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## **The Development of Teaching Materials Based on the PQ4R Strategy to Improve High Order Thinking Skill of Students**



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### **Abstract**

The current study aims to produce teaching materials based on the preview, question, read, reflect, recite, review (PQ4R) that are feasible and effective in improving students' high-order thinking skills. This research is a Research and Development (R&D) type of research. The development is carried out referring to the theory of Borg & Gall. This research population is the fourth-grade elementary school students in Lampung- Indonesia. Subjects in this study were determined using a purposive sampling technique obtained by as many as 44 students. The data collection tool uses a valid and reliable test instrument. The data analysis technique used NGain. The results showed that the teaching materials developed were feasible and effective in improving students' high-order thinking skills.

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### **1. Introduction**

Education is a form of embodiment of a dynamic human culture and full of development. Education is an effort to actively actualize the learning process so students can develop their potential (Tohir, 2020). The US-based Partnership for 21st Century Skills (P21) identified the competencies needed in the 21st century, namely "The 4Cs" - communication, collaboration, critical thinking, and creativity. HOTS learning is learning that develops students'

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higher-order thinking skills beyond just memorizing, restating and reciting (Nofrion & Wijayanto, 2018).

Students who have reached the HOTS stage mean that students are able to master knowledge at the levels of analyzing (analyzing), evaluating (evaluated), and creating (created). So that students are able to apply knowledge and use it to solve a problem faced by students (Anugrahana, 2018). HOTS is the ability of students to apply knowledge, skills, and values in reasoning and reflection to solve problems, make decisions, innovate and be able to create something (Keleman, 2021). HOTS is a thinking ability that adjusts a person's cognitive level. Students at primary school age should be introduced to HOTS according to their cognitive development at that age (Pulungan et al., 2021).

In order to obtain maximum results in increasing HOTS, educators play an important role in the learning process. The results of observations and interviews with educators in grade IV SD in the Sugiyono cluster, Bangunrejo sub-district, kab. Central Lampung obtained information that the learning process in class IV there is a gap between the planned implementation of the lesson plan with the situations and conditions that occur in the learning process. The learning process in the classroom is only centered on educators as a source of messages so that learning does not emphasize the activeness of students, the learning that has been carried out so far is only in the form of explanations of learning content and examples, but does not develop learning content and also varied examples.

The results of research observations at SD Negeri Gugus Sugiyono, Kec. Bangunrejo with the subject of 113 fourth grade students showed that the percentage of students' learning completeness was 40 (35%) while the percentage of students who did not complete was 73 (65%). This indicates that the level of HOTS ability is still relatively low. Besides that, the results of the pre-survey need analysis in the form of a test on higher-order thinking skills with the subject of 51 fourth-grade students at SD Negeri 1 Purwodadi Kec. Bangunrejo shows that 55% of students with low grades indicate that the ability of fourth graders at SD Negeri Kec. Bangunrejo has not yet reached the HOTS success indicator. This is in line with what was said by (Kusuma et al., 2017) which states that most students in Indonesia still have low abilities, when viewed from the cognitive aspect (knowing, applying, reasoning). The low ability of HOTS as a result of not implementing effective learning strategies.

Efforts that can be made to improve students' HOTS abilities are by using the PQ4R strategy. PQ4R strategy is used as a learning strategy that can help students to think critically, remember, and understand a learning material (Fitriani & Suhardi, 2019). One of the strategies that can improve memory performance in understanding lessons is the PQ4R strategi strategy (Gardenia et al., 2019). The results of the needs analysis given to educators show that as many as 8% of teaching materials that educators use already contain test instruments based on core competencies (KI), basic competencies (KD), indicators, and learning objectives. In addition, 100% of the learning carried out has not used the PQ4R learning strategy. This is what underlies educators to agree if PQ4R-based learning is applied. PQ4R strategy is a learning strategy that helps students to read, understand, and maintain learning topics towards actual learning. The implementation of these strategies requires teaching materials that can improve students' understanding.

The results of the needs analysis given to students showed that 51 (100%) of all respondents had not used the PQ4R strategy, but 40 (78%) of respondents stated that the existing learning materials were difficult to learn, and the material presented did not contain examples and everyday problems. day. In addition, learning in the education unit is not based on Preview, Question, Read, Reflect, Recite,

Review (PQ4R). This proves that it is necessary to carry out PQ4R-based learning on students, so that the potential possessed by students can develop optimally.

