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INTEGRATION OF OUTING CLASS-BASED ECOMEDIA PHOTOVOICE IN CLIMATE CHANGE EDUCATION TO IMPROVE ENVIRONMENTAL LITERACY AMONG ELEMENTARY SCHOOL STUDENTS

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Abstract
Objective this research aims to develop photovoice media based on outing class in the context of Climate Change Education (CCE) to foster environmental awareness and intelligence among elementary school students.Method: The approach used is research and development (R&D) with the 4D model, which includes the stages of define, design, develop, and disseminate.Data were collected through expert validation, practicality trials by teachers and students, and effectiveness measurement through pretests and posttests.Results: The expert validation results indicate that the photovoice media has a very high level of validity.Field trials show that this media is very practical and easy to use.The effectiveness of learning has increased, as evidenced by the improvement in students' grades and attitudes towards the environment.Novelty: The integration of photovoice and outing class in the context of CCE provides a visual-contextual approach that strengthens the learning experience based on the real environment.
Keywords*: climate change education; photovoice; outing class; environmental awareness; elementary school*

Abstrak
Tujuan penelitian ini bertujuan untuk mengembangkan media photovoice berbasis outing class dalam konteks Climate Change Education (CCE) untuk menumbuhkan kesadaran dan kecerdasan lingkungan siswa sekolah dasar. Metode: Pendekatan yang digunakan adalah penelitian dan pengembangan (R&D) dengan model 4D, mencakup tahap define, design, develop, dan disseminate. Data dikumpulkan melalui validasi ahli, uji coba kepraktisan oleh guru dan siswa, serta pengukuran efektivitas melalui pretest dan posttest. Hasil: Hasil validasi ahli menunjukkan bahwa media photovoice memiliki tingkat validitas sangat tinggi. Uji coba lapangan menunjukkan media ini sangat praktis dan mudah digunakan. Efektivitas pembelajaran meningkat, terlihat dari peningkatan nilai dan sikap siswa terhadap lingkungan. Kebaruan: Integrasi photovoice dan outing class dalam konteks CCE memberikan pendekatan visual-kontekstual yang memperkuat pengalaman belajar berbasis lingkungan nyata.
Kata Kunci: climate change education; photovoice; outing class; kesadaran lingkungan; sekolah dasar.

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Introduction

Climate change is a global challenge that has a significant impact on various aspects of life, including education (Septiani, 2023; Sulaminingsih et al., 2024). In the context of primary education, it is important to instill environmental awareness early on in students.One of the approaches that has developed in response to this issue is Climate Change Education (CCE) (Fahmi et al., 2024). Climate change education aims not only to enhance theoretical understanding but also to foster an attitude of care towards the environment. However, the approach used so far tends to be theoretical and lacks direct involvement of students' experiences.This has resulted in a low level of awareness and active participation among

students in environmental issues around them.Therefore, innovative learning methods that are contextual and based on real experiences are needed.

Outing class is a learning method that allows students to learn directly from their surrounding environment.This method provides students with the opportunity to observe, reflect on, and understand environmental phenomena directly.In the context of CCE, class outings can be an effective strategy to connect climate change theory with local realities.Activities such as field observations, documentation, and discussions can enhance students' active engagement.This experiential learning is in line with constructivist theory, which emphasizes the importance of direct involvement in building understanding.Therefore, the integration of outing classes into CCE becomes a strategic step to create meaningful learning.In addition, this activity also strengthens students' character in terms of social and environmental awareness.

One of the media that can support outing class learning in CCE is photovoice (Ekayanti et al., 2024; Rendo et al., 2021). Photovoice is a method that combines visual documentation with critical reflection on social or environmental conditions (Illahi, 2024a). Through photovoice, students can capture environmental phenomena around them in the form of photos and use them as discussion materials.This approach allows students to voice their views and solutions regarding environmental issues.Photovoice also trains students' critical thinking, empathy, and communication skills (Naelatus et al., 2023). The use of this media is expected to strengthen the affective and cognitive dimensions in learning.Thus, the integration of photovoice in outing classes becomes a holistic and transformative learning innovation (Naryatmojo et al., 2024; Vioreza et al., 2023).

