

The Validity and Practicality of Student Worksheets on Waves and Sounds for Junior High School Students

Zahara Lutfiya Azmi¹, Apit Fathurohman¹, Leni Marlina^{1*}

¹Master Program in Physics Education FKIP, Sriwijaya University, South Sumatra Selatan, Indonesia.

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Corresponding Author:
Lemi Marlina
leni_marlina@fkip.unsri.ac.id

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Abstract: Student worksheets are one sort of educational material intended to aid students' learning, explore experiences and ideas, and develop students' cognitive, psychomotor, and affective components. As a result, a study of the validity and applicability of the Student Worksheet on waves and sound content for junior high school students was done. The goal of this study was to see if the Student Worksheet was reliable and practical. The research design used in this study is a developmental study. A walkthrough and a questionnaire were employed as research tools. The validity test was said to be quite valid based on the average content aspect of 4.71, language 4.70, and design 4.78, according to the study's findings. While the practicality test was stated to be very practical, the results obtained one to one teacher on the average content aspect of 5, language 5, and design 5. One to one students obtained an average of 4.73 content aspect, 4.33 language, and 4 design .55. The results of the practicality of the small group of teachers on the aspect of content are on average 4.11, language 4.66, and design 4.44. The small group of students obtained an average of 4.22 in the aspect of content, 4.52 in language, and 4.36 in design. So it can be concluded that the Student Worksheet material waves and sounds for junior high school is very valid and very practical. Furthermore, it can be used for the effectiveness test stage.

Keywords: Validity; Practicality; Student Worksheet

Introduction

Natural sciences is a body of knowledge that is not only concerned with mathematical problems, but also with facts, concepts, principles, the environment, and everyday life (Kirby et al., 2022; Maison et al., 2020; Roslina et al., 2020; Vitasari, 2017). Learning science can help you gain information, process skills, and critical thinking abilities (Mat, 2019; Ramdani et al., 2020; Selviyana et al., 2022). Waves and sound are one of the material subjects in scientific study at Junior High Schools (SMP). Wave and sound material is the study of waves and noises that are encountered in everyday life and their applications in technology.

Based on findings from observations and questionnaires at SMP 59 Palembang. It was discovered that 90% of students stated that mastering science coursework, particularly physics on the topic of waves and sound, was challenging. According to the results of

the interview with the junior high school science subject instructor, he had used learning resources such as books but not the inquiry-based Student Worksheet.

Student worksheets are a type of learning tool that consists of sheets of content ordered systematically to aid students learning processes, such as improving science process abilities and critical thinking (Abdurrahman et al., 2019; Kahar et al., 2021; Marlina & Sriyanti, 2020; Mukti et al., 2018; Wazni & Fatmawati, 2022). Student worksheets can be used to assist learning activities in order to shape student activities, teacher-student engagement, and critical thinking abilities in students (Septiaahmad et al., 2020). Student worksheets isn't only interested in the facts; they're also interested in understanding the concepts they come across. Through the application of student worksheets, a process of generating ideas for issue resolution and critical thinking might emerge (Canna et al., 2021).

Inquiry-based student worksheets are student worksheets that use a learner-centered learning model

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so they can explore experiences and ideas in finding a finding (Siregar & Siregar, 2020). In addition, inquiry-based student worksheets can be interpreted as a worksheet that contains a process for obtaining information through experiments or experiments to find solutions to problems (Muskiti et al., 2020). Because in inquiry-based worksheets students will develop cognitive, psychomotor, and affective aspects (Fadhilatunnisa et al., 2021).

The results of previous studies show that inquiry-based worksheets have an effect on mastery of concepts and inquiry abilities in solving problem formulations (Indawati, 2021; Korkman & Metin, 2021; Yulia & Risdianto, 2019). This is what underlies researchers to overcome these problems by conducting research that aims to produce Student worksheets material waves and sounds that are valid and practical for junior high school students.

