JPPIPA 9(Special Issue) (2023)

Jurnal Penelitian Pendidikan IPA

Journal of Research in Science Education

http://jppipa.unram.ac.id/index.php/jppipa/index

Development of Optical Equipment Learning Media with the Utilization of Used Goods in Elementary School Science Subjects

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Received: June 10, 2023
Revised: November 5, 2023
Accepted: December 25, 2023
Published: December 31, 2023

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DOI: 10.29303/jppipa.v9iSpecialIssue.4217

Abstract: The problem that often occurs in the science learning process is the lack of involvement of students in using learning media, this is due to the lack of learning media available in schools. This study aims to test the feasibility of optical instrument learning media products with the use of used goods in elementary school science subjects. This type of research uses the R&D (Research and Development) model ADDIE (Analysis, Design, Development, Implementation, and Evaluation). The subjects used were 9 grade IV students of SDN Sumberasri 04 Blitar. Data collection in the form of interview results, expert validation sheets, student response questionnaires, and observation sheets. Data analysis in the form of qualitative data analysis and quantitative data analysis. The questionnaire used is in the form of Likert scale. The results showed validation carried out by media experts on simple microscope products 91.66%, simple magnifying glasses 95.85%, and simple periscopes 95.85%, and the response of students obtained an average score of 3.55. The results stated that media products are classified as very suitable for use in elementary school science learning.

Keywords: Optical Instruments; Science Learning Media; Thrift

Introduction

Natural science is defined as a group of knowledge that discusses objects and natural phenomena obtained through the results of thinking and research by scientists, how to implement it by relying on a skill in the form of experiments with scientific methods. As stated by (Bantwini, D., 2015) suggests that science is one of the fields of science that offers learning experiences in the real world and has a function as a foundation for knowledge growth. Then (Akuma & Callaghan, 2019) suggested that science learning is closely related to living things and the surrounding nature with various discoveries, experiments, observations and investigations packaged through physical skills. Furthermore (Doyan et al., 2020) defines that the nature of science is not only marked through factual data, but also by scientific activities carried out based on a series of scientific activities and scientific attitudes. The definition provides an understanding where science invites students to think scientifically by conducting an observation or investigation activity using concrete media to get scientific answers.

Science learning should be adjusted to the nature and character of students. Students need the involvement of concrete objects to help develop their ability to find a science product, and for later learning, students are also directed to the discovery process independently. Then (Gillies & Nichols, 2015) argues that skills in process science can help learners in critical thinking and thinking scientifically. Furthermore, (Susiloningsih et al., 2023) explained that science learning, especially at the elementary school level, emphasizes providing direct learning experiences through a scientific attitude. Basically, from this definition, it can be explained that students are given the

How to Cite:
Novanto, A.E., Sutama, S., Desstya, A., Prastiwi, Y., & Rahmawati, L.E. (2023). Development of Optical Equipment Learning Media with the Utilization of Used Goods in Elementary School Science Subjects. *Jurnal Penelitian Pendidikan IPA*, *9*(SpecialIssue), 1151–1164. https://doi.org/10.29303/jppipa.v9iSpecialIssue.4217

opportunity to cultivate curiosity, so that they are able to develop critical thinking skills by taking the initiative to ask a question and being able to find answers based on evidence from the results of scientific thinking.

Learning activities are prepared by educators as ideally as possible in order to help students understand the subject matter. Educators prepare lesson plans (RPP), choose models, methods to evaluate learning. This is prepared by teachers to make it easier for themselves to achieve a learning goal, one of the things that can be done is to prepare appropriate learning media. Learning media is a component of learning that can help educators and students to achieve a learning goal. As stated by Hardiansyah & Mulyadi, she explained that learning media can be designed by teachers and students according to the needs and learning objectives (Hardiansyah & Mulyadi, 2022).

Through this learning media can later help educators in delivering a learning material and for students themselves, this media can help them to understand the material presented. The learning process is one component of education that should be made fun and can arouse the enthusiasm of students to be active in the learning process, and of course provide space for creation. The use of appropriate learning media will have a positive impact in helping teachers to convey the content of the material being taught to students, therefore the involvement of learning media is highly recommended (Alika & Radia, 2021). This statement is in line with Herliana & Anugraheni opinion arguing that learning media is a material or tool that can be used to convey a message to students, this is intended to make communication more effective between teachers and students in classroom learning activities (Herliana & Anugraheni, 2020). This has the essence where learning media can be used as an effective tool in attracting attention, stimulating the thoughts, feelings, and abilities of students so that they can generate an interesting and meaningful learning atmosphere. In general, the benefits of learning media are that they can improve the learning process and can increase positive interactions between teachers and students.

The use of science learning media has a function that is no less important in transferring knowledge and planting concepts that are difficult for students to understand. According to (Y. W. Wahyu et al., 2020) suggests that there are five benefits produced based on the skills of students by science learning media, the first can create communication in the form of interaction between teachers and students and students with each other, then the second can stimulate attention, thoughts, feelings and willingness in students to be more active in participating in learning activities and learning becomes meaningful, Furthermore, it can foster the enthusiasm and interest in learning of students so that the attention of students will be more focused on the learning material taught, the next fourth is to instill basic knowledge which aims to make the learning carried out at that time always remembered and become meaningful learning, and the fifth provides a real and interesting learning experience for students to form independent learning activities.

