



Using LKPD Based on Inquiry Social Complexity Improves Student's Learning Outcomes

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Abstract. Learning activities in the classroom are often a problem for educators and students, this is due to the lack of educator initiative in providing interesting learning media so that most of the learning process in the classroom tends to be passive and only receives information from educators. Thus, learning activities are centered on educators. To overcome these problems, the researchers tried to provide Student Worksheets (LKPD) with a learning model based on Inquiry Social Complexity (ISC) in the hope of improving learning outcomes in class. The research method used is Research Research and Development (R&D) using the Borg and Gall development model. The results of this study were obtained in the form of making worksheets that have been arranged in such a way by analyzing and following expert theory. The product obtained is expected to be used by many educators to improve learning in the classroom.

Keywords: LKPD development · Social Complexity inquiry model · Learning Outcomes

1 Introduction

In essence, education is an uninterrupted activity carried out by humans throughout life. Everyone must be educated, whether through formal or informal means, from their own experiences, or from observing the experiences of others. Education is essential for every individual, regardless of their race, gender, social status, or ethnicity. This is the key to a successful and fulfilling life and is the foundation of a society's progress. It provides knowledge, skills, and understanding that are necessary for individuals to make sound decisions, establish meaningful relationships, and pursue meaningful careers. This is supported by [1] "Education is something that is essential and is a basic need for everyone" [2] also stated, "Education is essentially not only to achieve learning success which is seen in learning achievement, but how students can successfully face life in general". This can be elaborated that education not only prepares individuals for the future, but it also provides them with the skills needed to take part in society and make meaningful contributions. It provides individuals with the knowledge and skills they need to pursue their goals and dreams and to become valuable members of their community.

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As we enter the 21st century, the education system of Indonesia is preparing its youth for the rise of information and communication technology that is increasingly present in everyday life. This statement is supported by [3] as he said, "Education is a true protector of human needs as it follows the time". It is clear that education plays an integral role in life. It is not something that can be ignored, as it has nourished human life throughout its course. Education is an essential need that protects us, and is continually adapting to the times.

21st century learning is the result of a steady evolution of society over the years. Society has grown from primitive to agrarian, then to industrial and is now transitioning to an information-based one. This is marked by the increased prevalence of digital technology, which has seen an exponential growth in the usage of computers, the internet, and mobile phones since the 1960s [4]. The digital revolution has caused a major shift in society from offline to online. Data from January 2022 reveals that 73.7% of Indonesia's 277.7 million people are internet users (databoks.katadata.co.id). Due to this large-scale transformation, educational systems in Indonesia must keep up with these changes, whether people like it or not.

In the 21st century, students need to be empowered to independently create and build upon their knowledge. It is supported by a statement; "To stay up to date and develop holistically, students need to acquire literacy skills, knowledge, abilities, and attitudes, as well as the ability to use technology" [5]. The 2013 curriculum emphasizes active learning and practical experience as a means of promoting students' understanding and application of theories in their daily lives [6]. To ensure that education is up-to-date with current developments, the development of learning media in the form of LKPD is essential.

Lembar KerjaPesertaDidik (LKPD) is an educational resource which can be employed to bolster the implementation of a Learning Implementation Plan. This tool enables students to become more involved and inventive in the learning process. Suggested that by utilizing LKPD, the desired competencies and objectives laid out in the curriculum can be more easily achieved. In addition, the existence of LKPD can help educators achieve learning goals in classrooms [7]. In other words, even though LKPD can be useful for achieving learning objectives, the role of the instructor is still vital. The instructor serves as a guide, overseeing the students' progress during the course of the lesson.

Using LKPD can be a great aid in the learning process. It can provide an alternative for educators to deliver instruction, speed up the process and save time when presenting a topic, get students more engaged in the learning process, and generate student interest if the LKPD is organized neatly and systematically. Additionally, it can foster self-confidence, boost motivation and curiosity, and allow for more effective study time [8]. Separate worksheets for students can also facilitate understanding of learning materials and enable them to make observations and experiments independently when using online methods with groups, thus saving time [9].

