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Improving Problem Resolve Skill and Science Learning Result with Creating Worksheet Based on STEM

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ABSTRACT

The occurring problem, student worksheets have not been created truly in the learning process student worksheets used in the learning process only comes from. The student worksheets are not interactive, so that they have an impact on low learning outcomes and ability to solve science problems for fourth grade students at SDN 05 Binanga Dua. This research includes development research. This development research uses ADDIE development. The results of the development show that the manufacturing process produces the student worksheets on the STEM approach for grade IV students with a quality and valid. The results showed that the validation results of student worksheets feasibility test were based on the assessment of the three validators, namely the validation results of learning material experts of 88.23% with a very feasible classification, the validation results of linguists of 83.03% with a very feasible classification, the results of the presentation design expert validation of 93.75% with very decent qualifications. Furthermore, a feasibility test was carried out in small groups to obtain a data percentage of 84.6% and the trial was carried out again in the large group with a percentage result of 89.25% as a reinforcement of the feasibility assessment carried out by the homeroom teacher with a percentage result of 90%. So based on the validity of the student worksheets product, it shows very valid results which show that the student worksheets product is very feasible to be applied in learning activities.

KEYWORDS

Development; Student Worksheet; STEM

INTRODUCTION

One of the subjects of class IV science is force and motion of objects. The material on force and motion of objects refers to basic competencies, namely explaining several types of force and their properties, explaining the basic concept of force and its influence on objects in everyday life. These Basic Competencies include: (1) Identifying the various styles involved in daily activities; and (2) Utilizing these styles to help people overcome challenges in everyday life.

According to the interview result from one of teachers from one of the elementary schools in South Labuhanbatu, namely at UPTD SDN 05 Binanga Dua on 13 May and 5-6 April 2023, showed that teachers taught forces and motion of objects using conventional methods which were sometimes interspersed with group discussions. The learning process also lacks the use of open materials (Adilla, T. N., 2018). The material of force and motion of objects is usually not studied at the beginning of the semester (Susanti, L. Y., 2018 and Torlakson, T., 2014).

Science learning outcomes are of course influenced by learning resources as well, according to the result observation found that the science learning outcomes obtained are

still low, this is shown in the daily tests for the even semester of the 2022/2023 academic year where some students have not reached the minimum standard of completion criteria. The specified minimum completeness criteria of science subject score limit is 7. However, 13 of the 22 students have not yet completed their learning result. The 13 students still had learning outcomes ≥ 70. However, in reality there were still many students who got the under minimum completeness criteria score in science subject. The results of the learning process are realized in student learning achievement which is measured by the grades obtained by students after working on questions given by the teacher at the time the evaluation is carried out (Crosbi, &. H., 2000).

Based on a meta-analysis survey conducted by the World Economic Forum 2015 on elementary and middle school students, 16 abilities were produced that were needed in the 21st century. These sixteen abilities were divided into three categories, namely basic literacy skills and competencies and personality quality. The competency category bunch comprises of 4 capacities, specifically basic considering and problem-solving, innovating, communicating and collaborating. Issue understanding capacity is one of the most aptitudes that understudies must have. Separated from the study from Joynes, C., Rossignoli, S., & Fenyiwa Amonoo-Kuofi, E. (2019) the Consortium for Evaluation and Instructing of 21st Century Abilities (AT21CS) moreover gotten the same discoveries. The significance of having the capacity to unravel issues as an expertise to confront this competitive period requires instructors and schools to alter learning designs. Creating issue understanding capacities must begin from changing the student's part in learning from a detached learner to a dynamic learner.

The reality that happens within the field is that students' capacity to reply to questions with reasons, inquire questions when they do not get it the fabric is still missing, as well as when understudies are inquired to analyze a issue, conclude issues, and talk about issues that are still missing. This fact supports the researchers' initial findings which found that only around 47.8% of elementary school students at SDN 05 Binanga Dua class IV still had not achieved the minimum completeness criteria score (≥70) in the previous semester's science exam. Students still experience difficulties in determining and solving the problems they experience related to science learning material. This can be since there are still numerous understudies who as it were memorize concepts and are less able to utilize these concepts in case they experience issues in their lives related to the concepts they have, understudies are indeed less able to decide issues and define them (Trianto, 2009; Wijayanti, A, 2018).

