

Development of Worksheet Based on Search Solve Create and Share (SSCS) on Learning Interest, Science Process Skills and Student Learning Outcomes in Biology Material of First Level (X Class) Senior High School

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Abstract

This study develops and tests (LKPD) based on search, solve, create, and share (SSCS) in biology learning for class X MIA Semester I at SMA Negeri 5 Medan. To actively assess students' learning interests, science process skills, and learning outcomes at school because this process helps students search, find, and build their knowledge to solve problems. This research is development. Uses 4D development research (Define, Design, Develop, Disseminate). Interviews, material expert validation questionnaires, design validation questionnaires, language validation questionnaires, study field teacher responses to SSCS-based LKPD, student learning interest questionnaires, student science process skills questionnaires, and pretest-posttest assessment sheets were used. Material experts rate material validity as "Very Good/Decent" with an average of 91.75%. Design expert product quality results averaged 87.5% "Good/Decent". Teacher responses on the SSCS-based LKPD averaged 86.25% "Good/Decent". Students are 71% "Interested" in learning in small groups and 88% "Very Interested" in large groups. Science students' process skills averaged 86.67 in the big group and 76.67 in the small group in the "Good/Decent" category. Out of 37 students, 4 had a "Medium" N-gain of 0.7 on the biodiversity and virus meters, whereas 33 had a "High" N-gain of 0.8.

Keywords: LKPD; SSCS; Interest in learning; KPS; Student Learning Outcomes



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INTRODUCTION

The student education component has the responsibility to improve the quality of education (Sulastyaningrum et al., 2019). In addition to intelligence, pupils must have a genuine desire in learning in order to succeed well. Students won't want to participate in learning activities if they are not interested in the material, and they will be motivated to participate in activities if they are interested in the material. gaining knowledge in these

areas. Statements indicating a student's preference for one item over another might be used to determine their interests. Students who are interested in something tend to pay greater attention to that something (Nesi & Akobiarek, 2018). In order for the learning process to be considered effective, there must be contact between the teacher and the students, which means that student engagement is crucial. Interest is defined as a person's propensity for constant, object-centered attention that is facilitated by a unique engagement that people have with objects as a result of their interactions with their surroundings. Another way to describe interest in learning is as something that inspires pupils to work hard and be comfortable with responsibilities or the drive to learn new things (Rohimah et al., 2019).

It can enhance students' science process skills in addition to providing incentive for learning. Science process skills are the fundamental aptitudes that students possess to cultivate their intellectual, physical, and social talents through comprehending ideas, information, and discoveries related to the advancement of science and technology, as demonstrated by real-world instances through scientific learning (Hasanah & Utami, 2017). If students are accustomed to being trained in science process skills, then students will find it easy to solve problems and plan things (Evriani et al., 2017). Unfortunately, the LKPD used is still unable to assist students in performing certain science process skills, such generating and substantiating their hypotheses, because the workflow is still textual. Observations at SMA Negeri 5 Medan revealed that students were less enthusiastic to participate in and engaged in the biology learning process. Furthermore, the bulk of the content is presented through teacher lectures, which wear out students and decrease their motivation to learn; this is seen in the students' waning passion for the biology course. Students show little interest in the subject matter and minimal participation in the educational process.

According to information gathered from an interview conducted on January 25 2023, with a biology teacher at SMA Negeri 5 Medan, the LKPD that has been used up to this point is LKPD from the publisher. The publisher's LKPD already includes all of the necessary information, but the exercises do not help students learn how to find and comprehend the information by following the LKPD's activity instructions. In order to have an impact on the ongoing student learning outcomes, this LKPD includes more questions that can be answered by simply copying a summary of the available material. It also does not allow students to participate directly in the problem solving process by conducting investigations and coming up with solutions to problems that already exist. low, with students' cumulative average standing at 60 while the KKM (Minimum Completion Criteria) is at 75. In order to provide a foundation for validating their use, the researchers conducted research on the creation of SSCS-based Student Worksheets (LKPD) in high school teaching materials for viruses and biodiversity.