Generally, the LKPD used by educators is the LKPD that circulates in print/book agents. This type of LKPD simply outlines the material and provides practice questions, without going into detail about how to obtain formulas, theorems, or concepts. As such, it does not encourage curiosity and creativity in students as the LKPD has already

provided the essential information. This limits students' involvement in the learning process, causing them to merely memorize the material, instead of improving their mindset and honing their learning skills, which is what the current curriculum requires of them. To maximize the potential of the LKPD, it is important to create student activity sheets that foster independent learning and allow students to explore concepts in more depth. To achieve this, the Inquiry Social Complexity (ISC) model can be implemented. This model encourages students to ask questions, make connections, and explore topics through hands-on activities. Additionally, it focuses on the social aspects of learning, allowing students to work together to share ideas, discuss findings, and collaborate on projects. By providing these opportunities, the ISC model can help to create an engaging, interactive learning environment and further promote student creativity and involvement.

ISC can be described as the process of investigating and discovering answers to questions posed by Science. Inquiry learning is the method of gaining and constructing knowledge by observing and experimenting to find answers or resolve issues (Wenning & Khan, 2011). This type of learning encourages students to be more active in their search for knowledge, allowing them to make discoveries and understand concepts while also receiving guidance and instructions from educators. The Inquiry Social Complexity Model is a model focused on learning through inquiry, which breaks down the process into five distinct phases: observation, manipulation, generalization, verification, and application [10]. Observation involves gaining knowledge from the environment and collecting data from various sources. Manipulation involves using this data to interpret and draw conclusions. Generalization allows for the data to be organized in a meaningful way and for patterns to be observed. Verification helps to ensure that the data is accurate and that the conclusions are valid. Finally, application involves using the findings for the purpose of problem-solving and decision-making. The Inquiry Social Complexity Model is a powerful tool for developing and deepening knowledge, as it encourages the learner to interact with the environment and to draw meaningful connections between data and concepts. In other words, The Inquiry Social Complexity Model represents a framework for understanding and analyzing the complexities inherent in social inquiry. This model builds upon the notion of inquiry as a process of exploration, which involves the systematic examination of data and the formulation of meaningful conclusions.

Inquiry Social Complexity (ISC) is an educational model based on five major learning theories; constructivism, cognitive, behaviorism, social complexity, and social constructivism [11]. This model encourages students to work together to form a learning community, where they can share ideas, ask questions, and develop problem solving skills. It also encourages critical thinking and creative exploration, by providing a safe space for students to experiment and explore their own ideas and those of their peers. ISC also supports collaboration, as it allows for multiple perspectives to be heard and considered when developing solutions. This model can be used to foster an environment of respect, understanding, and collaboration, which can lead to increased knowledge, skills, and understanding of the material being studied.

The Social Inquiry Complexity learning model has an important role to play in the learning process to raise student skills from lower to higher levels. In this model, learning activities are organized into groups of 4 or 5 students, with the objective of optimizing student learning outcomes. Learning outcomes are the results yielded from the learning

process, and assessed through the evaluation of the student's knowledge, attitudes, and skills, as well as any behavioral changes that may have been seen [12]. Learning outcomes are the results of an individual's active and positive engagement with their surroundings. This model encourages students to collaborate and interact with their environment in a meaningful way, so they can gain the most from their educational activities. The Social Inquiry Complexity learning model is an effective way to promote a collaborative learning environment among students. It provides them with the opportunity to work together, share their ideas, and learn from each other. This model also encourages students to think critically and apply their knowledge in different situations, as well as to develop their problem solving and communication skills. Furthermore, students are able to gain a better understanding of the material being taught, as well as to refine their critical thinking and analytical skills. Through this model, students can develop their self-confidence and interpersonal skills, as well as their ability to think independently and creatively.

According to [13] learning outcomes are when someone has learned there will be a change in behavior in that person. It can be elaborated that Learning outcomes refer to the changes in behavior and internal abilities that a person acquires as a result of learning. This could refer to the development of new skills, knowledge and understanding. It implies that a person has internalized the information they have learned, and has developed a capacity to use it in different ways. It is an important measure of the success of a learning experience, as it shows that the person has acquired and retained the information necessary for them to use it in their everyday life. Learning outcomes also provide a meaningful indication of the individual's progress and development, helping to inform future learning activities. Additionally, they provide insight into how well the teaching methods used were received and are useful for evaluating the success of the overall learning process.