Educating materials play an imperative part in guaranteeing the viability of educating and learning exercises, one of which is understudy worksheets (Pertiwi, J W., Solfarina., & Langitasar, I. 2021). In this manner, it is regarded essential to create understudy worksheets that's adjusted to the conditions and needs of understudies. In an exertion to create problem-solving capacities, instruction nowadays ought to lead to a learning handle that emphasizes natural problems. The arrangement that's considered fitting to overcome the issue over is to utilize an suitable learning approach and educating materials so as to energize understudies to create a logical demeanor in basic considering. This STEM approach is an approach that alludes to the four components of science, specifically information, innovation, designing and arithmetic. The STEM approach is an integration of science, technology, designing, and arithmetic learning that's suggested to cultivate victory in 21st century aptitudes. (Brown, et al, 2011; Pertiwi, J W., Solfarina., & Langitasar, I. 2021; Irfana, S., D, Y., & Wijayanto, 2018). The STEM learning approach gives openings for instructors to appear understudies that concepts, standards, science, innovation, engineering and arithmetic are utilized coordinating way within the improvement of items, forms and frameworks utilized in their everyday lives (Zamista, A. A., 2018).

Based on the depiction of the issue, it is essential to conduct inquire about on the improvement of STEM (Science, Innovation, Engineering, and Arithmetic) based science worksheet to move forward the problem-solving capacities and learning results of lesson IV understudies at SDN 05 Binanga Dua, particularly on drive and movement fabric.

RESEARCH METHODS

This advancement inquire about was carried out at UPTD SD Negeri 05 Binanga Dua, Silangkitang Area, South Labuhanbatu Rule. In terms of period, the investigate was conducted on Course IV understudies within the indeed semester of the 2022/2023 scholastic year within the science subject fabric powers and movement of objects. The subjects in this inquire about were 22 Course IV understudies at UPTD SDN 05 Binanga Dua. In the meantime, the protest of this inquire about is the advancement of understudy worksheets based on Science, Innovation, Numerical Building (STEM) which were created by analysts. This sort of investigate is carried out utilizing the Inquire about and Advancement (R&D) strategy. Improvement is inquired about that can deliver unused items which are at that point created into a specific item and tried for viability. The definitions of the factors contained in this inquire about are:

1. The capacity to illuminate issues is one of the considering aptitudes that understudies have to be have by giving coordinate encounter in way of life so that it can increment students' capacities in developing, understanding and applying the concepts that students have learned.
2. Learning results are benchmarks or benchmarks that decide the level of victory of understudies in knowing and understanding subject matter from the method of their learning encounter as measured by tests.
3. The understudy worksheets that will be created for each fabric displayed has coordinates STEM in arrange to move forward students' problem-solving capacities.

This inquires about alludes to the ADDIE advancement show. This show comprises of five stages, to be specific Analyze, Plan, Advancement, Usage, and Assessment (Sani et al, 2018).