Method

The research method used is a design research type of developmental study. Aims to produce a valid and practical inquiry-based student worksheet. This research procedure has two stages, namely: 1) Preliminary study; and 2) Formative study (Akker, 2006). In the preliminary study stage, prepare everything needed for research, such as: needs analysis (preliminary study), time, place, material, and problems in research and literature study. Meanwhile, at the formative study stage, according to (Tessmer, 1993; Zulkardi, 2002), consisting of: self-evaluation, expert review, one-to-one, small group and field test.

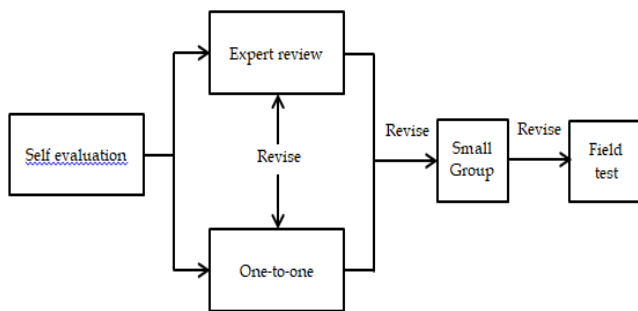


Figure 1. Flow diagram Formative study

This research was conducted at SMP Negeri 59 Palembang in class VIII-3 which consisted of 12 students in the even semester of the 2021/2022 academic year. The research instrument use walkthrough in the form of a validation sheet to determine the validity of the student worksheet and a questionnaire in the form of teacher and student responses to obtain practical data from the Student Worksheet. The research instrument uses a Likert scale with a score of 1-5 (Sugiyono, 2013).

Table 1. Category Validity

Average Score (\bar{X})	Category
$4.2 < \bar{X} \leq 5.0$	Very Valid
$3.4 < \bar{X} \leq 4.2$	Valid
$2.6 < \bar{X} \leq 3.4$	Quite Valid
$1.8 < \bar{X} \leq 2.6$	Less Valid
$1.0 < \bar{X} \leq 1.8$	Very Invalid

(Widoyoko, 2016)

Table 2. Practicality Category

Average Score (\bar{X})	Category
$4.2 < \bar{X} \leq 5.0$	Very Practical
$3.4 < \bar{X} \leq 4.2$	Practical
$2.6 < \bar{X} \leq 3.4$	Practical enough
$1.8 < \bar{X} \leq 2.6$	Less Practical
$1.0 < \bar{X} \leq 1.8$	Very Less Practical

(Widoyoko, 2016)

Results and Discussion

Student worksheet material waves and sound is the product produced in this study. Student worksheet is designed for junior high school students which is equipped with instructions for using student worksheet, material concept maps, core competencies, basic competencies, learning objectives, supporting information to strengthen understanding of the material, pictures and illustrations related to the material, contextual problems, experimental activities, evaluation questions, conclusions, and researcher profiles.

The resulting student worksheet contains science material for even semester VIII SMP on the topic of waves and sound. This study tested the validity and practicality of the Student Worksheet. The results of the validity and practicality tests can be explained as follows.

Student Worksheet Validity

Table 3. Average Validity Test Results

Rated indicators	Average
Content Feasibility Aspect	
Conformity of Material with KI, KD, and Learning Objectives	5.00
Learning Material Accuracy	4.66
Up-to-date Learning Materials	4.41
Benefits for Insights and Encourages Curiosity	4.58
Information Clarity	4.88
Aspects of Language Eligibility	
Legibility	4.83
Conformity with the Correct Indonesian Rules	4.78
Effective and Efficient Use of Language	4.49
Design Feasibility Aspect	
Order of Serving	4.66
LKPD Cover Design and Contents	4.77
Use of Fonts (Type and Size)	4.66
Illustrations, Graphics and Images	4.66
Layout (Layout)	5.00
Complete Information	4.93

The validation results in Table 3 state that the development of the Student Worksheet for sound and wave materials for junior high school students is declared very valid in terms of the results of the validity test from the aspects of content feasibility, linguistic feasibility, and design feasibility. The results of the

development of the Student Worksheet for waves and sound material for junior high school students can be seen in Figure 2 before the revision and Figure 3 the results of the development of the student worksheet after the revision.

