



Digital Learning Media Assisted by Quizizz Application (METALIQ) on Science Content of Ecosystem Topic for Sixth Grade Elementary School

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ABSTRAK

Penelitian ini bertujuan untuk menghasilkan "METALIQ" yang dikembangkan pada muatan IPA topik Ekosistem untuk siswa kelas VI SD. Penelitian ini merupakan penelitian pengembangan yang berpedoman pada prosedur model ADDIE. Subjek penelitian ini adalah "METALIQ" dengan topik Ekosistem untuk siswa kelas VI Sekolah Dasar yang melibatkan empat orang dosen sebagai ahli yang menilai validitas isi produk, dua orang guru yang memberikan respon praktisi, dan sepuluh orang siswa kelas VI SD mengisi respon siswa. Objek penelitian yakni kelayakan "METALIQ" yang ditinjau dari validitas isi, respon praktisi, dan respon siswa. Metode pengumpulan data pada penelitian ini adalah metode observasi, wawancara, studi dokumen, kuisisioner/angket dan instrumen rating scale. Untuk mengukur validitas isi "METALIQ", digunakan instrumen rating scale, sedangkan untuk mengukur respon praktisi dan respon siswa menggunakan kuisisioner/angket. Data validitas media pembelajaran yang diperoleh selanjutnya dianalisis menggunakan rumus Aiken's V untuk mengukur koefisien validitas isi. Mean merupakan analisis untuk mengetahui rata-rata skor respon guru dan respon siswa. Hasil analisis data validitas "METALIQ" untuk ahli isi berada pada rentang 0,75-1,00 dan ahli media pembelajaran adalah berada pada rentangan 0,625-1,00. Hal ini menandakan bahwa validitas isi "METALIQ" tinggi. Uji respon praktisi mendapat skor rata-rata sebesar 4,3, dan uji respon siswa mendapat skor rata-rata sebesar 4,55. Hal ini berarti semua aspek uji respon terhadap "METALIQ" memiliki kualifikasi sangat baik. Berdasarkan analisis tersebut, maka "METALIQ" pada muatan IPA topik Ekosistem layak untuk digunakan dalam pembelajaran.

ABSTRACT

This study aims to produce "METALIQ" which was developed on the topic of Ecosystems for the sixth-grade elementary school students. This research was a development research based on the ADDIE model procedure. The subject of this research was "METALIQ" with the topic Ecosystem for sixth grade elementary school students involving four lecturers as experts who assess the validity of the product content, two teachers who provide practitioner responses, and 10 sixth grade elementary school students filling out student responses. The object of research was the feasibility of "METALIQ" which is viewed from the content validity, practitioner responses, and student responses. The data collection methods in this study were observation, interviews, document studies, questionnaires and instruments rating scale. To measure the validity of the content of "METALIQ", the instrument was used rating scale, meanwhile to measure the responses of practitioners and students' responses used a questionnaire. The learning media validity data obtained were then analyzed using the Aiken's V formula to measure the content validity coefficient. The mean is an analysis to determine the average score of teacher responses and student responses. The results of the analysis of the validity of the "METALIQ" data for content experts were in the range of 0.75-1.00 and learning media experts were in the range of 0.625-1.00. This indicated that the content validity of "METALIQ" was high. The practitioner response test got an average score of 4.3, and the student response test got an average score of 4.55. This means that all aspects of the response test to "METALIQ" have very good qualifications. Based on this analysis, "METALIQ" in the science content of the Ecosystem topic was feasible for use in learning.