The lack of learning media available in schools is one of the concrete problems for the world of education, especially in schools in general. This limits the ability of students to discover and try new things. The phenomenon that occurred in the field when researchers made pre-research observations in grade IV SDN Sumberasri 04 Blitar, during the science learning process with the subject of optical instrument material, which should be the teacher providing the learning material, the teacher cannot involve learning media related to optical instrument learning materials such as microscopes, magnifying glasses and periscopes which are useful as experimental media for students.

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When associated with science learning, optical equipment material related to this material should be and become a mandatory learning activity for students to be invited to carry out experimental activities using the media directly so that students get real knowledge and insight experience. Based on this (Billah & Sarwanto, 2020) revealed that the learning process is very appropriate when the learning activities are carried out by conducting experimental activities or conducting simple experiments. Through experimental activities, students will be able to play a role and feel directly in the activity of observing the process of how the use of optical instrument media works in reality, so that in this activity it will form a basic step in students for the cultivation of a basic scientific concept for individual students.

Departing from these initial findings, researchers tried to find solutions and carry out observations on the

potential that existed around the school environment that could be used as opportunities or supporting materials that could be used as basic materials for making learning media for these optical instruments. The solution and potential is the use of used goods, according to researchers with the use of used goods can overcome the minimal budget owned by schools, basic materials used as optical instrument media are easily found in the environment around the students' residences and optical instrument learning media resulting from the use of used goods can later concretize science learning materials, especially materials related to optical instruments.

The use of used goods to be modified into a learning medium is an alternative chosen in this study. Used goods media is a tool used in the process of learning activities derived from the use of objects that are no longer used but can still be used for their use (Faishol et al., 2021). Used goods that can still be used for use such as drink bottles, paralons, sardine cans, cardboard, and so on can be processed and then used as a learning media that is adapted to the learning material (Putri Midayanti et al., 2021).

Used goods can be an alternative for schools with minimal budget, it can be explained from the theory mentioned above about used goods that the learning media from the use of used goods is the use of objects that are not used but their role can still be used or modified as learning media that seem unique and interesting. In addition, the media can help teachers in conveying learning material information to students and can arouse student enthusiasm for learning. The use of used goods themselves to be used as learning media will provide an innovation for schools without spending a lot of money, because the existence of used goods is quite easy to get in the surrounding environment.

Based on existing problems, researchers try to refer to the results of previous research to see opportunities for differences and similarities from existing research with research resulting from this study. The results of research conducted by (Jariah et al., 2021) on the development of contextual 3D learning media whose basic materials are made of used goods for grade IV elementary school students explain that contextual 3D media with the use of used goods that have been developed have been tested according to established procedures that have met the feasible criteria with a percentage of 98% value from media experts, Then the material expert with a percentage of value of 95% of the results both meet the criteria of very feasible. The study concluded that contextual 3D media with used goods basic materials is said to be very suitable for use in grade IV elementary school students on butterfly life cycle material.

The results (Yudi Prayogo et al., 2022) of the study show that the media is very feasible to use referring to the results of the assessment of material experts with a percentage of 85% with very feasible criteria, then the results of media validation conducted by media experts show that these results are included in the very feasible criteria with a percentage of 87%. While the results obtained from the student response questionnaire obtained a percentage result of 89% with the criteria of strongly agreeing. Thus, the pop up book learning media to introduce optical tools at SD Negeri 17 Pongok to grade VI students is declared effective for use in the learning process.

Furthermore, the development research that has been carried out by (Hindun, 2021) is about the development of science learning media through the use of used goods. The results of this study were seen from three experts or experts who assessed validity, namely material experts, design, and linguists with a percentage of 83.33%, this was classified into the very valid category. So that the results of this study can be concluded that the development of science learning media by utilizing used goods is valid for use, practical and effective to be applied to the science learning process. Then research conducted by (Hardiyansyah et al., 2019) produced portable digital microscope learning media products that are valid for use in light materials and optical instruments at the junior high school level. The results of the validation test conducted by the validators received an average score of 97.78% with very good criteria.

Research conducted by (Pambudi et al., 2018) with research methods used using Library Research or literature studies provides an explanation in the development of learning media in the form of circulatory system models this is motivated by the lack of teaching aids in elementary schools. Abstract learning by only utilizing teaching aids such as visual images alone makes students not motivated by learning motivation and difficulty in understanding a subject matter delivered by their teacher. The result of this study is that students become motivated and learning becomes concrete.

Judging from previous studies, researchers see the difference in this study, the first of which has not found the results of the development of science learning media with the use of used goods in making optical instrument learning media in the form of simple microscopes, simple magnifying glasses, and simple periscopes in elementary schools. Secondly, based on previous research, researchers have also not found the use of used goods to be used as a learning medium on optical instruments in science subjects in elementary schools. Furthermore, the similarities in previous research with this study according to the researcher's point of view lie in the basic materials, namely the use of used goods.

Departing from the problems that arise in science learning activities and phenomena that occur in the field.

Such as the lack of media availability in schools, the lack of budget in the procurement of learning support media and the lack of optical equipment media made from the use of used goods in science content in elementary schools. Referring to the existing problems and opportunities, therefore researchers want to develop science learning media which currently still seem abstract in its presentation to students. It is hoped that the development of this innovative learning media will boost students' interest in learning. As revealed by (Kumar & Sharma, 2021) revealed that the development of innovative learning media is very necessary, this will have a positive impact on the learning process. Students become easy to understand the material, motivated, and learning more interactive.

The development of learning media is a learning media by utilizing used goods to be used as learning media in the form of simple microscopes, simple magnifying glasses, and simple peaches on optical instrument materials. The purpose of developing this learning media is expected to produce a learning media product that is suitable for use as a support in delivering optical equipment material in science subjects. So that students can directly practice with the media, easily understand the concept of subject matter, and can achieve competence, experience, and learning to be meaningful for students.

