



Development of Teaching Materials Based on Differentiated Learning to Improve Critical Thinking Dimensions of The Pancasila Learner Profile

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Abstract: This research aims to develop teaching materials based on differentiated learning to improve critical thinking dimensions of the Pancasila Learner Profile for students in elementary schools. This research uses the Design and Development (D&D) method using the ADDIE model, which consists of five stages, i.e., analysis, design, development, implementation, and evaluation. The research participants comprised grade 3 elementary school students, material experts, media experts, and learning experts. The data collection techniques used in this study were filling out work logs, testing expert validation, and learner assessments. The analysis used in this research is qualitative and quantitative data analysis. The results of this study are teaching materials in three series, namely visual series, audio series, and kinesthetic series. The study results were teaching materials obtained a validation assessment with an outstanding category. Then, to test the effectiveness of N-Gain, the results showed effectiveness in the moderate category. Thus, Teachers can utilize this differentiated teaching material to teach the material and develop students' critical thinking skills in learning IPAS in elementary school.

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Introduction

The Pancasila Learner Profile is one of the developmental issues focused on in the current independent curriculum. The objectives of national education are a translation of the Pancasila Learner Profile (Kemendikbudristek, 2022). The purpose of education does not only focus on the knowledge aspect, but involves developing the character and behavior of learners, ensuring they have valuable skills, paying attention to aesthetics and ethics, and most importantly, ensuring behavior in daily life. (Arifudin et al., 2020). The existence of national education goals developed into the Pancasila Learner Profile in the basic framework of an independent curriculum that has a role for students in Indonesia has a Pancasila Learner Profile that is further developed in the character and skills that are always grown in the person of each individual (Irawati et al., 2022). There are six dimensions that can help learners succeed in educational goals that are based on the Pancasila Learner Profile including; 1) faith, devotion to God Almighty, and noble character; 2) global diversity; 3) mutual cooperation; 4) independence; 5) critical thinking; and 6) creativity (Kemendikbudristek, 2022).

As the primary source in directing and developing educational policies, as well as a potential reference for students, the function of the Pancasila Student Profile is to build and develop students' character interests and talents (abilities) (Kemendikbudristek, 2022). Pancasila remains alive and has become an ideology understood and used by students today. To ensure this, the cultivation of the Pancasila Learner Profile helps students understand and characterize the value of Pancasila as the primary basis (Faiz & Faridah, 2022).



One of the dimensions of the Pancasila Learner Profile is critical thinking. Critical thinking ability involves thinking skills where learners are expected to effectively present arguments or reasons that support the assumptions or conclusions they make (Rosidin et al., 2019). Critical thinking is making rational decisions that can be accepted or rejected after considering the potential consequences (Nawang Sari et al., 2022). Recognizing and learning instill the ability to reason critically in developing schools students to face problems that occur and are experienced around them (Ernawati & Rahmawati, 2022). It has a very potential role for students in managing their skills and encouraging creativity in their contribution to the profession they will be in. Therefore, the ability to reason critically has benefits over a long period (Fitriyadi & Wuryandani, 2021).

Learners have unique characteristics; they have their own interests, talents, and needs. Learning must be able to facilitate the needs of each learner. Build a learning process that can allow learners to process and learn with interest and the talents they have. In addition, the role of the ideal teacher is to understand and recognize the existence of various alternative methods and stages of strategies to make teaching materials in specific lessons. Arrange several drafts of learning activities, daily activities, and assignments that can be done in class or at home with a final assessment of students' readiness to learn these activities (Purba et al., 2021).

One way to facilitate learners' diversity is differentiated learning. Differentiated learning means learning that applies differentiation in the classroom, i.e., providing different ways of understanding material, processing or absorbing ideas, and producing learning products, which can help the learning process to be effective for learners. (Oskarsson & Johansson, 1987). There are learning efforts through several stages to meet the learning needs of students, namely by implementing differentiated learning (Herwina, 2021). Educators can manage four elements of learning: content, process, product, and learning environment, which are based on the diversity of learners in individual personalities, as well as learning readiness and learning profiles of learners (Purba et al., 2021).

