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STUDENT WORKSHEET DESIGN PERATION MATERIAL FOR RANK SHAPE AND ROOT SHAPE TO DEVELOP STUDENTS' COMPREHENSION SKILLS

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Abstract. The limited learning media, especially in studying the material of rank form and root form for students of SMA Negeri 4 Waesala motivated the author to make student worksheet practical, easy to understand, interesting, because it is equipped with pictures and systematics arranged in sequence with simple and clear language. This study aims to produce Student Worksheets on the operation material of binding shapes and root shapes of class X SMA Negeri 4 Waesala. The type of research used in the development process of student worksheet Mathematics operation material of rank form and root form is using the type of R&D (Research and Development) research, which is research that aims to produce a product and test the effectiveness of the product developed. The stages that researchers carry out in the development of student worksheet operation material for rank form and root form include analyzing the needs of student worksheet to be developed, developing initial products, expert validation and revision, small group trials, large group trials, final products. The subjects in this study totaled 27 people. Data collection techniques used observation, questionnaires, and interviews. The data analysis technique used is descriptive. Based on the results of data analysis, the student worksheet feasibility test was carried out through three stages as follows, namely the first stage of material validation tests, design, and language, the results of which all experts declared feasible. The second phase of the small group trial with 10 students, the result is that the student worksheet design is stated to be very interesting, but in terms of language it still needs to be simplified so that it is easier for students to understand. The third stage of the large group trial, the result is that the student worksheet design is suitable for use as a medium for learning mathematics, especially in the operation material of rank form and root form in grade X of SMA Negeri 4 Waesala. Most students stated that the design of student worksheet was interesting, as evidenced by 34 students who stated that they strongly agreed that the learning process was carried out using student worksheet.

Keywords: Development, Student Worksheet, Rank and Root Form Operations

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INTRODUCTION

One of the education problems faced by the Indonesian nation is the low quality of education for each level and education unit (Sumirat et al., 2022). This can be reflected in the PISA test results, where Indonesia always obtains the lowest score (Habibi & Suparman, 2020). In overcoming this, schools as formal educational institutions that receive top priority to organize the teaching and learning process, have great duties and responsibilities. In fact, in carrying out teaching and learning activities that can achieve the goals that have been set is not

an easy thing. Therefore, an effective and efficient teaching and learning strategy is needed.

Mathematics is one of the most fundamental sciences in every level of education (Siswono et al., 2020). Mathematics teaching is generally dominated by verbal introduction of formulas and concepts, without sufficient attention to student understanding (Pásztor et al., 2022). In addition, the teaching and learning process almost always takes place with a mechanistic lecture method, with the teacher being the center of all activities in the classroom, students listening, imitating or imitating exactly the same way that the teacher gives without initiative (Kaskens et al., 2020). Students are not allowed or encouraged to optimize their potential, develop reasoning and creativity. Learning mathematics is considered to only emphasize cognitive factors, even though personality development as part of life skills is the task of all subjects in school (Grigg et al., 2018). Faced with that condition, mathematics learning must change its image from mechanistic learning to fun humanistic. Mathematics learning in schools so far has only used conventional methods (Saracoglu, 2022). Teachers lack innovation in classroom learning activities, which can increase student interest and learning outcomes (Amrulloh & Galushasti, 2022) (Habibi & Suparman, 2020).

Based on the results of initial observations made in the mathematics learning process at SMA Negeri 4 Waesala, West Seram Regency, it is known that students are very difficult to learn mathematics, especially on the operation material of rank form and root form. So to understand the material is not only enough with the delivery delivered by the teacher in class. Because, teachers when teaching are not oriented to student understanding, so students are very difficult to solve the questions given or in the exams carried out. This is exacerbated by the lack of textbooks or some kind of guide material that can be used to help students to study independently and train themselves to solve problems. The average book that students use to study is very difficult to understand. Because, in addition to a brief explanation, there is no special guidance that can help students to understand the material taught.

The limited learning media, especially in studying the material of rank form and root form for students of SMA Negeri 4 Waesala, is the main reason for the need for practical, easy-to-understand, interesting student worksheets, because they are equipped with pictures and systematically arranged in sequence with simple and clear language. One of the learning media that can be used is Student Activity Sheets (Subekti & Prahmana, 2021). In learning using Student Activity Sheets, students are directed to discover and understand concepts from mathematics (Patresia et al., 2020). Learning activities using student worksheets can encourage students to process the material learned alone or together with friends in a form of group discussion (Arizen & Suhartini, 2020). Student worksheets can also give students full

opportunities to reveal their ability and skills to act on their own in developing their thought processes (Ozkan & Kilicoglu, 2021). With the use of student worksheets in learning, students are expected to be really active and independent so that they can absorb and remember longer what they learn (Ikalindhari et al., 2020).

