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STEM-Based LKPD Development and Contextual Problems to Improve Explanation, Concluding, and Evaluating Skills

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Abstract

Explanation, inference, and evaluation skills are part of HOTs (High Order Thinking Skills) that are useful in the future to face life's challenges. The three skills can be trained using teaching materials that are integrated with the approach during learning. One comprehensive and integrative learning approach is the STEM approach. This approach can improve students' explanation, inference, and evaluation skills. The implementation of STEM in teaching and learning activities can use teaching materials, one of which is LKPD. This study aims to produce a valid, practical, and effective STEM-based LKPD product to improve students' explanation, inference, and evaluation skills. The method used in this study is the research and development method. A validity test has been carried out consisting of a product validity test that is declared valid and suitable for use with a percentage of 80.9%. Practicality tests conducted by teachers obtained an average result of 83% and students of 87%. The effectiveness test is carried out with an n-gain test and an effect size test. Each of them obtained a result of 0.68 in the medium category and 2.7 in the high category. So, it can be concluded that STEM-based LKPD is effective in improving students' explanation, inference, and evaluation skills.

Kata kunci: LKPD, STEM approach, Explanation, Inference, Evaluation

Pengembangan LKPD Berbasis STEM dan Masalah Kontektual untuk Meningkatkan Keterampilan Menjelaskan, Menyimpulkan, dan Mengevaluasi

Abstrak

Keterampilan eksplanasi, inferensi, dan evaluasi ,merupakan bagian dari HOTs (High Order Thinking Skills) yang berguna untuk menghadapi tantangan kehidupan. Ketiga keterampilan tersebut dapat dilatih menggunakan bahan ajar yang terintegrasi dengan pendekatan selama pembelajaran. Salah satu pendekatan pembelajaran yang bersifat komprehensif dan integratif adalah pendekatan STEM. Pendekatan tersebut mampu meningkatkan keterampilan eksplanasi, inferensi, dan evaluasi siswa jika didukung dengan bahan ajar salah satunya adalah LKPD. Penelitian ini bertujuan untuk menghasilkan produk LKPD berbasis STEM yang valid, praktis, serta efektif untuk meningkatkan keterampilan eksplanasi, inferensi, dan evaluasi siswa. Metode yang digunakan dalam penelitian ini adalah metode research and development. Telah dilakukan uji validitas yang terdiri atas uji validitas produk yang dinyatakan valid serta layak digunakan dengan persentase 80,9%. Uji kepraktisan yang dilakukan guru diperoleh hasil rata-rata 83% dan siswa sebesar 87%. Uji efektivitas dilakukan dengan uji n-gain

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dan uji effect size. Masing-masing diperoleh hasil 0,68 dengan kategori sedang dan 2,7 dengan kategori tinggi. Sehingga dapat disimpulkan bahwa LKPD berbasis STEM efektif dalam meningkatkan keterampilan eksplanasi, inferensi, dan evaluasi siswa.

Kata kunci: LKPD, Pendekatan STEM, Eksplanasi, Inferensi, Evaluasi.

INTRODUCTION

Learning in the 21st century is expected to be able to produce quality human resources, have skills, and be ready to compete which is summarized in HOTs (High Order Thinking Skills) (Agustine *et al.*, 2020; Mushthofa *et al.*, 2021). HOTs consist of critical thinking and creative thinking skills (Angkol *et al*., 2017). Explanation, inference, and evaluation skills are part of critical thinking skills. Explanation skills train students to cultivate reasoning thinking (Agnafia, 2019), Inference skills train students to estimate solutions and draw conclusions on problems (Marisda *et al*., 2022), and evaluation skills familiarize students with reflective thinking (Priyadi *et al*., 2018).