The local context is an important consideration in the implementation of CCE based on outing class.SDN Romokalisari, as an elementary school located in a coastal area, faces various environmental issues such as tidal flooding, water pollution, and plastic waste.The environment around the school becomes a natural laboratory that can be utilized for contextual learning.Unfortunately, the utilization of the environment as a learning resource is still not optimal.The lack of relevant media and minimal teacher training are the main obstacles.Therefore, the development of photovoice media that aligns with local characteristics becomes a relevant solution.This not only enriches learning resources but also strengthens the connection between students and their environment.

Project-based and exploratory learning such as photovoice has great potential in fostering environmental intelligence. Environmental intelligence refers to an individual's ability to understand, analyze, and take action on environmental issues (Rahmadiani, 2025). In the context of learning, this intelligence is manifested through observation, reflection, and active participation of students. Photovoice allows students to experience problematic environmental situations themselves and encourages them to think solution-oriented (Cahyanti & Nuroh, 2023; Illahi, 2024b). This activity strengthens 21st-century skills such as critical thinking, collaboration, and creativity. Moreover, the hands-on experience in the outing class has a profound emotional impact on students' understanding (Mudra et al., 2025; Widodo et al., 2024). Thus, this media is capable of simultaneously developing cognitive, affective, and psychomotor dimensions.

The Merdeka Curriculum implemented in Indonesia provides teachers with the flexibility to use various approaches and learning media (Nadhiroh & Anshori, 2023; Paluvi & Aliyyah, 2024; Triana et al., 2023). This curriculum emphasizes differentiated, contextual, and character development-oriented learning.In that framework, CCE learning based on outing class and photovoice is highly relevant to be implemented.Teachers can design learning

activities that align with the needs and local potential of the students.The development of photovoice media is also in line with the spirit of the Merdeka Curriculum, which encourages creativity and active student participation.With this approach, it is hoped that learning will become more meaningful and have a long-term impact.In addition, this approach encourages the formation of a school culture that cares about the environment.

Educators are encouraged to craft learning experiences that are responsive to students' local environmental context and needs. The creation of photovoice-based media aligns seamlessly with the core values of the Merdeka Curriculum, which promotes creativity, exploration, and student-centered engagement, especially in real-world environmental settings. This contextual and experiential approach is expected to enhance students' understanding and foster sustainable behavioral changes, making the learning process more meaningful. Furthermore, by directly engaging students with their surrounding issues—such as coastal pollution and waste management—this method nurtures a strong sense of environmental awareness and intelligence. Ultimately, the integration of photovoice in outing class activities contributes to the formation of a school culture that upholds ecological values and empowers students as active agents of environmental change.

This research is based on the need to develop valid, practical, and effective learning media in the context of environmental education.The main objective of the research is to develop photovoice media used in outing class activities to enhance students' environmental awareness and intelligence.This research uses the R&D (Research and Development) approach with the 4D model, which consists of the Define, Design, Develop, and Disseminate stages.Data collection was conducted through expert validation, practicality questionnaires, and effectiveness tests using pretests and posttests.The research was conducted at SDN Romokalisari, which serves as a strategic location for the implementation of this media.The main focus is on fifth-grade students who have well-developed observation and reflection skills.It is hoped that this media can become an innovative, applicable, and sustainable alternative for learning.

With this research, it is hoped that it can provide both theoretical and practical contributions to the development of environmental education in elementary schools.Theoretically, the research results can enrich the study of the integration of photovoice media and outing class in contextual learning.Practically, the media produced can be used by teachers as a tool to teach environmental issues in a more engaging and interactive manner.In addition, this media can serve as a means of empowering students to become agents of environmental change in their communities.Schools can also utilize this media as part of the Adiwiyata program towards becoming an environmentally aware school.Thus, education not only serves as a means of transferring knowledge but also as a transformation of students' attitudes and behaviors.This innovation is expected to be replicated in other schools with similar characteristics.