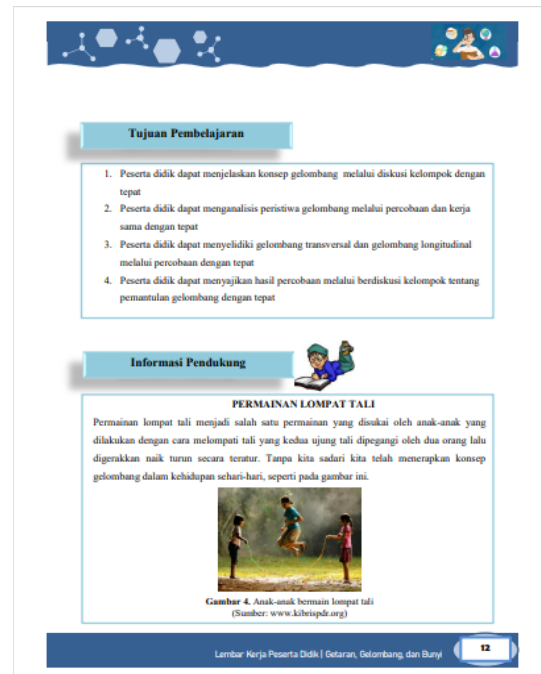


Figure 2. Results of LKPD Development of Wave and Sound Materials Before Revision

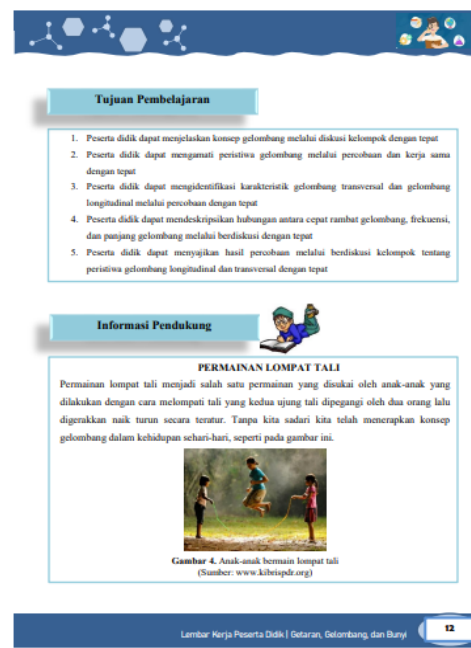


Figure 3. Results of Student Worksheet Development of Waves and Sounds After Revision

The following is the result of recapitulation of the average score on each aspect of the validity of the Student Worksheet material for waves and sounds for junior high school students. Aspects of validation

include: content, language, and design can be seen in Figure 4.

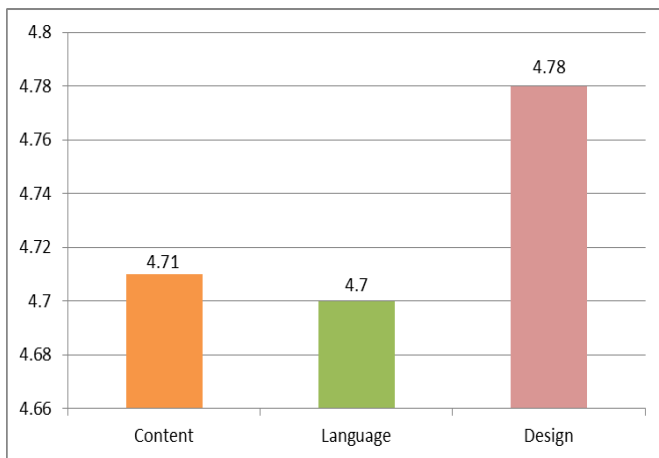


Figure 4. Recapitulation of Average Scores on Each Aspect of Student Worksheet Validity

Based on Figure 4. above, the validity results are known that the content aspect is 4.71 very valid category, language 4.70 with very valid category, and design 4.78 in very valid category. So that in the validity test based on each aspect, namely the content, language, and design of the Participant Worksheet, the wave and sound material for junior high school students is declared very valid. However, there are several parts that need to be improved, such as: writing learning objectives and cover worksheets.

