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Developing HOTS-Based Students' Worksheet for the Fifth-Grade of Elementary School

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Abstract

Education in the 21st century is simply interpreted as transformed learning. The revised 2013 curriculum in Indonesia emphasizes HOTS-based learning. HOTS is a process of thinking in a higher cognitive level that is developed from a variety of cognitive concepts and methods and taxonomies of learning. In the learning process, the teacher is usually uses the student's worksheet. However, some educational practitioners are not convinced that the activities contain of student's worksheet appropriate with the HOTS criteria. The aimed of this study is to develop students' worksheet based on higher-order thinking skills in learning English activities for fifth-grade elementary school students. This study used design and development (D&D) method and the ADDE models (Analysis, Design, Development, and Evaluation). The subjects were teacher and fifth-grade elementary school students. There were four topics of the worksheet were designed based on syllabus and student's need. The product result of this research is still in the form of prototypes and it was tested by using the Expert Test and User Test. The result of this study showed that this book gave positive response by stating that the book was categorizes as excellent in which it presented the material based on the syllabus and it had an interesting design. The HOTS' worksheet book that was developed in this study was expected as a medium for learning English that facilitated elementary school teachers and students.

Keywords: HOTS based English learning, Students' worksheet, elementary school students

Introduction

Learning systems in the 21st Century experienced an alteration caused by the demands of the era from year to year. The learning system was initially centered on the teacher while now it focused more on the students (Ichsan et al., 2019). According to Alsowat (2016), if teacher-centered learning is intense, teachers exert too much influence over their students, resulting in students preferring to learn information rather than abstract concepts. Current learning systems have changed to become more student-centered, because they are considered to be more effective than conventional learning systems.

In today's era, the progress of a country is greatly influenced by the human resources quality. Industry 4.0 is a new generation that affects the technical sectors, including education. The higher learning institution is seen as the forum for improving the necessary skills for Industry 4.0 adoption. Learning institutions need to compete with creative, transparent, and dynamic learning environments to provide an Industry 4.0 mindset or skills. Education 4.0 answers the industry revolution where humans and technology converge to allow for new possibilities (Hussin, 2018). According to Hussin (2018) the new learning vision enables learners not only to learn the necessary skills and knowledge but also to recognize the source through learning certain skills and knowledge. Therefore, the students are expected

to develop thinking skills to compete with many situations that occur in the real world (Wilson & Narasuman, 2020; Nguyen, 2018).

Higher order thinking skill (HOTS) is one of skills that is promoted in education 4.0. HOTS has a significant role in learning systems as it is a foundation for facing global challenges (Tyas et al., 2020). HOTS is the defined as the ability of thinking at a higher level than usual. According to Susanti et al. (2020), HOTS combines new information with old information to discover something new. While Indonesian ministry of Education explains that HOTS questions are measurement instruments to measure higher-order thinking skills, namely the ability to think that is not merely a recall, restate, or refer without processing (recite) (Fanani, 2018). By implementing HOTS, students are expected to think than usual to find something different. The use of HOTS in teaching-learning is aimed to develop the students' cognitive levels. It is in line with Synder&Synder (2008) stated that higher-order thinking skills improve students' engagement and achievement. Based on the Taxonomy Bloom's revised results, cognitive levels are divided into two levels: Lower Order Thinking Skills (LOTS) and Higher Order Thinking Skills (HOTS). LOTS consists of remembering (C1), understand (C2), and apply (C3), while HOTS consists of analyze (C4), evaluate (C5), and create (C6).

Promoting students' critical thinking from elementary school is one of the ways to develop a better generation (Miri et al. (2007). The implementation of the 2013 curriculum is considered as a way to attain HOTS

at elementary school. It is a definite attempt to boost the students' level of learning at the early age. One transformation aspect of the 2013 curriculum in primary school is to improve integrated learning processes using a scientific approach with the implementation of higher-order thinking skills (Nachiappan et al, 2018). In critical activities, all the practices for students are involved in the learning phase, from physical to psychological practice (Nofrion & Wijayanto, 2018).