Making a learning student worksheet is very important to do, through this student worksheet it is hoped that students can learn independently, more enthusiastically and thoroughly because this student worksheet provides facilities for students to repeat parts that are important to learn (Apsari et al., 2019), equipped with pictures and their simantics arranged in sequence with simple and clear language (Subekti & Prahmana, 2021) (Kahar et al., 2021). Design student worksheets, peration materials, rank shapes, and root shapes to develop students' comprehension skills.

METHOD

The type of research used in the development process student worksheet mathematics operation material of rank form and root form is using the type of r&d (research and development) research, which is research that aims to produce a product and test the effectiveness of the product developed. the development process of the student worksheet developed follows the stages of the development process developed by Borg and Gall (Buliali, 2022). This development model is considered feasible, because it has easy and appropriate stages for developing student worksheets. The stages that researchers carry out in the development of student worksheet operation material for rank form and root form include 1) analyzing the needs of the student worksheet to be developed, 2) developing initial products, 3) expert validation and revision, 4) small group trials, 5) large group trials, 6) final products (Iftanti & Madayani, 2019). Product testing in the form of student worksheet is expected to help the learning process in schools in increasing student understanding in Mathematics learning, especially on the operation material of rank form and root form.

Needs Analysis Student Worksheet

Analysis of needs in the development of student worksheet operation material for rank form and root form there are several stages carried out, namely reviewing the curriculum, identifying the material needed for making student worksheet, and literature study.

Developing Initial Products

Preparing the design of the student worksheet for mathematics learning carried out is to design a student worksheet by following the guidelines for preparing a good and correct student worksheet formulated through stages determine the title of the student worksheet to be produced, set the final goal of the student worksheet, namely the main competencies achieved by students after participating in learning with the student worksheet, determine more specific abilities or competencies that will support main abilities or competencies, establish the framework of the student worksheet or the outlines of the student worksheet, and develop material that has been designed in the framework.

Expert Validation and Revision

Expert validation is carried out by 4 experts, namely material experts, and design experts, linguists, and curriculum experts. Expert validation of the operation material of rank form and root form aims to provide and evaluate student worksheet based on learning aspects and aspects of material content that are in accordance with the needs in high school. Material expert validation is carried out by lecturers who are competent in the field of Mathematics. Design expert validation aims to provide information and evaluate student worksheet based on aspects of student worksheet design and preparation of student worksheet. Design expert validation is carried out by lecturers who master the student worksheet. Linguist validation is carried out by a lecturer who is competent in the field of language. The purpose of carrying out language validation on the student worksheet is so that later the student worksheet developed can use good and correct Indonesian rules and can also be understood by students well because it is arranged according to the level of student comprehension ability. Expert validation of the curriculum is carried out by subject teachers at the research location. Curriculum validation aims to determine the availability of the composition of the material used in the student worksheet with the applicable curriculum or used on.

Small Group Trial (Phase I Trial)

Student worksheet trials are carried out through the use of student worksheets on subjects who are targeted to find out the readability of the student worksheet. The trial is intended to identify student worksheet product errors so that they can be refined again into the final product. Small group trials were conducted on 10 Class X students of SMA Negeri 4 Waesala which aimed to determine the readability of student worksheets in terms of understanding the material and concepts of the material presented on the student worksheet so that later it can be

used as a learning medium in the learning process. The selection of the ten students was taken based on consideration of their abilities, namely students who have high, medium and low achievement levels.

Large Group Trials (Phase II trials)

The large group trial was carried out by 28 grade X students of SMA Negeri 4 Waesala. Large group trials are intended to test products (student worksheets) after going through improvements based on small group trials so that this student worksheet is interesting and easy to understand by students.

End Products

The final product produced is the student worksheet of the operation material of the rank form and root form has been declared worthy of assessment by material experts, media experts, and the opinions of grade VII students at SMA Negeri 4 Waesala, then the student worksheet can be used for learning at school.