The results of observations in one of the elementary schools in the West Bandung district show that 70% of students' ability to reason critically is low. This can be seen from various activities and the implementation of learning with minimal results for students who ask questions, make decisions and teach center learning. The low ability of students to think critically with research data at the first cycle stage shows that the ability of students in one of the elementary schools in Central Java is still low. (Mariatul Kibtiyah, 2022). Then, the research data showed that students' critical thinking ability in one of the elementary schools in Denpasar at the initial reflection stage was still low. The observation results showed that the teacher did not provide opportunities to ask questions or find out the problems given, so students looked passive, which caused low critical thinking ability (Wahyuni et al., 2022). So, based on these data, it shows that the critical thinking ability of students in elementary schools still needs to improve.

Other problems found from observations and interviews related to using teaching materials. One of the elementary schools in the West Bandung district has not used teaching materials based on differentiated learning, and learning is still teacher-centered. Then, several researchers developed differentiation-based learning tools (Puspitasari et al., 2020) with the results of developing a differentiation model learning device using book creator for BIPA learning in a class that has diversity and getting a high response from students, thus showing that the product can attract students' interest in learning. Furthermore, in research (Nurjanah et al., 2023), the results of developing a digital teaching module based on differentiated learning with material on Indonesia's cultural wealth and getting excellent assessment results



from expert review and students.

This situation shows that teaching materials and learning tools have already been developed and used in teaching and learning activities. However, it is still rare to find teaching materials developed based on differentiated learning and aiming to develop the Pancasila Learner Profile. So, there are concerns that if this continues, students' learning needs will not be met because they are not met according to their respective abilities, interests, and characteristics, which can fail to achieve learning objectives.

The research aims to develop teaching materials oriented to differentiated learning in fostering critical thinking dimensions in students in elementary schools. The focus of the material to be developed is on understanding the concept of money with currency value material in Natural and Social Sciences (IPAS) subjects, which is associated with fostering critical thinking so that students can apply it in their lives.

Research Method

The Design and Development (D&D) research method is used in this research, which is grouped into two main categories of research projects: (1) product and tool research, and (2) model research. (Richey & Klein, 2014). This research is included in the tool and product research, which was collected with the research subjects of Phase A and Phase B students at SD Negeri C, West Bandung Regency, with 20 students. The learning development model applied in this study is ADDIE with five stages, namely (analysis, design, development, implementation, and evaluation) (Sugiyono, 2022), to help make the product process run effectively.

Worklogs are writings collected by researchers to meet research needs and are data collection techniques used in this study. Worklogs are filled in by researchers as information and references in the form of writing in the process of designing teaching material development. Then, the test was conducted on students to obtain information about their initial and final abilities. Expert validation is carried out to assess the feasibility of products developed by researchers and experts who assess the products that have been developed, including material experts, media experts, and learning experts. The learner assessment is implemented to determine the response to the differentiation teaching materials that have been developed and applied in learning.

In addition, the researcher provided a questionnaire sheet of learning materials containing the assessment of students, referring to the indicators of the National Education Standards Agency (BSNP). Qualitative and quantitative data analysis were applied in this study by thoroughly describing researchers' design and development of differentiated teaching materials through data reduction, presentation, and conclusions (Sugiyono, 2022). Quantitative data is obtained from data collection using a questionnaire, which three experts have validated, and the assessment results by students. This data will be processed quantitatively to obtain information about the results of the development of teaching materials. The Likert scale is used as a reference for the maximum value on the questionnaire sheet (Sugiyono, 2022). The following is a Likert scale assessment.