Method

The research method uses the R&D (Research and Development) development method using the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). This research was carried out until the product feasibility test stage because researchers wanted to see the enthusiasm of learning students by using optical tool learning development media products with the use of used elementary school science subjects. This development was chosen to maximize or develop learning media that already exist in schools, especially in learning science grade IV optical instrument material. This research was conducted at SDN Sumberasri 04 Nglegok District, Blitar Regency. The subjects used were 9 grade IV learners. The data collection techniques used are interviews, expert validation sheets, student response questionnaires, and observation sheets.

The procedure of research development used using the ADDIE development model, which consists of 5 stages, including (a) analysis; At this stage, researchers carry out analytical actions such as conducting interviews with teachers regarding what problems are behind the emergence of learning media development and making observations related to the supporting potential of making learning media that are easily found around the school environment, especially the basic materials of making simple optical instrument media. . (b) design; This stage the researcher will make a plan related to the results of the analysis he has done then the researcher will look for a reference related to the development of the optical instrument media. (c) development; This stage the media will begin to be developed according to the planned design, then researchers will submit it to a team of validator experts for product validation. If the product is not suitable for use, the researcher will make a revision in accordance with the advice of the validator expert team. If the media product has been deemed feasible by a team of expert validators, researchers will conduct product tests on teachers and grade IV students of SDN Sumberasri 04 Blitar. (d) implementation; This stage of media that has gone through the previous stage will be implemented in real activities in the classroom. During the implementation, the material presented was material related to the learning media developed, namely light material and optical instruments. (e) evaluation; This stage researchers see what feedback is generated by students after using optical instrument media made from the use of used goods.

Data analysis techniques use qualitative and quantitative data analysis. Qualitative data is obtained from the results of interviews with teachers and the results of observational data on students. Quantitative data were obtained through media validation assessment sheets and student response questionnaires. The assessment score criteria for optical instrument learning media with the use of used goods using the Likert scale are what if the percentage gets a score of 81% – 100% then it is declared less valid, then what if the percentage gets a score of 61% – 80% then it is declared feasible, Furthermore, what if the percentage gets a score of 41% – 60% then it is declared quite feasible, then what if the percentage gets a score of 21% – 40% then it is declared less feasible, and what if the percentage gets a score of 0% – 20% then it is declared not feasible. Quantitative data obtained from the assessment of media experts, material experts, and practitioners are then converted into qualitative data with a Likert scale in Table 1.

Table 1. Score criteria for the assessment of media experts, material experts, practitioners, and student observation sheets on optical instrument learning media with the use of used goods.

Percentage (%)	Category
81 – 100	Very worth it
61 – 80	Worthy
41 – 60	Pretty decent
21 – 40	Less decent
0 – 20	Not worth it

Student response questionnaires are used to determine the feedback generated from the use of optical

instrument learning media with the use of used goods tested. The questionnaire of responses to students amounted to 10 statements with vulnerable scores; What if the assessment reaches a score range of 3.50 - 4.00 then it is declared very feasible, then what if the assessment reaches a score range of 3.00 - 3.49 then it is declared feasible, then what if the assessment reaches a score range of 2.00 - 2.99 then it is declared infeasible, and what if the assessment reaches a score range of 1.00 - 1.99 then it is declared infeasible. Quantitative data obtained from student response questionnaires are then converted into qualitative data with likert scale in Table 2.

Table 2. Score criteria for the results of questionnaires of student responses to the use of optical instrument learning media with the use of used goods.

Range	Categories
3.50 – 4.00	Very worth it
3.00 – 3.49	Worthy
2.00 – 2.99	Less decent
1.00 – 1.99	Not worth it

Research Results

Analisys

The results of the research at the (Analysis) stage are the pre-planning stage in making the product to be developed. At this stage, researchers carry out two actions, namely the analysis of the content contained in science subjects, light materials, and optical instruments, then analyze the needs of teachers and students. The results of the study were found in learning subtheme 3 heroic attitudes, learning to 3 class IV on the indicators of competency achievement (IPK) contained in the teacher's lesson plan (RPP) stated that students can express the findings they obtain from practical activities, then students can show and prove the results of their scientific answers based on the results of their findings.

Furthermore, the researcher conducted an analysis of the media used by teachers, especially in science subjects, optical instrument material, based on the results of interviews with grade IV teachers, the media in schools was very limited. The media used by teachers to support the learning process is to use smartphones owned by their students, as well as pictures in student books. Then in order to facilitate the delivery of material so that students understand in receiving the information conveyed, grade IV teachers also use their smartphones to show various videos related to learning material, essentially all kinds of ways are done by teachers so that students understand the material being taught. Can present learning media by not spending a lot of budget.

Design

Then the (Design) stage researchers try to explore some information from various sources related to how to make optical instrument learning media designs with the use of attractive used goods by utilizing the potential that exists in the field such as the use of used goods that are still suitable for use. Researchers searched for this information through the internet, journals, and books that researchers think are relevant to this study. Researchers also do not forget to involve supervisors to ask for guidance, and directions and ideas in the process of designing optical instrument learning media designs.

Development

Stage (Development) after going through the process of learning media design design activities is completed, the next step is for researchers to start to the next stage, namely the product validation stage, product revision if needed, and then trialed. The purpose of this stage is to produce optical instrument learning media in science subjects by utilizing used goods as learning media that are considered valid and fall into the category suitable for use as media in the science learning process, especially light materials and optical instruments.