Students' critical thinking skills are needed in everyday life because life's problems will be much more complicated, complex, and heavy over time so critical thinking skills are needed in solving these problems (Agustine *et al*., 2020; Mushthofa *et al.*, 2021). Critical thinking skills are recognized as supporting the success of working, studying or living in the present or future era (Setyawati *et al*., 2020). Reporting from Mushthofa *et al.*, (2021) dan Ruku & Purnomo (2020) that students who have good critical thinking skills will easily provide reasonable reasoning so that it is easier to understand the various difficulties in the subject matter. Therefore, critical thinking skills need to be trained through the learning process (Fadlina *et al.*, 2021).

The learning process that can train students' critical thinking skills can be applied through comprehensive learning (Santoso & Mosik, 2019) and integrative (Shabila *et al*., 2020). One of the comprehensive and integrative learnings is the STEM approach. STEM (*Science*, *Technology*, *Engineering*, *and Mathematics*) is a comprehensive and blending approach across four disciplines (Simatupang *et al*., 2019). The fusion of the four disciplines used is interdisciplinary. Existing problems or phenomena are solved through four interconnected disciplines (Sudikan, 2015).

STEM approaches applied in learning according to Novidya & Kustijono (2019) can hone critical thinking skills that include interpretation, analysis, explanation, inference, and evaluation of students. The improvement of Explanation, inference, and

evaluation skills is due to a STEM approach that combines all four disciplines to provide opportunities for students to identify and analyze arguments, solve a problem, conduct an evaluation, investigate a thing (Davidi *et al*., 2016) and draw a conclusion (Mushthofa *et al*., 2021). Thus, it can be concluded that the four aspects of STEM can hone Explanation, inference, and evaluation skills. To improve the Explanation skills, inference, and evaluation of students through a STEM approach, teachers will use various kinds of teaching and learning assistance during the teaching and learning process, one of which is LKPD. LKPD is useful for cultivating students' thinking skills and activities, for example analyzing observational data (Shabila *et al*., 2020). The use of LKPD is expected to be able to develop material concepts and learn independently (Aprilianti & Astuti, 2020).

The implementation of the STEM approach in learning, one of which is in the form of LKPD so that students are trained to identify problems according to what is given (Arrohman *et al*., 2022). STEM-based LKPD has an influence on cognitive and affective aspects of students (Santoso & Mosik, 2019) and encourage students to build an ethical attitude in critical thinking, deep thinking to solve problems, and understand the concept of science and its relationships in everyday life (Simatupang *et al.*, 2019).

Based on the results of observations made during an internship at SMPIT Ihsanul Fikri, Magelang City, it was found that the learning tools in science subjects used in general already refer to the 2013 curriculum. The teaching materials used are not varied because teachers only search the internet. This situation has an impact on students who are less enthusiastic in participating in learning. Then, the existing LKPD has not stimulated Explanation, inference, and evaluation skills, and has not integrated STEM. Critical thinking skills that include interpretation, analysis, explanation, inference, evaluation, and self-regulation affect learning outcomes. According to the research (Rasyidi, 2020) which states that critical thinking skills and learning outcomes have a positive and significant relationship. If explanation, inference, and evaluation skills increase, learning outcomes also increase. So, it can be concluded that the explanation skills, inference, and evaluation of students at SMPIT Ihsanul Fikri, Magelang City have not been maximized.

Seeing these problems, it provides encouragement for researchers to innovate teaching materials that integrate Explanation, inference, and evaluation skills according to student needs. Remembering, Explanation skills (Fithri *et al*., 2021), inference

(Hasanah *et al.*, 2021), and evaluation (Sayekti & Suparman, 2019) students can be effectively improved using STEM-based LKPD. So, researchers are interested in developing teaching materials in the form of STEM-based LKPD which are used in the learning process on dynamic electrical materials. So, the author is interested in developing teaching materials in the form of STEM-based LKPD which are used in the learning process on dynamic electrical materials. Furthermore, the purpose of this development research is to produce STEM-based LKPD products that are valid, interesting, easy, useful, and effective for improving students' explanation, inference, and evaluation skills, especially in dynamic electrical materials.

