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Development of Problem-based Learning LKPD to Improve Student Understanding

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ABSTRACT

Textbooks are a vital component in the educational process, serving as essential teaching materials that aid students in achieving learning objectives and competency standards. Teachers face challenges in choosing and determining appropriate learning models, but teaching materials offer solutions to address classroom issues. These materials can be sourced from personal experience, expert opinions, colleagues, books, mass media, the internet, and more. Teaching materials facilitate students' engagement with real-life facts and experiences, enabling them to assess and develop ideas, solve problems, acquire skills, and nurture creativity. Teaching materials encompass a wide range of formats, including printed resources (such as workbooks, modules, and learning comics), audio resources (such as sound recordings), audio-visual resources (such as educational videos and cartoons), and interactive materials (such as e-workbooks and web-based resources). The success of the learning process hinges on the careful selection and development of suitable teaching materials. This development is part of scientific research aimed at creating or improving products with practical value. Nana Syaodih Sukmadinata supports this perspective, emphasizing that research and development involve steps to create new products or enhance existing ones. In summary, teaching materials play a crucial role in educational success by providing students with valuable experiences and supporting the curriculum effectively.

Keywords: KPD Development, Problem Based Learning, Understanding Concepts, Creativity.

INTRODUCTION

Success in the learning process depends on selecting and developing appropriate teaching materials. This development involves scientific research aimed at creating a useful product. According to Sukmadinata (2008) where "Research and development is a process or steps to develop a new product or improve an existing product". This view aligns with Borg & Gall's (1983) perspective, which defines development research as follows: "Educational research and development (R&D) is a process used to develop and validate educational products. The steps in this process are typically referred to as the R&D cycle, which includes studying research findings relevant to the product to be developed, creating the product based on these findings, testing it in the intended setting, and revising it based on feedback from the field-testing stage. In more rigorous R&D programs, this cycle is repeated until field-test data confirms that the product achieves its defined objectives".

LITERATURE REVIEW

2.1 Definition of LKPD

Learning supported by teaching materials is often more effective, and one key type of teaching material is the learning worksheet or LKPD. An LKPD is a type of printed teaching material, typically defined as a task sheet that contains a summary of the material, instructions, and steps that students must follow to complete a task. This is to specific basic competencies that students are expected to achieve (Prastowo, 2012). According to Belawati dkk (2003), LKPD is a teaching material designed to allow students to study independently by providing material, summaries, and assignments alongside structured directions to aid in understanding the provided material. Majid (2009) also explains that LKPDs can consist of theoretical or practical tasks that students must complete. Additionally, LKPDs serve as guides for training students in cognitive development and as guides for all aspects of learning, providing experimental assistance and demonstrations. From these expert perspectives, LKPD can be concluded to be teaching materials that include several key elements: 1) study instructions; 2) basic competencies; 3) material summaries; 4) work steps; 5) assignments; and 6) assessments. These elements are packaged in innovative forms to maximize students' understanding and develop abilities aligned with the basic competencies to be achieved.

2.2 Benefits of LKPD

LKPD plays a crucial role in the learning process by increasing student engagement and facilitating the discovery of concepts and their improvement through self-directed activities. The use of LKPD can also develop process skills and optimize learning outcomes. In general, the benefits of LKPD include: 1) Assisting teachers in preparing lesson plans; 2) Activating students in the teaching and learning process; 3) Helping students take notes on the material being studied during teaching and learning activities; 4) Assisting students in acquiring information about concepts learned through systematic learning activities; 5) Training students to discover and develop process skills; and 6) Activating students in concept development. Overall, LKPDs are essential for both teachers and students in the learning process, supporting future learning improvements (Trianto, 2009; Erianjoni et al, 2023).

2.3 LKPD Function

LKPD has several important functions for students: **1)** According to Trianto (2011); Shor (2012) LKPD functions as a) a teaching material that reduces the role of educators while empowering students; b) a teaching material that simplifies students' understanding of provided material; c) a concise and assignment-rich resource for practicing skill development; and d) a tool for facilitating the learning process; and 2) Another perspective from Nurisalfah dkk (2015) outlines LKPD functions as 1) activating students in the learning process; 2) assisting students in concept development; 3) training students in the discovery and development of teaching and learning processes; 4) a guide for educators in lesson planning; and 5) a guide for carrying out learning processes. Candra et al (2023) also highlight LKPD functions: a) minimizing the teacher's role while engaging students more actively; b) simplifying the material provided for easier student comprehension; c) providing concise and abundant assignments to practice; and d) facilitating teaching

implementation for students. Overall, these expert opinions emphasize the importance of LKPD's functionality in enhancing learning outcomes.

2.4 Principles of LKPD Preparation

The preparation of LKPD should adhere to several foundational principles to effectively achieve learning objectives. Drawing from Juanda dkk (2021) explanation of Gray's educational principles, the preparation of LKPD involves: 1) Ensuring each exercise aligns with the instructional program's goals for each class or level; 2) Providing diverse exercises based on student needs and interests to reduce monotony; 3) Focusing on material as a means to an end rather than as an end itself; and 4) Aiding students understand what, how, and why they must perform tasks. Careful attention to these principles ensures that LKPD is suitable for both teachers and students, supporting optimal learning outcomes.

2.5 LKPD Structure

The general structure of LKPD includes 1) Activity Title, Theme, Sub-Theme, Class, and Semester: Covers activity topics based on KD and class identity. For LKPD with an inquiry approach, the title may be a problem statement; 2) Objectives: Learning objectives corresponding to KD; 3) Tools and Materials: Lists necessary tools and materials for learning activities; 4) Work Procedures: Provides work instructions for students to facilitate learning activities; 5) Data Table: Offers tables for recording observation or measurement results. Without data, empty tables or boxes may be provided for writing, drawing, or calculations; and 6) Discussion Material: Contains questions guiding students in data analysis and conceptualization.