Table 3. The results of validation of optical tool learning media by media experts

Assessment indicators	Optical tools learning media		
	Microscope	Magnifying glass	Periscope
Basic materials are easy to obtain.	3	4	4
The price of basic materials is relatively cheap.	4	4	4
The base material is safe to use (not irritating).	4	4	4
The resilience of the medium endures for a long time.	4	4	4
Sturdy media is used for learning.	4	4	4
Media is easy to move.	3	4	4
The media is easy to operate.	3	4	4
The components of the substrate resemble their original form.	4	4	3
The usefulness of the components of the media resembles the original.	4	3	3
The results displayed are clearly visible.	3	3	4
The results of the object of observation are clearly visible.	4	4	4
The results of the object of observation resemble the original.	4	4	4
Sum	44	46	46
Percentage	91.66%	95.83%	95.83%

Based on table 3, the results of expert validation of optical instrument learning media show that from 12 indicators in the results of the assessment of simple microscope optical instrument media, the number of scores is 44 with a percentage of 91.66%. Then the simple magnifying glass optical instrument media gets a total score of 46 with a percentage of 95.83%. Furthermore, simple periscope optical instrument media gets a total score of 46 with a percentage of 95.83%.

Table 4. Material expert validation results.

Assessment indicators	Score
KD conformity with IPK.	4
Suitability of activities to learning objectives.	4
Produce PAKEM and 4C learning.	3
The use of media does not cause misperceptions.	4
The use of words in the instruction manual is in accordance with the rules of Indonesian.	4
The language in the instruction manual is easy to understand.	4
Language is appropriate to the development of learners.	3
The terms used are easy to understand.	4
The presentation of material with media makes students active.	4
The presentation of material with the media encourages curiosity.	3
The results of the object of observation are clearly visible.	3
Can be uplifting.	4
Sum	44
Percentage %	91.66%

Based on Table 4, the results of material expert validation from 12 statements of material assessment indicators using learning media optical instruments made from used goods show that the number of scores obtained is 44 with a percentage of 91.66%.

Implementation

Stage (Implementation) after media development activities are completed and become products that are ready to be implemented, the next stage carried out in this research is to conduct limited trials. This trial activity will be carried out on a limited scale to 9 students and 2 practitioners. During the process of testing the feasibility of optical instrument learning media with the use of used goods in class, researchers made an observation using student observation sheets.

In the implementation of used optical instrument learning media products carried out on students in the classroom, at this stage of the activity validation was also carried out by 2 expert practitioners. The results of the study conducted by the first practitioner expert showed that the score obtained was 47, the number of scores when converted into percentage values got a value of 97.91% with the criterion "very feasible". Then the second practitioner expert showed that the score obtained was 45, the number of scores when converted into percentage values got a value of 93.75%, with the criterion of "very feasible".

Evaluation

At this stage (evaluation) aims to measure the achievement of the goals of product development. The ultimate goal of this study is to see the feasibility of using optical learning media in the form of simple microscopes, simple magnifying glasses and simple periscopes in science subjects, especially in light materials and optical instruments. Feasibility in this study is supported by data from the results of assessments conducted by students through questionnaire sheets of student responses to the use of these media products.

Discussion

Analysis

Based on the findings contained in the RPP, the content of science subjects made by teachers has led to discovery learning activities and to then train students in providing a scientific answer, then the next action is to take several actions such as. First, linking KD with learning objectives to be achieved, then the second formulates GPA based on KKO bloom's taxonomy, and the third analyzes the subject matter according to indicators and to then adjust to learning activities. This step was taken because he agreed with what was stated by Sobron he gave the idea that science or science is one of the human efforts to study and understand the universe through effective observation activities or right on target, and in its activities using various procedures and explanations based on reason so that the results can be found a conclusion (Sobron A.N et al., 2019). Then (Desstya et al., 2017) suggested that the process of learning science should be adjusted to the nature and based on the character of students. It is at this stage of concrete operational development that learners need the involvement of concrete objects to help develop their cognitive abilities. To find a science product and then understand it, students are also directed to the process of discovery independently. Students are given the opportunity to cultivate curiosity, so as to be able to develop the ability to ask questions and seek answers based on evidence from the results of activities and scientific thinking.

Referring to problems arising in science learning activities and based on phenomena that occur in the field and explanations of the results of interviews with class teachers. Such as the lack of media available in schools, as well as the high budget in the procurement of learning support media and have never found optical instrument media made from the use of used goods for science learning in elementary schools. Based on the results of interview data with resource persons related to these

problems, teachers' opinions on the learning media to be developed by researchers received a good response, because the results of the learning media products made can attract interest in learning and help students understand the material. This is in line with what was stated Atikasari & Desstya by involving learning media, this can increase students' interest in learning, especially media that is packaged attractively certainly adds a sense of enthusiasm in learning so that it can help in understanding learning material (Atikasari & Desstya, 2022).

Design

Departing from various results of relevant information and guidance activities with supervisors. The design design of optical instrument learning media in the form of a simple microscope, simple magnifying glass, and simple periscope is designed attractively and the function of the components contained in the used optical instrument learning media product is not much different from the components contained in the original optical instrument.

Media is designed attractively, environmentally friendly, and of course the media can help teachers convey information related to the subject matter and students are able to easily understand the learning material, so that learning becomes concrete. In line with what was revealed by Susanto et al. (2022) revealed that by using learning media, students will find it easy to understand various elements of material that seem abstract. Here are images of a simple microscope, a simple magnifying glass, and a simple periscope, along with an operating manual.

