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Electronics Student Worksheet Based on Higher Order Thinking Skills for Grade IV Elementary School

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ABSTRACT

The Student Worksheets (LKPD) available so far only contain black and white writing. In addition, the pictures and questions presented did not attract students' interest in learning. Therefore, it is necessary to develop LKPD that can attract students' learning interests. This study aims to develop Electronic LKPD (E-LKPD) thematic learning based on Higher Order Thinking Skills (HOTS). This research is a type of development research (RnD). The development model uses the ADDIE model which consists of the Analysis, Design, Development, Implementation, Evaluation stages. The E-LKPD product that has been developed is then tested on validators, teachers, and students to determine the effectiveness of its use. Data analysis techniques were carried out descriptively, qualitatively, and quantitatively. Validation is carried out by three validators, namely content, material, and language validators. The research instrument is a teacher response questionnaire for practicality and a student response questionnaire for attractiveness. The average validation result of media experts is 3.6 with the "very valid" category, while the material expert is 3.83 with the "very valid" category and the linguist is 2.83 in the "valid" category with revisions. The results of the analysis of the practicality of the E-LKPD can be assessed from the results of the teacher's questionnaire score obtained a score of 3.83 in the "very practical" category while the results of the analysis of the attractiveness of the E-LKPD obtained from the results of the student questionnaire score with a score of 3.19 in the "good" category. Based on the trial, it was concluded that the results of developing the E-LKPD product for HOTS-based thematic learning were valid, practical, and interesting to use in learning in grade IV elementary schools.

1. INTRODUCTION

LKPD (student worksheet) is an instructional tool that consist a series of questions information designed to guide students in understanding complex ideas (Choo et al., 2011). LKPD as one of the teaching materials have important role in providing assignments relevant to the material being taught to students, learning will be easier if accompanied by learning resources like LKPD (Prastowo, 2013). LKPD also useful as supporting facilities in achieving student competencies easily (Ranti & Usmeldi, 2019). LKPD has positive role in help students constructing a concept in learning (Yusuf, 2016). LKPD is a learning media that can be used to explore students' abilities in the learning process (Latifah et

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al., 2016). Moreover, in implementing the 2013 Curriculum which developed using thematic approach, school must be able to package the learning materials in the form of LKPD. But the problem are, LKPD used so far only contains questions that less interesting students to learn, the LKPD used contains only black and white writing and not many picture to increase student interest (Koderi et al., 2019). Based on the results of observation in schools by researchers, known that the utilization of LKPD take on several obstacles such as not qualify the characteristics of students and not being able to motivate students in the learning process. This is because the LKPD used is less attractive, less effective and considered not optimal causes students to be less motivated to use the available LKPD.

The results of interview between researchers with teacher during the preliminary study stated that, the LKPD used so far is not able to improve students' high level thinking skills or still facilitates students' low level thinking (*Low Order Thinking Skills*). This statement supported by the research result, state that 85% of the material in the LKPD still reach LOTS level (thinking levels C1-C3), this statement meaning that the levels of thinking C4, C5, and C6 (HOTS) are still 15% (Ladamay et al., 2021). Even though LKPD is needed by students to improve their learning outcomes (Jowita, 2017). LKPD is very important as a supporting facilities to supporting students in achieving their competencies and helping students construct material concepts (Ranti & Usmeldi, 2019; Yusuf, 2016). So that the development of LKPD teaching materials are able to improve students' High Order Thinking Skills (HOTS) is very necessary. LKPD teaching materials developed by teachers must be in accordance with the guidelines of 2013 Curriculum that is, can improve students' ability to think at high levels of HOTS. High Order Thinking Skills is an ability that must exist in every student (Darmawan & Wahyudin, 2018). Teachers need to have creativity in developing teaching materials (Wandari et al., 2018). Teaching materials was developed by teachers must be able to improve students' higher order thinking skills (HOTS) (Hartik et al., 2021).

