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Implementation of the Blended Learning Model through Interactive Learning Multimedia to Improve Understanding of the Concept of Harmony in the Ecosystem of Science Subjects for Grade V Elementary School Students

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Abstract The implementation of this learning aims to be able to implement the Blended Learning learning model through interactive learning multimedia in improving the understanding of the concept of Harmony in Ecosystem material for fifth grade students of UPTD SD Negeri Bluru. The purpose of blended learning is to increase flexibility, optimize time and increase interaction. To obtain accurate results, the implementation procedure is carried out using an experimental method with a pretest-posttest design with a control group. The implementation of learning is carried out by integrating two types of online and face-to-face learning based on interactive learning multimedia which is expected to create a more meaningful learning experience and improve students' understanding of ecosystem concepts. The results of the study showed a significant increase in students' understanding of concepts after participating in blended-learning learning. In addition, students also showed a higher interest in learning and were more active in participating in learning activities. Blended learning will continue to be improved and updated so that it can be used in other subjects with relevant material. In this case, there needs to be reflection, evaluation and follow-up systematically and comprehensively.

Keywords: Learning, Interactive, Multimedia

1. INTRODUCTION

The rapid development of digital technology has changed the educational landscape. The use of technological devices such as computers, tablets and smartphones is increasingly widespread among students. Especially when the COVID-19 pandemic has forced the world of education to adapt quickly, one of which is by implementing distance learning (PJJ). This encourages the use of increasingly intensive technology.

Based on Permendikbud No. 24 of 2012 concerning the Implementation of Distance Education (PJJ) in Higher Education, it explains that distance education is education where students are separated from educators whose learning uses various learning resources through information and communication technology and other media. Distance learning is a system that is deliberately designed for various needs that have not been met by regular education (Munir, 2012:122). This is in accordance with what is happening in the world of education today, where there are various obstacles in carrying out the learning process.

Science learning in elementary schools is a challenge for teachers. Understanding the concept of harmony in the ecosystem is very important for students to be able to maintain the balance of nature. In science learning, teachers need to conduct learning that attracts students'

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interest and involvement, so that conventional learning is considered less relevant. Understanding the concept of harmony in the ecosystem is one of the important competencies that must be mastered by elementary school students in accordance with the independent science learning curriculum. The concept of harmony in the ecosystem is an abstract concept that is difficult for elementary school students to visualize, so students often experience boredom in learning, especially on material that is considered difficult. Another challenge is the limited learning resources in schools, such as laboratories and teaching aids, which can hinder the learning process. Teachers need to innovate to be able to overcome challenges while being able to improve the quality of learning that is in accordance with students' learning needs according to experience and relevant to everyday life.

The use of interactive media in the learning process can have a positive impact and provide extraordinary benefits in facilitating students to learn. The word 'interactive' means that there is active two-way communication between the communicator and the communicant. Interactive Learning Multimedia (ILM) is a learning innovation where the product provides digital services to the IT system that can respond to user actions. ILM is a tool that has a combination of text, images, audio, video and animation that can be used to convey learning materials in an interesting and effective way. The use of ILM in elementary schools aims to increase students' interest in learning, facilitate understanding of the material, and support the various learning styles of each student.

MPI in elementary schools is used by teachers as an interactive educational tool to teach various subjects such as Science, Mathematics and others. Various media are offered in MPI, including informative videos and narratives that can explain concepts that are difficult for students to understand if only through text language. Educational games can be used to teach certain concepts while playing, doing various exercises and quizzes so that learning will be more fun.

The potential of blended-learning which is a mixed learning is expected to increase the effectiveness and understanding of students. Blended-learning also allows learning to be done anytime and anywhere, so that students can learn according to their own rhythm, needs and learning styles. The use of various interactive learning media can increase student motivation and engagement. The integration of technology in learning also allows for the development of 21st century skills. Blended-learning has relevance to the harmony material in the ecosystem, namely in terms of; 1) visualization of concepts, where the use of technology can visualize abstract concepts into simulations, videos and animations, 2) Active involvement, students can be actively involved in learning through various exploration activities, discussions and

problem-based projects, and; 3) connection with the real world, where harmony material in the ecosystem can be linked to current environmental issues that are relevant to students' lives. Currently, the most important competencies for generation Z are the ability to think critically. According to Putri Adita Wulandari, 2023 in Susan M. Brookhart, 2010, critical thinking skills involve analytical skills, logical skills, problem-solving skills, and decision-making skills.