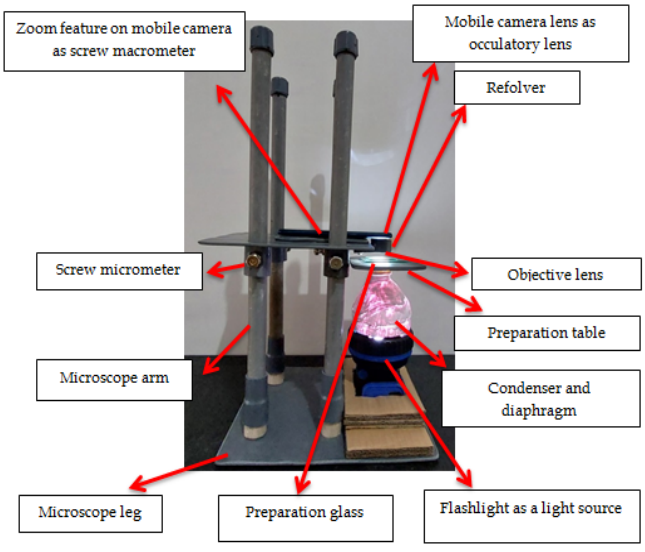


Figure 1. A simple microscope is equipped with the name of its component.

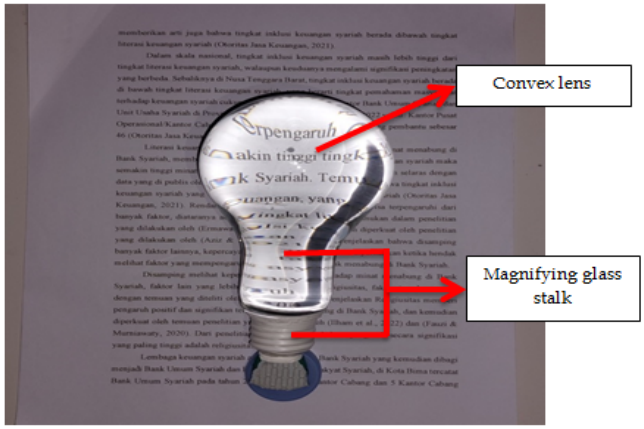


Figure 2. A simple magnifying glass is equipped with the name of the component.

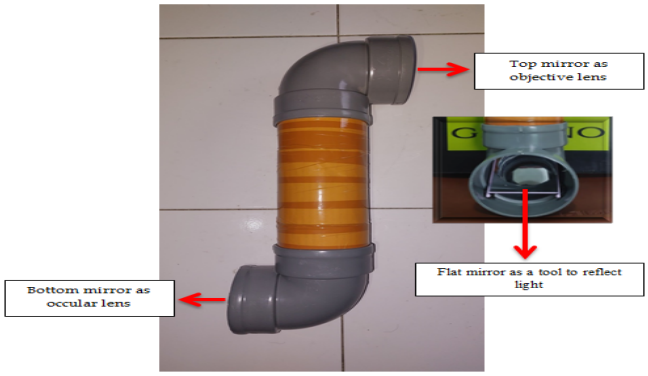
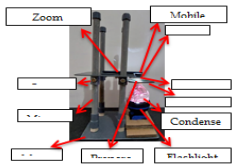


Figure 3. A simple periscope is equipped with the name of the component.

The manual for the operation of optical instrument learning media in science subjects, light materials and optical instruments contains guidelines on how to operate and contains the names of components from each learning media, simple microscopes, simple magnifying glasses, and simple periscopes.

Figure 4. Front view of optical instrument learning media operation manual.



Cara menggunakan atau mengoperasikan media alat optik Mikroskop Sedehana.

1. Langkah pertama letakkan mikroskop sederhana pada bidang datar dengan cara memegang lengan mikroskop sederhana.
2. Nyalakan senter yang berguna sebagai sumber cahaya.
3. Carilah benda yang ingin kalian amati seperti contoh air, bawang merah, daun adam hawa dan lain-lain sebagai media yang akan dijadikan objek pengamatan.
4. Letakkan media yang dijadikan objek pengamatan di atas kaca preparat, jika media pengamatan bersifat padat seperti bawang merah dan daun adam hawa tetesi atau basahi media tersebut dengan air dengan menggunakan pipet. Tutup permukaan atas objek dengan kaca preparat.
5. Letakkan kaca preparat yang telah diberi objek tersebut di atas meja preparat. Cara meletakkannya tepat di lubang tengah yang terkena cahaya dari senter.
6. Letakkan kamera handphone di atas lensa objektif. (jika kebingungan dalam penempatannya lihat gambar 1).
7. Atur jarak antara lensa objektif dengan objek yang akan diamati dengan cara menaik turunkan mikrometer sekrup.
8. Jika jarak diantara lensa objektif dengan objek yang akan diamati sudah benar, langkah selanjutnya yakni atur tingkat kefokusan objek yang diamati yang terlihat pada tampilan layar hanphone menggunakan fitur zoom yang terdapat pada kamera hanphone tersebut. (kegunaan fitur zoom ini hampir menyerupai makrometer sekrup pada mikroskop yang asli)
9. Jika ingin menghasilkan amatan secara keseluruhan dengan melihat sekeliling objek amatan maka geser secara perlahan objek yang diamati. Caranya dengan menggeser secara perlahan kaca preparat atau refolfer dan meja preparat yang telah didesain fleksibel dengan perlahan.

Figure 5. Display of the contents of the optical instrument learning media operation manual.

