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Development of LKPD Natural Sciences Based on Literacy and Numeration Assisted by Augmented Reality Media in Islamic Elementary School

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Abstract

The study aims to produce a Science Student Worksheet (LKPD) based on literacy and numeracy assisted by augmented reality media at the State Islamic Elementary School (MIN) of Bandar Lampung. This development research uses the ADDIE model which consists of five steps, namely: analysis, design, development, implementation, and evaluation. The subjects in this research are V class of MIN Bandar Lampung students. Data collection techniques apply to a questionnaire. Data analysis techniques in this study used qualitative and quantitative analysis techniques. Qualitative data is obtained from input from experts/validators when validating material, media, and language. Meanwhile, quantitative data are obtained from a two-sample comparative test t-test and N gain test. Based on the validation results, it has fulfilled several predetermined indicators, namely: a) Content Eligibility with an average value of 3.33; b) Oriented towards the development of LKPD with Literacy content with an average value of 3.28; and, c) Oriented to the Development of LKPD with a numerical content of an average value of 3.31. The linguist validator has also met several language indicators which have been set at 3.40 with a valid assessment category. On the practical aspect, an average value of 3.38 is obtained with the valid category. And the average value of attractiveness based on student responses is 3.27 which is included in the attractive category. This LKPD is interesting because an explanation of the experimental activities and the use of AR media is complemented by how to use it so that work mechanisms/procedures are also presented with props.

Keywords: Augmented Reality Media, LKPD, Literacy, Numeracy.

Abstrak

Penelitian bertujuan untuk menghasilkan Lembar Kerja Peserta Didik (LKPD) IPA berbasis literasi dan numerasi berbantuan media augmented reality di MIN Bandar Lampung. Penelitian pengembangan ini menggunakan model ADDIE *yang terdiri dari lima langkah yang terdiri dari: analisis, desain, pengembangan, implementasi dan evaluasi. Subjek dalam penilitian ini adalah peserta didik kelas V MI Bandar Lampung. Teknik pengumpulan data menggunakan angket. Teknik analisis data dalam penelitian ini menggunakan teknik analisis kualitatif dan kuantitatif. Data kualitatif didapat dari masukkan ahli/validator saat validasi materi, media dan bahasa. Sedangkan data kuantitatif didapatkan dari uji banding dua sampel t-test dan uji N gain. Berdasarkan hasil validasi telah memenuhi beberapa indikator yang telah ditetapkan yaitu: a) Kelayakan Isi dengan nilai rata-rata 3,33; b) Berorientasi pada pengembangan LKPD dengan muatan Literasi dengan nilai rata-rata 3,28; dan c) Berorientasi pada Pengembangan LKPD dengan muatan numerik nilai rata-rata 3,31. Validator ahli bahasa juga telah memenuhi beberapa indikator kebahasaan yang*

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telah ditetapkan sebesar 3,40 dengan kategori penilaian valid. Pada sisi aspek kepraktisan diperoleh nilai rata-rata 3.38 dengan kategori valid. Dan nilai rata-rata kemenarikan berdasarkan respon Peserta didik adalah 3,27 yang termasuk ke dalam kategori menarik. LKPD ini menjadi menarik karena penjelasan tentang kegiatan percobaan serta penggunaan media AR dilengkapi dengan cara penggunaannya sehingga tersaji pula mekanisme/prosedur kerja dengan alat peraga.

Kata Kunci: *Media, Augmented Reality, LKPD, Literasi,Numerasi.*

INTRODUCTION

Quality education has a central role in the progress of the nation because from there cultured and civilized human resources will be born. Nelson Mandela said that education is the most powerful weapon you can use to change the world. Literacy is not only shown through a society that is free from illiteracy but also has life skills, can compete, and has a good level of economic welfare. In line with that, in 2021, a new policy is enacted by the Indonesian Minister of Education, namely changing the National Examination into a National Assessment. The aim is to map comprehensively, not only the results but also the learning process of students so that they are in line with the demands of the times(Asrijanty, 2020). Furthermore, the National Assessment is divided into three parts, namely (1) Minimum Competency Assessment, (2) character survey, and (3) environmental survey (Cahyani & Susanah, 2022; Cahyanovianty & Wahidin, 2021; Widarti et al., 2022). Specifically, the implementation of the Minimum Competency Assessment is designed to develop students' reasoning abilities (Rohim et al., 2021; Setyawan et al., 2019). The Minimum Competency Assessment (AKM), is utilized as the minimum assessment needed by students to actualize themselves and participate in society (Asrijanty, 2020). The Minimum Competency Assessment (AKM) is applied as a reference in measuring cognitive abilities, especially reading literacy and numeracy literacy because these abilities are needed to solve problems in everyday life(Nurhanifa et al., 2021; Styo Siskawati et al., 2021; Teresia, 2021).