RESEARCH METHODS

This research is development research with the ADDIE model that aims to develop STEM-based student worksheets (LKPD) to improve the skills of explanation, inferring, and evaluation students. The skills of explanation, inference, and evaluation are part of the indicators of the ability to think according to Ennis. According to Sugiyono (2015), this development model consists of five stages which include Analysis, Design, Development, Implementation, and Evaluation, where the evaluation stage is part of each stage. The stages of product development can be illustrated in figure 1.

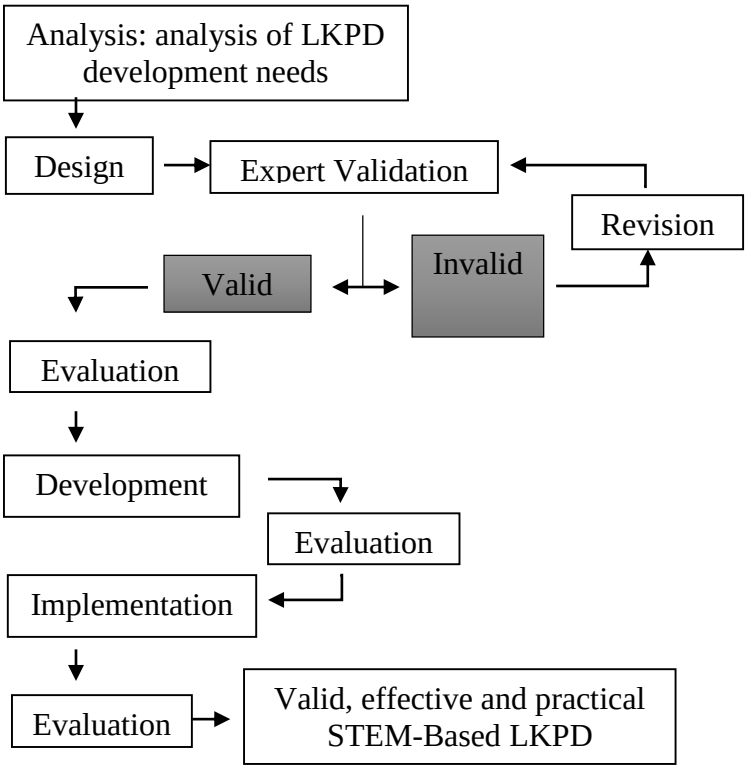

Figure 1. Product Development Flow

Based on Figure 1, the analysis stage is carried out by analyzing the product needs needed by students and teachers and analyzing the curriculum to select and compile material to be contained in STEM-based LKPD. Interviews were conducted to explore information on the form of teaching materials used in schools. Through these interviews, the fact was obtained from the field that teachers have not developed teaching materials independently. LKPD, modules and handouts used are obtained from downloading on the internet. The criterion on which the selection of teaching materials used is in accordance with the material in the package book. In addition to interviews, observations of learning in schools were also carried out, where it was found that students tend to be less enthusiastic in learning because the teaching materials used are monotonous.

Based on the findings in the analysis stage, a STEM-based LKPD was designed. the LKPD structure arranged includes: 1) cover pages; 2) table of contents; 3) instructions for use; 4) core competencies and basic competencies; 5) indicators; 6) learning objectives; 7) student activities; and 8) evaluation questions and 9). LKPD design is carried out by taking into account aspects of the validity and practice of LKPD which include aspects of content feasibility, language, presentation and graphics or images. Student activities in LKPD pay attention to the application of STEM approaches in learning as well as components of the ability to explain, infer and evaluate. In the LKPD design process, dynamic electrical material is determined, because the material is considered relevant to the STEM approach.