In addition, the development of LKPD teaching materials during the Pandemic Covid 19 is very much needed. On the Pandemic Covid 19 the leaning process that usually done conventionally has turned into distance learning or online (Sadikin & Hamidah, 2020). So that the use of conventional LKPD must be changed to Electronic LKPD so it can be used by students, especially during the Pandemic. The development of learning media based on technology of communication has a very high effect on students achievement (Ratheeswari, 2018). The use of electronic media as a tool in the learning process can affect the quality of student learning (Lestari, 2018). Learning media in the form of Electronic LKPD is intended to optimize teaching and learning activities (Yasa et al., 2018). But unfortunately there are still many teachers who have not used technology in the learning process (Fadila et al., 2019). Finding students ability to think at higher level (HOTS) is still low, and the availability of conventional LKPD is still not optimal for use in the distance learning as it is today, it is necessary to use Electronic LKPD based on High Order Thinking Skills (HOTS). Thus, this study aims to develop the Electronic LKPD based on High Order Thinking Skills (HOTS) for Grade IV Elementary School Students Theme 8 Subtheme 3 Learning 2.

2. METHOD

This research type is Research & Development (R&D) that uses the ADDIE (Analysis, Design, Development, Implementation and Evaluation) model (Sukaesih et al., 2019). The goal is to produce new product or to develop existing products for the learning process in school and to test the effectiveness of the product that was developed. The stages of the ADDIE development model are as follows on Figure 1. The ADDIE model is the perfect model from the early analysis stage problems, designing a learning media, media experts and material experts validate learning media to analyze whether of not a media design is feasible to implement. Every stage of the ADDIE model is always carried out evaluation to improve learning media (Wijaya et al., 2020).

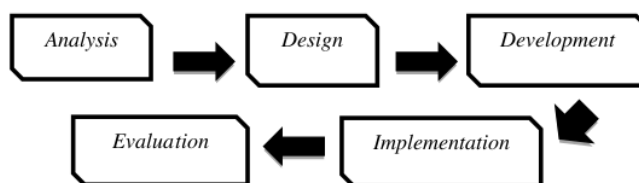


Figure 1. Model ADDIE

The subjects of this research is students of grade IV which in even semester at MI Nurul Islam Krai who selected randomly. Before the product implemented, the product is tested on validators to obtain improvements in order to achieve the level of validity, practicality and effectiveness of the E-LKPD products that have been developed. The instrument grid and instrument validity criteria can be seen in Table bellow. Data analysis techniques were carried out quantitatively and qualitatively.

Table 1. Aspects of Assessment by Material Expert Validators

No	Rating Indicator
	Content Eligibility
1.	Presentation Techniques
2.	Presentation Support
3.	Learning Presentation
4.	Completeness of Presentation
	Material Eligibility
5.	Compatibility of Material with KD Developed
6.	Material Accuracy
7.	Material Update
	Language Eligibility
8.	Commutative

Table 2. Aspects of Assessment by Media Expert Validators

No	Rating Indicator
1.	Language
2.	Presentation
3.	Effects of Media on Learning Strategies
4.	Full View

Table 3. Aspects of Assessment by Linguist Validators

No	Rating Indicator
1.	Presentation
2.	Language Ease
3.	Language Standards

Table 4. Final Assessment Criteria

Achievement Percentage	Interpretation
3,26 – 4,00	Very Valid
2,51 – 3,25	Valid
1,76 – 2,50	Less Valid
1,01 – 1,75	Not Valid

(Syaifuddin, 2017)

Based on the research model that has been described, the researcher adapts the development model from the following ADDIE model stage. **Analysis**, the analysis stage is the initial stage in the ADDIE development model. This stage consists of needs analysis, curriculum analysis, and analysis of student characteristics. In this stage, what needs to be identified regarding student needs is educational learning that can help students play an active role. In this development, appropriate and appropriate references are needed with the level of student understanding. This can be done by observing class IV at MI Nurul Islam Krai. At the characteristic analysis stage, the thing that needs to be analyzed is about the level of development of the fourth grade students of MI Nurul Islam Krai who will be the subject of research in using learning media developed by researchers. Characteristic analysis is done by observing the fourth grade students directly in the learning process.