UNESCO considers numeracy literacy a life skill and a sign of a nation's growth. Indonesia scores lower on the PISA numeracy literacy test. Indonesia scores 379 in the 2018 PISA numeration test or ranks 74 out of 79 countries (Anderha & Maskar, 2021; Ate & Lede, 2022). The Ministry of Education and Culture also held a similar test, the Indonesian National Assessment Program (INAP) or Indonesian Student Competency Assessment (AKSI), to measure reading, math, and science abilities by taking IV class of elementary school children who showed 77.13 percent lack in math ability. The findings show that Indonesian students have poor numeracy literacy. The Ministry of Education and Culture wants to form the National Literacy Movement (GLN) initiative to create a culture of literacy in all educational environments including schools (GLS). GLS promotes literacy, numeracy, scientific, digital, financial, cultural, and civic literacy in schools (Lamada et al., 2022; Mayapada et al., 2021; Megawati & Sutarto, 2021).

The organization for Economic Co-operation and Development (OECD) highlighted one of the elements behind Indonesia's lagging as a focus on Lower Order Thinking Skills (LOTS) in the learning process. With this style of teaching and learning, there is no systematic strategy for strengthening minds in the 21st century (Barut & Wijaya, 2021; Qasrawi & Beniabdelrahman, 2020; Tsaparlis, 2020). Teaching and learning activities which are increasingly dominated by explanations from teachers make learning boring, one-way, and less able to create ways that educate and empower students' learning abilities to discuss, conduct case surgery, solve the problem,

experiment, observe, etc. Students are obsessed with routine tasks, taking notes, remembering, listening (memorization), and responding to instructor directions so they lack a creative and initiative academic atmosphere (Fajaruddin et al., 2021; Hernawati et al., 2021; Setiawan et al., 2019). Students absorb more theory in teaching and learning activities than the practical consequences of the material. Students do not understand how to apply content to solve problems. Implementation of Basic Education is still dominated by cognitive characteristics with a teacher-centered approach (Jusmiana et al., 2020; Sababalat et al., 2021; Yusuf, 2021). As a result, students tend to accept the teacher's narrative more and the learning process becomes boring. It is not usual to face a hoarse class when students talk to each other, give opinions/suggestions/feedback, or conduct investigations or experiments related to events.

Looking at the parameters mentioned above, it is necessary to use teaching materials that are applied by educators or students which can broaden students' knowledge and experience in learning. Student Worksheets (LKPD) are teaching more practical materials because the main components are student activities based on Curriculum Basic Competencies or learning indicators. Therefore, LKPD can involve students in learning and educate them to explore, prove, and develop themselves through learning activities (Sari et al., 2020; Wandari et al., 2018). Science learning by carrying out activities directly (learning by doing) is packaged in a fun game atmosphere, especially in primary science learning which has a very factual quality and is directly related to natural phenomena, or natural events (Bujuri & Baiti, 2018; Bujuri, et al., 2020). The keys to improving students' literacy and numeracy include having fun learning and ample practice opportunities (Herniati et al., 2017; Richter et al., 2020; Zlirfan et al., 2021).

Based on the results of observation, interview, and analysis of documentation at MIN 5 Sukarame Bandar Lampung and Integrated MI of Muhammadiyah Sukarame Bandar Lampung, data is obtained that the main source of teaching materials used by teachers so far is the 2013 Curriculum Thematic Book package which had been provided by the Government. There are advantages and disadvantages in the use of these teaching materials, including in a structured manner, but it still does not intensively train literacy and numeracy skills in students. It can be seen in teacher and student textbooks, especially in reading texts that they still do not maximally guide students to be able to solve various problems or problems with different cognitive levels such as finding information in reading texts (titles, main sentences, main ideas/topics of reading, and reading conclusions). (Arsyad, 2016; Karo-Karo & Rohani, 2018; Susilana & Riyana, 2009).

