Development of digital learning evaluation In realizing

Suistainable Development Goals (SDGs)

Sudi Dul Aji, Hestiningtyas Yuli Pratiwi, Arief Rahman Hakim*, Muhammad Nur Hudha, Nada Damai Azka

Universitas PGRI Kanjuruhan, Jl. S. Supriadi No.48, Malang, East Java, 65148, Indonesia
ariefrahman@unikama.ac.id*

Abstract: *This research is motivated by one of the goals of the SDGs, namely realizing quality learning and handling environmental change. The purpose of this study is to determine the feasibility and practicality of evaluating digital learning in realizing the SDGs for elementary school students. This research is a development research with the ADDIE model (Analysis, design, development, implementation and evaluation). The test subjects in this study were class VI students at SDN 02 Putatkidul Gondanglegi. The data collection instrument uses a questionnaire. Data analysis techniques use quantitative data. Digital Study Evaluation created using the Kahoot! based on the results of the material validation, a score of 93.75% was obtained in the very feasible category, the results of the language validation were 95% (very feasible), the results of the teacher's practicality validation were 88.8% (very practical), the students' practicality results were 94% (very practical).*

Keyword: *Digital Learning Evaluation; SDGs; Kahoots*

Introduction

Education is something that cannot be separated from human life in growing and developing abilities, skills, and a sense of responsibility in people's lives that lead to self-reliance to develop oneself in dealing with any changes that occur in accordance with advances in science and technology. Education is an important foundation that influences the development process of an individual (Sa'diah, 2017) . Humans in their lives cannot be separated from the educational process, because education lasts a lifetime for humans. Education which makes a nation live in harmony and peace, without education a nation cannot properly and will not be able to achieve the goals of a nation and state. Through education a person can develop all his abilities both in the academic and non-academic fields.

The 21st Century National Education Paradigm mentioned that one of the strategies for achieving education in the future is to apply creative learning methods in elementary schools. This method adheres to the principle that each individual is unique and has their own talents, so learning methods must pay attention to the diversity of " *learning styles"* of each individual (Firmansyah 2018) . For this reason, educators should be required to master science and technology and also be able to process learning methods so that students do not get bored in learning . Likewise, with the *Covid* -19 pandemic, which has not yet ended, educators are required to be able to cultivate learning methods. Learning is the most important investment for every nation because it affects developing nations who are actively building their country (Idrus, 2019) . Development can only be carried out by humans who are prepared through learning, in order to achieve the essence of humanity, namely as a caliph on earth. The development of learning is inseparable from the formation of the character of students by having concern for the environment. Character is formed from attitudes that are

carried out continuously so that schools have an obligation to instill an attitude of caring for the environment on an ongoing basis (Asiah, 2011) .

Environmental literacy describes a person's ability to identify, understand and communicate knowledge in various contexts. Environmental literacy is an ability or skill in understanding the importance of protecting the environment for present and future generations (Irwandi and Fajeriadi, 2020) . This causes the implementation of learning on environmental education to often experience obstacles due to limited learning tools, materials that are not in accordance with the curriculum and learning resources or media that are not yet structured. Therefore, schools can improve this by providing opportunities for students to study outside the classroom and also observe nature. Environmental learning activities really need to be done in a way that can be planned, prepared and implemented through an approach that is in accordance with the development of the mindset of students.

The learning outcomes test is the test used to measure individual abilities in one field or certain fields (Kuncahyono, Beti Istanti Suwandayani, 2020) . Based on this, the learning resources used by students will be useful for increasing productivity in learning, especially in the environment. Utilization of environmental learning resources will facilitate the learning process of students, have attractiveness and motivate students in terms of being active, interactive, critical in solving problems and influencing the achievement of learning objectives.