STEM-based LKPD that has been designed, is then validated to media experts and material experts. Media experts and material experts who are used as validators are 1 science education lecturer and 1 high school physics teacher. Validation questionnaires are compiled based on LKPD validity indicators and use a likert scale. The validation questionnaire data is then analyzed using the following equation:

$$P = \frac{\sum SD}{\sum SM} \; x \; 100\%,$$

Table 1. Category of STEM-based LKPD Eligibility Results

Category	Percentage
Highly Valid or can be used without revision	$85.01\% \leq P \leq 100\%$
Valid or can be used with minor revisions	$70.01\% \leq P \leq 85\%$
Invalid or requires major revisions and is recommended not to be used	$50.01\% \leq P \leq 70\%$
Invalid or should not be used	$1\% \leq P \leq 50\%$

Source: Akbar (2013)

After the STEM-based LKPD developed is declared valid, then a trial stage is carried out for students to determine the effectiveness of LKPD in improving the ability to explaination, inference, and evaluation students. The trial was carried out at SMP IT Ikhsanul Fikri, Magelang City, with a research sample of 26 grade IX students determined through a purposive sampling process based on relatively the same daily test scores. trials conducted following the design *One Group pretest-posttest.*

Pretest – use of STEM-based LKPD - Posttest

Pretest and Posttest questions are 6 points of description of dynamic electricity that have been tested for validity and reliability. The validity of the question is obtained through expert validity with a validity value of 80% which is included in the valid category and reliability is carried out by the *Alpha's Cronbach* method with an Alpha coefficient value of 0.808 which is included in the reliable category.

In the trial process, LKPD practicality measurements were also carried out to teachers and students using practicality questionnaires. The practicality questionnaire used is prepared based on the LKPD practicality indicator and the Likert scale. D or the pretest and posttest values of the next trial stage are analyzed through several stages, namely: 1) prerequisite test; 2) different test; 3) N – Gain test and 4) effect size test. Prerequisite tests are carried out to determine the normality and homogeneity of the data. if the distributed data is normal and homogeneous, then a different test is performed with a t-test. In this study, the normality test used using the *Shapiro-Wilk* test and the homogeneity test using the F test.

Table 2. N-Gain Value Criteria

Criteria	Score/Result
$g \geq 0,7$	High
$0,7 > g \geq 0,3$	Medium
$g < 0,3$	Low

Source: Hake (2019)

Table 2 is used to determine the category of how much the level of explanation, inference, and evaluation abilities of students is affected by the use of LKPD through the N-Gain test analysis.

Table 3. Effect Size Criteria

Effect Size	Category
$D < 0,2$	Low
$0,2 < d < 0,8$	Medium
$D > 0,8$	High

Source: Yuberti & Saregar (2017)

Table 3 is used to categorize the effectiveness of STEM-based worksheets on students' explanation, inference, and evaluation skills. STEM-based LKPD practicality test was conducted to determine the responses of teachers and students to the practicality of the product. After the data were analyzed using the Likert scale method, results were obtained that showed the LKPD category. These categories can be described in the following table 4.

Table 4. Teacher and Student Practicality Test Categories

Category	Percentage
Very Practical	80% - 100%
Practical	60% - 79%
Pretty Practical	40% - 59%
Less Practical	20% - 39%
Impractical	0% -19%

Student activities are structured by considering the application of STEM approaches in learning as well as components of the ability to explanation, inference, and evaluation. The components that really need to be considered in the skill of explaining according to (Alma, 2009: 15), namely: a. Clarity which includes: 1) Clarity of language use fluently. 2) Clarity in stating an idea explicitly. 3) Attempts to avoid blurring. b. Illustration and examples: Illustration is a depiction of the idea that has been conveyed, its function is to clarify the idea so that it does not cause vague interpretations. Examples are given to concrete the illustrations given; their function is to avoid the occurrence of verbalism. For that it is necessary to note, simplicity, clear and concrete, in harmony with the level of experience. c. Emphasis. Emphasis is carried out in the form of: the use of variations including, sound (tone, volume or tone), gestures (symbols, movements) and the use of teaching media / resources. Affirmation or direction, among others, can be done by repetition, summarizing / resuming and conclusion which is usually done at the end of each thing conveyed and affirmation using keywords. d. Feed-Back. This is done with several intentions or interests: 1) As a simple evaluation. 2) Create new situations and foster interest in learning. Ways that can be done include reviewing student understanding, assessing student interests, controlling student attitudes and behaviors.