1. INTRODUCTION

The pandemic Covid-19 has a major impact not only on health but also has a major impact on the field of education (Herliandry et al., 2020; Lai et al., 2020). Almost all countries have experienced the impact of this pandemic, even many countries have increased their security by setting a lockdown status to anticipate the spread of the Covid-19 virus (Ma'ruf & Syamsudin, 2021; Tirajoh et al., 2021). Thus, it cause schools to be closed and implementing distance learning, with an online learning system from home (Mishra et al., 2020; Oyedotun, 2020; Patricia, 2020; Pawicara & Conilie, 2020; Sahu, 2020; Wahab, 2020). Learning online is defined as learning that uses information and communication technology (ICT) (Irfan et al., 2020; D. K. Wardani et al., 2018), so the learning process is carried out through internet media and using supporting devices such as smartphones, laptop/PC, and so on (Chang et al., 2021; Satrianingrum & Prasetyo, 2020). The incorporation of technology has changed the teaching and learning process by using online learning, the learning process can be carried out regardless of time and place (Inquimbert et al., 2019; Müller & Mildenerger, 2021; Van Alten et al., 2019). Technology and science that are increasingly developing trigger efforts to utilize the results of technology in learning process activities (Munir, 2017; Schneider et al., 2018). In this regard, it requires educators to be able to utilize technology to support the teaching and learning process in the classroom and outside the classroom (Adisel & Pranayasa, 2020). Technology, when used effectively, allows students and teachers to engage and collaborate with each other (Bower, 2019; Rahmawati, 2020). One of these uses is the use and making of learning media based on digital technology. Digital learning media is the use of technology in the form of software to convey information/knowledge to students, so that students can receive knowledge, attitudes, and skills more easily, without being hampered by space and time (Kusumadewi & Subroto, 2019). The use of these learning media can help educators in carrying out learning, for example in science learning content (Dwiyanti et al., 2021; Maharuli & Zulherman, 2021).

Natural Sciences (*IPA*) is one of the subjects that must be taught at all levels of education in Indonesia, one of which is at the elementary school level. In relation to science subjects, the use of learning media is considered very important and must be used, the reason is because *first*, the structure and content of science subjects are full of abstract concepts and principles, so that learning media are able to concretize abstract things according to the level of cognitive capacity. Elementary school students who are in the concrete operational stage, *secondly*, based on the cognitive capacity of elementary school students and that natural phenomena are elementary science work plans, therefore the science material should be practical and uncomplicated, which can only be stated if assisted by the media (Kurniawan et al., 2020; Wahyu et al., 2020). Learning science using digital media in distance learning conditions will be very useful for teachers in delivering material to students, learning activities become more interesting, students will get more time to study independently (Bardach & Klassen, 2020; Salsabila et al., 2020; Wenno, 2010), digital learning media can help teachers deliver material through distance learning to achieve learning objectives (Galvis, 2018; Salsabila et al., 2020). Based on this explanation, learning media has great opportunities. It is because the role, benefits and functions greatly affect teaching and learning activities (Anisa et al., 2021; Paskevicius & Irvine, 2019).

But in reality, in the implementation of distance learning or online, there are still teachers who do not use digital applications to support student-centered learning (Pertiwi & Utama, 2020; Syamsuddin & Lukman, 2019). Based on the results of interviews and observations carried out to the sixth-grade students of SDN 2 Bongkasa, there are several problems that occur during the online learning process. First, during the pandemic Covid-19, the teaching and learning process was carried out online from each student's home. So, the teacher was very difficult in providing guidance and delivery of subject matter. In addition, during the online teaching and learning process, there are also obstacles, namely supporting tools in the form of cellphones limited. Most of the students don't have cellphones, so they have to use their parents' cellphone. This makes it difficult for teachers to communicate directly with students. The difficulty of communicating with students causes the online learning process that teachers carry out to be hampered (Mayangsari & Nurrachmah, 2021; Puspaningtyas & Dewi, 2020). Second, teachers have less knowledge in using assistive devices such as laptops in online learning activities and have limited skills in operating supporting media such as learning videos, and others. So that teachers also rely on WhatsApp Groups in delivering subject matter. By only relying on learning media in the form of WhatsApp Groups without using learning media that can attract students' interest will make learning monotonous (Mahesti & Koeswanti, 2021; Mardhika & Normawati, 2018). Fourth, the content of science content is still narrow, for example, the limitations of the examples in the theme book, the lack of supporting pictures, no development of Ecosystem materials such as types of terrestrial ecosystems, no further explanation of the components in the food chain. Based on these problems, it is very necessary to have a solution that can solve the problem of the limitations of teachers in designing online learning that can attract students' interest.