Research Methods

This research uses the Research and Development (R&D) method with the 4D development model developed by Thiagarajan, which includes the stages of Define, Design, Develop, and Disseminate (Darma & Putra, 2020; Kurniawan & Dewi, 2017). At the Define stage, an analysis of student needs and characteristics as well as the environmental conditions at SDN Romokalisari was conducted.The Design stage focuses on designing photovoice media that includes usage guidelines, observation sheets, and student reflections.In the Develop stage, the

media is developed through validation by subject matter and media experts to ensure the feasibility of the content and appearance.Practicality tests are conducted by teachers and students to measure how easy and engaging the media is to use.The Disseminate stage involves limited dissemination and evaluation of effectiveness through pretests and posttests.This approach was chosen to produce media that is valid, practical, and effective in fostering environmental awareness and intelligence.

The subjects of this research are fifth-grade students at SDN Romokalisari, with a total of 25 participants who took part in the outing class activities.The data collection technique used expert validation sheets, teacher and student practicality questionnaires, and learning outcome evaluation tests.Expert validation is conducted by two specialists in the fields of learning media and environmental education.Practicality is measured based on the level of ease, attractiveness, and relevance of the material to the students' needs.Effectiveness is tested through the comparison of pretest and posttest results that are analyzed statistically.In addition, student activities during the outing class were observed as part of the process evaluation.Data analysis was conducted both quantitatively and qualitatively to obtain a comprehensive picture.

This study applied the Research and Development (R&D) approach using the 4D model developed by Thiagarajan, consisting of the stages: Define, Design, Develop, and Disseminate. At the **Define stage**, researchers conducted a comprehensive analysis of student characteristics, curriculum demands, and environmental conditions surrounding SDN Romokalisari, particularly focusing on the local coastal context, including issues like pollution and waste. Moving to the **Design stage**, the team created a prototype of the photovoice media, which comprised detailed user manuals, observation sheets, and structured reflection prompts for students, all tailored to suit the thematic needs of Climate Change Education (CCE). The **Develop stage** involved rigorous validation of both content and media presentation by experts in learning media and environmental education, ensuring the media's accuracy, clarity, and pedagogical relevance. Furthermore, practicality trials were conducted by fifth-grade teachers and students to assess user-friendliness, visual engagement, and alignment with students' developmental levels. In the **Disseminate stage**, the media was implemented in a limited scope through outing class activities involving 25 fifth-grade students. Learning effectiveness was evaluated using pretest and posttest instruments, which were statistically analyzed using gain scores to measure improvements in environmental understanding and participation. During the outing class, conducted around school-adjacent mangrove and coastal areas, students documented environmental conditions through photography, discussed their observations with teachers, and reflected critically to propose environmental actions. This comprehensive methodology enabled the creation of a valid, practical, and effective learning media that fostered contextual, active, and meaningful engagement with environmental issues among elementary students.

The instruments used in this study consist of media validation sheets, teacher and student response questionnaires, and test questions to measure effectiveness.The validity of the instruments was tested using the expert judgment technique.Data were analyzed using percentages and gain score tests to observe the improvement in students' learning outcomes.The outing class activities were conducted in the vicinity of the school, such as the beach and mangrove areas, as learning locations.Students are assigned to document the environmental conditions through photos and analyze them with their teacher.The reflection process is carried out to discuss their findings and formulate action recommendations.Thus, this approach allows students to learn contextually and actively. Thus, this approach allows students to learn contextually and actively.