Table 1. Likert Scale

| No | Scale | Interpretation |
|----|-------|----------------|
| 1. | 5 | Very Good |
| 2. | 4 | Good |
| 3. | 3 | Simply |
| 4. | 2 | Less |
| 5. | 1 | Very Less |

Furthermore, the average percentage of each component is calculated using the feasibility value formula, namely :

$$\text{Percentage} = \frac{\text{Sum of respondent's scores}}{\text{Sum of the maximum scores}} \times 100\%$$

After obtaining the percentage of expert validation and student assessment, the next step is to determine the feasibility of teaching materials, which is obtained by calculating the average value by making a conclusion referring to the following score standards:

Table 2. Standard Score

| No | Scale | Interpretation |
|----|----------|----------------|
| 1. | 81%-100% | Very good |
| 2. | 61%-80% | Good |
| 3. | 41%-60% | Simply |
| 4. | 21%-40% | Less |
| 5. | 0%-20% | Very Less |

Results and Discussion

The development of this differentiated teaching material goes through 5 stages namely analysis, design, development, and implementation evaluation. The first stage is to analyze the curriculum, namely making indicators of learning objectives obtained from learning outcomes in Phase B in Natural and Social Sciences subjects. The learning objective indicators can be seen in Table 3.

Table 3. Indicators of Learning Objectives

| Learning Outcomes | Learning Objectives | Indicators of Learning Objectives |
|---|--|---|
| Learners can differentiate between needs and wants, recognize currency's value, and demonstrate how money is used to gain value/meet daily needs. | 1. Distinguish needs and wants. | 1.1 Defining wants 1.2 Define needs 1.3 Differentiate between wants and needs. 1.4 Conclude that everyone's needs and wants are different. |
| | 2. Explain the value of the currency. | 2.1 Defining money 2.2 Explaining the history of money 2.3 Explaining the function of money 2.4 Explaining the types of money. |
| | 3. Demonstrate/explain the use of money. | 3.1 Explaining money management 3.2 Demonstrating how to manage money properly |

Furthermore, an analysis of the Pancasila Learner Profile on the critical thinking dimension was also carried out, which aims to obtain critical thinking indicators (Kemendikbudristek, 2022). Indicators of critical thinking will be integrated into differentiated teaching materials. The results of the analysis of the Pancasila Learner Profile can be seen in Table 4.

Table 4. Critical Thinking Indicators

| Element | Sub Elements | Phase B | Critical Thinking Indicators |
|--------------------------|--|---|--|
| Acquiring and processing | 1. Asking questions 2. Identifying, | 1. Asking questions to identify a problem and | 1. Identify the problem 2. Ask questions. |

| | | | | |
|--|--|-----|---|--|
| information and ideas | clarifying, and processing information and ideas | and | confirm understanding of a problem about himself and the surrounding environment. | 3. Collect information. 4. Classify information. 5. Compare information. |
| Analyzing and evaluating reasoning | Analysing and evaluating reasons and procedures | and | Explains relevant reasoning in problem-solving and decision-making | 6. Make decisions. 7. Explain relevant reasons for solving the problem. |
| Reflecting and evaluating one's thinking | Reflecting and evaluating one's own thinking | and | Conveys what one is thinking and explains the reasons for what one is thinking. | 8. Convey Ideas |

The learning objective indicators in Table 3 and the critical thinking indicators in Table 4 are a reference in preparing this teaching material. Thus, teaching materials are developed by integrating learning material, namely currency value material, with critical thinking indicators from one of the dimensions of the Pancasila Student Profile. In addition, teaching materials are developed based on differentiated learning.

Based on the results of non-cognitive diagnostic tests regarding learning styles, students are divided into three learning styles. So, researchers created a design of teaching materials in three series: visual, audio, and kinesthetic. Then, at this stage, researchers create a learning experience design to facilitate the three learning styles of students. Thus, in the development process, researchers made three teaching materials: visual, audio, and kinesthetic. The visual series presents the material in short stories, comics, animated videos, and pictures. The results of developing a visual series of differentiated teaching materials can be seen in Figure 1.