One of the uses of technology in digital learning media is using a digital platform in the form of a learning quiz. The digital learning quiz is an application to provide material in the form of questions which will be used by students to increase their knowledge of the subject matter (Al-Shehri & Al Harthi, 2021; Pentury et al., 2021). This digital learning quiz is included in the category of laptop/PC or-based learning media smartphone. Digital learning quizzes are able to create a learning atmosphere that is not boring and the material can be delivered well (Basuki & Hidayati, 2019; Martanti & Rusdarti, 2019). One of the digital learning quizzes is Quizizz. According to Mei Ju and Adam, this Quizizz application is an online quiz digital platform that only requires one screen on a smartphone or laptop/PC, tablet, iPad (Mei Yan et al., 2019; Yana et al., 2019). The questions for each student will also not be the same because it uses a random system. This minimizes students cheating on one another. In addition, Quizizz is flexible, it can be carried out anywhere, not necessarily in the same place (Grévisse et al., 2019).

Many studies have examined the Quizizz application, research that resulted in a Quizizz application-based learning evaluation media with quantity content PISA math problem material and was declared valid and effective to be used as an evaluation medium (Kristanto & Yuniarta, 2021). The same research has also resulting in the use of quizzes media as an application for learning evaluation activities that is stated effective because it is able to improve learning outcomes and understanding of students' material (Pusparani, 2020). Unfortunately, the Quizizz application is only used as an evaluation tool in previous research. Based on what has been mentioned above, we need a learning media that not only functions as an evaluation tool, but can also convey learning material. This is because good learning media is a media that have evaluation tools and material descriptions (Hamadi et al., 2021; Kim, 2019). Digital learning media assisted by the Quizizz application or referred to as "METALIQ" is the appropriate solution. The advantages of "METALIQ" contain questions that are related to the phenomena of everyday student life, which are presented in various types of questions, namely multiple choice, checkbox, open-ended, and fill-in questions, and slides subject matter equipped with illustrations, and animated videos, so as to help understand material about Ecosystems (Zuhriyah & Pratolo, 2020). The purpose of this study was to determine the validity of the development of "METALIQ" on science content, namely the topic of Ecosystems for sixth grade elementary school students, analyze practitioner responses and student responses to "METALIQ", with the hope that the learning process will continue even though it is faced with various problems that can be overcome by utilizing digital learning media assisted platform online for virtual discussions by utilizing the ability of educators to provide creative and maximum learning for students (Sprenger & Schwaninger, 2021). Thus, by using "METALIQ", the educators can exercise creativity and develop innovations in making media, especially "METALIQ", so that learning has the potential to be fun, interesting, and meaningful from previous learning for students (Bikanga Ada, 2018; Cózar-Gutiérrez & Sáez-López, 2016; Indaryati & Jailani, 2015).

2. METHOD

This research used the ADDIE development model. The ADDIE development model consists of 5 stages, namely Analyze, Design, Development, Implementation, Evaluation (Tegeh & Jampel, 2017). The analysis stage is carried out to determine the needs needed in the research process that will be used in the next stage. The next stage is the planning stage, which is the stage where the needs that have been obtained at the analysis stage are used in designing solutions for problem solving by developing a product. The third stage is the development stage in which at this stage, the product that has been designed is made into a real product which is then tested to determine the validity of the product developed. The next stage is the implementation stage which is carried out by conducting direct trials of the developed product to determine the effectiveness of the developed product. The last stage in this model is the evaluation stage, which is carried out by analyzing all the stages that have been carried out. In this development research, it is only at the development stage due to situations and conditions that are not possible. The design chart of the ADDIE development model procedure is presented as shown below. The subject of this research was "METALIQ" with the topic of Ecosystem for sixth grade elementary school students. The object of research was the feasibility of the media in terms of the validity of the content of the learning media, practitioner responses, and student responses. The content validity test of "METALIQ" involved four experts, namely, two subject matter experts and two learning media experts. The practitioner's responses were filled out by two homeroom teachers for sixth grade, and 10 student responses were filled out by 10 sixth grade students at SD Negeri 2 Bongkasa.