Blended-Learning is a learning model that combines conventional face-to-face learning with online learning. This model provides greater flexibility and personalization in the learning process, so that students can learn in a way that suits their needs and learning styles. Some theories about Blended-Learning are; 1) Constructivism Theory, where students build their own knowledge through active learning experiences. Blended-Learning also provides various activities that allow students to build their own understanding. 2) Connectivism, that knowledge lies in a network of connections between people, ideas and technology. Blended-Learning facilitates connections between students, teachers and other learning resources. 3) Social Learning Theory, namely learning occurs through social interaction. Blended-Learning allows students to interact with classmates and teachers both face-to-face and online. According to Nurul Hidayah, 2020 in Semler (2005) "Blended learning combines the best aspects of online learning, structured face-to-face activities, and real world practice. Online learning systems, classroom training, and on-the-job experience have major drawbacks by themselves. The blended learning approach uses the strengths of each to counter the others' weaknesses." Namely that blended learning is a learning facility that combines various delivery methods. Teaching models and learning styles, introducing various choices of dialogue media between the facilitator and the person receiving the teaching. Blended learning is a choice that is in accordance with current developments. According to Abroto, et al., 2021, in Husamah in Arlena's research, the characteristics of blended learning are as follows: a) learning combines many steps in delivering teaching materials, teaching models, learning styles, and various technology-based teaching materials. B) As a combination of direct or face-to-face teaching, independent learning and online learning. C) Learning experienced by students is an effective combination of delivery methods and learning styles. D) Teaching and the role of parents of students have an equally important role, namely as supporters, while teachers or instructors as facilitators.

The application of Blended Learning in learning the Science subject of Harmony in Ecosystems is to be able to:

1. Improving Concept Understanding

   This learning is able to visualize abstract concepts about ecosystems and the relationships between their components. Involves students easily in understanding the concept of food chains, food webs and their roles in them. Can improve students' ability to analyze data and information about learning materials.

2. Improving Your Skills Abda 21

   Can develop students' thinking skills and creative abilities in solving environmental problems. Improve students' willingness and communication skills through group discussions and assignments and foster students' motivation for independent learning and lifelong learning.

3. Increasing Learning Motivation

   Through learning using interactive media, the learning process becomes more interesting and enjoyable, can provide students with the opportunity to learn with their own learning style, readiness and speed, and can increase student involvement in the learning process.

4. Preparing Students to Face Future Challenges

   Blended Learning can provide the knowledge and skills needed to face increasingly complex environmental challenges, as well as build student awareness of the importance of preserving the environment.

5. Overcoming the Limitations of Face-to-Face Learning

   Learning can be done outside of school with flexible study hours and allows students to access learning materials and assignments anytime and anywhere.

Specifically, the implementation of Blended-Learning in learning science materials on harmony in ecosystems has the following objectives:

- Make learning more interactive, through the use of learning media in the form of videos, simulations, and educational games.
- Facilitate student-centered learning by providing opportunities for students to actively explore and discover new concepts.
- Enhance collaboration between students and teachers through discussion rooms and group assignments.

- Utilizing technology as a learning tool makes it easier for students to access relevant information and learning resources.
- Presenting material that is relevant to everyday life that can help students connect the material being studied with their surroundings or their own experiences.

Thus, the implementation of the blended learning model is expected to improve the quality of learning about harmony in the ecosystem and prepare students to become citizens who care about the environment.

2. LITERATURE REVIEW

The independent curriculum has basically implemented the implications of every development in society so far (Mahfudz Reza Fahlevi 2022 in Indarta et al., 2022). Learning in the independent curriculum focuses on the level of development and achievement of students based on their respective learning needs, so that learning becomes meaningful and enjoyable.

Understanding Blended Learning

Blended-Learning is a learning model that combines conventional face-to-face learning methods with digital technology-based learning. In English, Blended-Learning is a term consisting of two words, namely Blended and Learning. Blended means a good mixture or combination while Learning means learning. Blended-Learning is a blended learning that is carried out face-to-face and online. This learning model allows students to learn independently through digital content with direct teacher guidance in face-to-face learning. Digital technology has begun to be introduced by Freisen to the private sector training field which then obtained the term blended-learning which has been used since 1999. New technology has the potential to not only bridge space, but also to bridge time (through recording), and for individual learning, namely by giving students control over their path through the material, and over the speed of learning (Apriani Sijabat, et al. 2023 in Freisen, 2012). This blended-learning program is also a wise step to overcome learning problems that are constrained by distance and place (Tubagus Panambaian, 2020 in Garrison, d. R. & Vaughan, n, 2008). Blended-Learning learning has ease in accessing learning and communication between students and teachers. This learning model is one of the alternative learning activities that aims for students to be able to understand the material optimally. Basically, learning activities tend to be more centered on educators, which makes students bored in learning and participating in learning activities (Andi Wirdayani, et al., 2023 in Sandi, 2012). Blended-Learning provides a learning facility that

combines various delivery methods, teaching models, and learning styles introducing various choices of dialogue media between facilitators and people who are being taught (Santi Karlina and Aden Sudarman, 2021 in Achmad Noor, 2020:44). The Blended-Learning learning model utilizes sophisticated technology with the aim that students not only gain knowledge but also gain learning experience and skills in using digital devices. According to Sabilla Irwina Safitri, Arna Saskia, 2022 in Moebs and Weilbelzahi quoted from Husama, Blended-Learning is a mixture of online and face-to-face meetings in integrated learning activities.