Results of a class questionnaire for 37 pupils encourage outdoor learning like experiencing nature. This is supportive if the learning process uses LKPD since it helps students be active and grasp the topics being taught. LKPD innovation is needed to tackle these challenges by establishing Search, Solve Create, and Share. However, low student learning results indicate that the learning process was unsuccessful (Ilmiyah & Sumbawati, 2019). Students' cognitive, emotional, and psychomotor results show that learning is about understanding topic theoretical concepts as well as habits,

perceptions, joys, interests, talents, social adaptations, skills, ideals, wishes, and hopes. The most important psychological aspects affecting learning outcomes include intelligence, emotions, motivation, talent, and curiosity. Students who take education are expected to have positive changes in themselves, as is the goal of national education, namely to produce a young generation who have broad knowledge and good personalities. Positive changes in student behavior which are the result of the learning process at school can be seen from their learning results (Sari et al., 2019).

Pizzini (1991) stated that the SSCS learning model is a problem-solving based learning model where there are activities to identify and find solutions to a problem, so that learning feels meaningful for students. The SSCS learning model involves students actively in learning because this model facilitates students in searching, finding and building their knowledge to solve problems and provides students with opportunities to explore information (Andayu et al., 2018). SSCS-based LKPD is applied in real terms through scientific steps in building knowledge through scientific methods. Based on the background above, the researchers conducted research entitled: "Development of LKPD Based on Search Solve Create and Share (SSCS) on Learning Interest and Science Process Skills and Student Learning Outcomes in Class X Biology Material".

METHOD

This research procedure refers to the 4D version of the research and development method proposed by Thiagarajan (1974). Research and development methods are research methods used to produce a product. This research aims to produce LKPD based on Search Solve Create And Share (SSCS).

Instruments

The data collection instruments used in developing this LKPD are: (1) Validation Questionnaire for Material Experts; (2) Validation Questionnaire for Linguists; (3) Validation Questionnaire for Design Experts; (4) Biology Teacher Response Questionnaire; (5) Student Response Questionnaire; (6) Student Learning Interest Sheet; (7) Science Process Skills