The data collected at the analysis stage was carried out using interviews, observation, and document studies for needs analysis, and questionnaires collected data on practitioner responses and student responses. Furthermore, the content validity data of "METALIQ" used a quantitative method, namely in the form of a rating scale instrument. The rating scale instrument is used to facilitate the

process of calculating the validation results of the product being tested. The rating scale used in the instrument rating scale is 1-5, namely Very Less (1); Less (2); Enough (3); Good (4); Very Good (5) (Ilhami & Rimantho, 2017). The rating scale instrument is an instrument used for material experts and media experts in measuring the content validity of "METALIQ". Questionnaire is an instrument to measure practitioner response and student response. The preparation of the instrument was carried out through several stages, namely making a grid table, compiling the instrument, and consulting with the supervisor. The developed instrument grid is compiled with reference to material aspects, linguistic aspects, design aspects, visual aspects, audio aspects, typographic aspects, and usage aspects (Arsyad, 2013). The following is the grids of instruments used in this study.

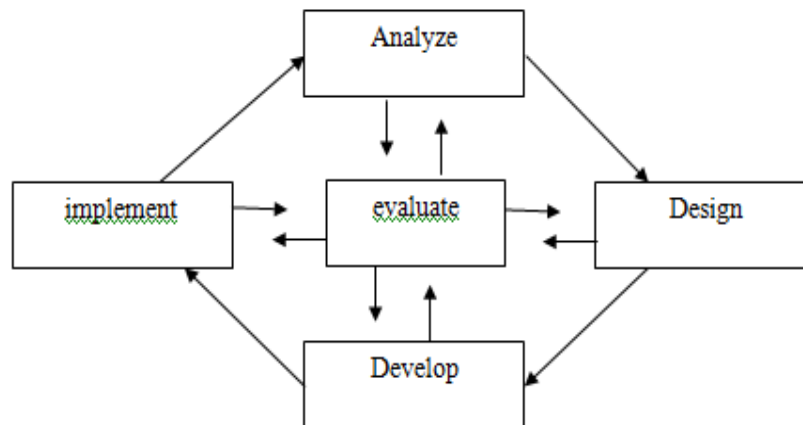


Figure 1. The ADDIE Development Model (Ismail, 2018)

Table 1. The Grid of "METALIQ" Material Expert Validation Instrument

| No | Aspect | Indicator | Item Numbers |
|-------|----------|---|--------------|
| 1 | Material | a. The clarity of learning materials | 1 |
| | | b. The suitability of learning materials with learning objectives | 2 |
| | | c. The material in the learning media is packed coherently | 3 |
| | | d. The suitability of the learning material with basic competencies | 4 |
| | | e. The completeness of the material contained in the learning media | 5 |
| 2 | Language | a. The language compatibility with Indonesian language rules | 6 |
| | | b. The sentences used are easy to understand and understand | 7 |
| | | c. The communicative nature of the language used | 8 |
| | | d. The level of language with students' cognitive | 9 |
| | | e. The effectiveness of the sentences used | 10 |
| Total | | | 10 |

(Modifikasi Arsyad, 2011)