Indicators from the aspect of inferring skills according to Ennis in Costa (1991) include 3 indicators namely: 1) Deducing and considering the results of deduction, consisting of logical group sub-indicators, conditioning logic and interpretation of statements / expressing interpretations. 2) Induce and consider the results of induction,

consisting of sub-indicators generalizing, putting forward conclusions and hypotheses, putting forward hypotheses, designing experiments, drawing conclusions based on facts, and drawing conclusions from the results of investigating. 3) Create and determine the value of considerations / decisions, consisting of sub-indicators of making and determining the results of considerations based on the background of the facts, making and determining the results of considerations based on the effect, create and determine the results of considerations based on the application of facts/concepts, and make and determine the results of considerations of balance and problems.

According to Sudaryono (2012:54-56) there are several things that need to be considered in conducting evaluations. The good evaluation procedures followed, and the perfection of the evaluation techniques applied, if they are not combined with the supporting principles, then the results will be less than expected. There are at least seven principles that must be considered, which in essence are supporting factors in conducting a successful evaluation. The seven evaluation principles are the principle of continuity, the principle of comprehensiveness (comprehensive), the principle of objectivity (objectivity), the principle of validity (validity) and reliability (reliability), the principle of using criteria, and the principle of usability.

RESULTS AND DISCUSSION

The feasibility of STEM-based LKPD is obtained based on validity tests conducted by validators with 3 aspects of assessment, namely content aspects, presentation aspects, and linguistic aspects. The following Table 5 shows the results of validator assessments.

Table 5. Validator Assessment Results

Assessment aspects	∑Average	Percentage (%)	Category
Content Aspects	4,10	82%	Valid
Presentation Aspects	3,71	74%	Valid
Linguistic Aspects	4,40	88%	Valid
Sum of all scores	**4,04**	**80,9%**	**Valid**

Based on table 5, STEM-based LKPD in the linguistic aspect has the highest percentage with 88%, followed by the content aspect with 82%, and 74% for the presentation aspect. The results of the overall assessment of STEM-based LKPD by the two validators obtained an average of 4.04 equivalent to an eligibility percentage of 80.9% so they are included in the valid category or can be used with minor revisions. Here's a look at STEM-based LKPD.

Figure 2. Cover Page

Figure 3. Example of LKPD contents

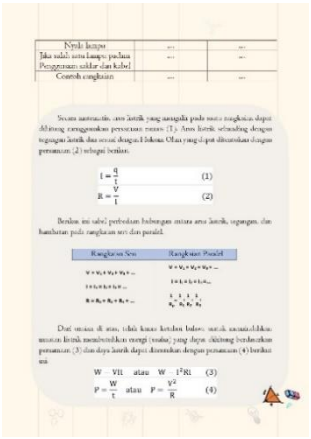

Figure 4. Example of LKPD contents

Figure 5. Example of LKPD contents

Figure 1 is the cover of the LKPD providing information that in its preparation it takes into account STEM and contextual issues. Figures 2, 3, and 4 provide information about the contents of the LKPD which are questions guiding students to construct their own concepts. Students' critical thinking in concluding, explaining, and evaluating will be assisted by the use of contextual problems in each concept that must be understood by students. In accordance with the results of Cahyono (2021) research which states that critical thinking in argumentation (the result of concluding, explaining and evaluating) can be fostered by learning that is based on contextual problems.

The presentation aspect gained a percentage of 74% with valid categories. Aspects of the presentation include the completeness of the LKPD, the collapse and clarity of the LKPD proposal, the consistency of the layout, and the attractiveness of the appearance of the LKPD. The content aspect has a percentage of 82% with valid categories. The content aspect according to Fitriyah & Wardana (2019) must be following the competencies in the applicable curriculum. Thus, the content aspects in this STEM-based LKPD are by KI

and KD in the curriculum, the material delivered is following learning objectives, the material presented leads to STEM aspects and supports the improvement of students' explanation, inference, and evaluation skills. So, there are several suggestions and inputs from validators to improve LKPD to comply with good standards. The follow-up carried out by the researcher, namely making improvements to several parts of the LKPD in accordance with suggestions and input from validators.