In this teaching material, students are also less motivated to integrate, evaluate, and reflect on uncovering relationships between sentences so they do not develop a deep understanding of the text they are studying. In the arithmetic aspect, this teaching material rarely includes understanding, application, and reasoning. Most children can only answer questions according to the example set by the teacher. In simple language, the questions given are only replaced by numbers, the case is generally the same. Thus, students will find it difficult if the teacher makes other examples even though similar ones occur in everyday life or challenges students to conduct reasoning between problems that occur and the emergence of other problems that appear in everyday events.

The researcher also identified that there are no worksheets aimed at improving students' literacy and numeracy abilities. Limited teacher skills and time are a concern. Students can only learn through text. Learning materials that only rely on textbooks produce students less interested and difficult to learn information because the purpose of LKPD is to increase theoretical

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understanding through practical exercises (Science practicum). Students struggle to understand ecosystems. This material tends to be memorized by students so it is prone to causing misconceptions. LKPD support is needed to clarify ecological material. Then, the use of learning media has also not maximized the use of digital technology, it is still visual, the use of dead image media is of the type of hand drawing, print, or print.

Given that the cognitive stages of elementary school-age children, according to Jean Piaget, are at the stage of concrete operational thinking where the mental activities of elementary school-age children are focused on something real, both real objects and real events, the use of LKPD is important. Assisted by application technology, in this case, Augmented Reality (AR) media is applied in the delivery of scientific material. AR is very important for the contextualization of scientific lessons Irwansyah et al., 2020) (Marinda, 2020). AR can help students critically solve everyday challenges (Hikmandayani et al., 2021; Salkiawati et al., 2021). According to validators, instructors, and students, AR learning media shows very good results and is acceptable for use in class and independently outside the classroom (Apriani et al., 2021; Syawaludin et al., 2019). Students look eager to learn using AR media (Setyawan et al., 2019). Based on tests on student groups, the first group learning to use books experienced an increase of 14.5% from the Pre-Test to Post-Test scores. while the second group, learning using Augmented Reality experiences an increase in the percentage of the Pre-Test score. 24.8% post-test (Faiza et al., 2022). This evidence shows that Augmented Reality can be used to improve students' Biology learning outcomes, especially the Human Digestive System material.

The explanation above proves the results of previous research that Augmented Reality media can be operated in the learning process and the results are effective and efficient which increases learning outcomes following research conducted by Elmqaddem (Elmqaddem, 2019). Therefore in this study, researchers have developed teaching materials in the form of LKPD which can train literacy and numeracy skills as well as encourage students to be literate about technology, by using AR media.

METHOD

The method utilized in this research is Research and Development (RnD) or research and development. It is a type of research which aims to produce a product. The research model used is ADDIE (Analysis, Design, Development, Implementation, and Evaluation). The ADDIE research model has five stages, namely (1) Analysis, at this stage the researcher conducts a needs analysis which includes curriculum analysis, approach analysis, teaching material analysis, student characteristic analysis, and material analysis. (2) Design, the researchers designed a Science Student Worksheet (LKPD) with literacy and numeracy content, designed augmented reality media, and designed a validation questionnaire instrument. (3) Development, at this stage the researcher realizes the design of the LKPD natural science (IPA) product, then enters literacy and numeracy content and realization of LKPD designs assisted by augmented reality media, carries out the validation process for literacy and numeracy-based IPA products assisted by Augmented Reality, to material, media, and language experts and make revisions based on suggestions from the validator. (4) Implementation, the researcher conducted trials on 40 V class students for small group trials and as many as 70 people for large group trials to determine the level of effectiveness and attractiveness of Literacy and Numeracy-based IPA-based LKPD Media assisted by Augmented Reality Media.

(5) Evaluation, at this stage two evaluations are carried out, namely formative carried out at the four previous stages, namely the analysis, and design,(Cahyadi, 2019; Setyosari, 2020).

The data collection technique used is a questionnaire which included several indicators aimed at material experts, media experts, linguists, and students as part of the tryout. For material experts, the aspects assessed in this toolkit include the feasibility of the content and the ability of the device to teach literacy and numeracy content. For media experts, the aspects assessed in this tool include technical aspects (appearance) as well as the construction of the compiled content. For language experts, the aspects assessed in the device include all abilities related to grammar so that the information presented can be conveyed to devise users. Finally, from the side of the students, the aspects that are assessed in this tool include their comfort and convenience in using this learning device.