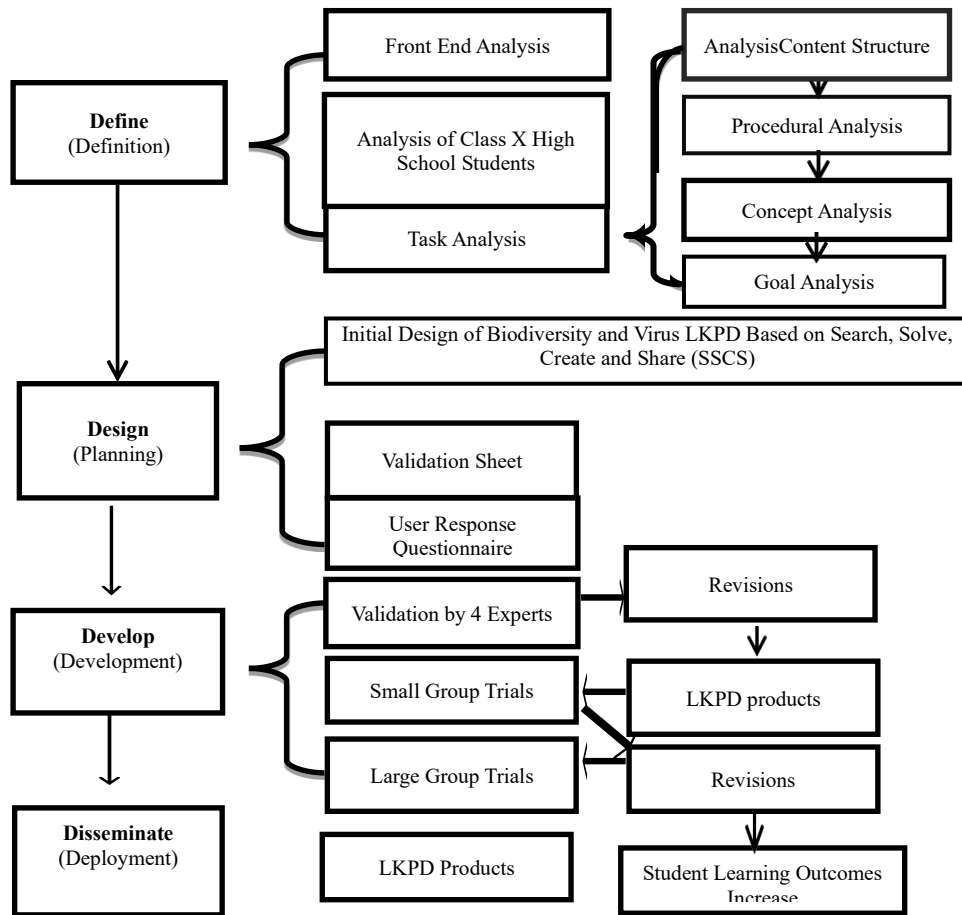


Figure 1. Research and Development Procedures (Arif & Muthoharoh, 2021)

Data analysis

The data used in this research is in the form of qualitative data about SSCS-based LKPD, the data of which was obtained from expert team validation and assessment questionnaires among teachers and students. The analysis data in this development research is descriptive analysis, namely explaining a problem, symptoms or conditions as they are and not testing a hypothesis.

Material Expert Validation Sheet

The research data is in the form of a validation scale obtained from material and design experts and is made in the form of a Likert scale accompanied by a score. The feasibility of a LKPD can be seen from the Likert scale as in Table 1.

Table 1. Criteria for Answering Validation Instrument Items with a Likert Scale and Scores (Sugiyono, 2020)

No	Answer	Score
1.	Very Good/Strongly Agree	4
2.	OK/Agree	3
3.	Not Good/Disagree	2
4.	Not Good/Disagree	1

Next, the data will be analyzed descriptively by calculating the percentage score for each criterion on the LKPD which is created using the following (Sudjana, 2005) formula:

$$P = \frac{\Sigma}{N} \times 100\%$$

Information:

P = Percentage of category

Σ= Total score of selected categories

N = Total ideal score

$$\text{Score (\%)} = \frac{\text{Total score per category}}{\text{The total score of the categories}} \times 100\%$$

From the results of calculations using the formula above, numbers are obtained in the form of percent (%). Then the scores are described using qualitative sentences in accordance with Table 2.

Table 2. Percentage Eligibility Criteria for Developed LKPD Content (Sudjana, 2005)

Percentage Interval	Criteria	Description
81.25% < P ≤ 100%	Very good	The contents of the LKPD are ready to be used in the actual field in the context of learning activities/without revision.
62.5% < P ≤ 81.25%	Good	The contents of the LKPD are ready to be used in the actual field in the context of learning activities with slight revisions.
43.75% < P ≤ 62.5%	Not good	The contents of the LKPD need to be revised carefully and carefully to look for weaknesses in order to perfect the product.
25% < P ≤ 43.75%	Very Not Good	The contents of the LKPD need to be revised a lot and are basic.

Design Expert Validation Sheet and Teacher Assessment

Data resulting from validation by design experts and teacher assessments on LKPD were assessed using an instrument in the form of a scale. Then the results are analyzed using (Sudjana, 2005), the formula:

$$P = \frac{\Sigma xi}{\Sigma x} \times 100\%$$

Information

P = % Assessment

Σxi = Total validator/teacher scores

Σx = Number of highest scores

Table 3. Percentage Criteria According to Indicators on LKPD by Teacher Design and Assessment Experts According to (Sudjana, 2005)

Percentage Interval	Criteria	Description
81.25% < P ≤ 100%	Very good	The contents of the LKPD are ready to be used in the actual field in the context of learning activities/without revision.

Percentage Interval	Criteria	Description
$62.5\% < P \leq 81.25\%$	Good	The contents of the LKPD are ready to be used in the actual field in the context of learning activities with slight revisions.
$43.75\% < P \leq 62.5\%$	Not good	The contents of the LKPD need to be revised carefully and carefully to look for weaknesses in order to perfect the product.
$25\% < P \leq 43.75\%$	Very Not Good	The contents of the LKPD need to be revised a lot and are basic.