The validity category with the highest percentage, namely the linguistic aspect, is 88%. This can be achieved because the preparation of STEM-based LKPD pays attention to PUEBI. In addition, the language used is communicative, straightforward, and effective so that an LKPD is formed that is easily understood by students following the research of Fitriyah & Wardana (2019) which states that an LKPD must use communicative sentences by PUEBI to make it easier for readers Pangesti et al., (2017) explained that teaching materials or LKPD must include clarity and accuracy of the information, readability, and suitability of language use according to the rules.

The improved STEM-based LKPD which can be said to be the final product was tested on class IX D students at SMPIT Ihsanul Fikri to find out the effectiveness and practicality. The test sheets used as a measure of students' explanation, inference, and evaluation skills have gone through stages of validity and reliability. Validity results were obtained by 80% with valid categories and reliability results were obtained by results of 0.808 with high-reliability categories. The results of the prerequisite test, namely the normality and homogeneity test, obtained that the distribution of pretest and posttest data is normally distributed and homogeneous. Thus, it can be concluded that the data is parametric and can be done t-test paired sample test. The results of the t-test show that Sig. (2-tailed) is 0.000 with a significance level of 0.05. According to calculations, if $0.000 < 0.05$, it can be concluded that there is a difference in the students' pretest and posttest scores. If there is a difference in the results of the pretest and posttest, the product can be said to be effective (Fitriyah & Wardana, 2019). The difference in explanation, inference, and evaluation skills can be seen in the acquisition of the average value of the pretest and posttest in the following figure chart 6.

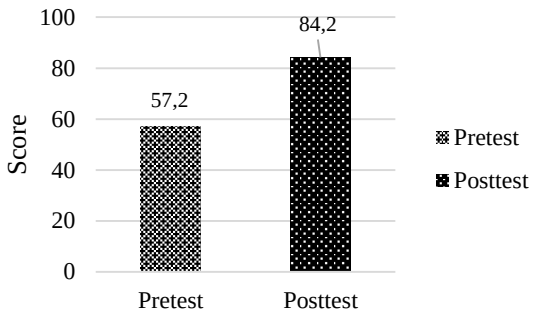

Figure Chart 6. Pretest and Posttest Average Score

Based Figure Chart 6 the average pretest score of 57,2 and average posttest score of 84,2. The N-Gain test was conducted to determine the magnitude of the improvement in explanation, inference, and evaluation skills in students after using STEM-based LKPD. The results of the N-Gain test yielded a value of 0.68 with moderate criteria. Then, the effect size results show a value of 2.7 with high criteria. The improvement of each indicator of students' explanation, inference, and evaluation skills is presented in the following chart.

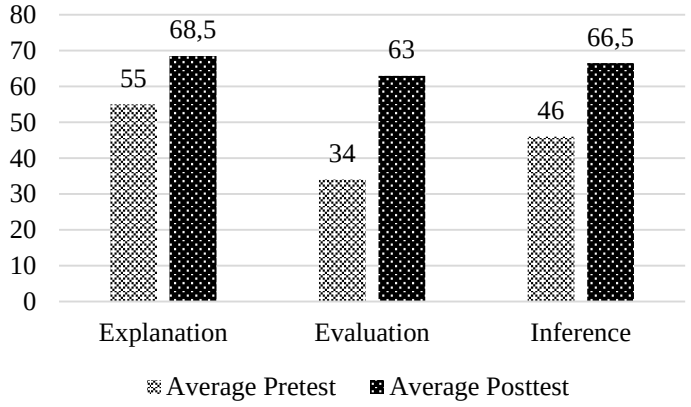

Figure Chart 7. Average Indicators of Students' Explanation, Inference, And Evaluation Skills