One of the teacher's tasks is to condition the student's environment so that it supports changes in behavior or changes in competence for students (Irwandi and Fajeriadi, 2020) . Things that generally occur in the implementation of learning include several types, namely *pre-test* , process and *post-test* . The use of questions given by the school is always in the form of objectives or descriptions that lead to the national exam. This makes students familiar with the form of context questions in everyday life. With this the completion of the form of questions is a tool that must be strong and effective in the school teaching and learning process.

During the *Covid-19 pandemic* , the learning needed by students was directly related to outdoors. Learning is an important part of determining the success of learning objectives. This success can be supported by several components such as educational resources, media, facilities, teaching aids and learning resources and the approaches used. Learning in the environment will be able to provide an approach to students and get the value of learning outcomes.

Solving problems that occur in the school environment or outside the school requires problem solving activities that will be carried out by students which are used to determine the learning abilities that have been carried out by the teacher as learning evaluation. Evaluation is an assessment process that aims to measure the level of understanding or mastery of students in the teaching and learning process (Ina Magdalena, 2017) . The assessment process refers to students' ability to solve problems with the material that has been taught in the form of an evaluation instrument.

The evaluation that will be discussed in this study is the evaluation of elementary school (SD) student learning outcomes (Fadhilaturrahmi, 2017) . In carrying out the evaluation, it is necessary to have an evaluation tool which is a measuring tool, answer keys and scoring guidelines. The measuring instrument used in the process of evaluating learning outcomes is in the form of multiple choice *tests . Based on the test* results, the teacher then makes justifications or decisions about the learning process. Test evaluation tools can be divided into two types, namely tests and non-tests (Idrus, 2019) . Tests can be in the form of oral, written or action. Meanwhile, non-tests can take the form of observations, interviews, case studies, rating scales, *check lists* and *inventories* . The preparation of test and non-test instruments for a teacher must refer to the guidelines for preparing each type and form of test or non-test so that the instrument to be compiled meets the requirements of a good instrument and has basic requirements in terms of validity and reliability.

Supported by the opinion of research (Idrus, 2019) that evaluation is part of the learning process which as a whole cannot be separated from teaching activities, carrying out evaluations carried out in educational activities has a very important meaning, because evaluation is a measuring tool or process for knowing the level achievement of the successes that have been achieved by students on teaching materials or material that has been delivered, so that with an evaluation, the objectives of learning will be seen accurately and convincingly. We can also do evaluation by giving the questions that have been given so that students don't forget, because at this time many educators only prioritize giving questions without giving an evaluation.

Improving students' ability to solve problems requires skills to find, analyze, create, reflect, and argue or what is often referred to as higher-order thinking skills (Awaliyah, 2018) . Honing these skills can be done through objective or subjective questions that require reasoning to answer which are known as HOTS *(High Order Thinking Skills*) questions. The most basic is the *LOTS level* or *Lower Order Thinking Skill* (low-level thinking skills) which includes aspects of the domain of knowledge which are limited to aspects of remembering. The middle level is MOTS or *Middle Order Thinking Skill* which is in the domain of understanding and application.

Based on the results of an analysis of several class teachers, the researcher found problems with thematic questions in Theme 2 (Adaptation to the Environment) of class VI Elementary Schools with Natural Science lessons due to the fact that in the midst of the Covid -19 pandemic students are currently experiencing learning difficulties such as lack of knowledge *about* questions Science on Theme 2 (Adaptation to the Environment) class VI SD.

Based on the problem analysis and theory above, the researcher wants to develop a learning evaluation through environmental learning with science questions in Theme 2 (Adaptation to the Environment) for class VI elementary school. The learning evaluation that will be developed is questions ranging from MOTS, LOTS and HOTS so that students better understand the learning material and can support their memory which helps students better understand the material presented during learning at school.