Data analysis techniques in this study apply qualitative and quantitative analysis techniques. Qualitative data are obtained from the input of experts/validators when validating material, media, and language. Meanwhile, quantitative data is used to explain the results of the development of Literacy and Numeracy-based Science Worksheets with the aid of Augmented Reality Media. Quantitative analysis techniques in terms of the validator questionnaire, it is carried out using the calculation of the average answers with the interpretation of the validity score. As for the student questionnaire, it is analyzed using a two-sample comparative test, t-test, and the N gain test.

RESULTS AND DISCUSSION

The first step in the ADDIE research model is analysis, the stage to determine the problem and find the right solution in the learning process. In detail, this stage begins to analyze problems that occur in science subjects, including a) curriculum and competency analysis, b) analysis of approaches, models, and methods used in learning, c) analysis of teaching materials, d) analysis of student characteristics and e) material analysis. Based on the results of observations, interviews, and analysis of documentation at State Islamic Elementary School (MIN) of 5 in Sukarame Bandar Lampung and at Integrated MI of Muhammadiyah Sukarame Bandar Lampung, data is obtained that the main source of teaching materials used by teachers so far is the 2013 Curriculum Thematic Book package which has been provided by the Government. There are advantages and disadvantages in the use of these teaching materials, including in a structured manner it still does not intensively train literacy and numeracy skills in students. It can be seen in the teacher's and student's package book, especially in the reading of the text that it still does not maximally guide students to be able to solve various problems or problems with different cognitive levels.

Furthermore, at the cognitive level, in these teaching materials, students are also less encouraged to carry out integration, evaluation, and reflection to find connections between one sentence and another, so as a result students do not gain a thorough and complete understanding of the reading text they are studying. Likewise in the numeration aspect, the three cognitive levels namely understanding, application, and reasoning, are also rarely explored in these teaching materials. As a result, most students when given questions are only able to answer questions if the questions given are the same as the examples explained by the teacher. In simple language, the questions given are only replaced by numbers, the case is generally the same. Thus, students will find it difficult if the teacher makes other examples even though similar ones occur in everyday life

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or challenges students to make reasoning between problems that occur and the emergence of other problems that appear in everyday events.

In addition to these problems, the researchers also found that there are no science worksheets specifically designed to improve student's literacy and numeracy abilities. Limitations of skills and time that teachers have been among the factors that cause it. As a result, students only use textbooks as learning resources. Learning resources that only rely on textbooks make students less active and difficult to understand the material because, in essence, the function of LKPD is to strengthen theoretical understanding in the form of practical activities (Science practicum). One of the materials which are difficult for students to understand is ecosystems. This material tends to be memorized by students so it is prone to causing misconceptions. Therefore an alternative is needed in the form of LKPD assistance to explain more concretely about ecosystem material.

Furthermore, considering that the cognitive stages of elementary school children according to Jean Piaget are in the concrete operational thought phase in which the consequences in the mental activities of elementary school-aged children are focused on something real, both real objects and real events, it is very important to use LKPD assisted with technology applications, in this case in the form of Augmented Reality (AR) media which is applied in the delivery of science material. AR is considered very important so that the science materials being taught can be more contextual (explanations and examples can be seen in real terms through learning animation videos). Thus, from learning activities that are designed in such a way, it is hoped that the side effects will be able to generate enthusiasm for learning in students because the media display is attractive and colorful, the animation is moving, can be downloaded, and is more environmentally friendly.

The second stage in the ADDIE model is design or planning. In terms of content, the design pays attention to the adequacy of literacy and numeracy aspects according to the assessment standards in the Minimum Competency Assessment (AKM) launched by the Ministry of Education and Culture. Literacy content in LKPD is designed to contain the cognitive abilities of students in understanding reading texts to find information, provide interpretation and carry out integration, evaluation, and reflection to solve problems, or questions contained in the reading text. Then, the numeration content contains efforts to improve students' logical-systematic thinking skills in reasoning using various types of numbers and symbols related to basic mathematics to solve problems contained in reading texts, whether in the form of mathematical narratives, graphs, tables, and other.

In the design of the IPA LKPD that the researchers developed, literacy content is stimulated through reading texts about Marine Ecosystems. Then, in designing augmented reality media, the first step taken is to identify images on the Science Worksheet for AR animation sketches, or in terms of 3D object modeling so that when learning can adopt place interactively because it seems as if the objects/images are observed in real-time. Thus, Augmented Reality can create interactions between the real world and the virtual world. all information can be added so that the information is displayed in real-time as if the information is interactive and real.

