



## Development of Student Magnetic Inquiry Project Results Sheet (SMIPRS) Integrated with Local Wisdom and Islamic Values

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### Abstract

This study includes research and development of the integrated Student Magnetic Inquiry Project Results Sheet (SMIPRS) of Local Wisdom and Islamic Values using the ADDIE development model, which aims to: 1) Describe SMIPRS integrated local wisdom and Islamic values, 2) Describe student responses to SMIPRS integrated with wisdom local wisdom and Islamic values, 3) describe the effectiveness of using SMIPRS integrated with local wisdom and Islamic values. The test subjects in this study were 33 students. SMIPRS trials in this study by providing SMIPRS and student response questionnaires and tests related to magnetism material. The study offers expert validation test results with very suitable criteria (95.83%). Meanwhile, student responses to implementing the SMIPRS integrated with local wisdom and Islamic values agreed (87.9%) to be implemented. Based on the effectiveness test, SMIPRS had a significant effect after it was implemented by students in the learning process (sig. = 0.000) with an average pretest and post-test difference of 23.61.

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## INTRODUCTION

The purpose of learning in schools is to produce competent and moral students. The information obtained is used to study life and the processes that occur in life. One of the natural sciences is physics. Physics is the science that investigates natural phenomena or natural phenomena. Teachers must innovate in physical learning at school [1].

Improving the quality of teaching physics at schools or tertiary institutions can be addressed by improving the quality of teaching physics at tertiary institutions, especially universities that train teachers/teaching staff in the field of physics. Some experts say that the quality of learning can be improved by increasing the quality of learning tools. The tutorial is a set of learning materials that enable teachers and students to carry out learning activities. Good learning tools are also expected to help create/implement good learning, increasing learning efficiency and competitiveness (Sahidu et al., 2018).

One of the problems in education is the limited teaching materials or learning tools that make it possible to enrich student experiences, build student knowledge and activities, and support problem-solving. The limitations of these learning devices affect the quality of learning. Textbooks are guidelines for teachers in the implementation of teaching and learning. Exciting and memorable learning experiences for students can be created by assembling learning materials according to student

characteristics. One of the learning tools that can help students in learning is the Student Worksheet. Student Worksheets facilitate teaching for teachers so that student activities are focused. Educators do not need to provide much information to students because most of the steps in learning activities are already listed in the Student Worksheet, which requires their activeness during the learning process [4].

So we need the development of a Student Worksheet. That sheet contains materials, summaries, and assignments students must complete (Anggraini et al. 1, 2016). Student Worksheet is also a tool that can facilitate the formation of interactions between teachers and students. Student Worksheet has a significant influence on learning outcomes. Learning with the help of Student Worksheet effectively improves students' learning outcomes, knowledge, attitudes, and skills. The average learning outcomes of students who study with Student Worksheets are higher than the intermediate learning outcomes of students who do not look at Student Worksheets [5]. Learning with Student Worksheets was well received by students. Using Student Worksheets is fascinating and can arouse students' interest and motivation. One of the determining factors for the success of scientific (physics) learning in class is the use of teaching materials. Using learning tools is very important for teachers to convey messages and learning content to students effectively and efficiently. Tutorials help refine concepts or ideas and encourage active participants to learn. Media can be a bridge for students to think, understand concepts, and act [6]. Therefore, selecting learning tools that suit your needs is necessary to achieve learning objectives.

Student Worksheets in their preparation can be designed and developed according to the conditions and situations of the learning activities encountered. Student Worksheets can also be used with other learning resources or learning environments. Student Worksheets can be a learning resource and environment following planned learning activities. Based on observations in students of the Tadris Kimia Study Program, FTK UIN Mataram, who took the General Physics course, the Student Worksheet used before was still not relevant to the provisions contained in the curriculum. Student Worksheets usually include practice questions and educational material reviews for each topic. Student Worksheets do not train students to carry out scientific processes, seek concepts and apply existing concepts, which means students do not actively participate in learning. Therefore, Student Worksheet based on an appropriate learning model or strategy is needed to achieve the expected learning objectives.