At design stage, the researcher makes a media concept design that will be made. Apart from making media designs, researchers are also media research instruments. The research instrument used to measure product performance is a teacher's questionnaire to measure the practicality of the media, a student response questionnaire to see the attractiveness of students regarding the media. Development is the process of making a design a reality. One important step in the development stage is testing before

implementation. Media that has been developed and declared wo²³y of testing by the validator. Furthermore, it was tested on students at MI Nurul Islam Krai. Students were given a response questionnaire to determine the attractiveness of the media that had been developed. The trial was conducted with a small group trial. The results of the questionnaire will be analyzed and evaluated which can further determine the quality, value of benefits, and student responses to the product. The results of ⁷e analysis, evaluation and student responses are used to determine the attractiveness of the media. The types of data used in this research are quantitative and qualitative data. Quantitative data in this development research were obtained from student response questionnaires as a feasibility test. The qualitative ¹⁸ data in this study was obtained from the validator's response. The questionnaire was assessed using a Likert scale questionnaire ²⁰ in four categories of assessment, namely strongly agree, agree, disagree and strongly disagree. The instruments used in this study were three instruments, namely the results of validity, results of media feasibility and results of media attractiveness.

3. RESULT AND DISCUSSION

Result

This preliminary research was done by observing the school and at the same time interviewed the teachers. The purpose of this preliminary research was to obtain initial data of preliminary analysis. Interviews were conducted to the teachers to determine the curriculum used at the school ². The needs analysis of class IV at MI Nurul Islam Krai are that teachers still find it difficult to implement teaching and learning activities that are in accordance with the 2013 Curriculum which learning activities are centered on students, but in practice it is difficult to do. Several factors affect the difficulty of implementing the 2013 Curriculum, is that LKPD teaching materials are published by the government, the contents of LKPD are not in accordance with the characteristics of students and the physical appearance of LKPD is very simple. So it is necessary to develop teaching materials in the form of E-LKPD that are in accordance with the characteristics of students so that students are more active in learning. ¹

The product was developed in this research is E-LKPD (Electronic Student Worksheet) based on Higher Order Thinking Skill (HOTS) in which there is material for class 4 Theme 8 Subtheme 3 Lesson 2. The results of the KD analysis in this curriculum are 1) Indonesian: Observing the characters in the fictional text, 2) IPA: Related force to motion to events in the surrounding environment, 3) SBdP: Knowing three dimensional drawings and shapes. The design of the E-LKPD content is made on the frame material form according to what has been regulated in the Curriculum SK-KD. The design of the E-LKPD display manifests itself in diagrams/flow charts and storyboards. This E-LKPD use software Kvisoft Flip Book Maker. Kvisoft Flip Book Maker is more interesting like conventional book in digital form. This software is proven to be a good and suitable virtual flipbook, the operating system is uncomplicated and attractive for student (Rasiman. & Pramasdyahsari, 2014).

E-LKPD Thematic Learning Based on High Order Thinking Skill (HOTS) was successfully developed the next stage is tested for validation by 3 validators that are Material Expert, Linguistic Expert, and Media Expert. The assessment result from 3 validators mentioned can be seen below. The result of Material Expert Assessment there are 1) Aspect of content eligibility get score 4 with criteria very valid, 2) aspect of material eligibility get score 3.5 with criteria very valid, 3) aspect language eligibility get score 4 with criteria very valid. So total for material expert assessment results is 11.5 while the average is 3.83 with criteria very valid. As for comments and suggestions for improvement from the material expert validator is the material needs to be clarified, especially indicators about getting to know the characters in the story, please correct them according to suggestion from validator material expert.