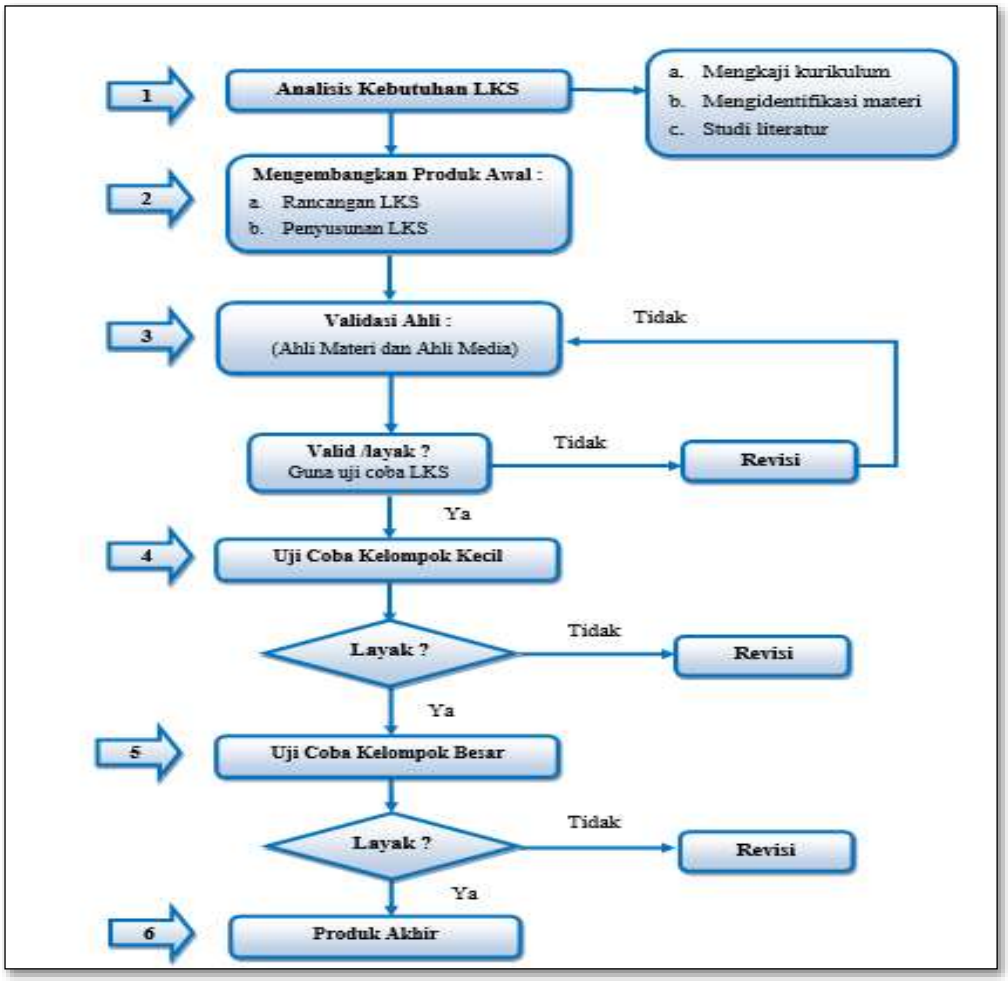

Figure 1. Development research procedure chart student worksheet

The subjects in this study were all grade X students of SMA Negeri 4 Waesala, West Seram Regency, totaling 27 people. Data collection techniques in this study were carried out in three ways, namely observation, interviews, and questionnaires. There are 2 types of questionnaires, namely questionnaires for validators and for students.

Table 1. Categorization and weighting of scores (Guttman scale)

Questions/Statements	
Answer	Score
Proper	1
Not worth it	0

The second closed questionnaire was addressed to class X students who were the subjects of research, totaling 27 students to find out the readability of students about the feasibility and attractiveness of student worksheets. The questionnaire uses the Likert scale with 5 alternative answers.

Table 2. Poll score weighting

Positive Statements		**Negative Statements**	
Answer	**Score**	**Answer**	**Score**
Totally Agree (SS)	4	Totally Agree (SS)	1
Agree (SS)	3	Agree (SS)	2
Disagree Less (KS)	2	Disagree Less (KS)	3
Disagree (TS)	1	Disagree (TS)	4

The data analysis technique used is descriptive. The results of filling out the questionnaire by experts are calculated using student worksheet eligibility criteria, namely:

Table 3. Eligibility criteria for student worksheets by experts

Eligibility Criteria for student worksheet	
Assessment Categories	Value Interval
Proper	$(S_{min} + p) \leq S \leq S_{max}$
Not worth it	$S_{min} \leq S \leq S_{min} + p - 1$

Meanwhile, to analyze and classify the results of questionnaires filled out by students for readability, student worksheets use descriptive analysis. The classification is arranged based on the normal curve using the ideal score obtained from the instrument.