Based on the description above, it is necessary to conduct research and development in creating and designing student worksheets that can facilitate students to carry out scientific activities. One of the models offered to the developed Student Worksheet is the collaborative project and inquiry learning model. One of the constructivist learning models provides opportunities for students to construct knowledge through inquiry [7]. Inquiry-based learning is widely applied in science education [8]. This learning can optimize the learning process to improve critical thinking [9]–[12].

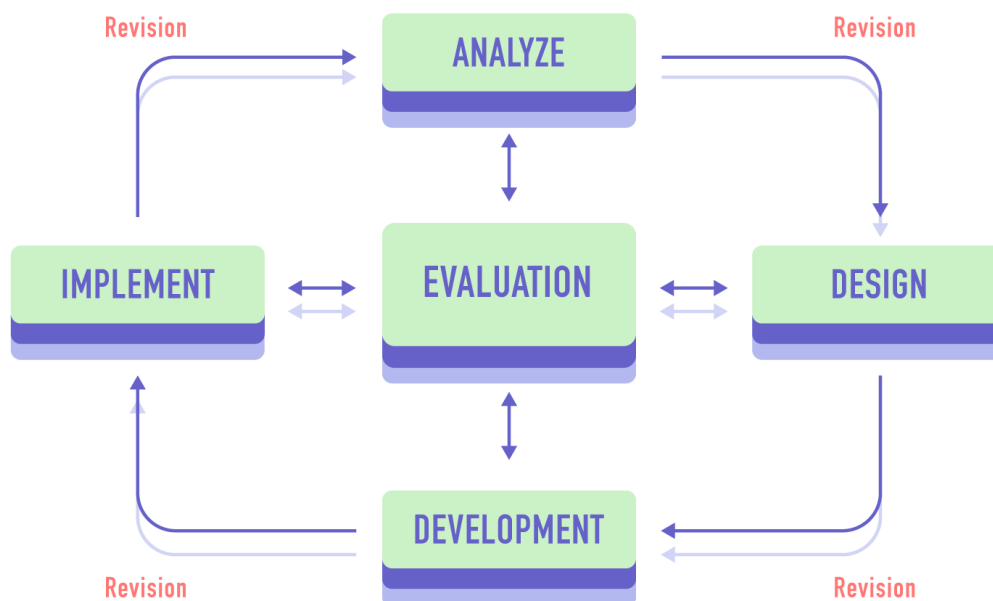
In addition to inquiry learning, project learning has been widely implemented in science education as a promising teaching approach to promote understanding in its cognitive, social, and emotional aspects [13]. Many theoretical and empirical studies have claimed that project-based learning positively impacts student development [14]. The project learning model can trigger students' creative thinking skills. Research results from Yustina et al. (2020) show that project-based learning is better at achieving students' creative thinking than conventional learning. So, embedding inquiry and project syntax in student Student Worksheets will provide a meaningful learning experience [15].

The student worksheets compiled are Student Magnetic Inquiry Project Results Sheets (SMIPRS) integrated with local wisdom and Islamic values. So it is necessary to see how far the validity, response, and effectiveness of SMIPRS are combined with local wisdom and Islamic discounts.

## METHOD

The research method used is research on developing learning design devices using models ADDIE [16]. Instructional design is a recipe or prediction of a suitable learning method to achieve the necessary changes in learners' knowledge, skills, and emotions. Learning design is a systematic design to ensure the quality of learning as educators desire. This study developed a learning device as a Student Magnetic Inquiry Project Results Sheet (SMIPRS) that integrated local wisdom and Islamic values on magnetism material for first-semester Class A and B students of the Chemistry Education Study Program.