Learning can be said to be modern according to Arif Widodo, 2020 in Susanto, 2014, namely if the learning model is in accordance with the development of the era, one indicator is that it has paid attention to the surrounding environment where students are. In the subject of Science, the material on harmony in the ecosystem is related to the local wisdom of the local community, namely the tradition of mutual cooperation, one of which is called Nyadran, which describes a relationship of dependence in the human ecosystem and with the culture of the community that is closely related to the life of oil palm and rubber plantations. Therefore, the material on harmony in the ecosystem has close relevance to the daily lives of students which can be used by students as an alternative learning source. According to Sukma Ayu Kharismawati (2023) in Susilo and Irwansyah (2019), educators are expected to have the ability to understand the community environment in order to include local wisdom values. Local wisdom has a very important role as a fortress in maintaining the cultural values and morality of a nation, so its existence must be preserved. Preserving and upholding local wisdom by integrating understanding throughout Indonesian society is essential (Ratih Maharani and Najib Jauhari, 2024 in Idammatusilmi & Putra, 2023).

Interactive Learning Multimedia (ILM)

The selection and use of appropriate learning media will make it easier for students to deliver material to students and also affect the effectiveness of the learning process. Anything that disseminates knowledge about the teaching and learning process is considered a learning medium (Puput Elsa Maulida and Zulherman, 2024 in Hanikah et al., 2022). According to Seels and Glasgow (in Arsyad, 2014:38), interactive learning media is a mechanism for displaying computer-generated material other than just through eye contact and hearing. Students will get a meaningful and enjoyable learning experience if the learning material delivered uses media where students can learn it directly or by imitation.

Harmony in the Ecosystem

One of the materials taught with contextual learning is ecosystem material. Ecosystem material studies the reciprocal relationship between living things and their environment (Anarli et al,. 2023 in Kalsum et al., 2018). The material on harmony in the ecosystem includes some understanding of the interactions between living things, food chains and food webs, ecosystem balance and the role of each organism in an ecosystem.

Elementary School Science Learning

Science learning in elementary schools has different characteristics from other subjects. Science is a learning that is real and can be observed directly. This learning emphasizes direct experience through observation and experimentation. The use of concrete objects as learning media can help the learning process. Science learning is integrative learning which combines various aspects of learning, namely cognitive, affective and psychomotor which also integrates various natural science disciplines such as physics, biology and chemistry and connects the material with students' daily lives. In fact, because the content of science is in line with experiences that are connected to everyday life, there is a strong interest in learning science, learning will feel more enjoyable and students achieve the desired learning outcomes, science is actually seen by elementary school students as a fun and simple subject (Kuntum Khaira Ummah, Dea Mustika, 2024 in Hasanah, 2022).

Science learning is useful in developing thinking skills, including training simple analytical skills that can develop students' ability to solve problems and can encourage creativity and innovation. Science learning materials are related to the surrounding environment with real experience-based learning that can utilize learning resources from the environment. Peronika Purba, et al., 2023 in Wasiilati, RM & Sugiyanto, S, 2018:167) stated that Science is a way for humans to understand the universe by making precise observations on targets and using systematic steps and explained with reasoning to produce a conclusion.

In the process of learning science, teachers encourage students to be able to find their own concepts then develop the ability to conduct simple investigations and can train students to make conclusions. The assessment and evaluation carried out in this learning include aspects of knowledge, attitudes and skills that use various assessment techniques that are relevant and appropriate and are authentic and sustainable.

3. IMPLEMENTATION METHOD

The implementation of the Blended-Learning model through interactive learning multimedia was carried out on Thursday, October 24, 2024 with an allocation of 3 lesson hours, namely at 08.00 - 09.45 during the first lesson to the third lesson at the UPTD SD Negeri Bluru, Batu Ampar District, Tanah Laut Regency with a class 5 population consisting of 5 female students and 4 male students with a total of 9 students. Learning is carried out in the Laboratory room where there is smoother internet access. The implementation of learning to determine student learning outcomes is carried out using experimental methods with a pretest-posttest design with a control group.

4. IMPLEMENTATION RESULTS AND DISCUSSION

Use of Learning Resources and Multimedia in Learning

The use of learning resources from textbooks, videos, interactive learning multimedia in Blended-Learning indicates that the level of student enthusiasm increases in participating in learning. Learning will be considered successful when the teacher is able to create a comfortable and enjoyable learning atmosphere according to the learning needs of students. With such a learning atmosphere, it will create motivation and a desire to be involved in learning.

Some of the problems faced are:

- Internet access is limited to one class only.
- Dependent on electricity, so learning will be disrupted when there is a power outage.
- Students who are not yet skilled at accessing the internet using laptops have been left out of the lesson several times.
- Having to bring chromebooks and devices to class, set them up and condition them to be ready to use, and then return them. This is indeed more difficult than conventional face-to-face learning.

The solutions that can be done are:

- Take turns with other classes if you want to do digital-based learning.
- Teach digital skills using chromebook devices by printing out keyboard images for students to practice with.
- Time efficiency, considering that Blended Learning requires bringing digital devices to class and then setting them up.