Table 4. Student worksheet readability criteria by students

No	**Assessment Categories**	**Value Interval**
1	Totally Agree (SS)	$(S \text{ min } +3p) \leq S \leq S \text{ max}$
2	Agree (SS)	$(S \text{ min } +2p) \leq S \leq (S \text{ min } +3\ p-1)$
3	Disagree Less (KS)	$(S \text{ min } +p) \leq S \leq (S \text{ min } +2\ p-1)$
4	Disagree (TS)	$S \text{ min} \leq S \leq (S \text{ min } + p-1)$

Data from the questionnaire analysis filled in by students are then consulted on the assessment category interpretation table based on the results of expert validation, which are as follows.

Table 5. Interpretation of assessment categories of eligibility outcomes by students

Assessment Categories	Interpretation
Totally Agree	Students are very familiar with the material, very familiar with the language used in the student worksheet and are very interested in the display of student worksheet operation material rank form and root form
Agree	Students understand the material, understand the language used on the student worksheet and are interested in the display of the student worksheet operation material rank form and root form.
Disagree Less	Students do not understand the material, do not understand the language used in the student worksheet and are less interested in the appearance of the student worksheet operation material form rank and root form.
Disagree	Students do not understand the material, do not understand the language used on the student worksheet and are not interested in the appearance of the student worksheet operation material rank form and root form.

RESULTS

Results of Needs Analysis

Reviewing the Curriculum

The results of curriculum validation conducted by mathematics teachers at SMA Negeri 4 Waesala found that the student worksheets developed were in accordance with the curriculum used at the school, so that the mathematics student worksheets on the operation material of rank form and root form were suitable to be used as a source of learning by students.

Literature Study

This literature study was conducted to find out the right stages in the development of mathematics student worksheets so that they can be implemented optimally. After the data is collected, the preparation of the student worksheet design is carried out. The student worksheet design is prepared based on the stages of making a mathematical student worksheet, operation material, rank form, and root form needed. After that, the student worksheet development stage is carried out according to the design made.

Based on the results of discussions with mathematics subject teachers, reviewing the curriculum and literature studies, it can be concluded that the need for the use of appropriate

learning media, namely mathematics student worksheets. Thus, the development of mathematics student worksheets is focused on the operation material of rank form and root form at SMA Negeri 4 Waesala

Product Initial Design Student Worksheet

The preparation of student worksheets comes from the results of researchers' studies of various books and references that have been collected for the process of preparing student worksheets, operating materials, rank forms, and root forms. The preparation of student worksheets is adjusted to the characteristics and needs of students, to the material, with the aim that later after the student worksheet is produced the process of its use can be effective for grade X students of Waesala State High School, West Seram Regency. The most important thing in the process of preparing this student worksheet is that the preparation of material is arranged systematically and simply, so that students can understand the material well when used for independent learning and also the use of pictures and instructions so that it can attract and motivate students when studying mathematics worksheets on the material of operations of rank forms and root forms.

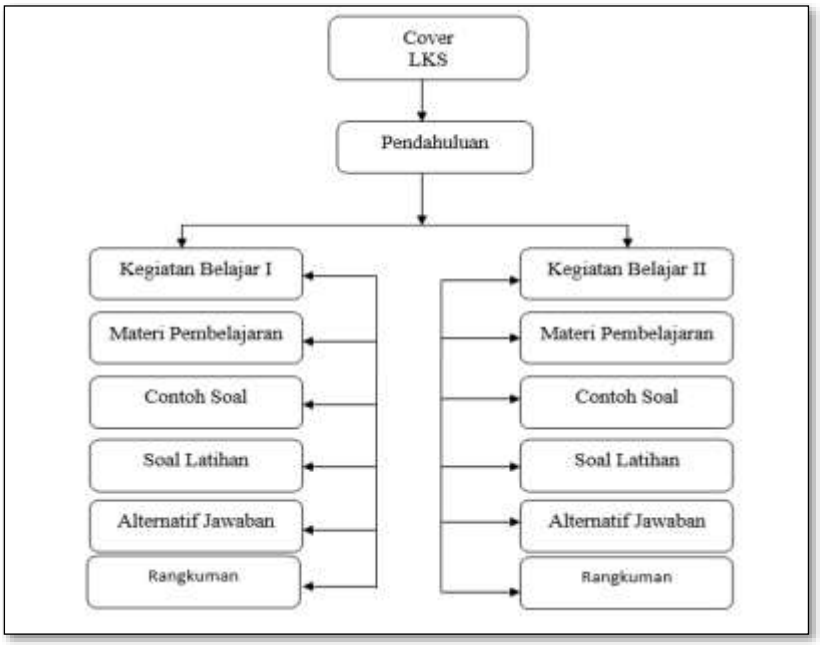

Figure 2. Initial design of student worksheet

Student Worksheet Eligibility According to Validators

Student Worksheet Validation by Material Experts

The results of material validation by experts obtained that there are several aspects that need to be improved, namely:

Table 6. The results of the revision of the student worksheet by material experts

No	Comments/Suggestions	Follow-up
1	Pay attention to the wording and sentence arrangement	Corrected various typing errors contained in the student worksheet
2	The composition of the material is not yet clear, look again at the references used	Clarify the composition of the material contained in the student worksheet and adjusted to the references used.
3	There are still many examples of problems that are wrong	Pay attention and revise the example questions used, especially in the answers to solving example questions.
4	Answers on formative tests and summative tests	Make answers on formative and summative tests to help students in the learning process
5	Table of contents missing	Create a table of contents
6	There are no blank places for students to fill in answers on exercises	Give students a blank space to write the answer in

The interpretation of the results of the material expert assessment can be seen as in the following table about the results of the student worksheet eligibility criteria by material experts.

Table 7. The results of student worksheet eligibility criteria by material experts

Class	Assessment Categories	Value Interval	
1	Proper	$(S_{min} + p) \leq S \leq S_{max}$	$10 \leq S \leq 20$
0	Not worth it	$S_{min} \leq S \leq S_{min} + p - 1$	$0 \leq S \leq 9$

Based on the results of data analysis conducted on the results of questionnaires that have been filled out by material experts, a total score of 20 was obtained. Thus, the total score obtained is at intervals of $10 \leq S \leq 20$ with the assessment category being feasible. Thus, it can be concluded that the student worksheet developed on the operation material of the rank form and root form according to the material expert validator is worthy of use in the learning process.

Student Worksheet Validation by Design Experts

Design experts provide an assessment of aspects of the functions and benefits of learning media, aspects of the characteristics of the display of student worksheet material and the characteristics of student worksheets as learning media. After the media expert makes an assessment, it is known that the things that must be revised, as for the revision of the media expert as follows:

Table 8. The results of the revision of the student worksheet by design experts

No	Comments/Suggestions	Follow-up
1	The appearance of the design is less attractive, and the colors are too flashy.	Make designs more attractive.

2	The left, right, top, and bottom side of the writing is too exaggerated	Eliminate left, right, top, and bottom side elements on writing too much
3	Student worksheet cover is not yet available	Create a cover on the student worksheet.

The interpretation of the results of the design expert assessment can be seen as in the following table about the results of student worksheet eligibility criteria by design experts.

Table 9. Results of student worksheet eligibility criteria by design experts

Class	Assessment Categories	Value Interval	
1	Proper	$(S_{min} + p) \leq S \leq S_{max}$	$14 \leq S \leq 28$
0	Not worth it	$S_{min} \leq S \leq S_{min} + p - 1$	$0 \leq S \leq 13$

Based on the results of data analysis conducted on the results of questionnaires that have been filled out by design experts, a total score of 28 was obtained. Thus, the total score obtained is at intervals of $14 \leq S \leq 28$ with the assessment category being feasible. Thus, it can be concluded that the student worksheet developed on the operation material of rank form and root form according to design expert validators is worthy of use in the learning process.

Student Worksheet Validation by Linguists

Linguists provide language assessments about the use of language used in the student worksheet developed After the linguist makes an assessment, it is known that things must be revised, as for the revisions of the linguist, among others, can be seen in the following table about revisions by linguists.

Table 10. Results of student worksheet revision by linguists

No	Comments/Suggestions	Follow-up
1	The use of language has not used good and correct Indonesian	Use good and correct Indonesian.
2	The use of punctuation marks is not correct and there are still many errors	Pay attention to the use of punctuation marks in the preparation of student worksheets and adjust them to the procedures for using punctuation marks properly and correctly.
3	There are many errors in the typing process	Correct the use of incorrect typing in each sentence.

The interpretation of the results of the material expert assessment can be seen as in the following table about the results of the student worksheet eligibility criteria by linguists.