The development model used is the ADDIE model, consisting of five stages: analysis, design, development, implementation, and evaluation. The following is a chart of the stages of SMIPRS-integrated local wisdom and Islamic values development based on the ADDIE model:



**Figure 1.** Stages of the ADDIE Development Model

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### 1. Analysis

The process of developing physics learning media in the form of SMIPRS Integrated Local Wisdom and Islamic Values with the analysis stage (Analysis) is gathering information from educators and students through preliminary research. This primary research includes observing activities during the teaching and learning process, using learning media, student characteristics, learning processes, and school curriculum, reviewing the literature (existing products), and identifying factors that cause problems so that there is a need to develop new media. At this stage, the researcher also analyzed the need for developing an Integrated SMIPRS of Local Wisdom and Islamic Values and the requirements for product development.

### 2. Design

The activity continued with realizing the product design by creating an Integrated SMIPRS of Local Wisdom and Islamic Values as a learning medium for students referring to the analysis stage.

### 3. Development

It is a validation activity by material experts and media experts, as many as three people, to determine the feasibility level of SMIPRS Integrated Local Wisdom and Islamic Values.

### 4. Implementation

After the Integrated SMIPRS of Local Wisdom and Islamic Values has gone through the validation stage by experts and is declared feasible, the Integrated SMIPRS of Local Wisdom and

Islamic Values is tested on educators and students to be able to find out their response to the attractiveness of the Integrated SMIPRS of Local Wisdom and Islamic Values that has been developed.

### 5. Evaluation

This evaluation is the final improvement of SMIPRS Integrated Local Wisdom and Islamic Values as learning media. In addition to this final evaluation, the assessment occurred in the previous stages of this study. Evaluations include analyzing needs, designing media, preparing learning tools, and testing and evaluating learning media in their application.

The instruments used in this study were non-test instruments in the form of material expert validation sheets, media expert validation, and student response instruments. The results obtained have been revised and used as material for improving the Integrated SMIPRS of Local Wisdom and Islamic Values. Non-test instrument data analysis in this study used descriptive data analysis techniques. The non-test instrument was a questionnaire using a Likert scale. The assessment is done with a Likert scale, converted into a value, and described through the graphical method [17].

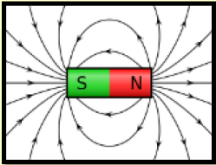
## RESULTS AND DISCUSSION

Before the Integrated SMIPRS of Local Wisdom and Islamic Values begins to be designed, relevant sources are first collected from several textbooks such as Giancoli, Serway, Tipler, physics ebooks, and the internet as reference materials and references in preparing the Integrated SMIPRS of Local Wisdom and Islamic Values. After all the materials have been collected, indicators and contents of the SMIPRS Integrated Local Wisdom and Islamic Values are made, namely instructions for using SMIPRS, material summaries, experimental activities, and local wisdom content and Islamic values.

After the SMIPRS Integrated Local Wisdom and Islamic Values meets all indicators, a background design and cover for the SMIPRS Integrated Local Wisdom and Islamic Values are made. Then the overall design is created using Microsoft Word. Variations and various fonts are also done to add to the impression of attractiveness. After the procedure is complete, the SMIPRS Integrated Local Wisdom and Islamic Values will be printed. The following is presented in Figure 2, the final appearance of the SMIPRS Integrated Local Wisdom and Islamic Values developed.

**LEMBAR HASIL PROYEK INKUIRI KEMAGNETAN MAHASISWA 1**

1.1 **Bahan Magnetis dan Non Magnetis**  
 1.2 **Medan dan Garis Gaya Magnet**  
 1.3 **Kutub Magnet**



**NAMA** ..... **KELOMPOK:**.....


**Anggota:**

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....
7. ....


**LHAKIM 1.1 BAHAN MAGNETIS DAN NON MAGNETIS**

**Tujuan Pembelajaran:**

Diharapkan setelah mempelajari LIPRS ini Anda dapat memahami dan menjelaskan tentang bahan magnetis, kutub magnet, dan medan magnet.