One alternative that can be used by educators to improve students' HOTS abilities is by developing teaching materials based on the PQ4R strategy. The integration of the PQ4R learning strategy has the opportunity to improve students' HOTS abilities compared to other learning strategies (Setiawati & Corebima, 2018). The use of teaching materials in the learning process is expected to guide students to be able to think at the waiting level to improve student learning outcomes. Based on the description of the background above, researchers are interested in developing PQ4R-based learning materials for four-grade elementary school students.

## **2. Materials and Methods**

This research is a type of research and development research referring to the steps of developing Borg & Gall (Aka, 2019). The teaching materials developed is a PQ4R strategy-based teaching material for four-grade elementary school students. The product development steps are as follows.

### *Initial Information Collection*

Data collection begins by analyzing reference sources, class observations, identification of problems found, and determination of appropriate solutions to overcome these problems. At this stage, the researchers conducted a questionnaire on the needs of public elementary schools throughout the Sugiyono Cluster of Bangunrejo City. Based on the questionnaire results, it was found that the learning problems experienced by students were the low learning outcomes of students.

### *Planning*

The planning determined by the researcher includes several steps, namely, first, the researcher makes an instructional analysis consisting of learning objectives, mapping of core competencies (KI), Basic Competencies (KD), and indicators for four grade elementary/MI students. In the second step, the researcher collects teaching materials following the material sourced from relevant books. Third, the researcher makes a draft teaching materials adapted to the PQ4R steps. At this stage, the preparation of the teaching materials draft includes titles, work instructions, KD mapping, assignments, and supporting materials. The fourth stage is making teaching materials that have been prepared, and the four-stage is planning evaluation tools.

### *Early Product Development*

After planning the material to be developed according to learning needs, the next step is to develop the initial product. The initial product development in this research includes preparing learning materials, preparation of handbooks, and evaluation tools. The development of the initial form in the form of a PQ4R strategy-based teaching materials product draft in thematic learning of Theme 4 Sub-theme 3 for four-grade students of State Elementary Schools in the Sugiyono Cluster of Bangunrejo City.

### *Initial Stage Test*

The initial test was carried out to test the validity and reliability of the developed instrument. Instrument validation was carried out by targeting material expert lecturers, media experts, and linguists and practitioners. First, expert validation test by material, media, and language experts. The results of the expert validation test are in the form of comments, criticisms, suggestions, and assessments of the teaching materials products that have been prepared. An expert validation test is used to revise the product design until a feasible and valid design is obtained. Furthermore, the validation test was carried out by four-grade educators at SDN 1 Purwodadi. The validation test was carried out to provide criticism and suggestions for improving the developed teaching materials until it was ready to be tested for the next stage.

### *Initial Product Revision*

Initial product revisions are based on suggestions and input from validation experts and practitioners. This activity is carried out to improve the PQ4R strategy-based teaching materials product.

### *Main Product Trial*

Revision of the main product is carried out based on suggestions and input on the product developed. It produces teaching materials based on the PQ4R strategy that is feasible to improve students' high order thinking skills.

### *Product Revision*

Revision of the main product is carried out based on suggestions and input on the product developed. It produces teaching materials based on PQ4R that is feasible to improve students' high order thinking skills.

## **3. Results and Discussions**

### *Feasibility of Worksheets Product Development Based on Preview, Question, Read, Reflect, Recite, Review (PQ4R)*

The results of research and development of PQ4R-based worksheets that were developed "properly" in class IV thematic learning Theme 4 Various Job Subtheme 3 My Parents Job. The development of these PQ4R strategy-based teaching materials adapts the R&D step by Borg & Gall (1983: 784) using seven out of ten steps. The development of PQ4R-based teaching materials begins with the collection of initial information. After researchers know the problems, researchers plan to develop teaching materials that students will use. Furthermore, the researchers compiled the initial product development of the teaching materials. In this step, the researcher sets out the pattern of development that will be outlined in PQ4R strategy-based teaching materials.