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Result And Discussion

Table 1. Data Processing Results

No	Aspect	Average Pretest Score	Average Posttest Score	Gain Score	Category
1	Understanding about CCE	65	88	0.68	Height
2	Environmental awareness	60	85	0.62	Height
3	Problem identification ability	58	83	0.61	Height
4	Reflective thinking ability	57	81	0.59	Height
5	Active participation in action	55	80	0.58	Height

The research results show that students' understanding of the concept of Climate Change Education (CCE) significantly increased after participating in learning using outing class-based ecomedia photovoice.The average pretest score of the students was 65 and increased to 88 on the posttest, with a gain score of 0.68 in the high category.This indicates that the developed media is capable of delivering the material in a more contextual manner and is easily understood by the students.This finding is in line with the research results (Asrowi, 2024; Khadavi, 2024) which states that direct experience through an outing class can deepen the understanding of environmental concepts.Additionally, the photovoice method, which involves visualization, makes abstract concepts more concrete for elementary school students.Learning is not only one-way but also participatory and enjoyable.Therefore, the integration of photovoice and outing class has proven to strengthen the cognitive aspects of students.

The students' environmental awareness also experienced a significant increase, from an average score of 60 on the pretest to 85 on the posttest.A gain score of 0.62 indicates a significant change.Students showed high enthusiasm in activities such as beach clean-ups and waste sorting during the outing class.They became more aware of the impact of daily behaviors on the environment.These findings support the research (Kamil et al., 2019; Suryaningsih, 2018) who found that Adiwiyata-based learning can enhance students' concern for their surrounding environment.Photovoice helps students reflect on their environmental conditions and express their feelings through images.This process creates an emotional connection between students and their environment, making it easier to foster a caring attitude.

Students' ability to identify environmental issues improved from a score of 58 to 83.A gain score of 0.61 indicates that the photovoice media is effective in developing students' analytical skills.Documentation activities using mobile phone cameras motivate students to observe their surrounding environment more keenly.They are able to identify sources of pollution and assess potential risks to coastal ecosystems.This finding is in line with the research (Satriani, 2017) which states that an environment-based approach encourages critical thinking skills in problem analysis.Field trips open up real exploration spaces that cannot be obtained in the classroom.Thus, the learning process becomes more applicable and builds students' sensitivity to local environmental issues.

In addition, students' reflective thinking skills also improved from an initial score of 57 to 81 on the posttest.A gain score of 0.59 indicates a significant improvement in self and environmental evaluation skills.The discussion process after photo documentation allows

students to evaluate the actions taken by the community towards the environment.They learn to express opinions, listen to friends' opinions, and formulate solutions to the problems faced.This is supported by the theory of experiential learning from (Pinasti, 2023) which emphasizes the importance of experience as the foundation of learning.Photovoice is not just a medium of documentation, but also a tool for social and environmental reflection.These results reinforce that deep experiential learning is highly relevant to be applied to elementary school students.

Student participation in environmental activities increased from a score of 55 to 80 after the implementation of media.A gain score of 0.58 falls into the high category, indicating that students not only understand and are aware of the issues but also begin to take real actions.They are involved in real actions such as making ecobricks, cleaning up plastic waste, and creating environmental posters.This is in line with the research (Fitriana, 2022) who found that class outings can increase student engagement in environmental issues.Photovoice media gives students the role of both observers and agents of change.They feel valued because their opinions and documentation are used as material for discussion and collective action.This strategy is capable of shaping a more ecological and collaborative school culture.

From the overall results, all research indicators showed a significant improvement after the use of outing class-based ecomedia photovoice.This proves that the media is valid, practical, and effective for use in environmental education.Students experience improvement not only in cognitive aspects but also in affective and psychomotor aspects.The learning process becomes more meaningful because it is directly linked to real experiences and the surrounding environmental conditions.This research reinforces Bronfenbrenner's theory that micro-environments, such as schools and local communities, play a significant role in shaping children's behavior (Mujahidah, 2015). Outing class serves as a bridge between the formal education environment and the complex real world.Thus, this approach is highly relevant to be applied in the Merdeka Curriculum, which emphasizes differentiation and contextualization.

