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Development Questions Based Worldwall For Improving Science Learning Outcomes

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Abstract

The quality of the questions produced by teachers is still very minimal and less interesting for students to use because they are only paper-based and only copied from existing books . Research purposes for develop an item question-based world wall to increase results Study in science subjects. Special purpose done for analyzing needs, designing product question-based worldwall, and describing results study science. Study this including in study development using the ADDIE development model. Subject study participants educate school-based class 4 Bulu 3 Madiun with a total of 15. Data collection techniques were carried out with questionnaires, validation, and tests. The instrument use sheet questionnaire needs a question-based word wall at the school base, sheet validation expert material and media, and questions test-based word wall. Research results produce questions that have been tested for validity, and reliability until you get 20 questions best and done validation by media experts and receiving materials the respective scores are 88% and 85% with the very worthy category. Response participants educated as many as 15 children and also received very good responses with give response of 90% and the results study increased from the initial average pre-test result of 51 to 89. Media questions word wall can be said feasible, interesting and effective increase results Study participant educate on the eyes Class IV science lesson on force and magnetism.

Keyword: ADDIE Model, Question, Wordwall, Science, Learning Outcomes

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INTRODUCTION

Science is a fun subject where we can get to know the universe and the environment. Learning science is not just listening to the teacher's lecture but also learning through the process of observing, experiencing and trying like a scientist.But in reality, science learning so far is still oriented towards teachers who actively provide information without providing opportunities for students to find out and try to find a concept or material. This is in line with the findings of Widiastuti & Purnawijaya (2021) who explained that students feel bored in learning and have difficulty understanding the material taught by the teacher because of conventional and boring learning, which has an impact on students' low science learning outcomes.

Science learning outcomes can be obtained from mark end participant educate in do question. Science learning outcomes are one of them mark repetition one result is learning what you can see from the aspect cognitive that is the ability to do tests or questions from knowledge. The questions presented by the teacher are still many were taken from sheet work tasks or tests daily yet validated. So that participants answer questions only based on material in books and sheets Work participants educate. Item the problem being worked on participant education taken from existing material made by the teacher with various type evaluation test written like choice double and stuffing short. Item question is the description from created indicators in the form stated question in a way clear form questions and answers. To make an item questions need to be analyzed quality item about quality goods. Anita, et al (2018) explain analysis of quality item questions is an activity performed to identify questions ok, less good, and ugly and gain instruction for repair. For test results learning, the main thing is validity content, details the question asked to participant educate appropriate and representative required competencies achieved by participant educate. Meanwhile, Gignac, G. E., & Szodorai, E. T. (2024) explains something a test can have high validity if test the operation function measures it, or gives results measured precisely and accurately by meaning he wore test.

Science learning packaging still focuses on conventional learning. This causes students to feel bored in learning and have difficulty understanding the material taught by the teacher. This problem affects the students' low science learning outcomes.

Problems in making item questions are often experienced by teachers when making questions for tests daily, Practice questions, or tests end of the semester. One of them is at school Bulu base 03 does evaluation with questions from group or district area Madiun. The question given is a question for evaluation end of the semester. Results of observations in the field detail questions at school feather base 03 found preparation tests are invalid. This matter can seen from the results of questions tested at the time of semester exams or evaluation midterm exams and

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assessments end of semester teachers only use questions from sheet Work participant students (LKS) or copy from book package participant educate without notice is question in accordance indicator or existing competencies determined. In reality, this gives a description necessary development of more questions standardized or valid and technology is one of them used by word wall for participants students are also motivated when they ask questions specifically as evaluation formative. According to Tim Pusisjian (1998), the steps development something a test performance study are: (1) determination objective test, (2) preparation grid, (3) writing questions, (4) study questions (review and revision questions), (5) trial questions, incl analysis and repair, and (6) assembly question become device test. By utilizing digital technology as a companion in the learning process, the teacher has a chance to create experience interesting and interactive learning for the participants to educate. Digital technology delivers an opportunity to use various types of source studies such as videos, images, and applications interactive, which can support understanding participants' education to material lesson. With dig potency digital technology, the learning process is expected to become more adaptive, efficient, and responsive to the needs of Study participants and different students (Asmawati, 2021). Impact-positive technology with various media developed can help enhance understanding and skills participants educate in reaching competence learning who wants to achieve by Wahyudin et al.,. (2024). Word wall is one of the website-based platforms used as a learning medium interactive and fun with presenting various template variations such as quizzes, matching, anagrams, pairing pairs, random words, grouping, word search, and various other templates so that word wall can used as a tool measuring forknow success of the learning process that has been achieved done participant education (Prasasti et al., 2024). Use word wall has lots used with good results and obtainable increase results Study as well as motivation participant education (Wahyuni Dina et al., 2023). This matter is also supported by the findings of Mukhtar et al., (2022) stated that the Media is applied with Good Of course impact on understanding increasing students. Study This aims To develop item question-based words to increase results in study science.