- Collaboration with parents so that students can have access to adequate devices and internet when they have to access learning resources at home.

In blended learning with these learning resources, it has provided positive results in the material on harmony in the ecosystem.

Implementation of Learning Models

The application of the Blended-Learning learning model will meet the needs of students in gaining knowledge based on their experiences. By mixing face-to-face and online learning, it will provide a richer and more interactive experience for students. The application of the Blended-Learning learning model that is carried out is:

- Face to Face Learning

  Through simple experiments, students observe living things in the school environment. Students conduct small group discussions consisting of 3 group members to analyze the results of the discussion according to the learning style that has been chosen. Each group can present the results of their respective discussions.

- Online Learning

  Teachers create a video that can explain difficult concepts or provide real-life examples of harmony in an ecosystem. Students access learning resources using interactive learning multimedia to find the desired materials, exercises and quizzes.

The successes of Blended Learning include:

- With varied and interesting learning, students' learning motivation can be increased.
- Combining face-to-face and online learning can help students understand abstract concepts more concretely.
- Able to develop 21st century skills, namely critical thinking skills, communication, collaboration and creativity.
- Students learn flexibly at their own pace and can repeat material they do not yet understand.

Some of the problems faced in the Blended Learning process include:

- There is only one space that allows for digital-based learning, making it difficult for teachers when they want to carry out learning with the Blended-Learning model or other digital-based learning models continuously.
- Teachers must manage their time well so that face-to-face and online learning can run effectively and efficiently.

- The use of digital-based learning models can reduce social interaction between students.

In facing these various problems, the solutions that can be implemented are:

- There is adequate electrical installation in every classroom that has internet access from the school's WiFi.
- Teachers need to make learning plans that are clear and easy for students to follow.
- Online learning and face-to-face discussions can be facilitated by teachers to maintain social interactions between students.
- Teachers can improve their competence by participating in various adequate training in using learning technology and learning models that are relevant to students' needs.

Thus, Blended-Learning for harmony in ecosystem material can be an effective solution in improving the quality of student learning. With careful planning and support from various parties, Blended-learning can provide a more enjoyable and meaningful learning experience for students.

Learning Assessment and Evaluation

To measure the success of learning and provide feedback to students, it is necessary to conduct regular and continuous assessments and evaluations.

The assessment and evaluation that I carried out were:

1) Formative Assessment

   Observation Aspects:

   I directly observe student engagement in discussions, experiments and presentations. Through the online learning platform, I monitor student activity when accessing learning resources and working on Exercises and quizzes.

   Exercise

   The exercises are conducted periodically and continuously both face-to-face and online. Using exercises in the learning process is useful for measuring the extent to which students have mastered the material that has just been learned so that teachers can make improvements to learning for the future.

   Reflection journal

   Students reflect on their learning that day by writing down answers to questions such as "what have you understood?", "what have you not understood?" and "what

do you want to know?" on sticky notes and then sticking them on the reflection board.

2) Summative Assessment

At the end of the lesson, students are given a quiz in the form of gamification using Quizizz. The quiz results will be used to measure students' level of understanding regarding harmony in ecosystems. The quiz format is in the form of multiple choice with a total of 10 questions.

Success

Some of the successes obtained from the use of formative and summative assessments are the use of formative assessments can help me identify difficulties faced by students individually or in groups so that teachers can provide appropriate assistance, constructive feedback can help increase student learning motivation, students are trained to think critically and analyze information and solve problems. While summative assessments show an increase in overall student learning outcomes.

The problem

In determining objective and consistent assessment criteria, especially formative, is a challenge in itself. There is no standard format for formative assessment, but it is developed according to the needs of teachers and students.

To conduct various assessments requires more time so that only two types of formative assessments and one type of summative assessment can be conducted.

Solution. Another challenge is to create or develop a clear and detailed rubric according to the aspects to be assessed.

In summative assessment, I utilize the Quizizz platform in the recapitulation of grades. Reports can be distributed to parents of students so that parents are involved in learning. Communicate to parents if there is an assessment in the form of assignments that must be done at home online.

Students are given flexible time to complete assessment tasks.

Table 1. Learning Syntax

Learning activity steps:
Essential Questions:
1. How are living things in an ecosystem related to each other? 2. How do living things in an ecosystem get energy? 3. How is the relationship between plants and animals in an ecosystem?
Opening Activities
• The teacher opens with a greeting and then asks how everyone is doing. • Teachers prepare students physically and mentally to be able to follow the learning well. • Teachers provide encouragement to students in class to be enthusiastic when following lessons through apperception which can arouse students' enthusiasm for learning. • Students are given the opportunity to lead a prayer together according to their respective religions and beliefs before the learning takes place. • Teachers take attendance • After the prayer is finished, the teacher provides clarification regarding the opening activity by linking it to the material and learning activities that will be carried out. • Students together with teachers discuss the objectives and plans for learning activities.
Core activities
1. The teacher invites students to do ice breaking related to the food chain. Each student has a name and a role in a food chain. If a name is called, another student will stand up and call out the name (role) of another student, until a food chain is formed. 2. Start the class by asking students the question, “Where do we get energy from?” “What do you see in the life on rubber or oil palm plantations?” 3. Dig deeper into students’ answers by asking, “Where does the food get its energy?” For example, if someone answers eating chicken and vegetables, the teacher can ask, “Where does the chicken get its energy?”, “Where do vegetables/plants get their energy?”. 4. Explore previous knowledge about photosynthesis and animal classification based on their diet. Students need to have an understanding of both of these topics to help understand the process of energy transfer and food webs.