The third stage of the ADDIE model is development or development. The development stage is the stage to produce a development product. This stage consists of two steps, namely expert appraisal accompanied by revisions and development testing. In this stage, validation is carried out on the product that the researcher has developed. The composition of the validator team in this study included material expert validators, media, language and educational practitioners to be used

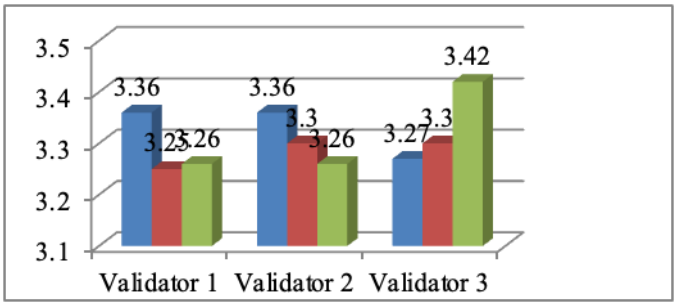
as a reference for improving the product being developed.

The fourth stage of ADDIE is the implementation where at this stage students take part in learning activities using LKPD IPA Loaded with Literacy and Numeracy and Assisted with Augmented Reality Media. After the learning process took place in several meetings, and meetings, especially at the last meeting, the researcher, assisted by the homeroom teacher, distributed questionnaires to be answered by the students. The questionnaire contains responses related to the IPA LKPD product with Literacy and Numeracy assisted by Augmented Reality media that the researcher has developed.

The final stage of the ADDIE model is evaluation. At this stage, a formative evaluation is carried out to determine the validity and feasibility of the product and the fourth is to see the effectiveness of the augmented reality-assisted product and a summative evaluation for the overall evaluation after all development stages have been completed.

Material Validation

The material expert validator assesses in terms of the feasibility of the content and suitability of the IPA worksheets that the researchers developed from the aspects of literacy, numeracy, and AR media base. Based on the assessment, it is concluded that on the Feasibility aspect of the Material Content, an average value of 3.33 is obtained with a valid category so no revision is needed, on the Development aspect of LKPD with literacy content, an average value is obtained of 3.28 with a valid category so no revision is needed, and on the Development aspect LKPD with numeration content obtained an average value of 3.31 with a valid category so that it also does not need revision. Presented in the graphical form it looks as follows:



Picture 1. Graph of Material Expert Validation Results

The average value states that the Literacy and Numeracy-based IPA-based LKPD Products with Augmented Reality Media of Ecosystem material of V Class of SD/MI that the researchers developed are in the "Good" category. This can be seen from the feasibility of the content regarding ecosystem material which has been adapted to aspects of literacy and numeracy according to the assessment standards in the Minimum Competency Assessment (AKM) designed by the Ministry of Education and Culture. Disstimuus literacy content through reading texts about Marine Ecosystems then the numeration content contains efforts to improve students' logical and systematic thinking skills in reasoning using various numbers and symbols related to basic mathematics to solve problems found in reading texts, whether in the form of systematic narratives, graphs, tables, and others. By giving this assessment, it can be said that Literacy and Numeracy-based Science Worksheets based on Augmented Reality Media of Ecosystem material of V Class of SD/MI developed by researchers are Feasible and Interesting to use as learning tools in the science learning process in V class of elementary school (SD), especially in discussing material ecosystem.

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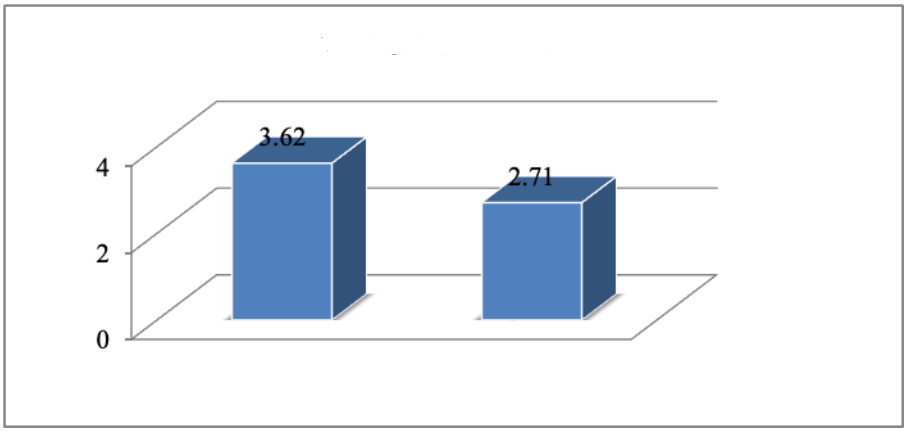
Science activity sheet products based on Literacy and Numeracy assisted by Augmented Reality Media ecosystem material for Class V SD are learning tools that combine elements of literacy, numeracy, and augmented reality to improve the science learning experience for students of V class in elementary school. The activity sheet product mentioned in the statement is intended for V-class students of natural science at schools following the elementary school curriculum. This product is based on Literacy and Numeracy and utilizes Augmented Reality Media to enhance the learning experience. According to his statement, the product has been developed by a researcher and has been evaluated by material experts who have been determined to be suitable for use.