Development

Followed up from the assessment data conducted by media experts on the validation test of learning media assessment, simple microscope optical instruments, simple magnifying glasses, and simple periscopes. It can be seen in Figure 6.

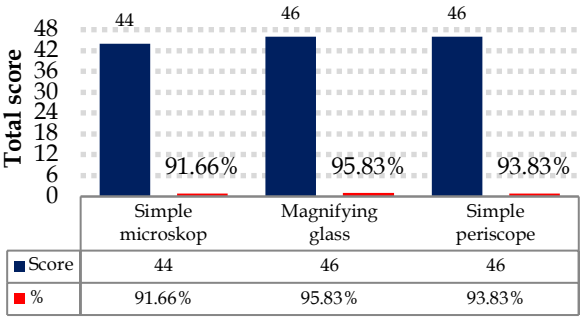


Figure 5. Bar chart of the results of the optical instrument learning media validation assessment conducted by media experts.

Figure 5 shows that the validation value of optical instrument learning media with the use of used goods from the total number of assessment scores is 48 total of the total scores. Simple microscope media get an acquisition score of 44 with a percentage of 91.66%. Simple magnifying glass media products get a gain score of 46 with a percentage of 95.83%. Furthermore, simple periscope media products get a gain score of 46 with a percentage gain of 95.83%. Based on the results of obtaining the percentage of each optical instrument learning media product developed in the form of a simple microscope, simple magnifying glass, and simple periscope with the use of used goods, the results of obtaining these media products can be said to be included in the category of very feasible for use in science learning. As Arikunto's theory which explains that learning media products are declared feasible if they have received a percentage value of ≥61% (Arikunto, 2014).

This data is also reinforced by relevant research conducted by (Jariah et al., 2021) in their research explaining that the results of developing contextual 3D media products from used goods in grade IV elementary school students are declared very feasible for use, the results of the scores obtained in the media expert test obtained a percentage value of 98%. Furthermore, research conducted by (Ardi, 2022) regarding human circulatory system props from used goods in science learning explained that the results of media validation conducted by media experts obtained an average feasibility value of 85.77%, with this result also human circulatory system development media products made of items in science subjects of elementary school students were declared very suitable for use.

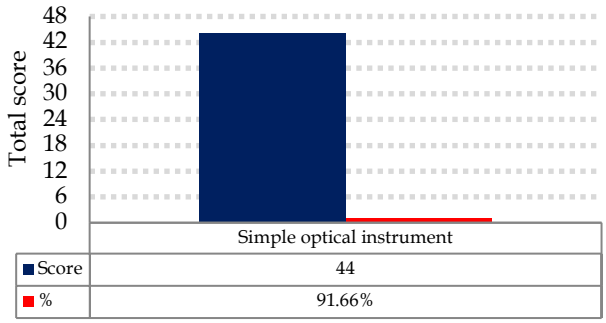


Figure 6. Bar chart of validation assessment results by material experts.

Based on figure 6, it shows the value of material validation of optical instrument learning media with the use of used goods from the many assessment scores totaling 48 total of the total scores. The results of the assessment conducted by material experts get a score of 44 with a percentage of 91.66%. Referring to the results of obtaining percentages obtained from material expert assessment activities on learning media products, optical instruments developed in the form of simple microscopes, simple magnifying glasses, and simple periscopes with the use of used goods. The results of these gains can be said to be in the very decent category.

The results of the material expert assessment are supported by Angko's statement (Angko & Mustaji, 2017) which explains that the percentage of all aspects that have been carried out by validator experts affects the feasibility level of a product developed. Then research conducted by (Pambudi et al., 2018) produced a media about the circulatory process made from used media materials to help students understand the circulatory process material in real and detail. The media also helps students in providing a concrete picture of new information and ideas and can unite the material that the teacher will convey to students so that the material can be received properly.

Implementation

Table 5. Result of student observations.

Observation aspect	Result	%	Category
Answering apperception questions.	6	67	Proper
Pay attention, listen and respond to the material taught.	9	100	Very decent
Write important information and investigate the problems given.	8	89	Very decent
Discuss between students	8	89	Very decent
Ask the teacher.	8	89	Very decent
Answer questions given by teachers.	7	78	Proper
Prove the function of simple microscope media products, simple magnifying glass, and simple periscope	9	100	Very decent
Conduct experiments in accordance with the material that has been taught using media products	9	100	Very decent
Summing up the learning material.	6	67	Proper
Listen to a brief evaluation of today's learning.	9	100	Very decent

Based on Table 5. The results of observations that have been carried out using optical instrument learning media with the use of used goods have an impact on aspect number two. In this aspect, researchers saw that there were 9 students who paid attention, listened and responded to the material taught. This is based on the theory expressed by (Istyadji et al., 2022) revealing that the role of the media is very necessary to build communication between teachers and students. In line with what was revealed, (Y. Wahyu et al., 2020) revealed that the benefits generated based on the skills of students by learning media can create communication in the form of interaction between teachers and students and students with each other. Then (Monhartini et al., 2023) explained that learning media is considered as a means that can be used to convey messages, through learning media can stimulate attention, emotions in activities and interest in learning students.

In aspect number three, 8 students were seen who carried out aspects of writing important information and investigating the problems given. Researchers view this aspect is related to the skills of the science process where students to solve a given problem, they carry out an experimental and investigative action based on the information that has been collected. In line with the theory expressed by (Gillies & Nichols, 2015) argues that skills in the science process can help learners in critical thinking and thinking scientifically. Then (Auliya Arrohman et al., 2021) explained that skills in the science process make the learning atmosphere lively and interesting. Furthermore, (Kamariyah et al., 2023) also argues that skills in the science process are a scientific step where students can train their ability to find something through experimental or practicum activities. Students are given the opportunity to cultivate themselves by instilling curiosity such as recording important information obtained from the information conveyed by the teacher and to then be able and skilled in thinking scientifically or conducting investigations to find scientific answers. This is expected to be able to train students' mental skills in finding answers based on evidence from the results of scientific thinking.