#### *a. Material expert validation*

Material expert assessment is based on aspects of teaching materials conformity with PQ4R strategy and content suitability. The product revision suggested by the material expert is rechecking the typo on the script. The white writing in the learning objectives section tends to be invisible to

students. It is recommended to replace it with black and background that the reader can read. Every PBI step/syntax must be reflected in each subject. Revisions need to be made regarding images, substance, writing, and others. The PQ4R strategy-based teaching materials product validation test results obtained a score of 90.7, which was included in the excellent category.

#### *b. Media Expert Validation*

The media expert's assessment includes a description of the contents of the teaching materials, presentation of pictures and tables, conformity of the content with technical requirements, graphics, and teaching materials design. Product revisions based on media expert advice, namely the writing of adjusted layouts, the use of images adapted to the theme and development of students, and the stages of activities adjusted to the PBI paradigm with the appropriate layout. The validation test results by media experts got a score of 96.35, which was included in the outstanding category.

#### *c. Linguist Validation*

Linguistics assessment includes straightforward, communicative writing, and using terms, symbols, or icons. The product revision is based on the advice of linguists, namely correcting the spelling to conform to the General Guidelines for Indonesian Spelling (PUEBI). The validation test results of linguists got a score of 94.3, which was included in the very good category. The recapitulation of expert validation results is presented in the table.

Table 1. Recapitulation of Validation Results

No	Validation	value	Description
1	theory	93	Very Valid
2	Language	87.5	Very Valid
3	Media	91	Very Valid

#### *The Effectiveness of PQ4R-Based Worksheet on Improving High Order Thinking Skill*

The effectiveness test was conducted to determine the effectiveness of PQ4R strategy-based teaching materials in the learning process that had been implemented. The effectiveness test was conducted on 24 four-grade students of SD Negeri 1 Purwodadi. The teaching materials being tested includes four sub-theme, one theme that has been previously designed.

The observation of student learning completeness obtained data that 18 students completed and 6 did not complete. Based on the effectiveness test using N-Gain, data was obtained that there was an increase in the average N-Gain value of students before and after learning was carried out using PQ4R-based teaching materials. The calculation results are presented in the table.

Table 2. Total N-Gain

No	Aspect	<i>Pre</i>	<i>Post</i>	<i>N-Gain</i>
1	Amount	1256	1752	9.84
2	Average	52.33	73	0.41
				Currently

The effectiveness of PQ4R strategy-based teaching materials in improving students' high order thinking skills supported by calculation data for increasing students' high order thinking skills on each indicator using N-Gain. The calculation results can be seen in the following table.

Table 3. Recapitulation of High Order Thinking Skill

No	High Order Thinking Skill Indicator	<i>N-gain</i>	Description
1	Analyze	0.764	Very high
2	evaluate	0.656	Currently
3	Create	0.416	Currently

Subsequently, a test was conducted to prove the significance of the differences between the two groups using the dependent sample t-test (attachment 35, page 129). Based on the results of calculations with  $DK = 39$  and a significance level of 0.05 (5%) obtained  $t\text{-count} = 8.53 > t\text{-table} = 2.021$ , then  $H_a$  is accepted, and  $H_o$  is rejected. It can be concluded that there are differences in students' high order thinking skills with using PQ4R based teaching materials with those that do not use the four-grade elementary school students.

The differences that occur are caused by PQ4R-based teaching materials in the experimental class, making students understand better. The TGT learning model with the PQ4R strategy is better than the direct learning model to improve students' mathematical reasoning and communication skills (Dzulhikam et al., 2020). Furthermore, the application of CIRC and PQ4R was more effective in improving students' reading ability (Al-Qawabeh & Aljazi, 2018). Based on the explanation above, it can be concluded that PQ4R -based teaching materials are effectively used in the learning process and can improve the high order thinking skills of four-grade elementary school students.

#### 4. Conclusion

Based on the analysis of research and development data, it is concluded that the PQ4R-based teaching materials product developed is suitable for use. This is evidenced by the results of the material expert validation which obtained a value of 90.7 which was included in the very valid category, the media expert's validation value of 96.35 was included in the very valid category and the value of the linguist validation was 94.8 with the very valid category. Based on the suggestions and validation results, PQ4R strategy-based teaching materials are appropriate for teaching materials in class IV Elementary School. PQ4R strategy-based teaching materials are effectively used in four-grade students' learning process at SD Negeri 1 Purwodadi, Kec. Bangunrejo Kab. Central Lampung to improve students' high order thinking skills. This is evidenced by an increase in the average pretest and posttest scores of students who obtained an N-Gain score of 0.41 in the medium category. Further testing was carried out to prove the significance of the differences between the two groups using the paired sample t-test. Based on the results of calculations with  $DK = 46$  and a significance level of 0.05 (5%) obtained  $t\text{count} = 8.53 > t\text{-table} = 1.67$  then  $H_a$  is accepted and  $H_o$  is rejected, so it can be concluded that there are differences in students' order thinking skills with using PQ4R strategy-based teaching materials with those that do not use the four-grade elementary school students.