RESULTS AND DISCUSSION

Development of STEM-based student worksheets in class IV UPTD SDN 05 Binanga Dua

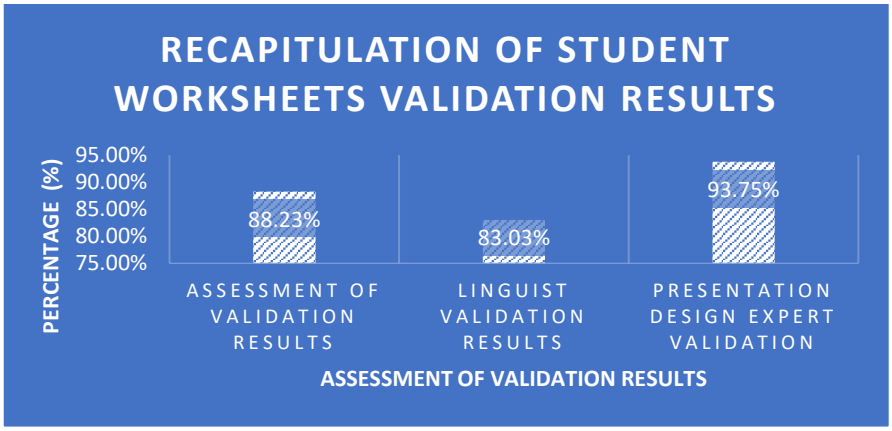

Figure 1. Recapitulation Diagram of Worksheet Students Validation Results

The diagram above shows that the assessment of expert validation results (material, language and presentation design) on STEM-based worksheet students has the criteria to be worthy of being tested in the field with a percentage that is not too significant. The highest rating was from design experts with a percentage of 93.75% and was categorized as very feasible. Then, the assessment of material experts with a percentage of 88.23% was categorized as very feasible. Meanwhile, the lowest percentage score for language experts was 83.03% and was categorized as very decent, and the average percentage score of three expert validations reached a score of 88.33% which was very decent.

Based on the result about of the educator needs investigation, it can be concluded that the advancement of STEM-based worksheet understudies is truly required by instructors and understudies within the learning handle. The comes about of verbal interviews with course IV lesson instructors expressed that the educating and learning prepare required STEM-based learning materials to bolster the learning handle and the lesson instructor expressed that the instructing materials utilized by the educator were pictures and the instructor also used instructing materials within the frame of educator handbooks and understudy. The lesson instructor moreover uncovered that the media utilized by the course educator was in fact less successful and as it were negligible. Based on the teacher's perceptions, there were still numerous understudies who made botches and did not get it when learning in course.

Development of learning materials in STEM-based worksheet students as well as data obtained from formative evaluations are collected and interpreted to solve difficulties faced by students. Not only that, in short of the evaluation results are used to revise learning to make it more effective. In developing STEM-based worksheet students on force and motion of objects, basic competencies and learning objectives will be included. In making STEM-based worksheet students, the Canva application was used. The topics presented in STEM-based worksheet students are material on life events accompanied by questions to deepen the material.

Based on the research results, it shows that it is very relevant to the needs of teachers and students. Because the teaching materials developed have been adapted to student needs. After it is developed, it is sent to experts for validation. When developing STEM-based worksheet students, revision notes were obtained by material experts, namely: (1) On the Indonesian language material so that the content of the material is further explained; (2) Correct the writing punctuation to make it neater. Meanwhile, revision notes from design experts are: (1) Improvements to adjust the learning design systematics. Then revision notes by material experts, namely: (1) correct writing errors; (2) in the force and motion material section, the explanation needs to be improved in a simple way and according to students' understanding. After receiving input from all experts, improvements will be made to the worksheet students.

Based on the inquire about comes about, it appears that it is exceptionally important to the wants of instructors and understudies. Since the educating materials created have been adjusted to understudy needs. After it is created, it is sent to specialists for approval. When creating STEM-based worksheet understudies, amendment notes were gotten by fabric specialists, to be specific: (1) On the Indonesian dialect fabric so that the substance of the fabric is assist clarified; (2) Correct the composing accentuation to form it neater. In the meantime, modification notes from plan specialists are: (1) Changes to alter the learning plan systematics. At that point amendment notes by fabric specialists, specifically: (1) redress composing mistakes; (2) within the drive and movement fabric area, the clarification must be progressed in a basic way and concurring to students' understanding. After accepting input from all specialists, enhancements will be made to the worksheet understudies.

After repairs have been carried out and given to specialists, the worksheet understudies is appropriate for utilize. It didn't halt there, it was given to lesson IV instructors at UPTD SDN 05 Binanga Dua, Silangkitang Area to reply it and the comes about were reasonable for utilize. At that point, its fabric on the subject of constrain and movement of objects was tried in little bunches of 9 individuals to discover out the qualities and shortcomings of them and the comes about were that everything went easily and there were no impediments or issues when understudies utilized it from the little gather trial and no have to be reexamine. After the little gather test, a expansive bunch test of 22 individuals will be carried out and the comes about are that everything runs easily and there are no deterrents or issues when understudies utilize it from the expansive bunch trial and there's no require for assist corrections. Their media on constrain and movement of objects is substantial and can be spread broadly.