Table 2. The Grid of "METALIQ" Media Experts Validation Instrument

| No | Aspect | Indicator | Item Numbers |
|----|------------|---|--------------|
| 1 | Design | a. It is in accordance with the characteristics of students | 1 |
| | | b. Having attraction | 2 |
| | | c. Display features on learning media that make it easier for users | 3 |
| 2 | Visual | a. The selected image can represent the material | 4 |
| | | b. The suitability of the selection of questions | 5 |
| | | c. The attractiveness of colors, backgrounds, images and animations | 6 |
| | | d. The time speed of each question | 7 |
| 3 | Audio | a. The sound rhythm | 8 |
| | | b. The compatibility of back sound | 9 |
| 4 | Typography | a. The selection of text type | 10 |
| | | b. The text size accuracy | 11 |
| 5 | Usage | a. Learning media can be used as independent teaching materials | 12 |
| | | | 13 |

| No | Aspect | Indicator | Item Numbers |
|--------------|--------|--|--------------|
| | | b. The number of questions given | 14 |
| | | c. The ease of the questions provided | 15 |
| | | d. Media makes it easier for teachers to teach | |
| Total | | | 15 |

(Modifikasi Arsyad, 2011)

Table 3. The Grid of “METALIQ” Practitioner/Teacher Response Instrument

| No | Aspect | Indicator | Item Numbers |
|--------------|------------|--|--------------|
| 1 | Material | a. The suitability of material with the learning objectives | 1 |
| | | b. The accuracy of the material in instructional media | 2 |
| | | c. The suitability images with instructional materials | 3 |
| 2 | Linguistic | a. The suitability of language to the level of development of the thinking of learners | 4 |
| 3 | Display | a. The suitability media with the characteristics of learners | 5 |
| | | b. The level of difficulty about the developments Thinking of students | 6 |
| | | c. The easiness of use of learning media | 7 |
| | | d. Letters/fonts in learning media are easy to read | 8 |
| | | e. Instructions for using learning media | 9 |
| | | f. Display of questions and answers on learning media | 10 |
| Total | | | 10 |

(Modifikasi Arsyad, 2011)

Table 4. The Grid of “METALIQ” Students Response Instrument

| No | Indicator | Item Numbers |
|--------------|--|--------------|
| 1 | The easiness of understanding learning media | 1 |
| 2 | The easiness of understanding Ecosystem material in learning media | 2 |
| 3 | The appropriateness of illustrations/photos of illustrations in learning media | 3 |
| 4 | The attractiveness of learning media | 4 |
| 5 | The learning media on student curiosity | 5 |
| 6 | The learning media on student motivation | 6 |
| 7 | The easiness of understanding material if the learning media is used in other subjects | 7 |
| 8 | The enthusiasm for the use of learning media | 8 |
| 9 | The boredom towards the use of learning media | 9 |
| 10 | The sounds and pictures of the material being studied | 10 |
| Total | | 10 |

(Modifikasi Arsyad, 2011)

The analysis methods and techniques used in this study are qualitative and quantitative descriptive data analysis. Qualitative descriptive method is a way of processing data in the form of sentences or words or categories about an object (Agung, 2014). The qualitative descriptive analysis method is used to process the data from the needs analysis. Quantitative descriptive method is a way of processing data in the form of numbers or percentages regarding the object under study (Agung, 2014). This method is used to analyze the scores of each expert through the assessment sheet of four experts (two media experts and two material experts). The score is assessed using the Aiken's V formula to calculate the content-validity coefficient for each item, to determine the level of validity of the developed “METALIQ” (Azwar, 2016). The criteria for the Aiken content validation index are presented in Table 5.

Table 5. Aiken Content Validity Index Criteria

| Aiken Validity Index | Criteria |
|----------------------|-----------------|
| 0.8 – 1.00 | High Validity |
| 0.4 – 0.8 | Medium Validity |
| $V \leq 0.4$ | Low Validity |

Furthermore, the scores obtained on the results of the practitioner response test and student responses are then calculated on average to determine the feasibility of learning media by applying the formula *Mean*. The average score obtained is then converted using a five-scale conversion guideline to obtain the results of the validity of the developed media (Koyan, 2012). The five-scale conversion guidelines used are presented in Table 6.