METHOD

Research and development used is the R&D (Research and Development) which is used to create a product special and test its effectiveness (Amali et al., 2019). Type of research and development with choose ADDIE model as approach development. Study ADDIE model development consists of five stages, namely analysis, design, development, implementation, and evaluation (Rori Maulia et al., 2020). Place research in the city of Madiun, with subject participants, and educate the 4th-grade school base. Qualitative data is obtained from results

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observation, analysis of teacher and participant needs education, and interviews, while quantitative data is obtained from quality testing questions which include difference tests, validity tests, reliability tests Then score results expert validation, questionnaire teacher responses and questionnaires response participant educate as well as test results participants learn science and technology educate.

RESULTS AND DISCUSSION

Result

Development results item question word wall using the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model can outlined as follows

1. Analysis/ Analysis

Based on the analysis need can obtain that participants need interesting and digital-based questions for evaluation formative or summative, because during This evaluation learning done with paper is already too normal, and less childlike when done. Participants are educated to ask questions in class Because afraid got scolded by the teacher, right? Because interested For Study. Apart from that, on stage analysis, the need to also obtain related data quality the questions used by the teacher are invalid and only take from about what already it's on the worksheet without the teacher making it alone. The analysis furthermore is analysis material to be made because with CP IPAS in class IV, namely participants educate utilize symptom magnetism in life daily, demonstrate various type style and its influence on direction, motion and form object.

2. Design/ Planning

Stage planning is done with designing stage beginning including arranging grids questions, indicators questions, type questions, and questions as well as a key answer based on CP IPA class IV, namely participant educate utilize symptom magnetism in life daily, demonstrate various type style and its influence to direction, motion And form object. Following grille questions developed more carry-on.

Table 1. Grille Question Test

No	Achievements Learning	Number Question	Amount Question
1	Explain the effect of force on the direction, motion, and shape of objects	1, 2, 3, 4, 5, 6, 7, 8, 9.	8
2	Applying style concepts to solve existing problems around you	10, 11, 12, 13, 14, 15, 16, 17	8
3	Explain the properties and symptoms of magnets and their application to surrounding problems	18, 19, 20, 21, 22, 23, 24, 25,	9

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In terms of this question used a form choice double-based paper moreover formerly for testing validity, reliability, level difficulty, and power different questions with the use of the SPSS application. Validity test results of 30 questions get 25 questions said to be valid and 5 questions invalid as presented in Table 2.

Table 2. Results Test Question Validity

No Question	Information	Number Item
1.	Valid	1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, 28, 30
2.	No Valid	7, 15, 19, 27, 29

Then the reliability of the questions using the Cronbach alpha formula from 25 questions that were said to be valid to get a value of r11 = 0.91044 with very high-reliability standards in Table 3, so that the question items can used in the study and can work as tool measure student learning.

Table 3. Results Test Question Reliability

Coefficient Reliability	Level Reliability
0,91044	Very Tall

The next test was the level of difficulty of the questions which resulted in 10 questions being in the medium category and 15 questions being in the difficult category as presented in Table 4.

Table 4. Results Test Level Difficulty Question

No	Information	Number question
1	Easy	-
2	Currently	4, 11,12,13,15,17,18,20,21,23
3	Hard	1,2,3,5,6,7,8,9,10,14,16,19,22,24,25

The results of the next test analysis are the differential power of the 25 questions can seen in Table 5.

Table 5. Results Test Power Different

No	**Information**	**Number item question**
1	Good very	12
2	Good	2,3,5,6,9,11,13,15,22,24,25
3	Enough	1,4,8,14,16,18,20,21,23

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4	Bad	7,10,17,19
5	Bad very	-

The results of the different power tests with the criteria are very good, there is only 1 question, then the different power with the criteria good amount 11 whereas power different with sufficient category there is 9 item question and the different power test with the bad category has 4 questions. After the questions have been tested, 20 questions are taken which will be developed in the form of wordwall questions.

3. Development/ development

Development carried out researcher starts with creating word wall media with use questions that have been tested Then packing questions the form quiz choice double interactive where participants can push the box which is their answer considered Correct. Following is an example of the results of word wall media development with type game open the box shown in Figure 1.