Possibility Test Comes about for Creating STEM-Based Worksheet Understudies on Drive and Movement Fabric at SDN 05 Binanga Dua

Possibility of their items with respect to drive and movement of objects utilizing three specialists for the approval handle of it that has been created. The areas that are approved are fabric, dialect and learning plan (introduction) that have been revalidated. It was found that the comes about of the fabric master gotten a score rate of 88.23%, counting the "Exceptionally Not too bad" category. Plan specialists gotten a rate score of 93.75% counting the "Exceptionally Conventional" category. Etymologists gotten a rate score of 83.03%, counting the "Exceptionally Conventional" category. After all the specialists expressed that it was substantial and commendable of being tried.

An instructor and understudy reaction survey were given to decide the suitability level of the instructing materials being created. The comes about of educator reactions to stem-based worksheet understudies were 88.75% with exceptionally doable criteria. This appears that the worksheet understudies created can meet the requests of the learning needs that will be instructed to understudies in course. Separated from that, it is fitting in terms of substance, dialect, introduction and utilize, making it less demanding for instructors to communicate learning.

Table 1. Questionnaire Results and Teacher Responses

No.	Indicators	Assessment Score Result	
		Teacher I	Teacher II
1.	The material presented is in accordance with KD	4	4
2.	Contains the learning objectives to be achieved	3	3
3.	The order of material and presentation is logical or systematic	3	4
4.	The material presented is related to everyday life.	4	3
5.	The pictures presented are quite interesting and support the objects described	4	3
6.	The language used is easy for students to understand	4	4
7.	The student worksheet created is quite interesting and encourages students to study at school or at home	3	4
8.	The material presented is able to make students active in studying alone or in groups	3	3
9.	Practice questions are presented to strengthen conceptual understanding of the material	4	4

10.	The practice questions are presented complete with working instructions	3	4
	Total	35	36
	Percentage	87,5%	90%
	Average	88,75%	
	Criteria	Very Well	Very Well

In Table 1 it is known that the results of validation by 2 class IV teachers, the first obtained a score of 35 percentage 87.5% with very practical criteria and the second teacher with a score of 36 percentage 90% with very practical criteria. Based on these results, it can be concluded that the teaching materials in the form of them that were developed are in the criteria of being very practical to use as teaching materials for students.

Table 2. worksheet students and Students' Responses

No	Students Code	Total Score	Respond Average	Criteria
1	AP	34	3.78	Interested
2	AG	26	2.89	Less Interested
3	AV	30	3.33	Interested
4	CR	31	3.44	Interested
5	BG	24	2.67	Less Interested
6	BY	33	3.67	Interested
7	DP	27	3	Interested
8	ET	30	3.33	Interested
9	EG	31	3.44	Interested
10	ES	29	3.22	Interested
11	FI	24	2.67	Less Interested
12	GP	22	2.44	Less Interested
13	HS	29	3.22	Interested
14	IE	34	3.78	Interested
15	JG	30	3.33	Interested
16	KS	35	3.89	Interested
17	KC	23	2.56	Less Interested
18	MA	32	3.56	Interested
19	MG	34	3.78	Interested
20	MZ	31	3.44	Interested
21	NK	28	3.11	Interested
22	RA	34	3.78	Interested
Average			3.28	Interested

Table 2 shows that the majority of students are interested in the worksheet students, 17 out of 22 students feel interested in that, while only 5 out of 22 students feel less interested. Based on the average respondent score, 3.28 was obtained in the "Interested" category.

The student response questionnaire was filled in by 22 UPTD class students at SDN 05 Binanga Dua at the end of the implementation phase. The comes about of understudy reactions to STEM-based one with a normal rate come to 88.47% with exceptionally doable criteria. This appears that the one created can meet the requests of learning needs that are coordinates within the STEM approach. Shiva is inquisitive about the numerous exercises

that utilize fabric related to standard of living and contain a assortment of curiously pictures. Hence, STEM-based one is reasonable for lesson IV understudies at UPTD SDN 05 Binanga Dua.