Tips: Guru bisa menyiapkan infografis/poster mengenai kedua topik ini dan menempelnya di kelas untuk membantu peserta didik secara visual selama proses belajar di bab ini.

5. While listening to students' answers, create a visualization of their answers on the board.**Example:**
   Man → chicken → grain → Sun
6. Ask to watch a learning video related to the ecosystem in the rubber plantation. This learning video is adapted to the culture in the local environment that is relevant to the students' daily experiences.
7. Next, ask students, “What do you think about this relationship?”
8. The teacher conveys the learning objectives to be achieved in this chapter and elaborates on what students want to know about food webs, energy transfer, and ecosystem balance through video learning.
9. Remind students about the vocabulary and terms in the lessons in grade 3 Chapter 1 Let's Get to Know the Animals Around Us and Chapter 2 Living with Nature which will be used again in this chapter (ecosystem, population, biotic components, abiotic components, herbivores, carnivores, and omnivores).
10. To integrate digital-based learning, teachers invite students to access Interactive Learning Multimedia (ILM) to study materials and assessments.
11. The teacher uses the STOP technique to prepare students for the next activity.
12. The teacher provides different learning resources and LKPD for each kinesthetic, auditory and visual group.
13. Students choose their own learning resources according to their learning needs. Teachers group students based on similar student choices.
14. Students work on assignments together with their groups and determine the division of roles within their groups.
15. Students do presentations together with their groups and other groups respond.
16. Teachers and students together make improvements, reinforcement and provide feedback.

Closing Activities

1. Students make resumes creatively with teacher guidance.
2. Students ask questions to strengthen their understanding of the material.

3. Students carry out summative assessments in the form of gamification via Quizizz independently.
4. Students write on sticky notes what they don't know yet and what they want to know and stick them in the space provided.
5. The teacher gives the task of reading the material for the next meeting..
6. Teachers give homework via Quizizz.
7. The teacher closes the lesson and takes turns giving other students the opportunity to lead a group prayer after the lesson is finished.
8. The teacher says hello.

Implementation Stages

Before carrying out the learning process, the teacher makes an interesting learning plan by doing various things, including:

1) Selecting material that is relevant to everyday life in order to attract students' interest, such as case studies on things that can damage the ecosystem due to human actions.
2) The use of varied media such as videos, images, simulations and gamification can present material in an interesting way.
3) Creating creative projects means designing projects that challenge students to think creatively, such as creating illustrations in the form of pictures or poems about the importance of a food chain in an ecosystem.

In a learning process, it is important for teachers to be able to create a conducive and enjoyable learning atmosphere. Some ways that teachers can do to create a conducive and enjoyable learning atmosphere include making the learning process, both face-to-face and online, flexible so that students feel comfortable, collaboration between heterogeneous learning group members can encourage students to learn from each other and giving appreciation for every effort and success of students both individually and in groups. Giving challenging assignments such as problem-based assignments can improve students' skills in solving problems in the surrounding environment. Collaborative projects can also improve cooperation skills between students and providing choices in doing assignments can train students' leadership in making responsible decisions.

Success

Some successes in the implementation of the learning process that were found were improvements in aspects of learning motivation, creativity, critical thinking skills, collaboration skills and understanding of learning material concepts.

The problem

The problems faced during the implementation of learning are no different from those previously explained, such as limited internet access, digital devices (Chromebooks) at school and online learning can reduce direct interaction between teachers and students.

The solutions implemented are providing facilities, creating learning modules and using interactive digital learning platforms to enable real-time interaction with teachers and friends.

By implementing the steps above and overcoming the existing problems, blended-learning of harmony in ecosystem material can create a more enjoyable, challenging and meaningful class for students. This can have a positive impact on increasing students' learning motivation, creativity and critical thinking skills.

Stages of Implementation and Success in Applying Local Culture and Wisdom

From this experience, the teacher then linked it to the sustainability of local culture and wisdom in the local area in Bluru village, namely the culture of commemorating the anniversary of Bluru village which is celebrated every year. In the past, the village anniversary was carried out with various activities including volleyball competitions, habsyi competitions, RT cleanliness competitions, watching outdoor cinema, kuda lumping and janger. Currently, the anniversary of Bluru village is carried out with activities including; making tumpeng gunungan, fun walking competitions, culinary, kuda lumping performances from RT 1 and 2 from Banyuwangi, and drum band performances from Bluru students.