Regarding the previous study that has conducted research related with the development of higher order thinking skills material, one of the elementary schools in Buleleng has apply the higher order thinking skills during the learning process but it is not maximal. The teacher tries to implement the higher order thinking skills during the learning process but it is not easy, the sources of material are limited and the learning process still the teacher centred. Lack of material sources is one of the biggest challenges that are encountered by the teacher such as the higher order thinking skills' worksheet to teach the students. However, relating the current problem with previous research, the researcher has not found the study that discuss about developing worksheet for students' fifth-grade elementary students based on higher order thinking skills. Therefore, the aim of this study is to develop a higher order thinking skills' worksheet for fifth-grade elementary school students. The worksheet that consisted with higher order thinking skills expect

to enhance the creativity and critical thinking skills from the students. The activities or the topic was developed based on syllabus used in the school.

Research Methodology

This study used design and development (D&D) by Richey & Klein (2007). The ADDE model (Analysis, Design, Development, and Evaluation) was used to develop the step of making this product. Teacher and fifth grade students were the subject of this research. The observation and interview were conducted with the teacher of elementary school of SD N 1 Banyuasri. The observation was made to find out the information that the researcher needs to support this study. In this phase, the syllabus of fifth-grade elementary school in the first semester was analyzed to gain the information about the learning activities.

After analyzing the needs and problems that occur in the field, the next step was designing the worksheets developed based on HOTS by involving the topic and materials from the syllabus analysis. The design was made regarding to the materials taught by the teacher and was developed deeper by providing suitable learning activities that can train their skills, especially thinking skills with high-level categories.

After designing HOTS-based English learning activities, the next stage was product development based on the designs that have been made.

Then, a prototype of the worksheet was developed. The initial draft of students' worksheet developed in the design phase was judged by the

experts in terms of its relevancy. The result of the expert judgment was used to revise the initial draft, which then developed into a final draft. This final draft was developed until it became a final product in the form of students' worksheet.

In order to check the quality of product, evaluation phase was conducted. There are 2 kinds of test given in this research, those are: expert test and user test. The test results are examined and analyzed carefully to find out the strengths and weaknesses of the product. At the evaluation phase, the advantages possessed can be maximized, while if they still have shortcomings, solutions must be immediately found to improve the quality of the English Activity Book.

In collecting the data, seven instruments are used: observation sheets, interview guides, syllabus analysis, content validity, product quality, and teacher and student questionnaires. Those instruments are used in different phases of ADDE model. By having those instruments, the data in this D&D research could be gathered well.

Findings and Discussion

Findings

This study reveals the results of the finding analysis of the condition of learning English in elementary schools, especially for grade 5 students in Buleleng Regency. Based on these findings, the study produced a product in the form of a student worksheets HOTS-based for learning English for fifth

grade of elementary school students. The process used the ADDE model which has structured stages. In addition, the results of expert judgment and user tests are also displayed to determine the quality of English Activity Book.

1. Analysis Phase

The document analysis was conducted in order to understand the content and learning objectives as suggested on the syllabus. The researcher used the results to enable the development of the product's content. Curriculum analysis is carried out by researchers looking for core competencies, basic competencies, indicators of competency achievement, and time allocation applied in SD 1 Banyuasri. As a result, the product's content may meet the needs of students. The data required for the designing processes were gathered through analyze the first semester of fifth-grade elementary school English syllabus. The results indicated that the syllabus for the first semester of fifth grade elementary students includes 4 topics. The topics are greeting, asking and giving instruction, asking and offering help, and describing things.