The results explained that the development of the times in the digital era during the pandemic will change the order of the methods used in learning. Of course this includes the environmental learning evaluation tool that will be used in schools. Learning in the digital era will refer to learning evaluation tools that play an important role in learning achievement. Digital learning evaluation aims to be able to increase understanding of the technology used and mastery of design and communication sciences appropriately (Jagannathan, Camasso, and Delacalle, 2018) . Learning evaluation tools in digital form will provide convenience for a teacher in developing strategies for environmental learning so that teachers need several applications to convey environmental learning without any difficulties. Learning evaluation tools in digital form will be realized through the *Sustainable Development Goals* (SDGs) program.

The Sustainable Development Goals (SDGs) are a sustainable plan originating from *the Millennium Development Goals* (MDGs) which at that time had not yet reached their goal at the end of 2015. So the SDGs are an action plan aimed at humanity to strengthen universal peace and prosperity in overcoming poverty as well as global challenges (Cumming et al, 2017) . The goals or targets of the SDGs are reducing poverty, completing basic education, ensuring a healthy life and increasing the welfare of the population and ensuring fair quality education and ensuring environmental sustainability.

Along with the times, the SDGs have more universal targets and replace the MDGs through goals that better meet future challenges. This is based on the SDGs document which was ratified at the United Nations Sustainable Development Summit which took place in New York on 25-27 September 2015. At the Summit it was determined that the SDGs would be enforced post-2015 to 2030 (Reyers et al, 2017) . With this, the SDGs underwent developmental changes that accommodate indicators in education, especially in terms of the environment in the world of education. Based on some of the SDGs targets described above, environmental learning must be in accordance with the applicable curriculum procedures so that instilling environmental care can be taught in schools through learning materials provided by teachers, especially in evaluating student learning.

Based on the description above, it can be concluded that the problems in measuring student learning evaluations are not supportive because they only use manual assessments without using existing technology. For this reason, it is hoped that the selection of SDGs-based learning or environmental development can assist teachers in providing easier and more practical learning evaluations during the current era of development.

From the results of the background presentation above, the way to overcome problems in carrying out learning evaluations is by using digital tools in SDGs-based environmental literacy learning to make it easier to take grades and measure student understanding. so that researchers are interested in developing with the title " **Development of Digital Learning Evaluation in Realizing *Sustainable Development Goals* (SDGs) in Elementary School Students".** With a digital basis, it will be easy to use as an evaluation of elementary school student learning when online.

Method

This research was conducted at SDN Putatkidul 02, Gondanglegi District, Malang Regency using research and development methods or commonly called *Research and Development.* According to (Hanafi, 2017) development is defined as a process to expand or deepen existing knowledge, for example developing learning media that can increase student attention. Research and Development (R&D) is a research method used to produce certain products and test the effectiveness of these methods.

In the field of education, research and development or Research and Development (R&D), is a research method used to develop or validate products used in education and learning. From the explanation above, it can be concluded that Research and Development is a research method that aims to produce certain products and test the validity and effectiveness of these products in their application. The stages in the ADDIE development model procedure consist of 5 steps, namely as follows:
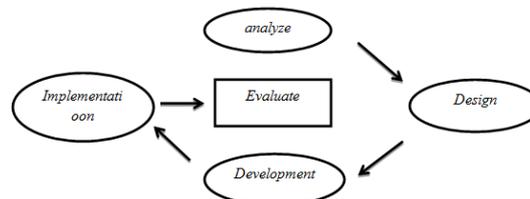

Figure 1 The ADDIE Development Model Stage
Source: Adaptation from (Sari & Purnama, 2018)

Based on the chart above, there are steps in development which include analysis (*analyze)* , design *(design)* , development *(development)* , implementation *(implementation)* and evaluation *(evaluate). Analyze* is the main activity, namely the activity of analyzing the need to carry out development. *Design* is a step to carry out a design based on the development process. *Development* is the activity of compiling a framework into a product form as the implementation of the development or application of the development to be carried out. *Implementation* is the step of implementing the design or framework that has been developed. *Evaluate* is a form of evaluation of the achievement of product development that has been carried out.