Table 6. Five-Scale Conversion Guidelines

| Scores | Qualification/Predicate |
|----------------------------|-------------------------|
| $3.75 < \bar{X} \leq 5.00$ | Very Good |
| $2.92 < \bar{X} \leq 3.75$ | Good |
| $2.08 < \bar{X} \leq 2.92$ | Enough |
| $1.25 < \bar{X} \leq 2.08$ | Not Good |
| $0 \leq \bar{X} \leq 1.25$ | Very Not Good |

Description: Average score acquisition.

3. RESULT AND DISCUSSION

Result

The analysis stage in this study was carried out consisting of three parts, namely curriculum analysis, needs analysis, and student characteristics analysis. This curriculum analysis was carried out as a basis for developing "METALIQ". The analysis carried out is to analyze basic competencies (*KD*), indicators of competency achievement, and material descriptions. The results of the basic competencies analysis, and indicators are shown in Table 7. This material was chosen because it was broad and abstract. Likewise, the descriptions contained in student books are incomplete, for example in learning about the meaning of ecosystems, lack of material about types of terrestrial ecosystems, and lack of supporting images to clarify concepts. The material is also presented too briefly, even though there are still some materials that need to be explained. Furthermore, a needs analysis is carried out to find out the needs in the field (at school). The method used is by conducting observations and interviews with one of the homeroom teachers for sixth grade of SDN 2 Bongkasa. The results of observations and interviews, that are science content material is still narrow, for example limited examples in the theme book, lack of supporting pictures; no development of ecosystem materials such as types of terrestrial ecosystems; no further explanation of the components in the food chain; the use of media during the distance learning process is still lacking, especially media that utilize technology. In addition, the sixth-grade teacher at SDN 2 Bongkasa already knows but has never used the Quizizz application during teaching and learning activities so that the teacher has never made material designs or quizzes in the Quizizz application.

Table 7. Basic Competencies (*KD*) and Science Learning Indicators Topics Ecosystem For Sixth Grade Elementary School

| Competencies | Indicator |
|---|--|
| 3.5 Analyzing the relationship between ecosystem components and food chains/webs in the surrounding environment | 3.5.5 Interpreting the meaning of food chains in an ecosystem |
| | 3.5.6 Interpreting meaning food web in an ecosystem |
| | 3.5.7 Analyzing the differences in the food chain with food webs in ecosystems |
| | 3.5.8 Identifying the components of an ecosystem |

The design stage was done by designing materials that capable of supporting implementation of distance learning. This design is in the form of a product framework that will be produced, namely the design of the content and things that will be conveyed in the learning media from beginning to end, starting from the opening design of the learning media, the core, and the closing of the learning media. In the media design, the material is made first, then quizzes / evaluation questions. The learning media made consists of 3 scenes, namely, the scene opening (there is 1 slide of the media cover page and 1 additional slide), the scene content (consisting of 17 slides of learning materials, 20 slides for evaluation quizzes), and the scene closing (consisting of 1 material conclusion slide and 2 complementary slides). The following is a design drawing of "METALIQ" presented in Figure 2.