Table 11. Results of student worksheet eligibility criteria by linguists

Class	Assessment Categories	Value Interval	
1	Proper	$(S_{min} + p) \leq S \leq S_{max}$	$5 \leq S \leq 10$
0	Not worth it	$S_{min} \leq S \leq S_{min} + p - 1$	$0 \leq S \leq 4$

Based on the results of data analysis conducted on the results of questionnaires that have been filled out by linguists, a total score of 10 was obtained. Thus, the total score obtained is in intervals of $5 \leq S \leq 10$ with the assessment category being feasible. Thus, it can be concluded that the student worksheet developed on the operation material of the rank form and root form according to the linguist validator is worthy of use in the learning process.

Small Group Trials

Small group trials totaled 10 students. Small group trials were conducted after going through validation tests of material, design, and language on student worksheets from experts. The results of the student readability test of mathematics worksheet operation material of rank form and root form are known that from 33 indicators are declared valid. The results of student readability of student worksheets, mathematics, operation materials, rank forms, and root forms.

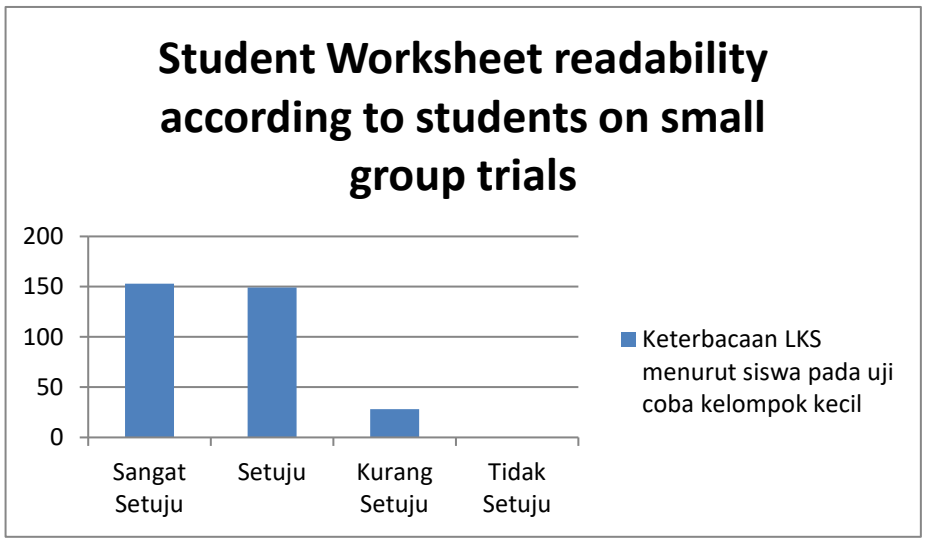

Figure 3. Student worksheet readability graph on small group trial

Table 12. Results of Student Worksheet Readability Criteria in Small Group Trials

No	Assessment Categories	Value Interval	
1	Totally Agree (SS)	(Smin +3p) ≤ S ≤ S max	1074 ≤ S ≤ 1320
2	Agree (SS)	(Smin +2p) ≤ S ≤ (S min +3 p−1)	826 ≤ S ≤ 1073
3	Disagree Less (KS)	(Smin +p) ≤ S ≤ (S min +2 p−1)	578 ≤ S ≤ 825
4	Disagree (TS)	Smin ≤ S ≤ (S min + p−1)	330 ≤ S ≤ 577

Based on the data mentioned above, it is known that the readability of student worksheets by students shows that the overall score of respondents with a value of 1115. When viewed based on the table above, the value is between $1074 \leq S \leq 1320$, the readability of the student worksheet by students is in the category of strongly agreeing and interpreted as an interesting student worksheet, but in terms of language it still needs to be simplified so that it is easier for students to understand.

Large Group Test

A large group trial conducted by 34 students. Student readability validation data on mathematics student worksheets on the operation material of rank form and root form is carried out like a large group trial, namely by providing assessment instruments (questionnaires) and student worksheets, students then provide an assessment of student worksheets by filling out the questionnaires that have been provided.