Practicality of Student Worksheets

Student Worksheets on wave and sound material for junior high school students that are already very valid based on the validator's assessment, then tested for practicality. Through the one to one and small group stages. The following are the results of the practicality test in the one-to-one stage.

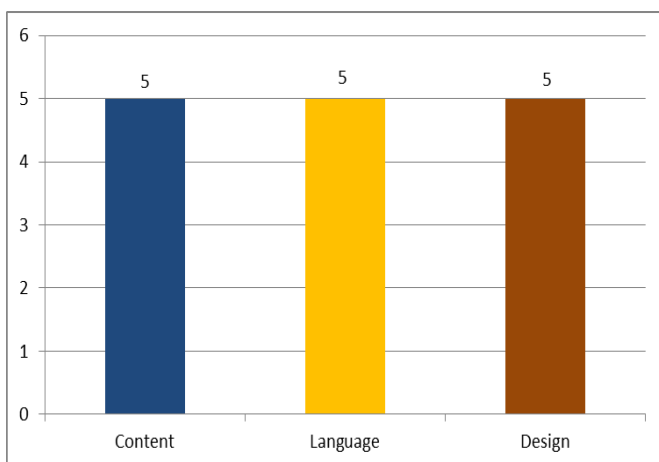


Figure 5. Recapitulation of the Average One to One Teacher Score on Every Practical Aspect of Student Worksheet

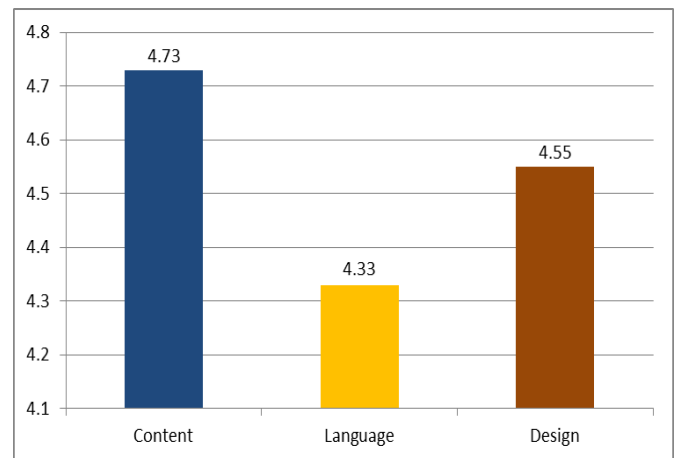


Figure 6. Recapitulation of the Average One to One Score of Students in Every Practical Aspect of Student Worksheet

Figures 5 and 6 are the results of the practicality test at the one to one stage for teachers and students. In this one-to-one stage, there are 3 teachers of science material and 3 students of class VIII-3 SMP Negeri 59 Palembang who provide responses and assessments of the Student Worksheet material waves and sound. The results of the practicality of the one to one teacher stage on the content aspect obtained an average of 5 with very practical categories, the average language aspect of 5 included in the very practical category, and on the design aspect an average of 5 very practical categories. Then in the one to one stage students obtained practicality results with an average content aspect of 4.73 very practical categories, language aspects 4.33 very practical categories, and design aspects obtained an average of 4.55 with very practical categories.

After getting very practical results at the one to one stage, then the practicality test is carried out at the small group stage.