Practicality of STEM-Based Worksheet Students for Class IV Students of UPTD SDN 05 Binanga Dua

In the Big Indonesian Dictionary (KBBI), the word practical means easy and easy to use. In this inquire about, an investigation of the common sense of the module was gotten through an perception sheet on the execution of the module and understudy reactions. Fatmawati (2016) expressed that the common sense of learning apparatuses is decided through examination of understudy reaction evaluations, as well as the usage of learning. The students' reactions point to decide the common sense of learning devices from the viewpoint of understudies as investigate subjects. Segening, Cokorde P (2022) expressed that learning execution examination points to decide the common sense of learning devices through coordinate perception by two eyewitnesses. These perceptions are surveyed from the teacher's capacity to oversee learning, as well as students' exercises amid learning.

Table 3. Description of Observation Results of Learning Implementation Using Worksheet Students

Aspects	Questions	Average Learning Score
Learning steps	Implementation of activities to understand STEM-based problems	3
	Implementation of activities explaining STEM-based problems	3
	Implementation of solving STEM-based problems	3
	Implementation of activities to compare and discuss answers	3
	Implementation of activities to draw conclusions	4
Social systems in learning	Creation of a democratic atmosphere	3
	Students collaborate in learning	4
	The teacher reminds students to work together	3
	Transactional communication between students and between teachers and students	3
Principle of management reaction	Teachers provide opportunities for students to ask questions, collect ideas freely and openly	3
	Teachers provide and manage relevant learning resources	3
	Teachers provide limited assistance to students who need it or who are experiencing difficulties	2
	Teachers respect students' opinions and encourage students to think creatively	3
	Teachers do not tend to position themselves as learning resources but give students freedom to express their opinions	3

	The teacher directs students to be able to construct knowledge	3
Total Score		46
Average Trial Score 1		3,06
Category		**Well Done**

Based on table 3, it can be seen that the average score for observing learning implementation with it developed is in the "Well Implemented" category with a score of 3.06. This score meets the success criteria for the practicality and feasibility of them in terms of learning implementation.

Through the learning implementation observation sheet using stem-based worksheet students which was developed and carried out at each meeting, the result was that the learning implementation observation score was in the "Well Implemented" category with a score of 3.06. This score meets the criteria for successful practicality of them in terms of learning implementation.

They developed in this research is said to be practical if the average learning implementation is at least in the "Well Implemented" category. So that through the results of the observation sheet on the implementation of learning to use them which was developed and carried out at every meeting, the results of them developed were declared practical. because it is in the "Well implemented" category with a final score of 3.06. This score meets the criteria for successful practicality of them in terms of learning implementation.

Practicality is seen from student responses. This student response data aims to see the extent of interest and feelings of enjoyment. Up to date and easy to understand the modules being developed. Student response data was obtained from a questionnaire which was analyzed based on percentages. The questionnaire given was in the form of questions regarding students' interest in used.

Based on the results of the student response questionnaire, it can be concluded that the student responses to it developed were effective. This module can attract students' attention so that students are interested in studying it, one of which is due to the attractive design and images in the module developed. Prastowo (2011: 124) states that very supportive images are needed in making the module because they add to the attraction and reduce student boredom in studying it.

Effectiveness of STEM-based Worksheet Students for Grade IV Students of UPTD SDN 05 Binanga Dua

STEM-Based Worksheet Students in Small Group Trials

Table 4. Student Learning Results Using STEM-Based Worksheet Students in Small Group Trials

Score (x)	Pretest			Nilai (x)	Postest		
	Frequency (f)	(x.f)	Percentage		Frequency (f)	(x.f)	Percentage
15	1	15	11%	65	2	130	22%
25	1	25	11%	70	1	70	11%
30	1	30	11%	75	3	225	33%
35	2	70	22%	80	1	80	11%
45	2	90	22%	85	1	85	11%

50	2	100	22%	90	1	90	11%
Total	**9**	**330**	**100%**	**Total**	**9**	**680**	**100%**
Average	**36,66**		**-**	**Average**	**75,55**		**-**

Based on Table 4, data shows that the learning outcomes before using STEM-based Worksheet Students and the changes in the small group test were with an average score of 36.66 with the criteria "Insufficient" meaning that the score achieved by students needs to be improved further. Meanwhile, student learning outcomes after using STEM-based student worksheets and changes in small group tests with an average score of 75.55 were "Good" criteria. It can be said that the use of STEM-based worksheet students has increased significantly.