Student Response Sheet

Data obtained from student responses to the LKPD guide can be analyzed using (Sudjana, 2005) the formula:

$$P = \frac{A}{N} \times 100\%$$

Information

- P = % Student responses
- A = Total score for each respondent
- N = Number of highest scores

Table 4. Criteria for the Percentage of Student Responses According to the Indicators on the LKPD (Sudjana, 2005)

Percentage Interval	Criteria	Description
$81.25\% < P \leq 100\%$	Very good	The contents of the LKPD are ready to be used in the actual field in the context of learning activities/without revision.
$62.5\% < P \leq 81.25\%$	Good	The contents of the LKPD are ready to be used in the actual field in the context of learning activities with slight revisions.
$43.75\% < P \leq 62.5\%$	Not good	The contents of the LKPD need to be revised carefully and carefully to look for weaknesses in order to perfect the product.
$25\% < P \leq 43.75\%$	Very Not Good	The contents of the LKPD need to be revised a lot and are basic.

RESULTS AND DISCUSSION

Validation Result Data from Material Experts and Design Experts

The results of validation and assessment by a team of material experts and a team of design experts for each aspect of the overall assessment are determined by the average score of the respective criteria. The results of the assessment aspects and indicators are described as follows,

Material Expert Validation Result Data

The results of the assessment by the material expert team on the three component aspects can be seen in Table 5.

Table 5. Research Results on SSCS-Based LKPD in Class X MIA Semester 1 Biology Learning at SMA Negeri 5 Medan for Assessment by a Team of Material Experts

No	Validator Code	Assessment Components			Total Score	Average %
		Eligibility of content	Feasibility of presentation	SSCS components		
1.	Prof. Dr. Tri Harsono, M.Si.	41	82	45	162	89.36
2.	Fatmahwati, S.Pd.	45	82	50	180	94.14
Amount		86	164	95	342	
Stdv		0.00	0.00	0.00		
Average percentage		82.69	97.61	91.34		91.75
Criteria		Good/decent	Very Good/Decent	Very Good/Decent		Very Good/Decent

Table 6. Results of SSCS-Based LKPD Assessment in Class X MIA Semester 1 Biology Learning at SMA Negeri 5 Medan by a Team of Design Experts

No.	Validator Code	Assessment Components				Total Score	Average %
		Cover Design	Cover Typography	LKPD Content Design	Illustration of LKPD contents		
1.	Drs. Gama Kartono, M.Sc	18	12	28	12	70	87.5
2.	Santiur, S.Pd	17	12	28	13	70	87.5
Amount		35	24	56	25	140	
Stdv		0.00	0.00	0.00	0.00		
Average percentage		87.5	100	87.5	78.12		87.5
Criteria		Good/Worthy	Very good/worthy	Good/worthy	Good/decent		Good/decent

Based on the assessment of material experts regarding the appropriateness of the contents of the SSCS-based LKPD in biology learning for class The average percentage of the material expert team's assessment results regarding the suitability of the content is described in Figure 2.

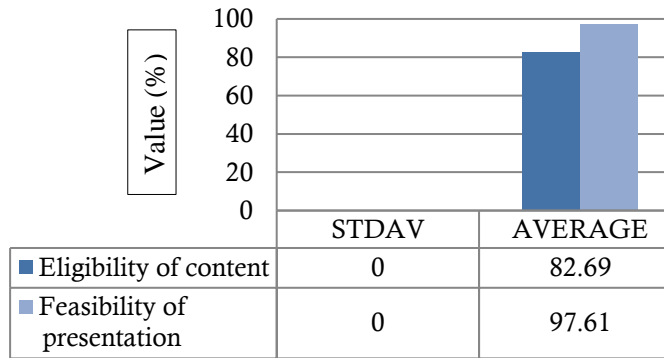


Figure 2. Average Percentage of SSCS-Based LKPD Assessment Results in Class X MIA Semester I Biology Learning by the Material Expert Team.

Design Expert Validation Results

The results of the design team's assessment of the four component aspects can be seen in Table 6. Based on the assessment of learning design experts, the cover design was declared valid with an average score presentation of 87.5 with the criteria "Good/decent". The average percentage of the design expert team's assessment results regarding the feasibility of the design is outlined in Figure 3.