Local wisdom in Bluru village is the tradition of "Ruwahan" or more commonly known as kenduri. Then, "Nyadranan" is carried out one month before the fasting month by pilgrimage and cleaning the graves together with all the villagers whose families are buried in Bluru village.

During the implementation of learning the harmony material in the ecosystem associated with local culture and wisdom, namely how to invite students to share experiences of how they are involved in activities in Bluru village. ecosystems in the surrounding nature so that students gain meaningful learning.

Problem:

I translate the problem into a challenge. The challenge I experienced was in the context of implementing culture and local wisdom that is relevant to learning materials and the use of appropriate models and technologies to create innovative and interactive learning, namely adapting the material to the culture and local wisdom that exists in the school environment. Another challenge is that teachers must be able to integrate local wisdom and local culture into learning materials. This is because the curriculum does not specifically touch on local wisdom and culture that exist in each region, including those in remote areas.

Solution:

The solution is to invite students to participate in connecting the material with the culture and local wisdom in their environment. With technology being the closest part of humans today, I invite students to search for articles or videos related to local wisdom and local culture using chromebooks that are adapted to the material, namely Harmony in Ecosystems. So the relationship obtained is a picture that various activities carried out in the community environment also describe the state of how an ecosystem (community environment) can run harmoniously, in harmony, balanced and sustainable.

Teachers must be able to explore the culture and local wisdom that exists in the area by conducting interviews, observations and confirmation with students, parents of students, local residents and fellow teachers who live in the area.

Follow-Up

Follow-up to the Implementation of Blended Learning

After implementing blended learning, the next step is to conduct evaluation and follow-up. This evaluation aims to identify successes, obstacles, and potential improvements that can be made.

Suggestions for Improvement and Follow-up

Here are some suggestions for improvements and follow-up that can be done to increase the effectiveness of the blended learning model:

1. Overall Process Evaluation:
    - Collect Feedback: Conduct surveys or interviews with students, teachers, and parents to find out their perceptions of the implementation of blended learning.
    - Data Analysis: Analyze student learning outcomes data, online session attendance rates, and survey results to identify areas for improvement.
    - Identify Strengths and Weaknesses: Determine what aspects are working well and what still needs improvement in the learning model.
2. Learning Model Improvement:
    - Improve the Quality of Material: Ensure that the learning material presented is relevant, interesting, and appropriate to the level of understanding of students.
    - Vary Learning Methods: Use a variety of online and offline learning methods to maintain students' interest and motivation to learn.
    - Optimize the Use of Technology: Ensure that all learners have equal access to technology and can use the learning platform properly.
    - Strengthen Collaboration: Increase collaboration between teachers, students, and parents to create a conducive learning environment.
3. Role of Teacher:
    - Competency Development: Attend training or workshops to improve your ability to design and manage blended learning.
    - Providing Mentoring: Provide individual or group mentoring to students who are experiencing difficulties.
    - Flexibility: Prepare flexible learning plans to accommodate diverse learning needs.
    - Effective Communication: Establish good communication with students and parents to provide support and motivation.
4. Role of Parents:
    - Facilitating Learning: Provide a comfortable and supportive learning environment at home.
    - Monitor Progress: Regularly monitor your child's learning progress and provide necessary support.

- Collaboration with Teachers: Establish good communication with teachers to work together to support children's learning success.

Key Points to Note:

- Learning Objectives: Make sure the learning objectives to be achieved are clear and measurable.
- The Role of Technology: Use technology as a tool, not a substitute for teachers.
- Flexibility: Adapt the learning model to the characteristics of the students and the learning context.
- Continuous Evaluation: Conduct regular evaluations to see progress and make improvements.

Things to Do:

- Forming a Team: Form a team consisting of teachers, parents, and if possible, involve students to jointly plan and implement blended learning.
- Holding Discussions: Hold regular discussions to share experiences, ideas, and solutions related to the implementation of blended learning.
- Developing Quality Learning Materials: Create learning materials that are interesting, interactive, and accessible to all learners.
- Provide Training: Provide training for teachers to improve their competency in using technology and designing effective learning.
- Create a Learning Platform: Develop a learning platform that is easy to use and accessible to all learners.

By carrying out systematic and continuous follow-up, it is hoped that the quality of blended learning can continue to be improved so as to achieve optimal learning outcomes for students.

The goal of Blended-Learning is to bridge distance learning through correspondence courses. In higher education, one such model is Diane Laurillard's conversational approach, which views learning as an iterative dialogue between students and teachers. Friesen found that, in the early days of Blended-Learning, the term meant almost any combination of technology, pedagogy, and even work assignments. Procter defined Blended-Learning in 2003 as the effective combination of multiple delivery modes, instructional models, and learning styles.

Simply put, Blended-Learning is a learning that utilizes various approaches that combine several learning delivery strategies using face-to-face activities, computer-based learning (offline) and online computers (internet and mobile learning). The material delivered is in the form of media containing text, animation, simulation, audio and video.