The use of augmented reality allows students to engage with the material in a more immersive and interactive way which has been shown to improve learning outcomes (Mursyidah, 2022). The suitability of this product has been evaluated by a materials expert who has determined that this product is fit for use in the classroom. This is due to the careful integration of literacy and numeracy concepts into the material which helps reinforce key ideas and increase understanding of the subject matter. In addition, the use of augmented reality technology has proven effective in engaging students and encouraging active learning (Arwansyah et al., 2022), which further supports the feasibility of this product.

This means that the product is proven to be effective and useful in teaching Science concepts to V-class students and is in line with the goals and objectives of the Literacy and Numeracy curriculum. The use of Augmented Reality Media in activity sheets adds a layer of engagement and interactivity for students. This type of technology can create learning more fun and interesting for students and can help deepen their understanding of the material. Overall, it appears that the product activity sheets are a valuable resource for science students in V class.

Media Validation

The media expert validator assesses the technical and construction aspects of Literacy and Numeracy-based Science Worksheets with the help of Augmented Reality Media of V Class Ecosystem material of SD/MI that the researcher developed. The technical aspects contain design and layout, views, and drawings. Meanwhile, the construction aspects contain the clarity of components, the availability of space, the completeness of identity, and creativity and innovation.



Picture 2. Graph of Media Expert Validation Results

The image above displays data from the validation results of media experts (design) carried out by 1 validator. The assessment concludes that on the technical aspect an average value of 3.62 is obtained with the valid category so that it is not revised and on aspects. Construction obtained an

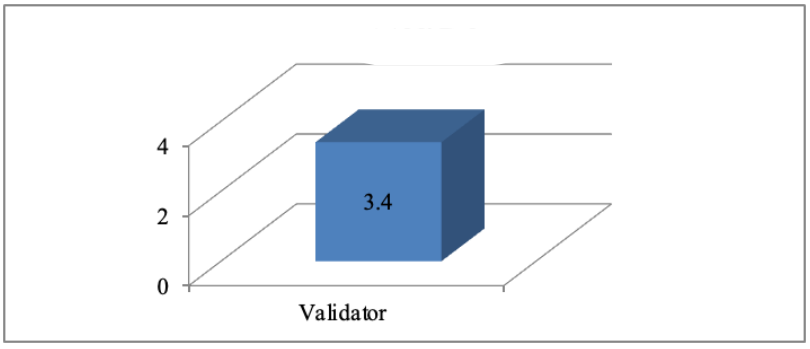
average value of 2.71 with a valid enough category so that it needs partial revision. The average value states that the conclusion of the assessment from the media expert validator (design) can be categorized as a Literacy and Numeration-based natural Science Student Worksheet based on Augmented Reality Media. Products are included in the "Good" category. This can be seen from the technical aspects and construction aspects. Technical aspects which contain design and layout, appearance and drawings, construction specs which contain clarity of space availability components, identity completeness, creativity, and innovation so that choosing 3D image objects with the help of Augmented Reality media can make it easier for students to interact because of the observed objects/images real-time form.

"Student Science Worksheet Product Based on Literacy and Numeration Assisted by Augmented Reality Media Ecosystem Material of SD V Class" is an educational tool that has been designed to help V class students improve literacy and numeracy skills in the school environment in the science education context. The use of augmented reality technology enables a more immersive and engaging learning experience for students because it allows them to interact with virtual elements in the real world.