Results and Discussion

The product to be developed is a digital Learning Evaluation using the *Kahoot!* . The material in this Learning Evaluation is living things material which is contained in theme 2, sub-theme 1 (Adaptation to the Environment) for grade VI elementary school students. Digital Learning Evaluation is structured to realize the fourth goal of quality education in the goals targeted at the *Sustainable Development Goals* (SDGs). Initial product design on digital learning evaluation using the Kahoot! in living things by using the design stages in development, namely ADDIE which has been simplified and limited through the *analyze* , *design* , *development* , *implementation* and *evaluate stages* . However, this product is only developed at the development stage. The following describes the stages of ADDIE's research development, namely:

1. *Analyze*

The analysis phase is the initial stage carried out by researchers to analyze needs, after analyzing needs, namely analyzing student characteristics. The first thing in the needs analysis was carried out by researchers at SDN Putatkidul 02 Gondanglegi which is located in Gondanglegi District, Malang Regency. During a pandemic like today, the learning and evaluation system is carried out online. During online learning, the intermediary media used is only the *Whatshap application* where material explanations and evaluation questions are delivered via the *WhatsApp application* as well as students who send their work. This raises various kinds of problems such as students not understanding the material presented because the way it is delivered is not communicative, whereas in the teacher evaluation process it is difficult to assess objectively because the teacher cannot directly monitor how students work on the daily assessments given. So that from these problems an evaluation tool is needed that can make it easier for teachers and students and can be used as an evaluation tool that is practical and can be done anywhere as well as students who must have experience using digital properties while learning online (Fadhilaturrahmi 2017) . Evaluation learning based on digital SDGs is a solution to overcome this problem.

Research observations were carried out at the end of the even semester in class VI and learning theme 2 where in theme 2 there were PPKn, Indonesian, Science, and Social Studies content. The researcher chose science learning content, namely content about Living Things. Selection of science content can consider that the implementation of the exam is carried out with a total of 25 questions.

In this analysis the researcher conducted an analysis of the level of student ability. Elementary school-age children have different levels of student ability which results in student evaluation results in learning. The level of learning ability that the researchers found in class VI students at SDN Putatkidul 02, Gondanglegi District, Malang Regency did not meet the specified KKM score.

2. *Design*

The next stage carried out by researchers after analyzing is the design stage. Design aims to design digital evaluation product questions. The design in this study contains questions that have been developed in accordance with the material, namely science content about Living Things in grade VI of elementary school. The type of questions used were multiple choice questions which totaled 25 items with pictures added.

In the process of making evaluation questions the researcher experienced problems when looking for references on how to make thematic questions which contained several subjects so that they were coherent with the following material, but with guidance and input as well as the results of discussions with colleagues, the science content evaluation questions were made in the form of story questions with additions pictures and materials according to the indicators.

Learning evaluation on this theme was designed using the Kahoot! . This will aim to facilitate teachers and students in carrying out the learning evaluation process. Learning evaluation tools in digital form can also be searched through various search pages such as

Google Chrome by downloading various applications that will be selected according to the needs of class teachers to assess students.

3. Development

Making evaluation questions. Evaluation of learning is made on the natural science content of living things. All questions are made based on the description of basic competencies. After the creation of the questions is complete, all questions and answer keys are entered into the digital application . The researcher chose to include evaluation questions in the *Kahoot! application.* . Then a limited trial was carried out by researchers, teachers and 5 grade 6 students at SDN Putatkidul 02 Gondanglegi. The results of the limited trial showed several errors that occurred, such as the letters used were not consistent, the number placement still contained errors that still required revision.

After the product has been designed, the product is given to the material expert validator and linguist validator. The data is in the form of an assessment obtained from the validator used by the researcher to measure the feasibility level of the evaluation questions in the application as well as input obtained from the validator will be used by researchers as material for consideration of improving the questions that researchers have developed. Then to the next stage the researcher makes improvements or product revisions to the questions according to the assessment and input provided by the validator.

