between students (Fitri et al., 2022; Indrawan et al., 2022).

Based on this background, it is necessary to conduct a study on "Analysis of Life Skills and Environmental Literacy of Grade V Students of Mangkang Kulon 02 Elementary School Semarang". The study aims to develop an Education for Sustainable Development-oriented science learning tool to improve students' life skills and environmental literacy.

Method

This research is included in the type of development research, namely Research and Development (R&D) which aims to create a feasible, practical, and valuable product (Harefa et al., 2023). This research is a development research using the ADDIE model. The ADDIE model is a model that is easy to use and can be applied in a curriculum that teaches knowledge, skills or attitudes (Cheung, 2016; Mutlu, 2016). The ADDIE model is also considered a more rational and more complete model compared to other models. Therefore, this model can be used for various forms of product development such as models, learning strategies, learning methods, media and teaching materials (Fadilah et al., 2023; Rohaeni, 2020). In this model, the process of developing ESD-oriented science learning devices to improve the life skills and environmental literacy of grade V students of Mangkang Kulon 02 Semarang Elementary School is integrated and carefully designed to produce products that are in accordance with learning, needs, and goals. ADDIE is an acronym that describes five basic steps, namely Analysis, Design, Development, Implementation, and Evaluation. The following is a summary of the ADDIE model design in this development research.

The first stage is the analysis stage, namely the identification and analysis of various needs and determination of problems, solutions, and appropriate products, including curriculum analysis, needs analysis, and student characteristics analysis. The results of this analysis are taken to the next stage, namely the design of the product to be developed. At the design stage, the design of the IPAS learning device to be developed is carried out along with the research instruments to be used. At the development stage, product development is carried out from the framework that has been created along with the research instruments. In addition, validation of the IPAS learning device is also carried out by expert validators, namely the supervising lecturer and practitioner validators, namely the teacher. If there is a revision, the revision is carried out immediately. At the implementation stage, the validated IPAS learning device is used as an implementation of learning for grade V students of Mangkang Kulon 02 Semarang Elementary School. Then, the evaluation stage is carried out throughout the research process.

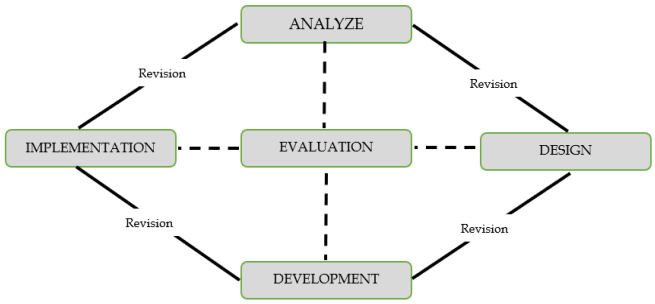

Figure 1. ADDIE design model

Result and Discussion

Analysis Stage

This analysis stage aims to identify problems and needs in ESD-oriented science learning for grade V of Mangkang Kulon 02 Semarang Elementary School to improve life skills and environmental literacy. This stage is very important to understand the problems faced and determine what is needed by students in order to achieve or even exceed the target of life skills and environmental literacy abilities as determined in this study.

This analysis was conducted by involving class V teachers of Mangkang Kulon 02 Semarang Public Elementary School, as well as class V students of Mangkang Kulon 02 Semarang Public Elementary School through data collection using a questionnaire via Google Form to measure the level of students' life skills based on a Likert scale of 1-4 with categories: 1=never; 2=sometimes; 3=often; 4=always, and referring to life skills indicators (WHO, 1997) including: (1) personal skills with 9 questions, (2) academic skills with 4 questions, (3) thinking skills with 5 statements, (4) social skills with 11 questions, and (5) vocational skills with 7 questions.

For data collection in measuring the level of environmental literacy, Google Form was also used

based on indicators contained in environmental literacy indicators (McBeth et al., 2009), including: (1) knowledge using multiple-choice questions on ecological knowledge with 5 questions, (2) cognitive ability using questions in the form of statements with 15 questions based on a Likert scale of 1-5 with categories: 1=no concern; 2=little concern; 3=neutral; 4=some concern; 5=very much concern, (3) attitude using questions in the form of statements with 9 questions based on a Likert scale of 1-5 with categories: 1=strongly disagree; 2=disagree; 3=neutral (no opinion); 4=agree; 5=strongly agree, and (4) behavior using questions in the form of statements with 6 questions based on a Likert scale of 1-5 with categories: 1=never; 2=rarely; 3=sometimes; 4=often; 5=always.

It is known that the analysis of the average results of the life skills abilities of grade V students of Mangkang Kulon 02 Semarang Elementary School can be seen in table 1.

Table 1. Results of Analysis of Average Life Skills Abilities of Students

Life Skills	Percentage	Criteria
Personal skill	42.59	Enough
Academic skill	38.52	Weak
Thinking skill	30.84	Weak
Social skill	28.41	Weak
Vocational skill	36.31	Weak

Based on table 1, it is known that the average result of social skills is the weakest, which is 28.41%. Thus, it is necessary to have an IPA learning that can improve students' oral and written communication skills, their ability to manage conflict and control their emotions, and their ability to cooperate and participate in a work group. Thus, project-based IPA learning is very necessary.