Based figure chart 7 there is an increase in the average score of explaining, concluding, and evaluating skills after learning using LKPD. The explanation indicator increased by 13.5 with an average n-gain value of 0.30 belonging to the moderate category. This indicator is experiencing the lowest increase. The inference indicator increased by 20.5 with an n-gain value of 0.37 belonging to the moderate category. Then, the basis for the evaluation indicator increased by 29 with an n-gain value of 0.43 with a moderate category. Learning by using STEM trains students to conclude, students can conclude correctly and the conclusions made are relevant according to the concept of the material presented (Ritonga, 2021). In addition, STEM accustoms students to always

make conclusions, so that students get used to conclusions (Fadlina et al., 2021). Then, the STEM approach trains students to think critically in making their decisions (Khoiriyah et al., 2018). The LKPD developed has integrated STEM. Integration of STEM aspects allows students to connect the four disciplines, namely science, technology, engineering, and mathematics in learning activities (Ananda & Salamah, 2021). This can train students to analyze and express new ideas logically, systematically, and critically (Choiriah, 2019). In addition, ongoing learning is also able to cultivate students' scientific thinking skills (Agustina et al., 2020).

In this study, the STEM aspects contained in LKPD, namely in the "Illustration" and "Student Activities" sections. Both sections have contained STEM aspects. The explanation is as follows: (1) Illustration. The science aspect examines dynamic electrical matter. In this aspect of science, dynamic electrical material is reviewed in the form of an illustration of the electrical circuit of a house. Aspects of technology are integrated in the assessment of the benefits of technology in various kinds of lamps. This aspect of engineering is reviewed by electrical circuits in series and in parallel. The mathematics aspect reviews the calculation of electric current, electrical resistance, electrical voltage, electrical energy, and electrical power. (2) Student Activities. Aspects of science are integrated into the concept of dynamic electricity used in stringing electricity. The technology aspect is integrated in the utilization of light bulb and LED technology assembled in the manufacture of "My House Electric Circuit". Engineering aspects are integrated in designing and assembling products in the form of "My House Electric Circuit" in series and parallel. Aspects of mathematics are integrated in data analysis and solving evaluation questions. The first is the aspect of science which has the main objective of equipping students in developing higher-order thinking skills to face the challenges of life in the future (Saido *et al*., 2015). Science consists of scientific components that stimulate students to ask questions and provide opportunities for students to explain certain phenomena (Agnezi, 2019). This is in accordance with the aspects of science contained in LKPD that can train Explanation and inference skills.

Both aspects of technology, familiarize students with expanding skills, helping needs, facilitating work, and desires through the application of computational knowledge and thinking (Bruton, 2017; Davidi *et al*., 2016). Evolving technology is needed by students in applications during learning as well as daily life (Stohlmann *et al*., 2012). The implementation requires skills in inference and evaluation and can be trained through

Illustration activities and Student Activities in this LKPD. The three aspects of engineering, Pangesti *et al*., (2017) explained that the engineering aspect can give students the opportunity to develop their higher-order thinking skills. In this case, the skills trained are Explanation and evaluation. The concept of evaluation is closely related to thinking about alternative problems encountered according to existing facts and evidence (Zaini, 2015). The three aspects of mathematics, this aspect is a reference for calculating data analysis and conclusions on Student Activities and completing calculations for evaluation questions. So, it can make it easier to interpret things and solve problems so that students can more easily understand related to physics concepts (Andawiyah, 2014; Pangesti *et al*., 2017).

Based on the results of the n-gain and effect size tests, it can be concluded that the use of STEM-based LKPD is declared effective in improving evaluation, inference, and evaluation skills if there are differences before and after using LKPD (Sulistyowati, 2019). This indicates that STEM is a whole unit that correlates with each other to be able to practice students' evaluation, inference, and evaluation skills. This LKPD can train students' critical thinking skills because students are invited to reflective thinking and involve cognitive processes in analyzing or evaluating something (Khairunnisa, 2021). Strengthened in the research fadlina et al., (2021) and Pramuji et al., (2018) explained that STEM-based LKPD can improve critical thinking skills. In addition, STEM learning trains students to solve problems and improves students' understanding of specific concepts (Zulfawati & Mayasari, 2021).