The result of Linguistic Expert Assessment Results there are 1) Aspect of presentation get score 3.33 with criteria very valid, 2) aspect of easy language get score 2.4 with enough valid, 3) aspect of language standards get score 2.75 with score valid. So total for linguistic expert assessment results is 8.48 while the average is 2.83 with criteria valid. As for comments and suggestions for improvement from linguistic expert validator is put the Unikama logo and the authors name on the cover, the writing on the E-LKPD should be enlarged, on each video write down the source of the video obtained. The result of Media Expert Assessment Results there are 1) Aspect of language get score 3.3 with criteria very valid, 2) aspect of presentation get score 4 with criteria very valid, 3) aspect of media affects o learning strategies get score 3.5 with criteria very valid, 4) aspect of alternate view get score 3.6 with criteria very valid. So total for media expert assessment results is 14.4 while the average is 3.6 with criteria very valid. As for comments and suggestions for improvement from media expert validator is please really fill in the E-LKPD according to the theme, don't contain cartoons but there is no essence of benefits for children, increase the number of practice questions because that is highlighted is electronic student worksheets, for example activity units 1 to 6 and also provides an assessment rubric in each unit, the language used in the

E-LKPD is not illustrative according to the characteristics of 4th grade elementary school students, please use the language of instruction in the contents of the E-LKPD in the electronic special instructions section, it has not been emphasized that the contents of the E-LKPD are only general instructions.

After being declared eligible by the validators, the E-LKPD is applied to small groups. And then the product of E-LKPD must be evaluated. At this stage the assessment that is seen is the practicality aspect and the attractiveness aspect of the E-LKPD. The practical aspect can be seen from the teacher's response questionnaire, while the attractiveness aspect can be seen from the results of the student response questionnaire with the following results. The result of Teacher Responses Questionnaire there are 1) Aspect of language is 3.3 with criteria very practical, 2) aspect of presentation is 3.5 with criteria very practical, 3) aspect of condition is 3.5 with criteria very practical. So total for teacher responses questionnaire results data is 10.3 while the average is 3.43 with criteria very practical. As for comments and suggestions for improvement from teacher is the color needs to be fixed to make it attractive. While the results of analysis the attractiveness E-LKPD obtained from results of student questionnaire score 3.19 with "good" category.

Discussion

Based on the results of the research on the development of Electronic LKPD Thematic Learning based on High Order Thinking Skills (HOTS) above, the product that have been developed is very effective to be applied. This is absolute based on assessments from material expert, media expert, linguist expert, practicality test on teachers and attractiveness test on students. These results can be understood and mean that the Electronic LKPD Thematic Learning based on HOTS for Grade IV elementary school is very useful in helping students understand more concrete, helping students construct materials, and can facilitate students' ability to think at higher level C4 (analyzing), C5 (evaluating), C6 (creating). Electronic LKPD Thematic Learning based on HOTS makes students no feel bored while learning process because learning and doing practice questions becomes more fun.

The different this research from similar research is the development of Electronic LKPD is the use of HOTS questions in the E-LKPD. The HOTS elements designed for each item on the Electronic LKPD are able to make students discover new knowledge gained and achieve possible answers in new situation (Kusuma et al., 2017). Developing Electronic LKPD based on HOTS will make students analyze and interpret previous information so that it is not monotonous. In addition, the HOTS questions presented in the Electronic LKPD are not just memorization questions but can improve the quality of questions and assessment results. The goal is that students are not only required to memorize but also be able to apply it in everyday life such as to solve certain problems.

HOTS questions are not difficult, the editorials are long and convoluted so that they do not waste the readers time and are systematic to measure Competency Achievement Indicators (IKK) effectively and have material depth of material so that students will be stimulated to answer questions well. The characteristics of HOTS questions include measuring HOTS based on contextual problems in various forms of question items (Widiana, 2017). Future generations need HOTS thinking skills to take on with complex situations, so that everyone is able to solve these problems, think critically, have creativity and be able to collaborate to find solutions to the problems faced. So that teachers really need to train High Order Thinking Skills (HOTS) to students (Sunarti et al., 2020).