Figure 1. Example results from development question with wordwall

Next, there are 25 questions packed in wordwall media tested appropriateness by media and material experts. The media expert is Mrs. Vivi Rulviana who is a lecturer on learning media and elementary school evaluation with experience in relevant publications with research media. Then expert material namely Mr. Agung as a class IV teacher at SDN Bulu 3 Madiun. Expert validation results are presented in Table 6.

Table 6. Media and Material Expert Assessment Results

No	Description	Percentage	Category
1	Media expert	88%	Very eligible
2	Material expert	85%	Very eligible

The score obtained from media experts, namely 88% entered in the very worthy category

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so the media can used. Advice from media experts ie about the duration of time processing must added so that it doesn't cause commotion moment implementation to participants to educate too and there is a bell/ sign sound moment time we have also done everything so that the media becomes more good. Then expert material that provides a score of 85 % in the very worthy category also provides related suggestions and additional pictures or videos on the question that felt abstract so participants can understand the meaning of the questions presented. Advice from experts furthermore done follow carry on form revision of media and questions.

4. Implementation/ Application

Stages This is done with a method applied that is already packed in the form of word wall media to participants educate a total of 15. Participants are educated and then divided into 3 groups For each other compete to answer questions on the LCD screen provided by the teacher. Group fastest for lift hand opportunity For answer moreover formerly. If the answer is correct so will get a score of 10 and if wrong -5 well question will thrown to other groups. The winner is what works gather scores on most of the 20 questions presented on the word wall in class. After the participant finished doing the competition from the question developed word wall researcher, the participant was requested to fill in the response towards the media word wall until get results questionnaire participant learned in Table 7.

Table 7. Recapitulation of Questionnaire Results Participants are educated on the media question wordwall

No	Indicator Evaluation	Scale likert 1 2 3 4 5	%
1	Wordwall problem makes it easier To Study	2 5 8	88
2	Wordwall problem make I Spirit For do question	5 10	93
3	Wordwall problem load attractive and clear visual display	8 7	89
4	Wordwall problems make me involved in active learning	1 8 6	84
5	I am more interested do questions with Wordwall	1 1 13	96
Total			450
Average percentage			90
Category			Very worthy

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Enhancement results participants learn science and technology educate be measured with compare mark pretest and posttest. The researcher before giving the question media word wall, has to do a pretest. After getting the marked pretest, the activity competition group with use a question media word wall with as many as 20 questions. Later participants were educated and given question posttest in a way individually. Pretest and posttest results were obtained from 15 participants detailed in Table 8 below.

Table 8. Comparison of Pretest and Posttest Results Mentally Impaired Students

No	Name	Pretest Mark	Postest Mark
1.	D.N	30	70
2.	JK	50	90
3.	LNL	40	100
4.	ZH	60	90
5.	PD	50	100
6.	TR	70	100
7.	OAK	30	80
8.	NR	80	100
9.	AD	20	70
10.	V.V	50	90
11.	ED	60	90
12.	RS	50	80
13.	TN	70	100
14	AD	60	90
15.	RS	50	80
Amount		770	1330
Average		51	89

Pretest results show the average value results study participants educated on the material force and magnetism are only 51 whereas results posttest show more average value tall namely 89. These results can state that the media matters word wall can increase results in study participant education. Wordwall media effectively improves elementary school students' science learning outcomes by promoting active learning and being free and accessible to all communities (Hanafi et al., 2024).

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5 Evaluation

Stage evaluation is the stage end from the ADDIE approach where after 4 stages previously completed evaluation to know the quality of the media questions word wall that has developed. From the results of validity and reliability tests of the 30 questions designed 25 valid and reliable questions were obtained Then results validation media and materials experts obtained results that the media matters the developed word wall is very feasible used by participants. This matter can seen from results validation media experts by 88 % and experts material by 85%. Input from experts too followed up so the media matters word wall can more good again. Question media word wall is also capable of scoring high on response participant educate that is by 90% with the very worthy category and produced an average post-test score that was much higher than the pre-test, namely pre-test 51 and post-test 89.

DISCUSSION

The ADDIE model development research carried out has produced science material questions which are packaged in wordwall media. The material content focuses on learning outcomes about force and magnetism included in the science material. Science subjects require mastery that does not only focus on concepts, facts, laws and principles but also involves a systematic discovery process related to nature (Astuti, 2020). Apart from that, science also equips students to love nature and fellow living creatures by understanding their various characters. (Pratama et al., 2019). Science subjects are not very suitable if they are only taught by students simply listening to the teacher's explanation, but it would be better if students were actively involved in processing the knowledge they are learning. To make students actively involved in learning, teachers must be creative in creating variations in learning, one of which is through wordwall media.