2. Design Phase

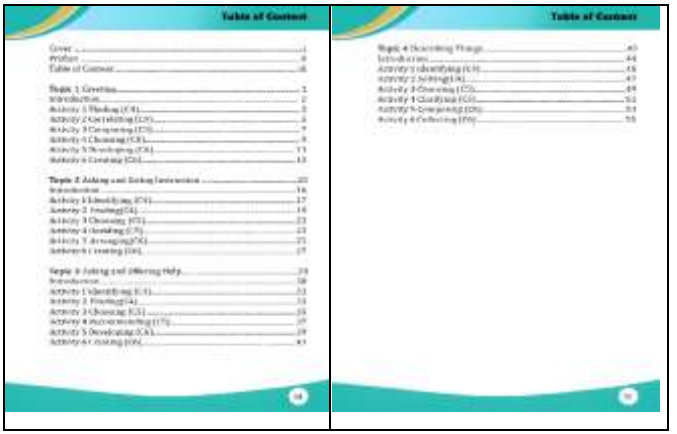
After analyzing the needs and problems that occur in the field, the prototype of activity book could be designed. This process was started by constructing blueprint based on the syllabus that is used in the elementary school especially for grade 5. The list of topics in the blueprint is then made into several learning activities by completing the

explanatory instructions and the developed worksheet. All of this process was done while still paying attention to HOTS as the basis for developing English activity books. Furthermore, the design of English activity book is enriched using relevant learning activities which can train their skills, especially thinking skills with higher-order thinking patterns. The blueprint for the worksheet design was made by reflecting the results of the syllabus analysis. In this blueprint, the materials and themes of each topic were decided.

3. Development Phase

The development process of the students' worksheet used Adobe Photoshop software. There are several steps in developing HOTS-based students' worksheet book. First, prepare sources, pictures, and all media to support the development of the students' worksheets. It was the first step that must be completed in order to build the worksheet effectively. The source took the form of a syllabus analysis result. The pictures or photos are required for the worksheet's illustration and the researcher used license pictures from freepik.com to provide the activity of the worksheet. The design is intended to attract the reader's attention and help them in understanding the context of the students' worksheet. Second, construct the content of the students' worksheet. The students'

worksheet was designed in A4 shape of paper. It contains four central units as the expectation of English teachers known from the result of the syllabus analysis. It can be seen in Picture1.



Picture 1. The Students' Worksheet Table of Content

Third, make cover the book by using adobe photoshop software. There were six steps conducted to create the Students Worksheet Book's cover by using Photoshop. 1). Press Ctrl+N to make a new layer and then choose A4 paper size. 2). To make the background, select the pictures that would be used and then put them on Layer 2. 3). Put the Ganesha University of Education's logo. 4). Select the font for the title. 5). Add the author's name. The result of the students' worksheet cover can be seen in Picture 2.

Picture 2. The Final Result of the Students' Worksheet Cover

Fourth, make the worksheet content. There were some steps in making the students' worksheet book content, such as 1). Press Ctrl+N to make a new layer, then set the paper size into A4 (29,7 cm x 21 cm), 2). Create the border of the worksheet. Find the pictures and set them into a border. 3). Put the instruction on the worksheet, 4). Add the worksheet language features below the instruction. The final product can be seen in Picture 3.

Picture 3. The final product

4. Evaluation Phase

Worksheets book that was made was then evaluated through two expert judgments, which evaluated the worksheet based on the appropriateness and validity of the content and the quality. Besides that, the teachers and students as the users of the product were also asked to give their evaluation through the use of questionnaire. The content validity judgment were conducted by taking two experts (Judge 1 and Judge 2), which are skilled in media and material development. In order to evaluate the content, there were 32 criteria used as the points of evaluation. The judgment results were then assessed and analyzed using Gregory formula, which is presented on Table 3.

Table 3. Gregory Formula

	Judge I		
Judge II	Relevant	A=0	B=0
	Irrelevant	C=0	D=32

From Table 3, it can be seen that column A indicates that the expert judges did not agree with the item. Column B indicates that judge 1 agreed while judge 2 did not. Reversely, column C indicates that judge 1 disagreed while judged 2 agreed. Finally, column D indicates agreement between the two judges. The content validity score is obtained from the formula D/(A+B+C+D).