Teachers collect student data by paying attention to the stages of the learning process as usual, such as preparing teaching components, namely searching for CP and TP on the Merdeka Mengajar platform, creating teaching modules and assessments; student preparation, then implementing learning consisting of preliminary steps, core activities, namely delivering learning materials; and closing; conducting reflections and giving assignments / homework.

In the teaching preparation step, teachers look for references to learning achievements and learning objectives on the Merdeka pengajar platform page, create teaching modules that are tailored to the learning materials and learning objectives to be achieved. Teachers consider various possibilities to be able to determine the steps of learning activities in a sequential manner and can be implemented comprehensively.

Teachers need to understand the material to be presented and determine the stages to be carried out in a learning flow. In the planning process, stages are made by considering the allocation of time and the needs of students in learning.

In presenting harmony material in the ecosystem, the material object cannot be presented directly. Therefore, teachers need to visualize it into a relevant learning video. In this case, the teacher uses a learning video about the role of living things in a food chain presented in a situation that is relevant to the culture and daily experiences of students. In the discussion of the food chain, the teacher uses a video that is input into interactive learning multimedia. The teacher creates interactive learning multimedia using the Articulate Storyline 3 (AS3) application where there are menus that students can access according to their needs, such as introduction, instructions, developers, learning objectives, learning materials, exercises and quizzes, and references.

Other platforms used as support in making learning materials are YouTube and Quizizz which are embedded into the MPI. Thus, students can easily learn the material, do exercises and quizzes according to their wishes. Teachers can provide guidance to students who have difficulty in using or playing edugames in MPI.

Good learning is learning that in addition to paying attention to physical conditions, also pays attention to the psychological conditions of students. The use of the STOP technique can be done when students are felt to have started to lose concentration in learning. This is done so that students feel relaxed and can return to concentrating on the next stage of learning.

Learning harmony material in the ecosystem of the 5th grade Science subject at UPTD SD Negeri Bluru is packaged in audio-visual form by considering the learning speed and needs of each student through interactive learning multimedia, assessment using quizizz and assignments/homework in the form of quizizz assignments. By using the assignment mode on quizizz, teachers can monitor student progress and then report it to parents.

The use of Blended-Learning learning in grade 5 students of UPTD SD Negeri Bluru with the material Harmony in the Ecosystem of Science Subjects has had a positive impact on student learning outcomes. This is evident in the results of the students' pretest and posttest.

The results of the pretest of 9 students with a threshold value of 70 showed that 2 students got a score of 70 and the others got a score of less than 70.

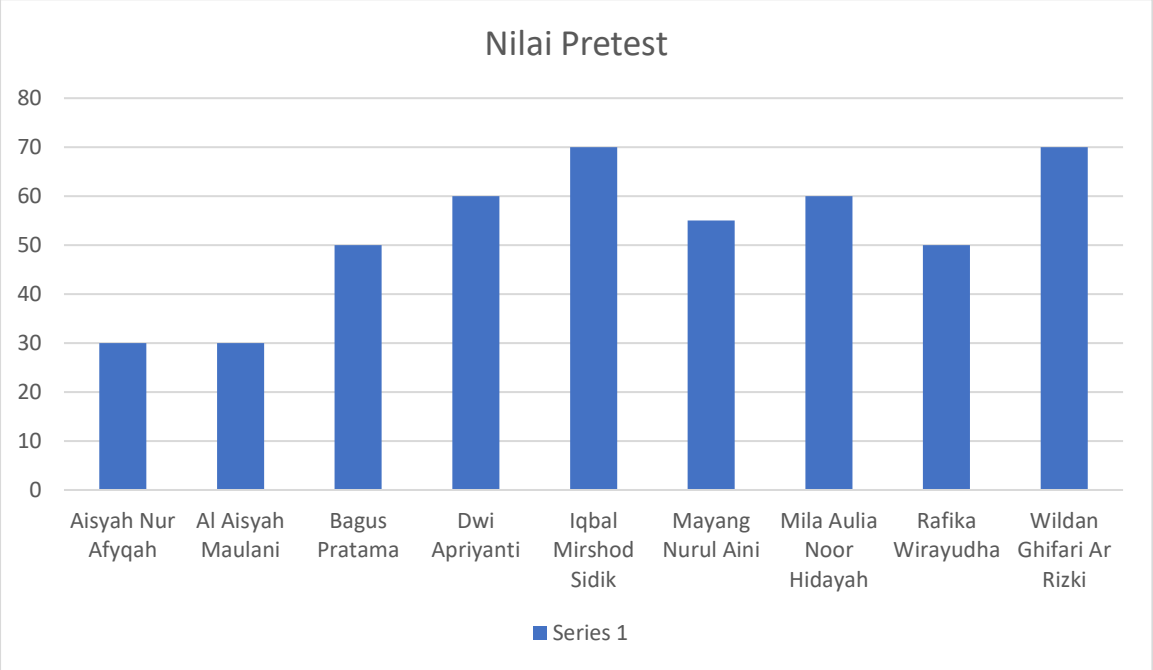

Figure 1. Pretest results for grade 5 students

The average result of the 5th grade pretest on the learning material on harmony in ecosystems was 52.78.