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## References

- Aka, K. A. (2019). Integration Borg & Gall (1983) and Lee & Owen (2004) models as an alternative model of design-based research of interactive multimedia in elementary school. *Journal of Physics: Conference Series*, 1318(1). <https://doi.org/10.1088/1742-6596/1318/1/012022>
- Al-Qawabeh, R. H., & Aljazi, D. A. A. (2018). The Effectiveness of Using PQ4R Strategy in Teaching Reading Comprehension in Arabic Language Subject among Ninth Grade Students' Achievement in Jordan. *World Journal of Educational Research*, 5(2), 159. <https://doi.org/10.22158/wjer.v5n2p159>
- Anugrahana, A. (2018). Tinjauan Deskriptif Penerapan Higher Order Thinking dan Problem-Based Learning Pada Mata Kuliah Geometri Berdasarkan Kemampuan Matematika Mahasiswa. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, 8(2), 142–156. <https://doi.org/10.24246/j.js.2018.v8.i2.p142-156>
- Dzulhikam, M., Ridlo, S., & Dewi, K. (2020). The Effectiveness of PQ4R Learning Method in Ecosystem Materials To Improve Students' Learning Outcomes and Reading Skills. *Jise*, 9(1), 118–125. <http://journal.unnes.ac.id/sju/index.php/jise>
- Fitriani, O., & Suhardi, S. (2019). *The Effectiveness of PQ4R (Preview, Question, Read, Reflect, Recite, Review) in Reading Comprehension Skill*. 330(Iceri 2018), 251–254. <https://doi.org/10.2991/iceri-18.2019.52>
- Gardenia, N., Herman, T., & Dahlan, T. (2019). *PQ4R Strategy (Preview, Question, Read, Reflection, Recite, Review) for Mathematical Communication Ability*. 253(Aes 2018), 322–327. <https://doi.org/10.2991/aes-18.2019.75>
- Keleman, M. (2021). Assessment of Higher Order Thinking Skills Through Stem Integration Project-Based Learning for Elementary Level. *International Journal of Social Science and Human Research*, 04(04), 835–846. <https://doi.org/10.47191/ijsshr/v4-i4-40>
- Kusuma, M. D., Rosidin, U., Abdurrahman, A., & Suyatna, A. (2017). The Development of Higher Order Thinking Skill (Hots) Instrument Assessment In Physics Study. *IOSR Journal of Research & Method in Education (IOSRJRME)*, 07(01), 26–32. <https://doi.org/10.9790/7388-0701052632>
- Nofrion, N., & Wijayanto, B. (2018). Learning Activities in Higher Order Thinking Skill (Hots) Oriented Learning Context. *Geosfera Indonesia*, 3(2), 122. <https://doi.org/10.19184/geosi.v3i2.8126>
- Pulungan, M., Toybah, T., & Suganda, V. A. (2021). Development of HOTS-based 2013 Curriculum Assessment Instruments in Elementary School. *Journal of Teaching and Learning in Elementary Education (Jtlee)*, 4(1), 50. <https://doi.org/10.33578/jtlee.v4i1.7858>
- Setiawati, H., & Corebima, A. D. (2018). Improving students' metacognitive skills through science learning by integrating PQ4R and TPS strategies at A Senior High School in Parepare, Indonesia. *Journal of Turkish Science Education*, 15(2), 95–106. <https://doi.org/10.12973/tused.10233a>
- Tohir, A. (2020). Efektivitas Model Pembelajaran Inkuiri dalam Meningkatkan Hasil Belajar Siswa Kelas IV SDN 27 Tegineneng. *Jurnal Ilmiah Sekolah Dasar*, 4(1), 48. <https://doi.org/10.23887/jisd.v4i1.23015>
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