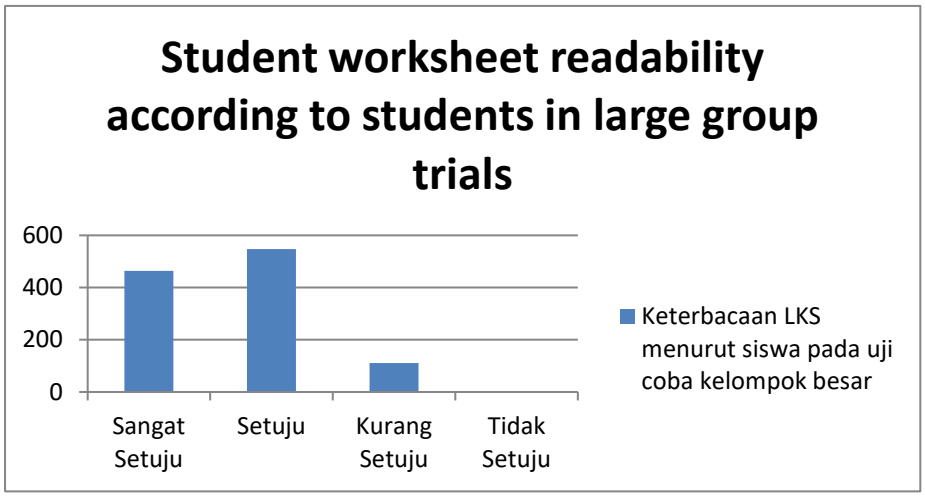

Figure 5. Student worksheet readability graph on large group trials

Table 13. Results of student worksheet readability criteria in large group trials

No	Assessment Categories	Value Interval	
1	Totally Agree (SS)	$(Smin +3p) \leq S \leq Smax$	$3648 \leq S \leq 4488$
2	Agree (SS)	$(Smin +2p) \leq S \leq (Smin +3p -1)$	$2806 \leq S \leq 3647$
3	Disagree Less (KS)	$(Smin +p) \leq S \leq (Smin +2p -1)$	$1964 \leq S \leq 2805$
4	Disagree (TS)	$Smin \leq S \leq (Smin + p-1)$	$1122 \leq S \leq 1963$

Based on the results of the analysis above, it is known that the readability of student worksheets by students shows that the overall score of respondents with a value of 3719. When viewed based on the table above, the value is between $3648 \leq S \leq 4488$ the readability of the student worksheet by students is in the category of strongly agree and it is interpreted that the

student worksheet is interesting and can be used in the learning process in grade X of SMA Negeri 4 Waesala.

DISCUSSION

The process of making mathematics student worksheets is carried out according to the development process, namely development based on student worksheet needs analysis, developing initial products, expert validation and revision, small group trials, large group trials and final products. Analysis of student worksheet needs is carried out in several stages, namely reviewing the curriculum, identifying the material needed for making student worksheets, and literature study.

The feasibility of student worksheets is known from material tests and student worksheet designs, small group trials and large group tests. The aspects assessed from the student worksheet are the functions and benefits of the student worksheet, the attractiveness of the student worksheet and the material of the student worksheet, the operation material of the rank form and the shape of the root. The assessment of the material test and student worksheet design is that the student worksheet is suitable to be used as a mathematics learning medium, small group trials are in the category of strongly agree and it is interpreted that the student worksheet is interesting to be used as a mathematics learning medium even though in terms of language it needs to be revised according to the suggestions of students. While the assessment of the large group test, which is in the category of strongly agreeable and overall very good used as a medium for learning mathematics, so that it can be used as the final product of learning mathematics operation material of rank form and root form in grade X of SMA Negeri 4 Waesala

CONCLUSION

Based on the results of research and development, several conclusions were obtained, namely the development of mathematical student worksheets on the operation material of rank form and root form developed using the Borg and Gall model. This student worksheet feasibility test is carried out through three stages of material validation tests, design, and language. As a result, all experts (100%) said it was feasible. Then continued with the second stage of small group trials with 10 students, the results of the student worksheet design were declared very interesting, but in terms of language it still needs to be simplified so that it is easier for students to understand. Furthermore, in the third stage of the large group trial, the result was that the student worksheet design was suitable for use as a medium for learning

mathematics, especially in the operation material of rank form and root form in grade X of SMA Negeri 4 Waesala, West Seram Regency. Most students stated that the design of this student worksheet was interesting, as evidenced by 34 students who expressed strong agreement with the learning process carried out using student worksheets. Overall, the mathematics student worksheet on the operation material of the rank form and root form is stated to be very well used as a learning student worksheet at SMA Negeri 4 Waesala.

RECOMMENDATIONS

Based on the results of research and development, there are several aspects that can be recommended, namely the need for the involvement of other experts who are more to assess in terms of material, design, and language used in the development of student worksheets. So that student worksheets are easily understood by students and can increase student motivation in the learning process. Designing student worksheets should use attractive images, formal and simple language, and equipped with illustrations, so as to attract students to learn and make it easier for students to understand the material.