Figure 1. Visual Series

The audio series teaching materials aim to facilitate learners with audio learning styles. In the audio series, learning is packaged in the form of songs, podcasts and short story recordings. The audio series teaching materials can be seen in Figure 2.



Figure 2. Audio Series

Learners who have kinesthetic learning style tendencies are given learning activities in the form of roleplay, observing the surrounding environment, interviews, and games. The kinesthetic series is developed with activities that make learners move a lot in order to facilitate the needs of learners with kinesthetic learning styles. The learning activities in the kinesthetic series can be seen in Figure 3.



Figure 3. Kinesthetic Series

Besides being developed in a differentiated manner, this teaching material can also help students improve their critical thinking skills. Researchers compiled activities on each learning objective that contained critical thinking indicators. The following are excerpts of activities in teaching materials that can help students improve critical thinking skills.



Figure 4. Activities Containing Critical Thinking Indicators

Furthermore, in each learning objective, there are always activities that are related to the daily lives of students or their surrounding environment. For example, in the discussion of the

function of money, at the end, students are asked to tell their experiences when using money. This is so that learning can be more meaningful. These activities can be seen in Figure 5.



Figure 5. Learner Activity

Not all activities in each series are different; some have the same learning experience. For example, Activity 8, namely, Market Day and Activity 9, making a financial notebook, are intended for students with kinesthetic learning styles. However, students with visual and auditory learning styles are also given the same activities because these activities are essential. Thus, several learning objectives are tailored to each learning style, meaning that the learning experience is different. However, there are learning objectives that are given with the same learning experience, one of which is in activities 8 and 9 described above, because the best learning experience for these activities is that learners must demonstrate directly, so that not only learners with kinesthetic learning styles get the learning experience, but all learners with various learning styles follow the learning.



Figure 6. Learner Activity

Teaching materials that have been developed are then validated and tested on students. Material experts, media experts, and learning experts carry out validation. Then, trials were conducted with grade 3 elementary school students to test the effectiveness of teaching materials. Validation is carried out to obtain an assessment category. The assessment category for the development of teaching materials shows excellent validation results, as illustrated in Table 5.

Table 5. Validation Results

| Expert | Maximum Score | Score | Percentage | Category |
|--------------------|---------------|-------|------------|-----------|
| Material Expert | 50 | 50 | 100% | Very Good |
| Media Expert | 50 | 48 | 96% | Very Good |
| Learning expert | 50 | 50 | 100% | Very Good |
| Average Percentage | | | 98,6% | Very Good |



Testing the effectiveness of differentiated teaching materials is done to students by giving tests. The test was carried out through two stages: pretest and posttest. After obtaining the pretest and posttest scores, the data was processed to obtain the N-Gain. The N-Gain value obtained was 0.57, which was classified as moderate. Information related to the effectiveness test of differentiated teaching materials can be found in Table 6.

Table 6. Effectiveness Test Results

| Pretest | Posttest | N-Gain | N-Gain Category |
|---------|----------|--------|-----------------|
| 29,35 | 70,3 | 0,57 | Medium |

Based on the N-Gain results showing a moderate category, the researcher analyzed the posttest results. The analysis results show that students need help with questions that contain indicators of making decisions, comparing information, and explaining relevant reasons for a problem. However, students answered correctly in other questions, and many learning objectives were achieved. Then, after testing the effectiveness of teaching materials to students, the next stage is giving a questionnaire for responses to teaching materials that have been used in learning; the results of the response from the questionnaire that has been filled in by students with an average value of 95.3 including an outstanding category.