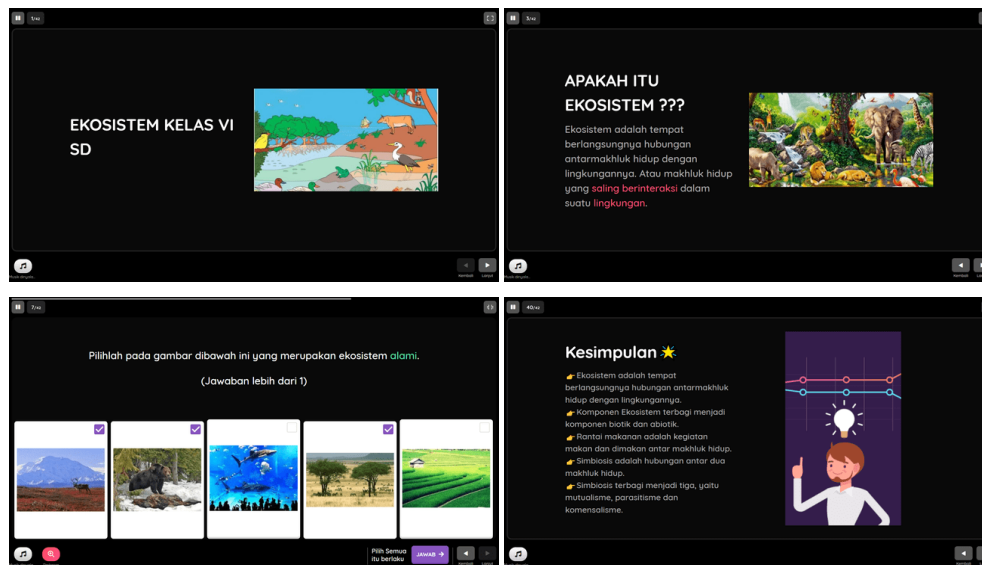


Figure 2. The Design of "METALIQ"

The development stage was used to test the validity of the content to four experts, namely two experts and two expert learning materials instructional media, and also make a withdrawal response to practitioners and students' responses related to the feasibility of "METALIQ". In this study involved two homeroom teachers of sixth grade and 10 students of sixth grade. Based on the results of the assessment at the development stage, the content validity test of "METALIQ" in terms of material carried out by two learning material experts obtained an index ranging from 0.75-1.00, thus indicating that all aspects of the material on "METALIQ" have high validity. The results of the "METALIQ" validity test assessment in terms of media carried out by two learning material experts obtained an index ranging from 0.625-1.00, thus indicating that all aspects of the material in "METALIQ" have high validity. The practitioners' responses to "METALIQ" got an average score of 4.3, when converted according to the five-scale conversion guideline, it was in the range of $3.75 < 5.00$. Thus, all aspects of the practitioners' responses to "METALIQ" have very good qualifications. The students' responses to "METALIQ" got an average score of 4.51, when converted according to the five-scale conversion guideline, it was in the range of $3.75 < 5.00$. Thus, all aspects of student responses to "METALIQ" have very good qualifications. The implementation stage is not implemented due to limited situations, conditions, and resources. The last stage is the evaluation stage, which is an assessment carried out on learning media products based on the results of the validation of experts, practitioner responses, and student responses, in order to determine the validity of the developed media and get suggestions and comments, so that the developed media can be improved in order to be a feasible media used in the learning process. The evaluation stage is done to the overall development process, which in this study up to the development stage.

Discussion

The product produced in this development research was "METALIQ" for sixth grade elementary school students. "METALIQ" which was developed by following the stages of the ADDIE development model. The stage of ADDIE carried out in "METALIQ" was the analysis stage, the results of the needs analysis are obtained which are adjusted to the core competencies (*KI*), basic competencies (*KD*), and indicators contained in the teacher and student books, so that "METALIQ" can be used in accordance with the competencies to be achieved (Fitriyah, 2021; Mulyati & Evendi, 2020). In addition, in the analysis of student characteristics, it is known that elementary school students are in the concrete operational stage, so that during the learning process they need concrete objects. Based on this theory, it can be said that learning media is needful in the ongoing learning process (Rahmatullah et al., 2020; Yanto, 2019). The development of "METALIQ" is based on several criteria used such as material aspects, linguistic aspects, design aspects, visual aspects, audio aspects, typographic aspects, and usage aspects (Arsyad, 2013).

Based on the results that have been obtained and seen from the feasibility of "METALIQ" which has been developed at the design stage, "METALIQ" has many advantages. which is equipped with illustrated images and evaluation quizzes designed with the phenomena of everyday student life, and "METALIQ" is also different from learning media that have previously been developed, because there is no learning media that develops learning using teacher-controlled materials, so students can easily observe

material well, and provide evaluation quizzes in the form of games. "METALIQ" contains learning materials and questions that are not separated, and combined with interesting pictures, videos, backgrounds, and back sounds (Alannasir, 2016; Mutia et al., 2018). With this development, it can also help students to learn independently in distance learning, thus making learning more practical (Azizah et al., 2020; Gazali & Nahdatain, 2019).