REFERENCES

Amrulloh, M. S., & Galushasti, A. (2022). Professional development teacher to improve skills of science process and creativity of learners. *Journal of Education and Learning (EduLearn)*, *16*(3), 299–307. https://doi.org/10.11591/edulearn.v16i3.20404

Apsari, R. A., Putri, R. I. I., Sariyasa, S., Abels, M., & Prayitno, S. (2019). Geometry Representation To Develop Algebraic Thinking: A Recommendation For A Pattern Investigation In Pre-Algebra CLASS. *Journal on Mathematics Education*, *11*(1), 45–58. https://doi.org/10.22342/jme.11.1.9535.45-58

Arizen, A., & Suhartini, S. (2020). Mobile learning student worksheet based on socio-scientific-issues: Enhancing students' scientific literacy skills in biology. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *6*(1), 15–24. https://doi.org/10.22219/jpbi.v6i1.11196

Buliali, J. L. (2022). *Development of Interactive Media with Augmented Reality for Prospective Solution Quota-Friendly Learning and Physical Limitation in the Pandemic Era*. *14*(1).

Grigg, S., Perera, H. N., McIlveen, P., & Svetleff, Z. (2018). Relations among math self efficacy, interest, intentions, and achievement: A social cognitive perspective. *Contemporary Educational Psychology*, *53*, 73–86. https://doi.org/10.1016/j.cedpsych.2018.01.007

Habibi, H., & Suparman, S. (2020). Literasi Matematika dalam Menyambut PISA 2021 Berdasarkan Kecakapan Abad 21. *JKPM (Jurnal Kajian Pendidikan Matematika)*, *6*(1), 57. https://doi.org/10.30998/jkpm.v6i1.8177

Iftanti, E., & Madayani, N. S. (2019). Developing Joyful Story Sheets (JoSS): An Effort to Build Character for EYL Learners in Indonesia through Reading JoSS. *Dinamika Ilmu*, 155–173. https://doi.org/10.21093/di.v19i1.1543

Ikalindhari, A., Ambarwati, R., & Rahayu, D. A. (2020). Developing student worksheet based on iMindMap in animalia topic to train creative thinking ability. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *6*(3). https://doi.org/10.22219/jpbi.v6i3.13235

Kahar, M. S., Syahputra, R., Arsyad, R. B., Nursetiawan, N., & Mujiarto, M. (2021). Design of Student Worksheets Oriented to Higher Order Thinking Skills (HOTS) in Physics Learning. *Eurasian Journal of Educational Research*, *21*(96). https://doi.org/10.14689/ejer.2021.96.2

Kaskens, J., Segers, E., Goei, S. L., Van Luit, J. E. H., & Verhoeven, L. (2020). Impact of Children's math self-concept, math self-efficacy, math anxiety, and teacher competencies on math development. *Teaching and Teacher Education*, *94*, 103096. https://doi.org/10.1016/j.tate.2020.103096

Ozkan, T., & Kilicoglu, E. (2021). Reflections of Authentic Learning on Students' Scientific Process Skills and Achievements in Mathematics. *Acta Didactica Napocensia*, *14*(1), 29–45. https://doi.org/10.24193/adn.14.1.3

Pásztor, A., Magyar, A., Pásztor-Kovács, A., & Rausch, A. (2022). Online Assessment and Game-Based Development of Inductive Reasoning. *Journal of Intelligence*, *10*(3), 59. https://doi.org/10.3390/jintelligence10030059

Patresia, I., Silitonga, M., & Ginting, A. (2020). Developing biology students' worksheet based on STEAM to empower science process skills. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *6*(1), 147–156. https://doi.org/10.22219/jpbi.v6i1.10225

Saracoglu, M. (2022). Reflective Thinking And Inquiry Skills As Predictors Of Self-Efficacy In Teaching Mathematics. *Problems of Education in the 21st Century*, *80*(1), 213–231. https://doi.org/10.33225/pec/22.80.213

Siswono, T. Y. E., Hartono, S., & Kohar, A. W. (2020). Deductive Or Inductive? Prospective Teachers' Preference Of Proof Method On An Intermediate Proof Task. *Journal on Mathematics Education*, *11*(3), 417–438. https://doi.org/10.22342/jme.11.3.11846.417-438

Subekti, M. A. S., & Prahmana, R. C. I. (2021). *Developing Interactive Electronic Student Worksheets through Discovery Learning and Critical Thinking Skills during Pandemic Era*. *13*(2).

Sumirat, S. F. P., Sudihartinih, E., & Sumiaty, E. (n.d.). *Kajian Learning Obstacle pada Topik Bilangan Berpangkat Ditinjau dari Literasi PISA 202*.