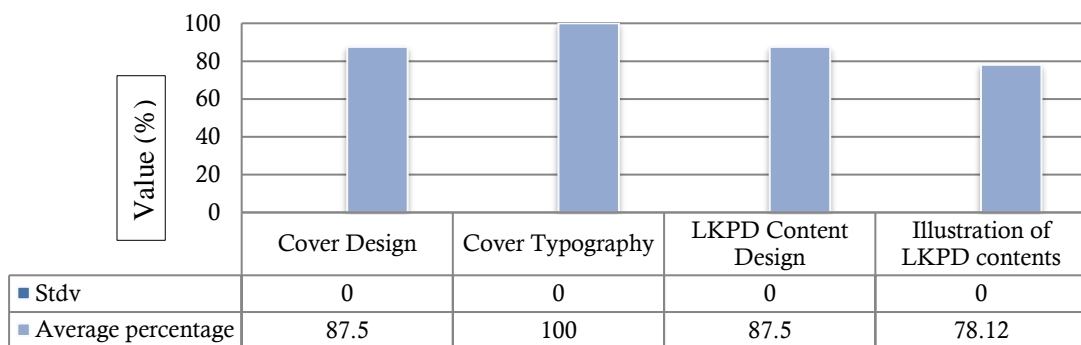


Figure 3. Average Percentage of SSCS-Based LKPD Assessment Results in Class X MIA Semester 1 Biology Learning by the Design Expert Team.

Biology Study Teacher Assessment Results

Based on the results of the assessment carried out by the two biology study teachers at SMA Negeri 5 Medan, this research product was declared "Good/Decent" with a total average percentage of 86.25 in the "Decent" criteria. The results of the assessment of the 5 assessment indicators carried out by biology teachers at SMA Negeri 5 Medan can be seen in Table 7.

Table 7. Results of Teacher Response Questionnaires on SSCS-Based LKPD in Class X MIA Semester I Biology Learning at SMA Negeri 5 Medan

No	Teacher name	Amount	Stdv	Average Percentage
1.	Fatmawati, S.Pd	70	0.00	87.5
2.	Santiur, S.Pd	68	0.00	85
Amount		138		172.50
Average				86.25

Percentage Results of Student Interest in Learning

After all questionnaire data has been filled in by respondents, the data is then processed and analyzed. The results of the overall data description in small groups can be seen in Table 8.

Table 8.Percentage of Small Group Student Interest in Learning

Indicator	Statement	Evaluation		%
		Yes	No	
Feeling happy	1. I felt happy following biology lessons during the learning process	10	0	100
	2. I never complain if there is a biology assignment from the teacher	8	2	80
	3. I am often absent during biology lessons during the lesson	3	7	30
	4. The use of SSCS-based LKPD has triggered me to be more active in class	5	5	50
	5. I am enthusiastic about studying biology because the teacher teaches in a fun way	8	2	80
	6. The learning atmosphere becomes fun by using SSCS-based LKPD	6	4	60
	7. I enjoy studying biology because it relates to everyday life	10	0	100
	8. I was bored when the biology lesson was going on while the lesson was going on	2	10	20
	9. I attended biology lessons on time when the learning took place	9	1	90
	10. If I have difficulty understanding the material, I ask.	10	0	100
Interest	11. The assignments given by the teacher made me even more interested in biology	9	1	90
	12. I am interested in studying biology using SSCS-based LKPD	6	4	60
	13. I will always try to get good grades on every test and assignment given	8	2	80
	14. I procrastinate doing assignments/homework given by the teacher.	5	5	50

Indicator	Statement	Evaluation		%
		Yes	No	
Student Attention	15. I remain focused on studying even though learning is going on.	9	1	90
	16. I fell asleep while studying biology during the lesson	9	1	90
	17. When there is biological material that I don't understand, I try to study it.	10	0	100
	18. I found it difficult to understand biology material during the lesson.	2	8	20
	19. The material provided by the teacher is useful for me.	10	0	100
Involvement	20. Without anyone telling me, I studied biology myself at home.	4	6	40
	21. With SSCS-based LKPD I can contribute actively in the group	5	5	50
	22. I studied biology the night before class the next day.	9	1	90
Amount		157	65	1570
Average percentage (%)				71%
Standard Deviation		0.00	0.00	0.00

Based on table 9, the percentage results of all indicators of student interest in the large group of 37 students regarding SSCS-based LKPD on biodiversity and viruses are 88% with the category "Very interested" and a standard deviation of 0.00. The results of the overall data description for the large group can be seen in Table 9.