Meanwhile, the post-test results show that there are results that can be seen in the following table:

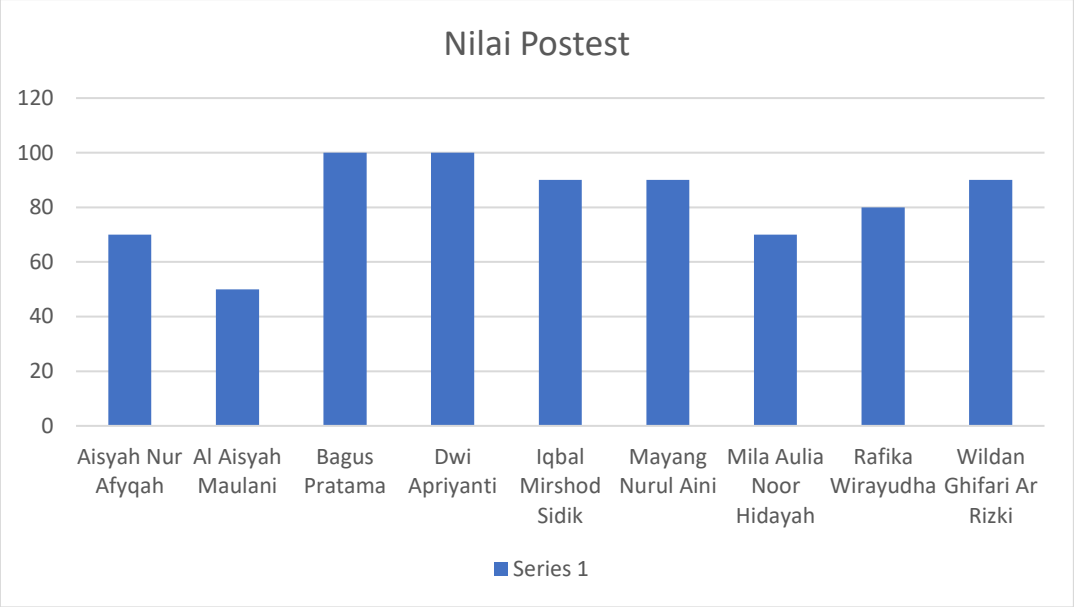

Figure 2

From the results of the table above, the average post-test score for grade 5 in the Science subject on the subject of harmony in ecosystems was 82.22.

These data show that there is an increase from the pretest to the posttest score in the Natural Sciences subject on the subject of harmony in ecosystems in learning using the blended learning model through interactive learning multimedia.

From the formative assessment conducted by the teacher in learning using the blended learning model through interactive learning multimedia, the teacher has met the students' learning needs. The observation sheet shows that in the learning process students look interested, enthusiastic and active in carrying out the learning process both independently and in groups and presentations. In the rubric sheet, there are results that show that the level of understanding of the tasks given according to the students' learning styles has been in accordance with expectations and learning objectives. In addition, the reflection carried out by students also shows that students are happy with the learning models and media that have been used.

5. CONCLUSION

The report results display a data result that shows the level of learning success when using the blended learning model through interactive learning multimedia. Teachers prepare planning by looking for learning achievements, learning objectives, preparing teaching materials and LKPD, implementing the learning process and transforming teaching materials, making tutorial instructions, monitoring the learning process, providing reflection assessment questions and follow-up according to the stages that have been made. While the sequence of learning carried out by students is by identifying, understanding, applying and communicating. Some problems encountered in the learning process, namely access to technology, facilities and infrastructure and student motivation can be overcome by implementing alternating learning with other classes where internet access is smoother. Facilities and infrastructure can be overcome by utilizing existing assets in schools, and student motivation can be increased with learning that pays more attention to student learning needs with varied learning. The implementation of blended learning requires careful planning, support from all parties, and training for teachers.

FOLLOW-UP

Based on the results of the learning report that has been carried out, there are several important points that need to be followed up to improve the effectiveness of blended learning through interactive learning multimedia on harmony in the ecosystem material for grade 5 elementary school. First, a more in-depth evaluation will be carried out on the material that has been delivered. Material that is considered still poorly understood by students will be repeated using a different approach, such as interactive simulations or group discussions. Second, the quality of interactive learning multimedia will continue to be improved. This can be done by adding new features, updating content, and improving the visual appearance to make it more attractive and interactive. Third, more intensive socialization will be carried out to students and teachers about the use of interactive learning multimedia. This aims to make students more accustomed to using the learning media independently and teachers can integrate it into daily learning activities. Fourth, cooperation will be carried out with the school to provide adequate facilities, such as a stable internet network and sufficient computer devices, so that the blended learning process can run smoothly. Finally, further research will be conducted to measure the long-term impact of implementing this blended learning model on improving students' understanding of the concept of harmony in the ecosystem.

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