Based on the results of the content validity test of "METALIQ" in terms of material experts and media experts, practitioner responses, and student responses to "METALIQ" at the development stage, the resulting product is stated valid, so it is feasible for use in science learning for sixth grade elementary school. Thus, "METALIQ" can be said to be feasible because it has the characteristics of good learning media and is in accordance with the student's character, is able to maximize interaction, attracts students' attention, provides various kinds of feedback, and can be used without the limitations of space and time (Bujuri, 2018). Good learning media have a positive impact, such as increasing student learning motivation, increasing student learning independence, eliminating space and time limitations (Aurora & Effendi, 2019; Rasman, 2021). Another reason is because in general elementary school students are at a concrete stage, where the characteristics and comprehension of different students towards lessons, especially in lessons that have abstract basic concepts, require a way of delivering and presenting material that as much as possible is preceded by a real form before arriving at the abstract concept. This is similar with the statement of Wardani (2020) which states that the period of students in the concrete operational stage is also called the age of exploring and asking questions, because it is driven by students' curiosity about their living environment, the behavior often arises to ask people around them from anything that what he saw made him curious (R. S. Wardani & Kumalasari, 2020).

The findings of this study, in similar with research conducted by Nurfadhillah et al (2021) produced an Android-based interactive mathematics learning media that uses the Quizizz application and can be operated on a smartphone. The learning media developed can provide an interesting learning impression for students (Nurfadhillah et al., 2021). The results of other studies stated that the media using the Quizizz application was valid with a percentage of expert validation results of 92.5% (very good) and 85% (very good) from construction. This showed that the Quizizz application is effectively used as a learning media (Nisa & Pahlevi, 2021). This similar with another study conducted by Oktaliana et al (2019) produced an evaluation tool assisted by the Quizizz application. The advantages contained in this study included that the Quizizz application has provided various mathematical symbols that can be used in making questions and answers, there is also a question bank that the teacher can use as a reference for making questions, and there are game elements that can increase student interest (Kristanto & Yunianta, 2021). Based on the research findings, it showed that the Quizizz application is effectively used as a learning media.

The implication of this research is teachers can obtain new knowledge of "METALIQ". The teachers can also use "METALIQ" to improve their mastery of Technological Pedagogical and Content Knowledge (TPACK) (Koehler et al., 2017; Papanikolaou et al., 2017). It is due to entering the industrial revolution 4.0 which has an impact on students' dependence on technology in everyday life, teachers should be able to utilize technology in teaching and learning activities (Sedana, 2019; Suryadi et al., 2020). The use of this learning media is not only beneficial for teachers, but for students as well. This learning media is designed with interesting features not only text. "METALIQ" makes learning fun and will have implications for student learning outcomes and motivation. In line with the results of the research that has been carried out. In this study, it is limited to the development stage only, so that further research is needed to continue the implementation stage which has not been carried out to obtain data on the effectiveness level of "METALIQ".

In addition to the advantages that have been stated above, this research has limitations. These limitations such as the Quizizz media uses time, so if the quiz has started but there are students who are late in joining then the student's process of doing the quiz can affect their ranking, even though the score they get is large and requires an internet network and communication tools such as laptops or cellphones to use them. In addition, the weakness of this development is this research only limited to developing media which is then tested for the validity of the developed media without testing the effectiveness of the developed media. Based on these weaknesses, it is hoped that there will be similar studies that develop this Quizizz media to find out the effectiveness of the developed media

4. CONCLUSION

This study produced "METALIQ" for sixth grade elementary school students who were stated valid based on the results of content validity assessments by material experts, learning media experts, practitioner responses, and student responses. Thus, it can be believed that "METALIQ" is stated valid and

feasible for use in science learning on Ecosystem material for sixth grade elementary school and is able to help explain or convey abstract material.

5. REFERENCES

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