*Apakah setiap magnet dapat menarik semua jenis benda?*



*QS Yasin 36: Mahasuci (Allah) yang telah menciptakan semuanya berpasang-pasangan, baik dari apa yang ditumbuhkan oleh bumi dan dari diri mereka sendiri maupun dari apa yang tidak mereka ketahui. Allahpun menciptakan magnet dengan 2 kutub yang berbeda*

**A. HIPOTESIS**

1. ....
2. ....
3. ....

**B. PENGUMPULAN DATA**

Tabel 1.1 Pengelompokan Bahan Magnetis dan non Magnetis


NO	MAGNETIS	NON MAGNETIS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

**C. KESIMPULAN**

.....

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Kurniawan Arizana - 1

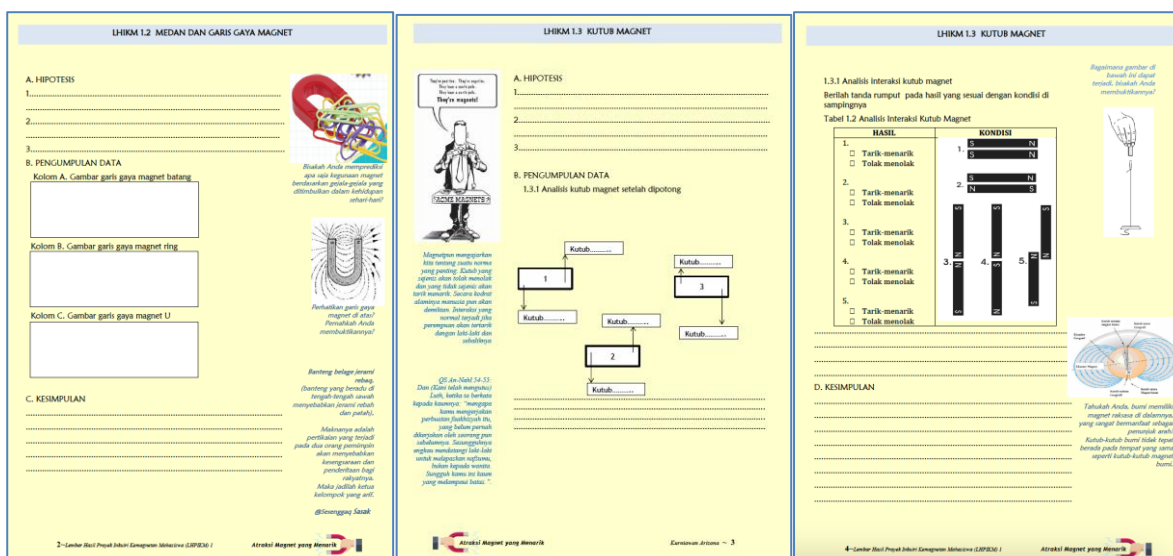


Figure 2. Final Appearance of SMIPRS (LHPIKM) Integrated Local Wisdom and Islamic Values

The feasibility of learning media in the form of SMIPRS Integrated with Local Wisdom and Islamic Values is obtained from data that has been obtained from the assessment of material experts, media experts, and educators. Instruments are used using ratings or scores 1-4 according to the percentage interval score results and predetermined interpretation criteria, as seen in Table 1.