Products that have been validated by material experts and linguists will be implemented directly to students after revisions or improvements have been made. The product was tested on class VI elementary school students at SDN Putatkidul 02 Gondanglegi according to the group schedule determined by the teacher during the Covid-19 pandemic.

At the development stage, the researcher also conducted material validation and language validation by expert lecturers. Validation is done once because it has produced a valid product. In the language validation process and material validation is carried out online where the researcher sends the question files to expert lecturers for validation. After carrying out the validation stage, researchers made improvements based on suggestions and input from expert lecturers.

4. Implementation

Implementation is an advanced stage of the development that has been carried out. At this stage the results of the SDGs-based digital learning evaluation development were tested on 20 grade VI students at SDN Putatkidul 1. The trial was carried out directly, the researcher explained and gave examples of use and how to work on digital evaluation questions using the Kahoot! Application *. After* that the researcher shared a link to be able to enter the questions in the *Kahoot! application.* then after all students have entered, the researcher distributes the game code or link to start working on the questions. The trial was carried out in the classroom together with the class VI teacher.

Implementation is carried out with the aim of obtaining practical data on learning evaluation in digital form. Practicality is measured through a questionnaire given to teachers and students. While effectiveness is measured through the results of student work. All data is processed to see the value of practicality and effectiveness.

5. *Evaluate*

The last stage is the evaluation stage where researchers make improvements to digital learning evaluation products based on input and suggestions from teachers that were obtained after conducting trials in the field. The feasibility or validity of evaluating digital forms was tested on 2 validators or lecturers who were language experts and material experts. The following is a description of the validation test results:

The material validation instrument consists of two aspects, namely the question aspect and the construction aspect and 20 statements. Based on the results of validation by digital learning evaluation material experts gets a score of 3 out of the maximum score that can be obtained, namely 4. The average obtained from the formula for calculating the percentage of material validation results with a percentage of 93.75% which indicates that the material can be said to be valid. Then it can be explained that the matter of evaluating digital learning obtained a total percentage value of 93.75%. The description of the analysis criteria for eligibility has been listed in chapter III, thus the question of evaluating digital learning declared feasible with a feasibility level of "very high" which indicates the material is said to be valid.

The instruments given to linguists consist of 5 aspects, namely straightforward, dialogic and interactive components, conformity with language rules, suitability for student development, accuracy of sentence structure (Fauziyyah, nd) . Based on the validation results by linguists in table 4.3, a score of 34 is obtained with the maximum score that can be obtained is 44. It can be concluded that the average percentage of material validation results is a percentage of 95% which indicates that the language can be said to be valid.

The practicality of digital evaluation was tested on student response questionnaires and teacher response questionnaires. The following is a description of the results of the questionnaire according to (Kumalasasi 2018) , namely as follows : The instrument given to the teacher's questionnaire consisted of 9 aspects and 18 statements contained in table 4.4 by obtaining a total percentage value of 88.8% , the instrument given to class VI students consisted of the 3 aspects and 18 statements contained in table 4.6 by obtaining a percentage value of 94%.

Conclusion

Based on the results of research and product development, it can be concluded: Evaluation of digital learning using the Kahoot *!* about the IPA load is a product developed in the form of realizing *Sustainable Development Goals* (SDGs) by using the steps of the ADDIE development research model using 5 stages, namely *Analyze* (Analysis) which includes: needs analysis and characteristics analysis, *Design* (Design) which includes: designing evaluation questions and research instruments, *Development* (development) which includes: development of evaluation questions and validation of achievement of developing evaluation of learning through the *Kahoot! application.* Evaluation of digital learning in the *Kahoot! Application* that is matter of evaluation of science content theme 2 Adaptation to the environment sub-theme 1 with Living Things material including evaluation questions suitable

for use as learning evaluations of science learning theme 2 for class VI of elementary school semester I.