Meanwhile, the analysis of the average results of environmental literacy skills of grade V students of Mangkang Kulon 02 Semarang Elementary School can be seen in Table 2.

Table 2. Results of Analysis of Average Environmental Literacy Skills of Students

Environmental Literacy	Percentage	Criteria
Knowledge	37.60	Low
Cognitive Ability	41.06	Currently
Attitude	50.22	Currently
Behaviour	32.00	Low

Based on table 2, it is known that the average result of student behavior is the lowest, which is 32.00%. Thus, it is necessary to have an IPA learning that can increase students' actual commitment in this case, the commitment that is implemented or shown in real actions in the form of waste management in their environment. So that project-based IPA learning is also very much needed.

Classroom observation activities were also conducted on class V teachers of Mangkang Kulon 02 Semarang Elementary School and feedback was obtained that teachers had not implemented student-centered learning, so it was necessary to use these learning activities to improve their teaching and learning activities. In addition, other problems were also found, namely, (1) students had not been able to determine the information and problems presented through indicators in analyzing problems, because students tended not to be able to link learning concepts to the real world; (2) They had difficulty in generating new ideas or concepts, this was seen during learning activities in the science subject content, there were still some students who had difficulty understanding the material presented by the teacher and there were some students who did not focus when the teacher delivered the lesson material.

Based on the results of the analysis, it is necessary to develop an Education for Sustainable Development (ESD)-oriented science learning tool to improve students' life skills and environmental literacy, which includes Learning Objective Flow, Teaching Modules, Teaching Materials, and Student Worksheets.

Design Stage

At the design stage, the researcher designed and compiled learning tools including Learning Objective Flow, Teaching Module, Teaching Materials, and Student Worksheets in the subject of Science Chapter 8 "My Dear Earth, My Poor Earth" with the topic "Oh, the Environment is Damaged" oriented to ESD to improve students' life skills and environmental literacy. In addition, the researcher also prepared pretest and posttest questions to measure students' environmental literacy skills on the ecological knowledge indicator before and after the learning process took place.

Development Stage

At this stage, two validations were carried out, namely expert validation and practitioner validation of the ESD-oriented learning device (Learning Objective Flow, Teaching Module, Teaching Materials, and Student Worksheets). Expert validation was carried out by two experts, namely two lecturers who had been appointed and assigned by the Semarang PGRI University, Natural Sciences (IPA) postgraduate study program. While practitioner validation was carried out by one practitioner, namely a fifth grade teacher at Mangkang Kulon 02 Semarang Elementary School. The design of the ESD-oriented learning device product (Learning Objective Flow, Teaching Module, Teaching

Materials, and Student Worksheets) that had been created was then validated by the expert validator and the practitioner validator so that the device product was referred to as the initial draft. The validation results that had been declared valid by the validator would obtain the ESD-oriented learning device (Learning Objective Flow, Teaching Module, Teaching Materials, and Student Worksheets) which was referred to as the final draft. The validation results would be revised if requested by the validator.

Table 3. Average Results of Expert Validator Assessment

Validation Aspect	Percentage	Criteria
Flow of Learning Objectives	93.00	Very Valid
Teaching Module	94.44	Very Valid
Teaching materials	93.85	Very Valid
Student Worksheet	96.43	Very Valid

Table 4. Average Results of Practitioner Validator Assessment

Validation Aspect	Percentage	Criteria
Flow of Learning Objectives	90.00	Very Valid
Teaching Module	94.44	Very Valid
Teaching materials	93.08	Very Valid
Student Worksheet	94.29	Very Valid

Table 5. Average Readability Results

Validation Aspect	Percentage	Criteria
Teaching materials	92.19	Very good
Student Worksheet	93.75	Very good

Table 6. Results of the Validity Test of Question Items

Question Number	Validity	Interpretation
1, 2, 8	Valid	Enough
3, 5, 6	Valid	Very Low
7	Valid	Low
4, 9, 10	Valid	High

Table 7. Reliability Results of Question Items

Cronbach's Alpha	N of Items
.662	21

The result of r_{11} = 0.662, so the reliability of the question item is in the HIGH category.

Table 8. Results of Analysis of Question Difficulty Level

Question Number	Interpretation
1, 3, 5, 6, 7, 8	Easy
2, 4, 9	Currently
10	Difficult

Percentage of students achieving passing grade: $\frac{23}{28}$ x 100% = 82.14% then interpret the difficulty of the questions in the EASY category.