2.6 LKPD Preparation Requirements

Didactic requirements pertain to effective learning principles (Suasti et al., 2018): 1) LKPD must consider various student abilities, providing homogeneous experiences; 2) Serves as a guide for students in obtaining information about concepts to be discovered; 3) Stimulates students through various media and procedures, such as writing, experimenting, and practicum; 4) Develops cognitive, social, emotional, and aesthetic abilities in students; and 5) Assists in students' personal development and contextual learning experiences.

Construction requirements pertain to language, sentence structure, vocabulary, difficulty level, and clarity in LKPD: 1) Adherence to grammar suitable for students' developmental levels; 2) Clarity and precision in sentence structure; 3) Gradation in sequence from high to low ability levels for complexity; 4) Consideration of student limitations in LKPD design; 5) Providing ample space for student exploration and expression; 6) Simple and concise language to avoid confusion; 7) Use of illustrations over text for student interest; 8) Inclusivity of all student abilities in LKPD; 9) Clear purpose to motivate students and guide learning processes; and 10) Clear identity for easy use by educators and students.

Technical requirements involve the presentation of LKPD, including writing, visuals, and appearance: 1) Writing should use printed letters, bold fonts for topics, and appropriate line lengths; 2) Frames help distinguish commands from student responses; 3) Balance between text and illustrations for harmonious design; 4) Visuals should support content comprehension and enhance learning; and 5) Attractive presentation motivates students to study LKPD thoroughly.

1.7 Advantages and Disadvantages of LKPD

Like any teaching material, LKPD has both advantages and disadvantages. Here are some advantages: 1) Allows learners to learn and progress at their own pace; 2) Enables students to review self-study material covered in theoretical lessons; 3) The combination of text and images enhances the delivery of information in verbal and visual formats; 4) Engages students actively in exercises and questions; 5) Print media can be easily reprinted and distributed; 6) Encourages students to be more active and independent in learning; and 7) Offers teachers insights into student achievements through LKPD evaluations. These advantages make LKPD a popular choice among teaching materials due to its practicality and effectiveness in supporting independent learning and assessment. However, there are also some disadvantages: 1) Questions in LKPD may be repetitive, covering similar material in subsequent sections or chapters; 2) There is a risk of teachers relying solely on LKPD without providing proper guidance; 3) LKPDs from publishers may not always align with the concepts being taught; 4) Print media tends to emphasize cognitive lessons more than emotional and attitudinal aspects; and 6) It can lead to boredom if overused without variation. In conclusion, LKPD's strengths make it a valuable tool for teachers and students, while its weaknesses can be mitigated with thoughtful implementation and supplementary materials.

METHOD

Data collection in this research is conducted in a natural setting, utilizing primary data sources. Data collection techniques employed in this study include observation, in-depth interviews, documentation, field notes, and literature studies. The study encompasses several models of development research, including the general Dick & Carey model implemented on a larger scale learning system, the ASSURE model utilized in actual classroom learning situations, the Camp (2007) model focusing on curriculum planning, the Smith & Ragen (2004) model centered on student learning, and the ADDIE model. Each development model possesses unique characteristics. However, these models fundamentally adhere to the same principle, which is to develop high-quality learning products.

RESULT

Based on the contents of the introduction, it can be concluded that R&D involves developing a product and validating it. This process is known as the R&D cycle and encompasses several stages. It begins with identifying and studying the problem, recording research findings related to the product to be developed, creating products based on these findings, validating the product’s feasibility with experts, and making revisions to address deficiencies found during testing, culminating in the final product being ready for use.

The success of the learning process is determined by several supporting factors. One key factor is the use of teaching materials. Teaching materials encompass all types of materials used by teachers/instructors to facilitate teaching and learning activities in the classroom. These materials can be either written or unwritten. As stated in the Creative

Guide to Making Innovative Teaching Materials, teaching materials consist of information, tools, and discourse organized systematically to present competencies in an integrated manner, allowing for the implementation of learning objectives. Teaching materials serve as tools and media that provide students with opportunities to gain life-related experiences. Through these experiences, students can practice assessing and developing ideas, solving problems, acquiring skills, and fostering creativity. According to the author, teaching materials are one of the components of the curriculum. They include various types of information, texts, and tools to be transferred to students through different forms of printed teaching materials (worksheets, modules, pocket books, learning comics), listening materials (sound recordings), audio-visual materials (learning videos, educational cartoons), and interactive teaching materials (e-worksheets, websites, etc.).

CONCLUSIONS

Based on the introduction, the conclusion can be drawn that Research and Development (R&D) is a process involving the development and validation of a product, which follows a cycle of various steps. These steps include identifying and studying the problem, recording research findings related to the product, developing the product based on these findings, validating the feasibility of the product with experts, and revising to correct any deficiencies found during testing until the final product is ready for use. Furthermore, the success of the learning process relies on several supporting factors, with one major factor being the use of teaching materials. Teaching materials encompass all forms of materials utilized by teachers/instructors to facilitate teaching and learning activities in the classroom, whether written or unwritten. According to the Creative Guide to Making Innovative Teaching Materials, these materials are arranged systematically to display competence in an integrated manner, enabling the implementation of learning objectives. Teaching materials serve as tools and media that offer students opportunities to gain real-life experiences related to factual knowledge. Through these experiences, students engage in assessing and developing ideas, problem-solving, acquiring skills, and fostering creativity. These materials are a crucial component of the curriculum, containing various forms of information, texts, and tools transferred to students through printed materials, audio recordings, audio-visual materials, and interactive materials.

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