This E-LKPD is made for thematic learning, because thematic learning is an integrated learning that uses themes to link several subjects so that it can provide meaningful experiences to students. With the link between several subjects, students will gain knowledge and skills as a whole so that learning becomes more meaningful for students. As a process model, thematic learning has characteristics including 1) student-centered, 2) providing direct experience, 3) the separation of subjects is not very clear, 4) presents concepts from various subjects, 5) is flexible, 6) results learning according to the interests and needs of students.

Moreover, in the Pandemic Covid 19 like now, the learning process that is usually done conventionally has turned into distance learning or online (Sadikin & Hamidah, 2020). The process of distance learning or online learning is very need of information technology (Hanifah Salsabila et al., 2020). Teachers must have classroom management skills by utilizing information and communication technology (Riyadi et al., 2018). Because of this condition, the use of Electronic LKPD is very effectively used by students, especially during the Pandemic. The use of Electronic LKPD is one of solution in increasing the mastery of learning material by students (Choo et al., 2011). Other research also states that Electronic LKPD is more interesting to use in the learning process, can improve student learning outcomes and can train students' critical thinking processes (Haryanto et al., 2020).

The development of technology and communication in learning media has a high influence on student achievement (Ratheeswari, 2018). The use of electronic media as a tool in the learning process

can affect the quality of student learning (Lestari, 2018). Utilization of information and communication technology in learning can support development of students' cognitive, affective and social abilities to be higher (Ganefri et al., 2017). The use of technology in the learning process 80% interesting and easy for students to understand (Ghavifekr & Rosdy, 2015). The development and selection of modules from printed version modified an electronic has advantages. Electronic modules make it easier for readers to access digital content, easier distribution and purchase, simple backup and storage, a breakthrough solution for monotonous printed books, providing two way interaction techniques (Fojtik, 2015; Jou et al., 2016).

Electronic LKPD as student exercise sheets that are made digitally and carried out systematically and continuously for a certain period of time (Rai et al., 2021). E-Book is a form of technology has effective and relevant content and features (Panyajamorn et al., 2018). Practical methods and innovative techniques for understanding information that link textual knowledge and technology help readers to be active in the learning environment (Mohan & Kesari, 2016). This Electronic LKPD using Kvisoft Flipbook Maker application. Kvisoft Flipbook Maker is an interactive multimedia software to create teaching materials from Portable Document Format (PDF) into flash pages, each PDF page is made like a real book sheet by flipping through each page so that it can resemble an online magazine, e-newspaper, and digital books (Putri et al., 2020). The content is all types of audio of visual material including speech, text, music, animation, photos, of video and any different combinations (Embong et al., 2012). According to Rasiman & Anggita Kvisoft, it is proven that virtual flipbooks are good and suitable to be used for teaching materials so that learning materials become easy to understand, interesting and effective for students to have critical thinking skills. Because there are elements of animation and there is also music which is considered very good for students in the learning and learning process (Rasiman. & Pramasdyahsari, 2014).

Therefore, the Electronic LKPD Thematic Learning based on HOTS can be a very effective learning media used in the learning process, especially during Pandemic Covid 19 like now. In addition, HOTS elements was presented in the Electronic LKPD are the difference between this research and other research. HOTS questions are able to make students discover new knowledge, analyze and interpret information. Students are not only required to memorize but also be able to apply it in everyday life such as to solve problems. This product can be used by teachers elementary schools as an additional reference for teaching, adding insight to teachers to be able to develop teaching materials that can improve higher order and critical thinking skills, interests, learning outcomes and explore the types of intelligence possessed by students.

4. CONCLUSION

This development research resulted a teaching material product in the form of Electronic Student Worksheets (E-LKPD) thematic learning based on Higher Order Thinking Skill (HOTS) for grade 4 theme 8 Sub-theme 3 Learning 2. This product give better understand to students because the question based on High Order Thinking Skill (HOTS) are applied in all subject matter in the thematic learning on ELKPD. So students not feel bored during learning process, more than that students are used to doing High Order Thinking processes.

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