Discussion

Critical thinking skills at SD Negeri C are still relatively low, and one of the causes is the limited teaching materials used. Critical thinking ability is a person's capacity to solve problems in a structured, rational, and analytical manner by using various relevant information (Suresman et al., 2023). Critical thinking skills are critical for students to have. Improving critical and creative reasoning skills is essential to developing learners' knowledge in elementary school (Gunawan et al., 2023). Students must have the skills and capacity to communicate their problems to others. Mastery of these skills can be achieved through learning planning by teachers that includes challenging activities encouraging students to reason critically while solving problems. (Darmawati & Mustadi, 2023). The ability to reason critically for students is essential to build the quality of thinking and achieve optimal learning outcomes. (Syafitri et al., 2021). Research on the development of differentiated teaching materials in improving critical thinking skills in IPAS subjects in grade 3 elementary schools, with the acquisition of differentiation-based learning material development, is included in the category of very feasible to be applied in IPAS learning.

The results of data analysis have an impact on increasing the development of critical thinking in students. Each learning objective in teaching materials always contains critical thinking indicators that train students to reason critically, such as one example in the material of needs and wants; through a short story, students practice identifying a problem in the story, then learn to collect and compare information, classify information, make decisions, provide ideas and explain relevant reasons for a problem. Because if, in learning, students are not accustomed to problem-solving, it will make students weak in the development of critical thinking skills. (Sulthon et al., 2021). The teaching materials developed can facilitate and familiarize students with reason critically.

The learning materials in this teaching material are presented systematically. This will make it easier for students to master the material because it is arranged from simple to complex. The presentation of material starts from the most basic to in-depth (Malahayati & Zunaidah, 2021). The presentation of material in this teaching material is in line with the curriculum, and the packaging of the material is aligned with the student's character. Material that is effective, appropriate, and by the curriculum and the needs of students is the preparation of good material for student learning. (Fajri, 2018).



These teaching materials are developed in a differentiated manner based on learning styles. Then, this teaching material presents material in various ways tailored to the needs of students. This varied presentation facilitates learners with different learning styles, so three series of teaching materials have been developed to help learners with visual, audio, and kinesthetic learning styles achieve their learning objectives. Differentiated learning aims to guide learners during learning by reviewing learning variations aligned to the needs of different learners (Endeshaw, 2023). Learning effectiveness is achieved when teachers can evaluate learners' abilities and needs and then use this data to guide learners' progress toward deeper understanding (Brevik et al., 2018).

In addition to being developed into three series to facilitate students' learning styles, this teaching material was developed with a varied presentation to foster students' interest in learning and to learn with fun. The variations in the presentation of material include being presented in the form of short stories, illustrated stories, songs, podcasts/ animated videos, roleplay games, and comics. The presentation of the material was developed in the form of comics because comics not only present exciting visuals but also convey material or learning objectives more enjoyably. (Nugraheni, 2017). Then, the material is packaged in games; games can increase students' interest and motivation in the learning process and make it easier for them to understand the material presented by the teacher (Sulistiyawati et al., 2021). The material is presented through animated videos, songs, and others. Learning that utilizes video or animation tends to be more effective because it can stimulate two human senses simultaneously, namely vision and hearing (Ariani & Ujjanti, 2021).

Based on the validation and overall effectiveness tests, teaching materials based on differentiated learning to improve critical thinking are suitable for use in IPAS learning activities in elementary schools. Teachers who want to teach IPAS material can use this teaching material, mainly differentiated learning of currency values, to improve critical thinking skills in grade three elementary schools.

Conclusion

The results of this study are teaching materials in three series, namely visual series, audio series, and kinesthetic series. The study results were teaching materials obtained a validation assessment with an outstanding category. Then, to test the effectiveness of N-Gain, the results showed effectiveness in the moderate category. Thus, Teachers can utilize this differentiated teaching material to teach the material and develop students' critical thinking skills in learning IPAS in elementary school.

Recommendation

There are recommendations for several parties, including 1) Students are expected to read the instructions for using differentiation teaching materials before using these teaching materials. 2) Teachers can act as facilitators so that learning runs smoothly. 3) For further researchers, conduct research on the development of teaching materials or other learning tools based on differentiation from other aspects, such as differentiation of content, processes, products, and learning environments.

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