References

Asiah, St Nur. 2011. "Submitted to Fulfill One of the Requirements for Obtaining a Bachelor of Islamic Education (S.Pd.I) in the Qualification Improvement Program for the Faculty of Tarbiyah and Teacher Training UIN Alauddin Makassar," 84.

Awaliyah, Siti. 2018. "Compilation of Hots Questions for Middle School PPKN and IPS Teachers." *Social Praxis And Dedication* 1(1): 54–62.

Cumming, Tracey L., Ross T. Shackleton, Johannes Förster, John Dini, Ahmed Khan, Mpho Gumula, and Ida Kubiszewski. 2017. "Achieving the National Development Agenda and the Sustainable Development Goals (SDGs) through Investment in Ecological Infrastructure: A Case Study of South Africa." *Ecosystem Services* 27 (October): 253–60. https://doi.org/10.1016/j.ecoser.2017.05.005.

Fadhilaturrahmi, Rizki Ananda &. 2017. "Evaluation of Social Studies Learning Based on Two-Dimensional Bloom's Taxonomy in Elementary Schools." *Basicedu* 1 (2): 12–21.

Fauziyyah, Fera Nur. nd "Development of Cheerful Interactive Multimedia in Mathematics Subject Elements and Building Properties," 311–24.

Firmansyah, Galih Dani Septiyan Rahayu & Dida. 2018. "Development of Assistance-Based Innovative Learning for Elementary School Teachers." *Community Service* 1 (1): 17–25.

Hanafi. 2017. "R&D Research Concepts in the Field of Education." *Journal of Islamic Studies* 4 (2): 129–50.

Idrus. 2019. "Evaluation in the Learning Process of Idrus L 1." *Management of Islamic Education* 9 (2): 920–35.

Ina Magdalena, Alvi Ridwati & Bunga Aulia. 2017. "Evaluation of Student Learning." *Education And Da'wah* 2 (1): 117–27. https://doi.org/10.24252/idaarah.v1i2.4269.

Irwandi, Irwandi, and Hery Fajeriadi. 2020. "Utilization of the Environment as a Learning Resource to Increase Interest and Learning Outcomes of High School Students in Coastal Areas, South Kalimantan." *BIO-INOVED : Journal of Biology-Innovation Education* 1 (2): 66. https://doi.org/10.20527/binov.v1i2.7859.

Jagannathan, Radha, Michael J. Camasso, and Maia Delacalle. 2018. "The Effectiveness of a Head-Heart-Hands Model for Natural and Environmental Science Learning in Urban Schools." *Evaluation and Program Planning* 66 (February): 53–62. https://doi.org/10.1016/j.evaprogplan.2017.09.001.

Kumalasani, Maharani Putri. 2018. "Practical Use of Interactive Multimedia in Class IV SD Thematic Learning." *Journal of Basic Education* 2 (1A): 1–11. https://doi.org/10.21067/jbpd.v2i1a.2345.

Kuncahyono, Beti Istanti Suwandayani, and Abdurrohman Muzaki. 2020. "The 'That Quiz' E-Test Application as the Digitization of 21st Century Learning Skills in Bangkok Indonesian Schools." *Education* 11(2): 153–66.

Reyers, Belinda, Mark Stafford-Smith, Karl-Heinz Erb, Robert J Scholes, and Odirilwe Selomane. 2017. "Essential Variables Help to Focus on Sustainable Development Goals Monitoring." *Current Opinion in Environmental Sustainability* 26–27 (June): 97–105. https://doi.org/10.1016/j.cosust.2017.05.003.

Sa'diah, Nanda Kharismatus. 2017. "The Effect of the Mind Mapping Method on Learning Outcomes of Class V Students in Theme 7 Sub-theme 1 Learning 4 Sdn Lidah Kulon IV Surabaya City." *Pgsd* 5(3): 1021–30.