This plan integrates the Learner Work Sheet (LKPD) and Inquiry Social Complexity (ISC) method to improve student learning outcomes. The LKPD will help students develop critical thinking skills through hypothesis testing and organizing information to draw conclusions. Meanwhile, the ISC method will enable students to interact with their social environment to solve complex problems. With the combination of these two methods, it is expected that student learning outcomes will be improved. Thus, we are confident that this innovation will bring about positive changes to student learning. In addition, educators and students will also be able to collaborate and create an environment of learning and understanding, allowing students to grow and develop their skills and abilities.

2 Research Methods

This research utilized the Research and Development (R&D) approach for its undertaking. The goal of this research is two-fold: to create an original product, or enhance an existing one. Specifically, the research focused on the development of the LKPD, which will be done through the use of the Borg and Gall development model. This model is composed of several stages, such as the potential and problem stages, data collection, product design, design validation, design improvement, product testing, product revision, use trial, and product revision [14]. Each of these stages helped to ensure that the

product created or improved is of the highest quality and fulfills its intended purpose. This research also used a quantitative approach in order to assess the validity of the product created or improved. During the data collection stage, the research team would be collecting numerical data in order to measure the success of the product. Furthermore, the product testing and use trial stages would also help to further gauge the success of the product. In the product testing stage, the research team would be testing the product in a laboratory setting in order to assess its performance and identify potential problems. The use trial stage would involve the product being tested by learners in a real-world environment, thus providing the research team with valuable feedback and insight into how the product is performing.

3 Results and Discussion

A. First Stage: potential Problems

Today, educators face a range of challenges in attempting to increase student learning outcomes through classroom activities. Student learning outcomes are the measure of success in the learning process, and can have a positive or negative impact. To this end, researchers have proposed the development of teacher-assisted learning tools, such as Learning Kits for Pedagogical Development (LKPD). These tools allow teachers to design and deploy interactive educational materials that can help to improve student learning. In addition, the use of LKPD provides a platform for teachers to monitor and assess the progress of their students during the learning process. With technology-aided learning, teachers can gain insights into what works and what does not, allowing them to make adjustments based on their students' performance. Additionally, this type of learning also allows for collaborative learning, where students can engage in group activities, giving them the opportunity to learn from each other. Furthermore, the use of LKPD can help to reduce educational costs, as the materials can be used over and over again, eliminating the need to purchase additional supplies. In sum, the use of teacher-assisted media such as LKPD can provide an effective and cost-efficient way to optimize learning activities in the classroom.

B. Second Stage: data Collection

Once the potential problem has been identified and the process is complete, the next step is to gather supporting evidence and materials for the module. This involves collecting relevant sources, references, images, and other materials related to the topic of the module. Researchers must also collect information for product development, such as curriculum analysis, teaching materials analysis, and learning outcomes analysis. Curriculum analysis examines the thematic learning materials in the curriculum, considering content standards and student-centered learning. The analysis of learning outcomes is intended to analyze the impact of the module on student learning outcomes as a result of the application of the module in the learning process. After completing the problem-solving process, the next step is to collect data to support the creation of the module. This includes obtaining sources and references as well as images related to the square material. Furthermore, researchers acquire information that is necessary

for product development, such as (a) curriculum analysis, (b) analysis of teaching materials, and (c) analysis of learning outcomes. Curriculum analysis involves examining subject-based learning materials in the curriculum that adheres to content standards and is student-centered. The analysis of teaching materials focuses on Core Competencies (KI), Basic Competencies (KD), Competency Achievement Indicators (GPA), learning objectives, etc. Teaching materials are analyzed in the development of LKPD based on Inquiry Social Complexity (ISC). Analysis of learning outcomes is done to assess the effects of the module on student learning outcomes as a result of its implementation in the learning process.