Table 9.Percentage of Study Interest of Large Group Students

Indicator	Statement	Evaluation		%
		Yes	No	
Feeling happy	1. I felt happy following biology lessons during the learning process	35	2	95
	2. I never complain if there is a biology assignment from the teacher	30	7	81
	3. I am often absent during biology lessons during the lesson	17	20	46
	4. The use of SSCS-based LKPD has triggered me to be more active in class	32	5	86
	5. I am enthusiastic about studying biology because the teacher teaches in a fun way	35	2	95
	6. The learning atmosphere becomes fun by using SSCS-based LKPD	36	1	97
	7. I enjoy studying biology because it relates to everyday life	36	1	97
	8. I am more responsible for my duties	35	2	95

Indicator	Statement	Evaluation		%
		Yes	No	
Interest	9. I attended biology lessons on time when the learning took place	35	2	95
	10. If I have difficulty understanding the material, I ask.	32	5	86
	11. The assignments given by the teacher made me even more interested in biology	34	3	92
	12. I am interested in studying biology using SSCS-based LKPD	35	2	95
	13. I will always try to get good grades on every test and assignment given	36	1	97
	14. I procrastinate doing assignments/homework given by the teacher.	11	26	30
Student Attention	15. I remain focused on studying while learning is taking place.	37	0	100
	16. I fell asleep while studying biology during the lesson	29	8	78
	17. When there is biological material that I don't understand, I try to study it.	35	2	95
	18. It is easy for me to understand biodiversity and virus material by using SSCS-based LKPD	35	2	95
	19. The material provided by the teacher is useful for me.	35	2	95
Involvement	20. Without anyone telling me, I studied biology myself at home.	34	3	92
	21. With SSCS-based LKPD I can contribute actively in the group	36	1	97
	22. I studied biology the night before class the next day.	34	3	92
Amount		714	100	1930
Average percentage (%)				88%
Standard Deviation		0.00	0.00	0.00

Percentage Results of Science Process Skills

Description of Science Process Skills has 6 indicators in the test. The percentage scores for small group students can be adjusted to the Science Process Skills scale which is summarized in Table 10.

Table 10. Small Group Science Process Skills Scale

Aspect	Score	The number of students	Total Score
Observation skills	4	10	40
Skills in using tools and materials	4	10	40
Prediction skills	5	10	50
Skills in taking measurements	3	10	30
Skills in implementing procedures	4	10	40
Communication skills	3	10	30
Total			230
Percentage			76.67

To categorize the percentage value for each indicator, the percentage value for small group students can be adjusted to the Science Process Skills scale which is summarized in Table 11.

Table 11. Large Group Science Process Skills Scale

Aspect	Score	The number of students	Amount
Observation skills	5	37	185
Skills in using tools and materials	4	37	148
Prediction skills	4	37	148
Skills in taking measurements	4	37	148
Skills in implementing procedures	4	37	148
Communication skills	5	37	185
Total			962
Percentage			86.67

Response Results from Small Group Trials and Large Group Trials on SSCS-Based LKPD

The first trial was a small group trial carried out on 10 class X Mia students. After that, large group trials were carried out on all 37 X Mia students.

Small Group Students' Science Process Skills

The total score obtained from small group students for each indicator of students' science process skills consists of: (1) Observation skills have a total score of 40; (2) Skills in using tools and materials have a total score of 40; (3) Prediction skills have a total score of 50; (4) Measurement skills have a total score of 30; (5) Skills in implementing procedures have a total score of 40; (6) Communication skills have a total score of 30. The percentage of students' science process skills in small groups can be seen in Figure 4.