According to several research results, it is stated that the use of augmented reality in education has been shown to improve student learning outcomes, especially in terms of problem-solving skills and the ability to apply what they have learned to real-world situations. (Mariana et al., 2022; Pratama et al., 2021). Another study also found that the use of augmented reality in science education can also increase students' motivation and engagement with the material(Pringgar & Sujatmiko, 2020). Based on these findings, it can be concluded that the activity sheet products developed by researchers are likely to be effective in helping students improve literacy and numeracy skills in the context of science education.

Language Validation

The linguist validator assesses language from the aspects of a) Straightforward, b) Dialogical and Interactive Communicative, c) Conformity with Student Development, d) Conformity with Language Rules and e) Use of Terms, Symbols, and Icons used in the development of IPA LKPD researchers make.



Picture 3. Graph of Linguist Validation Results

The table and figure above display data from the validation results of linguists conducted by 1 validator. The conclusion of the assessment shows that in the linguistic aspect an average value of 3.40 is obtained with a valid category so it is not revised. Thus, it can be concluded that the Literacy and Numeracy-based Science Worksheets with the help of Augmented Reality Media for the Ecosystem material of Class V in SD/MI that the researchers developed are in the "Good" category.

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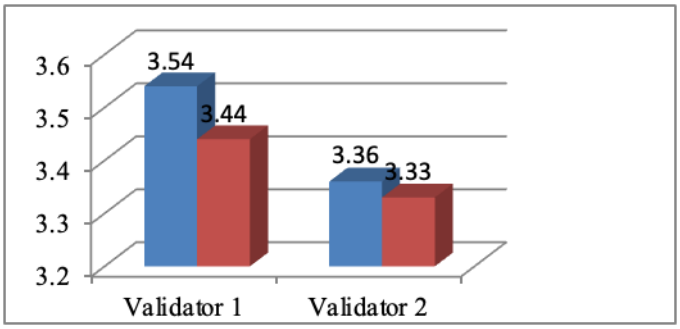
This can be seen in terms of straightforward, communicative, and interactive aspects, the appropriateness of student development, the appropriateness of language rules, and the use of terms, symbols, and icons to facilitate students' understanding of language.

Researchers have developed an activity sheet for class V in elementary school science students that incorporates elements of literacy, numeracy, and augmented reality. The activity sheets are designed to be used in the context of the media ecosystem and have been evaluated by linguists as deemed appropriate for use. Incorporating literacy and numeracy into science education has been shown to enhance student learning and engagement. A study found that students who are taught science concepts through the use of literacy and numeracy-based activities had a better understanding of the material and scored higher on assessments compared to students who are taught using traditional methods.(Ambarwati & Kurniasih, 2021). By combining these approaches, researchers have created an effective tool for teaching science to V-class students.

Educational Practitioner Validation

The validators from the educational element are V class teachers at MIN 5 Bandar Lampung and MIT Muhammadiyah Sukarame Bandar Lampung. The two validators from the teacher's side provide an assessment of whether the Science LKPD with Literacy and Numeracy Content which has been designed has value in the aspects of effectiveness (usefulness) and practicality for use in implementing Science Teaching and Learning in MI.



Picture 4. Graph of educational practitioner validation results

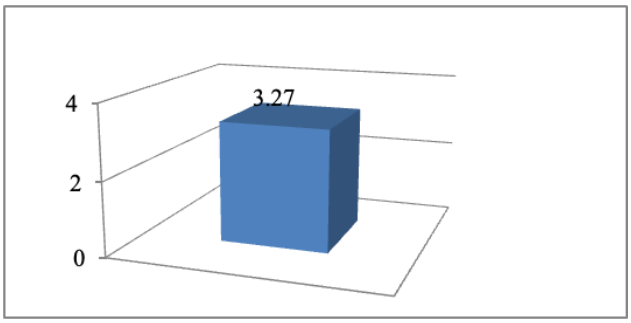
The graph above displays data from the validation results of educational practitioners conducted by 2 teachers from MIN 5 Bandar Lampung and MIT Muhammadiyah Sukarame Bandar Lampung. For example, validator 1 assesses directly two aspects. The first is (blue) in terms of effectiveness (usefulness) with an average of 3.54 and the second is (red color) in terms of practicality and with an average of 3.44, Likewise Validator 2 does the same thing. Based on the assessment (accumulated from both validators I and II) for the aspect of effectiveness (usefulness), an average value of 3.45 is obtained in the valid category so no revision is needed. Then on the practicality aspect, an average value of 3.38 is also obtained with a valid category so no revision is needed. It can be concluded that literacy and numeracy-based science worksheets based on augmented reality media ecosystem material for grade V SD/MI have met the assessment criteria set by the education practitioner validator and are considered to be in the "Good" category. This can be seen from the aspects of the effectiveness and practicality of the media that have been tested so that they can be used in the implementation of learning.