C. Third Stage: Product Design

The product design created in this study is intended to serve as a guide for creating a product that will result in improved cognitive learning outcomes for students. To achieve this, the product design was based on an existing Lembar KerjaPesertaDidik (LKPD) format and developed with an Inquiry Social Complexity (ISC) approach. This product design must be complemented by the development of several other learning tools, such as a syllabus, lesson plans, learning media, and assessment instruments. The syllabus, lesson plans, and teaching materials must be tailored to the results of a curriculum analysis and materials analysis. The assessment instruments must take the form of grids and pre- and post-test items. Together, these tools will help ensure that the product design is successful in its mission to aid in improved cognitive learning outcomes. In addition to the product and learning tools design, the research team will also need to create a comprehensive evaluation system. This system will allow for the monitoring, tracking, and assessment of the effectiveness of the product design and the other learning tools. The evaluation system will include both quantitative and qualitative measurements, as well as feedback from students and teachers. This system will also provide useful insights for further development and refinement of the product and learning tools.

D. Fourth Stage: design Validation

Design validation is an assessment process to evaluate the effectiveness of a product's design. Expert and practitioner validators are used to check the quality of the content, language, and graphics of the design. The feedback from the validation is used to provide comments and suggestions for improvement that allows the learning tool to be optimized for better performance. By using this validation process, it is ensured that the product design meets the standards for quality and usability. Design validation is an important step towards ensuring the quality of a product's design. It involves evaluating the design's content, language, and graphics from the perspective of expert and practitioner validators. The feedback from the validation is used to identify any potential issues as well as provide comments and suggestions for improvement. This helps to ensure that the design meets the necessary standards for quality and usability. In addition, it allows designers to make

any necessary changes to the design in order to optimize the learning tool. By using this validation process, it enables the product design to be as successful as possible.

E. Fifth Stage: Design Revision

The product design is thoroughly evaluated by both expert and practitioner validators, who provide their insights and suggestions. This feedback is used by researchers to fine-tune the product design and ensure that it meets the required standards and is worthy of being tested. This feedback is invaluable in the product design process, as it allows researchers to identify and address any areas of improvement before the product is launched. The expert validators are typically drawn from the research field and have the necessary knowledge and experience to provide meaningful feedback. The practitioner validators, on the other hand, bring a reality check to the process, with their practical experience providing invaluable insights into how the product will work in the real world. Both validators provide feedback on the design, usability, and functionality of the product, as well as offering suggestions and advice on how to make the product better. The feedback is then used to refine the product design and ensure it meets the desired specifications.

F. Sixth Stage: product Trial

After the design of learning products and tools has been validated and revised, it can be tested in a controlled group. This test serves to obtain feedback from students in order to make adjustments to the learning tools before they are used with a larger group. At this stage, a student response questionnaire is used to collect data and assess the product being tested. Through this limited trial, it will be possible to identify any potential issues that may arise when the product is used in actual learning activities. The student feedback received during the testing phase is invaluable in ensuring the success of the learning product. The feedback allows the designers to make changes to the product in order to improve its usability and effectiveness. For instance, if students point out that a tool is too complicated or difficult to use, designers can work to simplify it for better results. Additionally, if students note that a tool is not engaging enough, designers can consider adding interactive elements to make it more stimulating. Through this process of testing and revising, the product can be optimized for the best possible learning experience.

G. Seventh Stage: Product Revision

After the product has been tested, the feedback and suggestions from a select group of students who have used the learning device can be used to enhance the product. This feedback can be used to make changes to the product such as improving the interface, adding more features, or updating the content. The researchers can then test the updated product on a larger scale and make necessary changes to ensure its effectiveness. Once the product has been tested and improved, it is ready for use.

4 Conclusion

To increase student learning outcomes, the researcher has proposed the use of a student worksheet (LKPD) that is adapted to the technological advances of the 21st century, as well as the implementation of the Inquiry Social Complexity (ISC) learning model to

stimulate interest in learning and create more positive results. The LKPD worksheet will contain questions and tasks related to the subject matter and will be designed to challenge the student's understanding of the material while also providing guidance and support. The Inquiry Social Complexity (ISC) learning model will provide a structured approach to learning that encourages collaboration and critical thinking while also allowing for meaningful interactions between students and their teachers. Both of these measures are expected to lead to improved student learning outcomes, with an emphasis on the development of the student's understanding and application of the material.

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