Gregory Formula:

Gregory Formula:

$$Content\ Validity = \frac{D}{A+B+C+D}$$

$$Content\ Validity = \frac{32}{0+0+0+32}$$

$$Content\ Validity = \frac{32}{32}$$

$$= 1$$

The results of the judgments indicated that from the 32 criteria of the content validity of the students' worksheets content was 1, it can be categorized based on the criterion validity of the content as very high validity. The next step conducted was quality judgement. Each expert judge was given a product evaluation sheet to assess the quality of the developed HOTS-based English activities book. The judge was chosen based on their qualification in HOTS-based English activities, especially for those concerned about HOTS-based English activities. The expert judgment was design based on the criteria of a good book that was adapted from BSNP. These five aspects being assessed in the expert judgment, in which each aspect consists of several items that should be assessed.

The expert judgment rubric was given to the education experts to be evaluated. There were four expert judges which can be categorized as Judge 1, Judge 2, Judge 3, and Judge 4. After the experts evaluated, the researcher measured the assessment results. The scores were calculated as follows.

Mi = 1/2 (Score Maximum + Score Minimum)

Sdi = 1/3 (Mi)
Mi and Sdi's result, according to the formula, would be:
Mi = 1/2 (Score Maximum + Score Minimum)
= 1/2 (160 + 32)
= 1/2 (192)
= 96
Sdi = 1/3 (Mi)
= 1/3 (96)
= 32

The results of Mi and Sdi were calculated in the table's formula to determine the rating score categories, such as: excellent, good, average, below average, and poor. It can be seen in Table 4.

Table 4. The Accumulated Score of Each Criteria

Score	Criteria
X ≥ 144	Excellent
112 ≤ X < 144	Good
80 ≤ X < 112	Average
48 ≤ X < 80	Below Average
X < 48	Poor

Based on the expert judgment rubric results, the total score given by the first expert was 137 which categorized as an "Good". The total score given by the second expert judge was 136 which categorized as "Good". The total score given by the third expert judge was 128 which categorized as "Good". The total score given by the fourth expert judge was 157 which categorized as "Excellent". From the results of the total point that given by four expert judges, three of them has

categorized the material as "Good" and one judge has categorized the material as "Excellent". The mean score of the results of the expert judgment rubric was 139 which means the material categorized as "Good Worksheet".

The next step was quality judgement for user review. Each user review expert was given a product evaluation sheet to assess the quality of the developed HOTS-based English activities book. The users review were teacher (T) and students (S) in SDN 1 Banyuasri, Buleleng. The questionnaire was consisted of 10 items. The total maximum score for this rubric was 50 and for the minimum score was 10. The researcher measured the assessment results using a formula adapted from Budiantari, Nitiasih, & Budasi, (2013) as a guide. The teacher was explained by the code (T) and the student was explained by the code (S), (student (S1), student 2 (S2), student 3 (S3), student 4 (S4), student 5 (S5)).

Based on the user review rubric results, it was found that the total score given by the user (T) was 49 scores, it can be categorized as an "Excellent worksheet." The second user (student 1) was 40, which categorized as Good, the total score of the third user (student 2) was 50, which categorized as Excellent, the total score of the fourth user (student 3) was 50, which categorized as Excellent, the total score of the fifth user (student 4) was 49, which categorized as Excellent, and

the total score of the sixth user (student 5) was 40, which categorized as Good. The mean score of the results of the users review was 46 which means the material categorized as "Excellent Worksheet".

Discussion

Based on the observations and interview, the data shows that the teachers of the elementary schools in Buleleng Regency have not carried out HOTS-based learning activities in the classroom. The schools also did not provide students with English exercise books or any other worksheets that require high-level thinking. The findings show the worksheets at several sampling schools in Buleleng Regency still lacks emphasis on HOTS. Many activities in the worksheets and English book still apply LOTS. The HOTS learning activities are less included in the teacher's book; most of the books utilized focus on knowledge (C1), understanding (C2), and application (C3) (C3). HOTS, on the other hand, must be focused on the analysis (C4), evaluation (C5), and creation (C6). In this era, the school must provide learning media that contained high-level thinking. In line with Muskita et al (2020), students should be involved in the process of high-level thinking when they are learning, so teachers should develop opportunities to learn that promote students improve their critical thinking skills. Students' responses to HOTS-based content are surely not evenly distributed (Nadhiroh, N., & Latifah, S., 2020). In fact, not every student is skilled in the same capacity. This

challenge occurred as a result of the characteristics of each child which each child has a different cognitive level in received the learning process (Bakry, 2015).