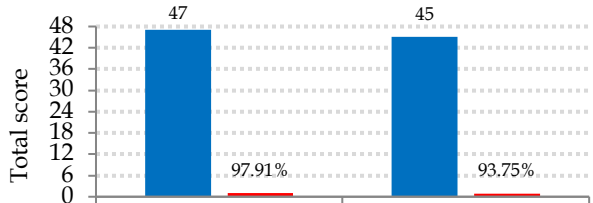
In aspects number four and five getting the same number, researchers saw 8 students looked enthusiastic and interested in learning, activities carried out such as asking about learning material to teachers during the learning process and discussing with their friends. The results of these observations are in line with research conducted by (Yustita Ramadhina et al., 2022) regarding the creation of mini watter heaters from used goods in her research explaining that it can attract students to be enthusiastic in the learning process and can foster a sense of cooperation between groups in working on the watter heater project. This can also foster critical thinking in each individual student..

Aspect number seven assessment there are 9 students also seen active in conducting direct trials of learning media, this is in line with science learning activities (Qistina et al., 2019) he suggested that science learning is related to how to find out about natural symptoms systematically, so that science learning is not only given as mastery of a collection of knowledge in the form of facts, concepts, as well as principles only but in this learning also train or as a process of scientific discovery. In line with what was stated by (Zidny & Eilks, 2020) stated that science learning not only teaches students to memorize and know various science concepts but also trains students in understanding problems, analyzing them, and finding solutions to solve problems given based on their knowledge and thinking skills.

Furthermore, aspect number eight there were 9 students who were enthusiastic in conducting an experiment using the media. The results of this observation are in accordance with the definition of science learning where the field of science studies several events that exist in nature. Science is knowledge that is systematic and formulated, this is closely related to material symptoms based on an observation. Then (Fahrezi et al., 2020) in their research emphasized that science is one of the subjects at the elementary school

level which is intended so that students have organized knowledge, ideas, and concepts related to the environment, which are obtained from experience actualized through a series of scientific activities. Then (Billah & Sarwanto, 2020) revealed that learning is very appropriate when learning activities are carried out by conducting experimental activities or conducting simple experiments.

The data that researchers have obtained when validating carried out by practitioners can be seen in Figure 7.



	Practitioner 1	Practitioner 2
Score	47	45
%	97.91%	93.75%

Figure 7. Bar chart of assessment results conducted by practitioners.

From the data of figure 7. It can be explained that the assessment score obtained from the first practitioner gets a score of 47 with a percentage of 97.91%. Furthermore, the second practitioner received a score of 45 with a percentage of 93.75%. Judging from the results of percentage acquisition carried out by the two practitioners, the percentage results of both when converted into qualitative data then the data is declared into the category of very feasible.

In the expert validation activity, the first practitioner gave a score of 4, which is very good for indicator number two about the use of simple microscope media, simple magnifying glasses, and simple periscopes with the use of used goods able to arouse students' learning interest. This assessment is based on the statement of (Wahyuningtyas & Sulasmono, 2020), he explained that the use of teaching media in the learning process can generate will and interest, as well as a tool in generating motivation, stimulation in learning activities. Then (Kartika et al., 2023) also argues that learning media that are said to be effective are learning media whose role can have a happy effect in participating in learning process activities so that students more easily understand the learning material being taught.

In this activity, the first practitioner expert gave a score of 4, which is very good for indicator number three about media can help teachers in conveying information. In line with the research conducted (Putri Midayanti et al., 2021) regarding the use of used goods as an elementary school learning medium. The results of the research are very useful and their role can clarify the material they are teaching, save time, trigger students to play a more active role. In line with the opinion expressed by (Moghavvemi et al., 2018) stated that the use of learning media in elementary schools is very important because learning media will make it easier to convey information to students, especially students in elementary schools. Teachers should use learning media as an intermediary tool in delivering a learning material, the purpose is none other than so that students can understand the learning material well.

The results of the assessment conducted by expert practitioners on indicator number four such as simple microscope media, simple magnifying glasses, and simple periscopes with the use of used goods are able to help students understand abstract subject matter into contractors, in this indicator expert practitioners give a score weight of 4 or very good. This is supported by research conducted by (Putri Midayanti et al., 2021) the use of used goods as elementary school learning media, the result of the research is that teaching media is very useful and its role can clarify the material it is teaching . In line with the explanation from (Sutama & Fajriani, 2022) explained that learning media is a tool for delivering learning messages that are useful for improving teaching and learning process activities where students act as message receivers able to translate messages and information in accordance with the purpose of the learning material being taught.

Furthermore, in indicator number five about the use of media in learning activities can encourage students to build their knowledge and provide scientific answers, expert practitioners give a score weight of 3 or good. This is in line with (Lang et al., 2022) arguing that the role of learning media can be used as a tool to stimulate thoughts, feelings and willpower. This assessment when associated with science learning that is being taught using development products, in line with what was stated by (Hisbullah & Firman, 2019) explained that science is a science that studies several events that arise in the universe related to facts, concepts or principles, this is the basis for a scientific process of discovery and observation. Basically, science learning invites and trains students to think scientifically about all natural phenomena that occur in their environment.