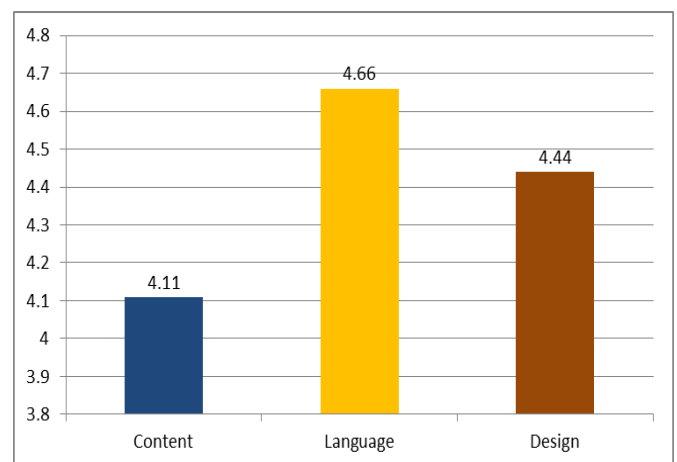


Figure 7. Recapitulation of the Average Value of Small Group Teachers in Every Practical Aspect of Student Worksheet

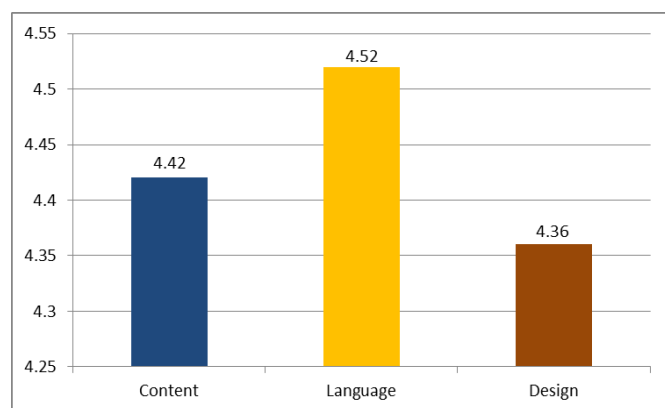


Figure 8. Small Group Average Score Students in Every Practical Aspect of Student Worksheet

Figures 7 and 8 are the results of the practicality test at the small group stage for teachers and students. At this small group stage, it consisted of 3 teachers of science material and 9 grade VIII-3 students of SMP Negeri 59 Palembang who provided responses and assessments of the Student Worksheet material on waves and sound. The results of the practicality of the teacher's small group stage on the content aspect obtained an average of 4.11 in the practical category, the language aspect on average 4.66 including the very practical category, and in the design aspect an average of 4.44 the very practical category. Then, at the small group stage, students obtained practicality results with an average content aspect of 4.42 very practical categories, language aspects 4.52 very practical categories, and design aspects obtained an average of 4.36 with very practical categories.

Based on the results of the validity and practicality tests, the Student Worksheet on waves and sounds for junior high school students developed was declared very valid and very practical. This is in line with previous research conducted by Abdurrahman et al. (2020), Ichsan et al. (2021), Nuraina et al. (2022), Pratama & Saregar (2019), Maulana et al. (2022), and Sulastri et al. (2022), stated that a teaching material in the form of handouts and student worksheets were valid and practical based on the results of the validity and practicality tests in every aspect, namely aspects of content, language, and design.

Quality, valid, and practical Student worksheets can be used in the learning process (Khaira et al., 2020; Muskita et al., 2020; Frisilla & Hardeli, 2022; Purwoto, 2022; Sari et al., 2021; Sri et al., 2019). This proves that the valid and practical Student Worksheet for sound and wave materials for junior high school students can be used to determine effectiveness in the learning process.

Conclusion

Based on the results of the research that has been carried out, it can be concluded that the validity and

practicality of the Student Worksheet material for waves and sounds for junior high school students is stated to be very valid and very practical. Based on the validation results, the average content aspect is 4.71, language is 4.70, and design is 4.78. Then practically based on the results of one to one teacher on the average content aspect of 5, language 5, and design 5. One to one students obtained an average of 4.73 on content aspect, 4.33 language, and 4.55 design. The results of the practicality of the small group of teachers on the aspect of content are on average 4.11, language 4.66, and design 4.44. The small group of students obtained an average of 4.22 in the aspect of content, 4.52 in language, and 4.36 in design. Student Worksheets can be used in the learning process for the effectiveness test stage.

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