Table 9. Results of Distinguishing Power Analysis

Question Number	Interpretation
1, 7, 8	Enough
2, 4, 9	Good
3, 5, 6	Very ugly

Implementation Stage

The design of this study is to use the one group pretest posttest method/approach, which is a study conducted in only one class. This design uses a pretest before being treated and a posttest after being treated. Treatment of one group without a control or comparison group aims to determine the results of the treatment more accurately, because it can be compared with the conditions before being treated. So that it is a dependent variable that is not solely influenced by the independent variable (Sugiyono, 2018). This condition can occur because there is no control variable and the sample is not selected randomly.

At this stage, what the researcher did was to apply the final draft or product of the ESD-oriented learning device (Learning Objective Flow, Teaching Module, Teaching Material, Student Worksheet) as a result of the revision to the Teaching and Learning Activities in class V of Mangkang Kulon 02 Semarang Elementary School and test the pretest and posttest questions on the class V students. At this stage, the determination of the research subjects, initial data analysis, implementation of the trial in class V of Mangkang Kulon 02 Semarang Elementary School, data collection from the research results (trial of the learning device), and final data analysis were continued.

Table 10. Average Results of Pretest and Posttest

Evaluation	Number of Students	Percentage
Pretest	24	47.08
Posttest	24	59.17

Table 11. Descriptive Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest Ecological Knowledge	47.08	24	16.280	3.323
	Posttest Ecological Knowledge	59.17	24	17.673	3.607

Based on the output table of the T-test results, the value obtained is sig. = 0.001 which means smaller than α 0.05. Thus, H_o rejected and H_a accepted or:

H_o = There is no difference in the value of students' Ecological Knowledge before and after being given learning of Science Chapter 8 "My Dear Earth, My Poor Earth" with the topic "Oh, the Environment is Damaged", declared rejected.

H_1 = There is a difference in the value of Ecological Knowledge before and after being given learning of

Science Chapter 8 "My Dear Earth, My Poor Earth" with the topic "Oh, the Environment is Damaged", declared acceptable.

Based on the results of descriptive analysis, the average value of the pretest of students' Ecological Knowledge was obtained = 47.08 and the posttest value of students' Ecological Knowledge = 59.17. This means that there was an increase in the value of students' ecological knowledge after receiving IPS learning Chapter 8 "My Dear Earth, My Poor Earth" with the topic "Oh, the Environment is Damaged". Thus, it can be concluded that providing IPS learning Chapter 8 "My Dear Earth, My Poor Earth" with the topic "Oh, the Environment is Damaged" has a significant effect on increasing the value of ecological knowledge of grade V students of Mangkang Kulon 02 Elementary School Semarang.

Table 12. Average Results of Student Responses to Learning

Category	Number of Students	Percentage
Very good	19	79.17
Good	5	20.83
Enough	0	0.00
Not enough	0	0.00

Table 13. Average Results of Student Learning Activity Assessment

Group name	Percentage	Criteria
Beringin	5.87	Very Active
Durian	5.67	Very Active
Bambu	6.00	Very Active
Terompet	5.87	Very Active
Apel	5.87	Very Active

Evaluation Stage

This stage is intended to evaluate the success of a product that has been developed, namely learning devices (Learning Objective Flow/ ATP, Teaching Modules, Teaching Materials, LKPD) that are ESD-oriented to improve the life skills and environmental literacy of fifth grade students of Mangkang Kulon 02 Elementary School, Semarang. The results of this stage are called final products. In addition, the results of the initial data analysis, the results of the final data analysis, and the results of the pretest and posttest assessment questions are used to measure the level of success of the life skills and environmental literacy of students oriented to ESD.

Conclusion

Based on the results of research and development, it was concluded that ESD-oriented learning devices are suitable for use in elementary school grade V science learning because they meet the following criteria: (1) validity because all components (such as teaching materials, media, and evaluation instruments) are in accordance with the material to be taught and the learning objectives to be achieved, and can be measured through expert validation or direct trials with students; (2) meeting the criteria of practicality because they are easy to use by teachers and students, not complicated, and in accordance with class conditions and characteristics, as well as ease in preparing learning devices, such as the time needed and the resources needed; and (3) meeting effectiveness because they are able to improve student learning outcomes, make students more interested and enthusiastic in following lessons, and help teachers achieve the learning objectives that have been set, and can be measured through test results or evaluations given to students. Thus, the ESD-oriented science learning device Chapter 8 "My Dear Earth, My Poor Earth" with the topic "Oh, the Environment is Damaged" can improve the life skills and environmental literacy skills of grade V students of Mangkang Kulon 02 Semarang Elementary School.

Acknowledgments

The researcher would like to express his gratitude to the teachers and students of grade V of Mangkang Kulon 02 Elementary School Semarang, who have taken the time to make this research a success. Then to the supervisor of the postgraduate study program of Science Education, Universitas PGRI Semarang who has supported, motivated, given direction and guided until the completion of this research.

Author Contributions

This research contribution is the result of collaboration between students and two supervisors. The author is a student, while the two supervisors are lecturers who are tasked with providing guidance and direction to the author in completing this research writing until completion.

Funding

This research is independent research, not receiving external funding from any party and in any form.

Conflicts of Interest

The author declares no conflict of interest in the publication of this scientific article.

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