The increase in learning outcomes using STEM-based worksheet students for small groups can be calculated using the gain score.

$$g = \frac{(gain)}{(gain)_{max}} = \frac{(posttes)-(pretes)}{100-(pretes)}$$

$$g = \frac{75,5-36,6}{100-36,6}$$

$$g = \frac{38,9}{63,4}$$

$$g = 0,61$$

Based on the test results, it can be concluded that the increase in STEM-based Worksheet Students student learning outcomes from small group class trials increased by 0.61, which is in the g ≥ 0.7 range, which can be classified in the "High" category. The trend level can be seen in Table 4.20 below:

Tabel 5 . Criteria for Improving Learning Outcomes

No	Score	Category
1.	g < 0,3	Low
2.	0,3 ≤ g < 0,7	Mean
3.	g ≥ 0,7	High

To see an increase in student learning test results on them, small groups were tested in Figure 5 as follows:

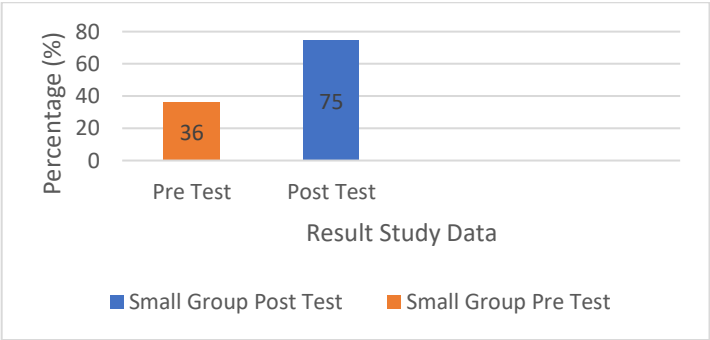

Figure 2. Diagram of Improvement of Small Group Learning Results Tests

Product Effectiveness in Large Group Field Trials

After conducting field trials on small groups and there was improvement. So, the researchers conducted a field trial on 22 students in large groups. The results of trials in large groups were carried out in the learning process before and after using them in science lesson content. The following are the student learning outcomes in Table 6 below:

Table 6. Student Learning Results Using STEM-Based Worksheet Students in Field Trials

Score (x)	Pretest			Score (x)	Posttest		
	Frequency (f)	(x.f)	Percentage		Frequency (f)	(x.f)	Percentage
50	4	200	18%	75	3	225	14%
60	6	360	27%	80	7	560	32%
70	5	350	23%	85	3	255	14%
80	4	320	18%	90	3	270	14%
90	2	180	9%	95	2	190	9%
100	1	100	5%	100	4	400	18%
Total	**22**	**1510**	**100%**	**Total**	**22**	**1900**	**100%**
Average	**68,63**			**Average**	**86,36**		

Based on table 6, data shows that the learning outcomes before using STEM-based worksheet students were with an average score of 68.63 with the criterion "Poor" meaning that learning needs to be increased in large groups. Meanwhile, student learning outcomes after using them were with an average score of 86.36 with "Very Good" criteria. So, it can be concluded that there was a very good increase in large group field trials.

The increase in learning outcomes in the control class on the theme of events in life can be calculated using the gain score.

$$g = \frac{(gain)}{(gain)_{max}} = \frac{(posttes)-(pretes)}{100-(pretes)}$$

$$g = \frac{86{,}3-68{,}6}{100-68{,}6}$$

$$g = \frac{17{,}7}{39{,}4}$$

$$g = 0{,}44$$

Based on the test results, it can be concluded that the increase in STEM-based worksheet students student learning test results on the material of force and motion of objects from the control class trial increased by 0.44, which is in the range of $0.3 \leq g < 0.7$, which can be classified in the "Medium" category". The trend level can be seen in Table 7 below:

Table 7. Criteria for Improving Learning Outcomes

No	Score	Category
1.	$g < 0{,}3$	Low
2.	$0{,}3 \leq g < 0{,}7$	Mean
3.	$g \geq 0{,}7$	High

To see the increase in student learning test results on STEM-based worksheet students in field trials in Figure 4.8 as follows:

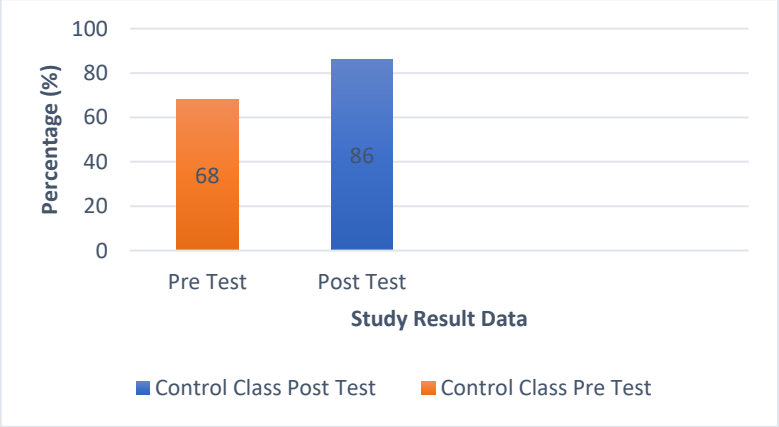

Figure 3. Diagram of Improvement of Field Trial Learning Outcome Tests

When the student worksheet developed has been declared feasible, it can be applied to determine the increase in problem-solving abilities and student learning outcomes by using an assessment of student performance or activity skills after using the worksheet students.

The comes about of the gain score test or the increment within the normal score of course IV understudies at UPTD SDN 05 Binanga Dua within the posttest evaluation after utilizing the worksheet understudies had tall criteria, specifically 88 compared to the pretest appraisal score some time recently utilizing it of 54 with medium criteria. This shows that there has been an increment within the learning results of UPTD course understudies at SDN 05 Binanga Dua with a pick-up score of 0.575 with direct viability criteria so it can be concluded that STEM-based worksheet understudies instructing materials for lesson IV understudies at UPTD SDN 05 Binanga Dua can be said to be successful in utilize. It is supported by the previous research (Khairani, L. A., Djulia, E., & Bunawan, W., 2023). the field trial phase The effectiveness criteria are achieved with the number of students reaching 28 people in the post-test or around 93,33% with the results of the gain score classified in the "medium" effectiveness criteria with a score of 0.54 so that interactive multimedia based on STEM is effective for use

CONCLUSION

Based on the comes about of the inquire about that has been carried out, conclusions can be drawn, to be specific:

1. The development of STEM-based worksheet understudies, approved by master teachers such as teachers within the perspectives of dialect appropriateness, fabric reasonableness, and plan reasonableness, is anticipated to bolster the learning prepare. It was found that the comes about of the fabric master gotten a score rate of 88.23%, counting the "Exceptionally Better than average" category. Plan specialists gotten a rate score of 93.75% counting the "Exceptionally Not too bad" category. Etymologists gotten a rate score of 83.03%, counting the "Exceptionally Not too bad" category. After all the specialists expressed that it was substantial and commendable of being tried.
2. The created STEM-based worksheet Understudies meets the desired adequacy criteria. Based on the comes about of the N-gain score test or the increment within the normal score of course IV understudies at UPTD SDN 05 Binanga Dua within the post-test evaluation after utilizing the worksheet understudies, it had tall criteria, specifically 88 compared to the pretest evaluation score some time recently utilizing

it of 54 with medium criteria. This appears that there has been an increment in learning results for lesson UPTD SDN 05 Binanga Dua understudies with an N-gainscore esteem of 0.575 with direct viability criteria so it can be concluded that STEM-based worksheet understudies instructing materials for lesson IV students at UPTD SDN 05 Binanga Dua can be said to be successfully utilized.

3. Based on the comes about of the reaction survey by 2 course IV instructors, the primary scored 35 rate 87.5% with exceptionally down to earth criteria and the second teacher scored 36 rate 90% with exceptionally down to earth criteria. Based on these comes about, it can be concluded that the educating materials within the shape of STEM-based worksheet understudies that were created are within the criteria of being exceptionally viable to utilize as educating materials for understudies. In the interim, based on the normal understudy reaction, it was 3.28 within the "Interested" category. So, it can be concluded that understudies are "Inquisitive" about the worksheet understudies being created.

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