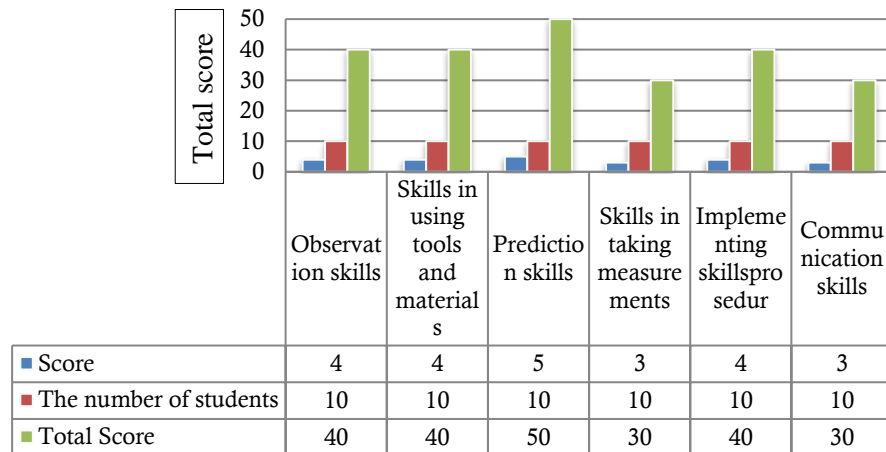


Figure 4. Percentage of Small Group Students' Science Process Skills on SSCS-Based LKPD in Class X MIA Semester 1 Biology Learning

Science Process Skills of Large Group Students

The total score obtained from the large group of students was 37 students for each indicator of students' science process skills consisting of: (1) Observation skills had a total score of 185; (2) Skills in using tools and materials have a total score of 148; (3) Prediction skills have a total score of 148; (4) Measurement skills have a total score of 148; (5) Skills in implementing procedures have a total score of 148; (6) Communication skills have a total score of 185. The percentage of students' science process skills in small groups can be seen in Figure 5.

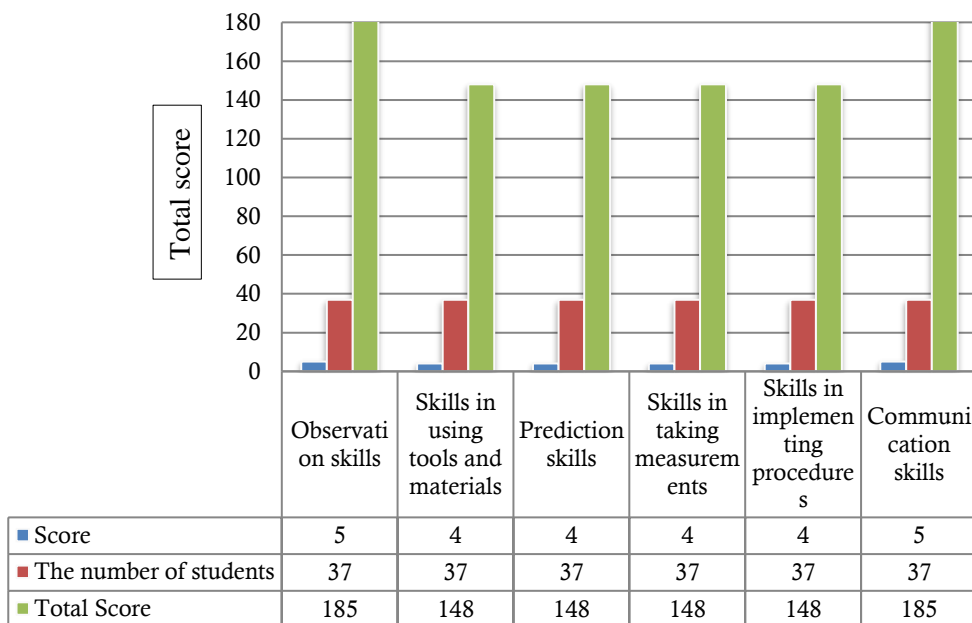


Figure 5. Percentage of Large Group Students' Science Process Skills on SSCS-Based LKPD in Class X MIA Semester 1 Biology Learning.