This research found that the STEM-based LKPD that has been developed has not been able to improve critical thinking skills. In this study, the material presented in STEM-based LKPD can improve Explanation, inference, and evaluation skills. The material presented through student activity activities and illustrations has not been able to improve critical thinking skills, namely interpretation, analysis, inference, evaluation, explanation, and self-regulation. Therefore, STEM needs to be collaborated with other learning models or approaches so that it can improve critical thinking skills.

The practicality test of teachers and students is assessed in three aspects, namely the content aspect, the presentation aspect, and the linguistic aspect. The student practicality test was carried out to determine student responses as research subjects to STEM-based LKPD products (Safitri, 2020). Here are the results of the practicality test of teachers and students.

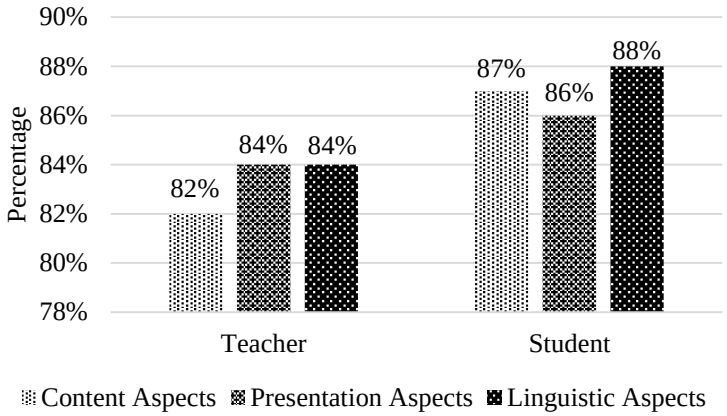

Chart 3. Teacher and Student Practicality Test Results

Based on the chart 3, the STEM-based LKPD that has been developed meets the criteria so that students can easily use it. Practicality itself according to Agnezi (2019) shows the level of ease in the implementation, use, and process of carrying out certain activities in a product developed.

The content aspect earned a percentage of 82% by teachers and 87% by students with very practical categories. In this case, the description of the content of each LKPD already leads to STEM aspects, the use of LKPD makes students actively study, and the material is presented in a sequence and clear manner. On the aspect of the presentation, the teacher obtained a percentage of 84% and 86% by students with a very practical category. LKPD that makes it easier for students to take part in learning can be declared practical (Sulistyowati, 2019). In this case, the overall contents of the LKPD, both illustrations, drawings, and tables are arranged. In terms of appearance, the design and color are presented quite attractive, and the selection of font sizes is quite clearly legible. The presentation that is compiled must be consistent and in accordance with the needs of the material (Ariq & Fitrihidajati, 2021). Thus, students can use LKPD optimally and have an effect on student academic results (Hidayah & Kuntjoro, 2022). Then, a language spec gained a percentage of 84% by teachers and 88% by students with a very practical category. The language used is easy to understand, simple and complies with PUEBI. In addition, the use of interactive and communicative language makes it easier for students to understand the content of the LKPD so that students do not have to ask the teacher much (Simatupang et al., 2019). The use of appropriate language clearly and straightforwardly makes students easily receptive and interested in using LKPD (Ariq & Fitrihidajati, 2021).

CONCLUSION

Based on the results of research and discussion, it can be concluded that (a) This research produces STEM-based LKPD (Science, Technology, Engineering, and Mathematics) on the theme of my home electrical circuit that can improve students' evaluation, inference, and evaluation skills and is declared valid or suitable for use with an average percentage of 80.9%. (b) STEM-based LKPD (Science, Technology, Engineering, and Mathematics) is stated to be very practical to use based on the average results of teacher practicality tests of 83% and students of 87%. (c) Furthermore, STEM-based LKPD (Science, Technology, Engineering, and Mathematics) was declared effective in improving students' evaluation, inference, and evaluation skills based on the results of the N-Gain calculation of 0.68 with a moderate category and an effect size result of 2.7 with high criteria.

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