Further, the result of the syllabus analysis indicated that there were four basic competencies for one semester. The first basic competence can be concluded with the coherency of the theme "asking and giving instruction", the second theme was "asking and offering help", the third theme was "describing things", and the fourth theme was "greeting". The fourth basic competence which was "greeting" became the first topic in the students' worksheets that being developed by the researcher, because the theme for the "greeting" was more suitable to be introduced at the beginning of the meeting in the teaching and learning process. Then for the second topic was followed by the coherence of the theme "asking and giving instruction", topic 3 was "asking and offering help", topic 4 was "describing things". Developing students' worksheets was the next step after designing the product by making the product's blueprint. The contents of the students' worksheets were made by using a platform namely Adobe Photoshop software. According to Abdurrahman et al (2019), Yennita et al (2018) the utilization of proper learning systems and the utilization of showing materials should appropriate so that understudies' critical abilities can develop.

After revising the students' worksheets content, the content validity evaluation was judged to determine the students' worksheets relevance. The content validity used two expert judges and used 32 items. To analyze the results of the expert judgment, calculation using Gregory formula was conducted. Based on the expert judges' content validity judgments, from the 32 criteria of the content validity of the students' worksheets content was 1, it can be categorized based on the criterion validity of the content as very high validity. After the content validity of the product was conducted, it was judged as an evaluation of the worksheet's quality. Four expert judges were asked to judge the quality by taking 32 items as the ones that needed to be judged.

Further, the categorization of the expert judges' scores was then made by using the formula suggested by Budiantari et al (2013) for the calculation. The results indicated that the first expert judge's total score was 137, which fell into the "Good" category. Then, the second expert judge's total score 136 also fell into the "Good" category. Then, the third judge's total score was 128, which was categorized as Good category and excellent category was received from the last judge as the total score given was 157. From all the judges mean socre was 139 which can be categorized as "Good worksheet".

After being assessed by the expert judges, then the researchers conducted the users review on teacher and student at SDN 1 Banyuasri. In

the product trial, there were 6 users, the first was a teacher who teach in fifth grade and 5 students in fifth-grade at SDN 1 Banyuasri and used 10 items. The user review result was calculated. It was discovered that the total score of the first user (T) was 49, which categorized as Excellent, the second user (student 1) was 40, which categorized as Good, the total score of the third user (student 2) was 50, which categorized as Excellent, the total score of the fourth user (student 3) was 50, which categorized as Excellent, the total score of the fifth user (student 4) was 49, which categorized as Excellent, and the total score of the sixth user (student 5) was 40, which categorized as Good.

Worksheets in the classroom must provide the flexibility or concern attention required in the classroom, and students in a current enrolled have shown that worksheets were their favored mode of learning (Podolak & Danforth, 2013). The developed worksheet more focused on developing students HOTS. It makes this study different from the previous studies, which focused more on how worksheet was used on students, how they perceive it, and what the challenges were. Therefore, the final result of the worksheet can be used as learning material that can help the development of students' critical thinking.

Conclusion and Suggestion

The HOTS-based English learning students' worksheet was developed as a learning medium for the first semester of fifth-grade elementary school students in SDN 1 Banyuasri. This prototype product explains the material and had a colorful design that the researcher also included. There were also educator instructions that make it possible for the teacher to direct students when providing the contents in the worksheet. This HOTS worksheet can be an effective teaching medium that can improve students' critical thinking skills because the worksheet provided individual and group activities for fun learning activities.

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