Table 1. LHPIKM Validation Test Results Integrated with Local Wisdom and Islamic Values

NO	Rated aspect	Score				Total	Mean
		1	2	3	4		
1	Identity completeness	4	4	4	12	4	
2	Relevance to the Guidelines	4	4	4	12	4	
3	Clarity of sentences and punctuation	3	4	4	11	3,67	
4	Image display clarity	4	3	4	11	3,67	
5	Clarity of instruction sentences	4	4	4	12	4	
6	Clarity of language use (easy to understand)	3	4	4	11	3,67	
<b>Sum</b>		22	23	24	23(95,83%)		
<b>Average</b>		3,67	3,83	4			
<b>Overall average</b>				<b>3,83 (95,83%)</b>			
<b>Category</b>				<b>Very feasible to use</b>			

Note:

The score range is filled with numbers as follows: 4 = very feasible to use 3 = feasible to use 2 = not suitable for use 1 = not suitable for use	Minimum score = $7 \times 1$ (aspects assessed) = 7 Maximum score = $7 \times 4$ (aspects assessed) = 28 Range of scores = $(28-7)/7 = 3$ Determination of criteria: Score 25.1–28: it can be determined that it is very feasible to use Score 22.1–25.0: can be determined as appropriate for use Score 19.1–22.0: it can be determined that it is not suitable for use Score $\leq 19$ : can be determined not suitable for use
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The results of the SMIPRS validation test on all aspects of the assessment, with an average score of 3.83 (95.83%), are in the very feasible category to use. The results of the evaluation of each indicator are shown in Table 1.

Scores of student responses to the application or implementation of the integrated SMIPRS Local Wisdom and Islamic Values were classified into 4 (four) categories, namely disagree ( $\leq 31.00$ ),

disagree (31.01-34.0), agree (34.01-37 .00), and strongly agree (37.01-40). The score interval in each category is determined by the difference between the maximum score (40) and the minimum score (10), then divided by 5. The average score of the data processing results of student responses to SMIPRS is 35 (87.9%), which is included in the agreed category.

Based on the test results according to the material studied are presented in Table 2.

**Table 2.** Average Pretest and Post-test Scores of SMIPRS Effectiveness Test

N	Pretest	S. Dev	Post-test	S. Dev
33	49,94	13,58	73,56	10,93

Based on the data above, the average N-gain value for the SMIPRS effectiveness test is 0.49 (moderate category). While the average value of the SMIPRS effectiveness test based on the scope of the material can be seen in Table 3.

**Table 3.** Average Pretest and Post-test Scores Based on Material Coverage in the SMIPRS Effectiveness Test

The Properties of Magnets		Create and Dispel Magnetism		The Benefits of Magnets	
Pre	Post	Pre	Post	Pre	Post
55.62	82.31	42.14	50.46	40.12	68.17

The results of effectiveness in terms of student pretest and post-test scores in the learning process through SMIPRS show a descriptively increase in students' thinking skills on magnetic material. Meanwhile, based on the paired t-test, it can be seen in Table 4.

**Table 4.** T-test results (Paired Samples Test)

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-23.61111	11.62578	1.93763	-27.54471	-19.67751	-12.186	32	.000

The paired t-test results show a significant difference between the pretest and post-test scores (average difference of 23.61). This implies a significant influence from implementing the integrated SMIPRS of local wisdom and Islamic values on magnetism material by students of the Tadris Chemistry Study Program, FTK UIN Mataram. Through meaningful learning via collaborative scientific inquiry projects, it has been proven that it can enhance students' thinking abilities [18], life skills [19], [20], scientific attitudes [21], and foster social dimensions [22]. Therefore, the Student Worksheets (SMIPRS) that have been prepared serve as one of the means to achieve various competencies and attitudes of students.

## CONCLUSION

Based on the results of development and research by material experts, media experts trials on educators, small group tests, and field tests on students of the Chemistry Education Study Program, FTK UIN Mataram, Odd Semester Academic Year 2022/2023, it can be concluded that the SMIPRS Integrated with Local Wisdom and Islamic Values meets the requirements with very decent quality and get a response agreed to be implemented as an alternative learning tool used in the learning

process. The effectiveness of student pretest-posttest scores in the learning process through SMIPRS showed promising results in improving students' thinking skills on magnetism material. As a recommendation from this research, it is necessary to develop student inquiry project results sheets that integrate local wisdom and Islamic values in other appropriate natural science materials.

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