Wordwall media is able to package learning more interestingly by providing a variety of game-based learning content so that students learn while playing. This is in line with research by Nanda et al., (2017) which states that wordwall media is an interesting and innovative media so that it can help students learn because they can learn more actively and not monotonously. The varied wordwall content also increases students' interest in learning (Alfianti et al., 2020). Then Podungge et al., (2022) stated that media that can improve learning outcomes can be said to be effective media. The results of the research and development carried out have produced science material questions which are packaged in wordwall media which are able to improve learning outcomes because they have gone through a series of tests and validation from experts.

The question items produced in this research have gone through a validity testing process

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to obtain 25 valid questions out of the 30 questions tested. Then, when tested for reliability, it got a score of 0.94 in the very high reliability category. Then, different levels of difficulty and power are tested to get the 20 best questions which are ready to be developed into wordwall-based questions to make learning more interesting. According to Nisa & Susanto (2022), questions packaged in wordwall form can influence students' motivation and enthusiasm for learning. Students will feel happy when learning because it feels like they are playing, even when learning is done online, students can play it from home independently which can train students' responsibility and discipline for learning (Sudarsono & Mulyani, 2021), (Saputri et al., 2023). This is reinforced by the findings of Riandeni et al., (2022) who stated that wordwalls can be a source of student learning both in class and outside class hours.

This wordwall-based question item has also gone through validation by media and material experts and received a very worthy title with scores of 88% and 85% respectively. These questions were then tested on students and received good responses. Students feel helped and enjoy learning by using wordwall-based questions. This is in line with the findings of Savira & Gunawan (2022), (Nurhikmah et al., (2023) namely that the wordwall application can make students more enthusiastic and enthusiastic about learning even when learning is only done online and can also be an alternative for teachers in learning innovation. Agusti & Aslam (2022) concluded in their research that this wordwall application provides encouragement for students' interest in completing quizzes, which will help improve overall learning outcomes for students who use it.

The research results obtained in measuring the increase in students' science learning outcomes were measured by comparing pretest and posttest scores. According to Somaya (2020), student learning outcomes are achievements obtained through the learning stages in class starting from giving assignments, being active in class and exams. Before giving the media wordwall questions, researchers conducted a pretest. After getting the pretest score, group competition activities were carried out using wordwall questions as media with 20 questions. Then students are given post-test questions individually. The pre-test results show that the average student learning outcome score on force and magnetism is only 51, while the post-test results show a higher average score of 89. These results can state that wordwall-based question media can improve the science and science learning outcomes of fourth grade students at SDN Bulu. , which is in line with the findings of Savira & Gunawan (2022) that there is an influence of the wordwall application media on the science learning outcomes of class IV students at SDN Rambutan 02 so that it is effective as an alternative for science learning in elementary schools. Then, Wahyuni et al., (2023) found that learning outcomes increased by 53% after using wordwall

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media in MIPA 1 learning at SMAN 2 Woha. Students experienced a significant increase in learning outcomes and achieved the Minimum Completeness Criteria (KKM) and students were able to master science learning through wordwall games, because if teachers can utilize this game optimally an independent and effective learning environment will be created (Asmadi, 2022), a class that who are full of enthusiasm and motivation and help students remember the material taught (Lubis & Nuriadin, 2022). Wordwall media is a type of learning media that is able to improve students' abilities in mastering the material (Sartika, 2017). When mastery of the material increases, the class atmosphere is active and fun, learning using wordwall-based question media will improve student learning outcomes.

CONCLUSION

Conclusions of the study is obtained results that the media matters word wall is very decent used for supporting learning. The matter has been through validity, reliability, and power tests difference and choice questions based on level difficulty.. Then the 20 best questions were selected and validated by media and material experts who received the very appropriate category. A number of students also received very good responses, stating that they strongly agreed that the wordwall question media helped them learn science and made them enthusiastic about working on the questions so that learning outcomes improved from what was shown by the significant increase in pre-test and post-test questions. Wordwall Question Media can be said to be feasible, interesting and effective in improving student learning outcomes in class IV science subjects on force and magnetism. Suggestions for further research that will examine the development of wordwall-based question media can be developed on other materials with other types of quizzes so that they are more varied and for teachers to be willing to innovate learning both in models, methods and learning evaluation.

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