According to several studies, science worksheets that apply augmented reality media can increase learning effectiveness because they allow students to learn interactively and have fun. (Darmawan & Nawawi, 2020). LKPD IPA can also help improve students' literacy and numeracy

abilities so that they can strengthen their competence in the field of Science. In addition, the use of augmented reality media in learning has also been proven to increase student motivation and reduce learning boredom (Alvionita et al., 2021). This is supported by research results which show that students who learn by using augmented reality media have a very good level of success (Halmuniati et al., 2022).

Student Response

Through small groups, trials are carried out in VA Class at MIN 5 Bandar Lampung. The number of students in the VA class is 40 people. However, as many as 20 test subjects found the response results as presented below.



Picture 5. Graph of Student Interests Response Results

Based on the picture above, displays the results of the attractiveness response of students in small groups. The conclusion of the assessment on the attractiveness aspect of LKPD IPA obtained an average value of 3.28 meaning that LKPD IPA contains Literacy and Numeracy and the Assistance of Augmented Reality Media that researchers have developed is included in the "Very Interesting" category.

Meanwhile, in the large group trial conducted in VB Class at MIN 5 Bandar Lampung and in VB Class at MIT Muhammadiyah Sukarame Bandar Lampung, totaling 70 people, it is found that the average attractiveness result is 3.27, meaning that the IPA LKPD contains Literacy and Numeracy and is assisted by Augmented Reality Media. that the researcher has developed is included in the "Very Interesting" category. This can be seen from the student's response.

Based on the results of the IPA LKPD product trials for SD/MI, both in small groups and large groups, it is concluded that students' responses are included in the "Very Interesting" criteria. This can be seen from the students' responses in terms of the attractiveness obtained from the answers to the student questionnaires and the ease of implementation so that in learning students can use the learning media in science worksheets based on Literacy and Numeracy which are effectively used. Thus, there is no need for revision or improvement. Based on the assessment carried out on student trials, literacy, and numeracy-based science worksheet products using augmented reality media in V Class at MIN 5 Bandar Lampung and in V Class in MIT Muhammadiyah Sukarame Bandar Lampung are included in the "Good" category and do not need to be revised.

Thus, it can be concluded that literacy and numeracy-based science worksheet products using augmented reality media have been developed and are ready to be used in the science learning process in V Class at MIN 5 Bandar Lampung and in V Class at MIT Muhammadiyah Sukarame Bandar Lampung. It is related with the study conducted by Hendriyani (2019) which shows that the

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use of augmented reality can improve students' ability to present subject matter and increase learning motivation. In addition, a study conducted by Yuliono (2018) also shows that augmented reality can help students understand the subject matter better. Meanwhile, the practicality aspect of the media can be seen in a study conducted by Cahyaningtyas (2020) which shows that augmented reality can provide a more enjoyable learning experience for students and is easy for teachers to use in the learning process. The study conducted by Saputri (2018) also shows that augmented reality can help students complete assignments and improve learning outcomes.

CONCLUSION

Based on the results of the study, it can be concluded that the development of literacy and numeracy-based science worksheets using augmented reality media at the State Islamic Elementary School (MIN) of Bandar Lampung is considered valid or feasible to use. This can be seen from the assessment of validator experts who have met the established indicators, namely material experts, media experts (design), and linguists. The assessment from the material expert validator shows that the Science Worksheet for SD/MI which contains literacy and numeracy assisted by AR media in Ecosystem Material is in the category of valid or appropriate for use. The assessment from the media expert validator (design) also showed the same results. Meanwhile, the assessment of the linguist validator shows that the IPA LKPD has fulfilled the established linguistic indicators. Based on the assessment of education practitioners, it is known that the IPA LKPD for SD/MI which contains AR media-assisted literacy and numeracy in Ecosystem Materials is in the category of valid or suitable for use. The limitations of this Science Student Worksheet (LKPD) are that the discussion only focuses on Ecosystem material, while much of the Science material in SD/MI requires explanation. One of the weaknesses of studying Ecosystems is that exposed objects cannot be observed directly and of course will give different interpretations for everyone.

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