Evaluation

Judging from figure 8, the results of the student response questionnaire show that students more easily understand learning by using learning media. This can be proven from the results of the student response questionnaire on indicator number three which received an average score of 3.88 This result is supported by the opinion expressed by (Untari, 2017) he explained that the subject matter delivered will be more clearly conceptualized so that its meaning can be easily

understood by students and the teaching methods carried out by teachers become more varied. Furthermore, (Melita et al., 2023) also revealed that learning media has an important role in learning activities because of its role as an intermediary for teachers in delivering messages or information, this is so that learning materials can be easily understood by students well. Learning media also acts as a useful supporting tool to clarify the meaning of a message conveyed, so that the role of the media can achieve learning objectives well (Andayani et al., 2022).

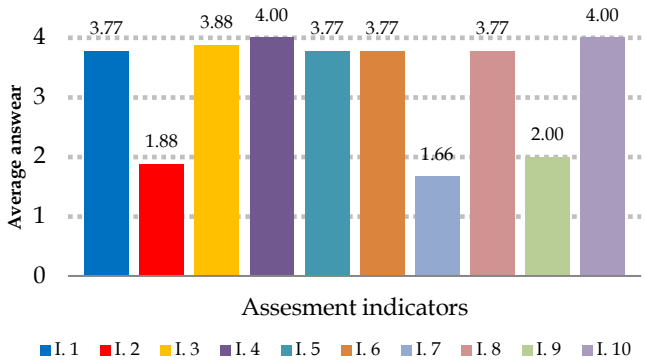


Figure 8. Bar Chart of Student Response Questionnaire Assessment Results

The results of the student response questionnaire in figure 4.10 also show that students become more enthusiastic in participating in learning activities. This can be proven from the results of the student response questionnaire on indicator number four which received an average score of 4. This result is reinforced by the statement stated by Hardiansyah & Mulyadi, he revealed that learning media is made interestingly, this aims to make students enthusiastic, interested, and motivated to be enthusiastic in participating in the learning activity process (Hardiansyah & Mulyadi, 2022). This is in line with the research conducted (Nurlaila et al., 2020) in her research explaining that learning media made from waste used goods in the elementary school equivalence package produces a learning media whose role is very helpful for students in understanding the subject matter delivered by the teacher. Then (Fathurohman et al., 2023) also explained that students, especially elementary schools, prefer learning by involving learning media in the learning process in class.

Referring to figure 8, the results of the student response questionnaire show that students become trained in conducting experimental activities, students can also provide scientific answers. This can be proven from the results of the student response questionnaire on indicator number eight which received an average score of 3.7. The data is supported by research conducted (Masrikhiyah, 2019) "Improving the quality of student knowledge regarding research on improving the quality of student knowledge related to natural science through the use of microscope optical instruments. This is related to the definition of learning science content explained by (Samsudin et al., 2023) explaining that science content is a fun subject, because learning science is the same as learning about the universe and the surrounding environment. Not only that, science is the mastery of a collection of knowledge such as facts, concepts and also a process of discovery. Through experimental activities, students will be able to play a role and feel directly in the activity of observing the process of how the use of optical instrument media works in real terms for humans, so that in this activity it will form a basic step in students for the cultivation of a basic scientific concept for individual students.

Furthermore, based on the results of the student response questionnaire in figure 8 also shows that students in addition to being able to provide scientific answers, students can also get new and meaningful learning experiences after conducting experiments using these learning media. This can be proven from the results of the student response questionnaire on indicator number ten, they all answered very much in agreement regarding the statements contained in indicator number ten and got an average score of 4.00. This data is reinforced by a research statement conducted (Shofi & Humairoh, 2019) regarding "Introduction and training on the use of microscopes in grade IV elementary school students", the results achieved from this study are that students can directly operate optical instrument media in the form of microscopes so that they can observe microganism that cannot be seen with the naked eye. Then research (Mahardika et al., 2022) on "Analysis of the role of periscope props to improve optical concepts in grade XI students of Al-Furqon Jember High School" resulted in research where periscope props learning media proved to be able to increase students' understanding related to the concept of optical instrument material, besides that students also became interested and enthusiastic in participating in learning optical material and easier to understand.

Conclusion

The results of the study and discussion can be concluded that the validation test conducted by media experts on simple microscope learning media products gets a percentage of 91.66%, simple magnifiers get a percentage of 95.83%, and simple periscopes get a percentage of 95.83%. Then the assessment conducted by material experts got a percentage of 91.66%. Furthermore, the assessment conducted by practitioners stated that the development media product was declared very suitable for use in learning science optical

instrument material. The feasibility results are also strengthened by the assessment results of each item on the observation sheet of students who on average are classified as very feasible criteria. Furthermore, the results of the assessment of student response questionnaires also show very feasible criteria. This result also states that optical instrument learning media with the use of used goods is declared suitable for use in the elementary school science learning process optical equipment material.

Acknowledgments
Thank you to the University of Muhammadiyah Surakarta for supporting this research and SDN Sumberasri 04 Blitar for granting a place permit to carry out this research.

Author's Contribution
A.E.N., Designing research, writing articles and creating learning media for optical instruments with the use of used goods; S.M., Giving directions; A.D., Designing research instruments, designing research flows, ensuring media products are neatly arranged before being submitted to validators; Y.P., Article writing, L.E.R. article editor editor , Language translator.

Funding
No funding from any agency.

Conflict of Interest
The researcher stated that there is no conflict of interest from anywhere related to the publication of this research journal article.

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