Data analysis of student responses from small group and large group trials

The results of the small group test, namely students' perceptions of the developed biology worksheet, show the criteria "Good/Decent" with an average percentage of 78.83 and a standard deviation of 0.00. The implementation of the small group trial aims to find out students' opinions as information for making improvements before implementation. large group test.

The results of the large group test, namely students' perceptions of the biology worksheet that was developed, showed the criteria "Good/Decent" with an average percentage of 82.56 and a standard deviation of 0.00. The purpose of carrying out small group tests is to find out students' opinions as information for making improvements so that a large number of biology LKPDs are produced that meet feasibility. A comparison of the assessment results from small group and large group tests can be seen in Figure 6.

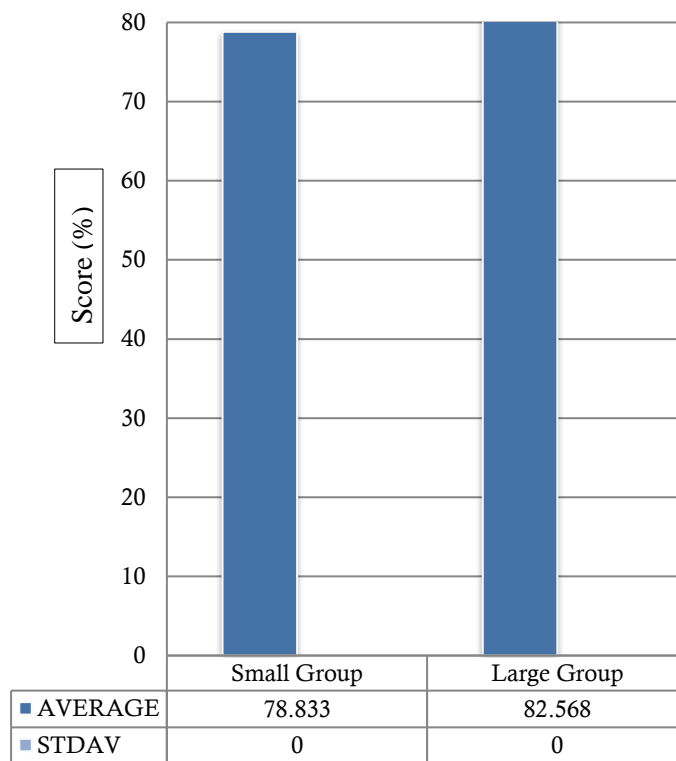


Figure 6. Average Percentage of Student Response Results to SSCS-Based LKPD in Class X MIA Semester 1 Biology Learning

Increasing Student Learning Outcomes

Classical learning mastery is seen from the increase in student learning outcomes obtained from the comparison of the final posttest test scores and the pretest initial test scores. The increase in student learning outcomes can be calculated using N-gain, as according to Hake (1997) the level of gain from normalized gain is categorized as high if $g > 0.7$. From the learning outcomes obtained by 37 students on the biodiversity and virus meter, there were 4 students with a moderate N-gain of 0.7 and 33 other students obtained a high N-gain of ≥ 0.8 .

CONCLUSION

Based on the findings of SSCS-based research on biology learning for class X MIA Semester I at SMA Negeri 5 Medan which has been proven to have high implications for teacher use in the learning process. The implications of this conclusion include: (1) The developed LKPD will make a practical contribution, especially in the process of implementing learning in the field of biology studies, where this LKPD can be used as additional teaching materials and alternative teaching materials for teachers to make it easier to deliver the material being taught. ; (2) The developed LKPD can enrich and add to the body of knowledge in order to improve the quality of learning, especially those related to the development of teaching materials in the form of biology learning LKPD for class X MIA first semester at SMA Negeri 5 Medan; (3) The developed LKPD can provide ideas and reference material for teachers, educational institutions, managers, developers and future researchers who wish to study and develop in more depth the biology learning LKPD; (4) The LKPD developed can be used as a means to help or make it easier for students to understand the subject matter of class.

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