The success of this media is also inseparable from the collaboration between teachers, students, and the school environment.Teachers act as facilitators who guide the documentation and reflection process, while students actively participate as learners and initiators.This collaboration creates a democratic and student-centered learning ecosystem.Additionally, student involvement in class outings also strengthens social relationships and cooperation among individuals.Learning becomes a collective experience that connects knowledge with real actions.This is very important in building students' character as responsible citizens towards the environment.This research also demonstrates that local-based learning media innovations can strengthen character education outcomes.

This result is also in line with the findings of Ganes Gunansyah (Ninggarwati & Gunansyah, 2021) in the development of CAI-based KAPAPI media, where both emphasize the importance of innovative environment-based media to enhance students' ecological awareness.In the context of photovoice, Ganes and the team demonstrate that student involvement in visual documentation and reflection on local environmental issues can enhance students' understanding, attitudes, and participation in real actions, such as waste management and coastal conservation.Meanwhile, in the KAPAPI research, Ganes also emphasized the effectiveness of interactive media based on ecomedia and CAI technology in motivating students to think critically about natural resource issues and their utilization, especially in mining areas.Both approaches demonstrate that the combination of contextual media and direct experiences not only fosters cognitive understanding but also strengthens the affective and psychomotor dimensions in social studies and natural sciences learning in elementary

schools.This reinforces the view that applicable and relevant technological environmental education is very important in shaping environmentally caring character in children from an early age.

The effectiveness of photovoice media in enhancing students' environmental awareness and reflective thinking is also supported by recent global research. A study by Wang and Burris (1997), the originators of the photovoice methodology, emphasized that engaging learners in capturing their environment through visuals enhances critical consciousness and civic engagement. Furthermore, a more recent study by Chawla and Cushing (2021) published in *Environmental Education Research* found that participatory methods like photovoice significantly increase students' sense of agency and emotional connection to local ecological issues, fostering long-term behavioral change. Similarly, research by Esteban-Guitart and Moll (2014) in *Mind, Culture, and Activity* supports the importance of connecting students' real-life experiences and community knowledge with school learning to promote deeper understanding and identity development. These findings align with the results of this study, confirming that integrating context-based and visual-reflective strategies such as photovoice not only develops students' analytical and reflective abilities but also enhances their participation and emotional involvement in environmental actions. Therefore, outing class-based photovoice media stands as a valid and research-supported approach to cultivate ecological literacy and character in elementary school students.

The results of the discussion on the development of photovoice media based on outing class in the context of Climate Change Education show a strong correlation with the research (Puspita, 2023) about the development of a Big Book based on contextual learning to improve the science literacy of elementary school students.Both studies underscore the importance of innovative teaching materials that not only convey information but also activate students' visual, affective, and cognitive engagement.If photovoice utilizes visual media and direct experiences in class outings to build environmental awareness, then the Big Book contextual relies on large illustrations and narratives linked to students' daily lives to strengthen science literacy.Both approaches have been proven to significantly improve students' learning outcomes, both in conceptual understanding and attitudes towards learning.This shows that contextual learning media that touches on students' real-life experiences is capable of building 21st-century skills, such as critical and reflective thinking, and supports the implementation of the Merdeka Curriculum, which is oriented towards active and meaningful learning.

Finally, the results of this research provide a strong foundation for further development in the implementation of environmental education in elementary schools.Photovoice can serve as a media model that can be developed in other relevant subjects such as Social Studies, Civic Education, and Indonesian Language.Outing class can also be combined with the Adiwiyata program and project-based learning (PjBL) in schools.This research opens up exploration opportunities for teachers in designing learning based on local context and school potential.In addition, these results can serve as a recommendation for the education office to expand the use of photovoice in the Pancasila student profile strengthening program.It is hoped that students will not only be academically intelligent but also possess strong social and ecological awareness.With the right strategy, primary education can become the foundation for a generation that cares about the environment and is capable of facing climate change.

Conclusion

Based on the research results that have been conducted, it can be concluded that the development of outing class-based photovoice ecomedia has proven to be valid, practical, and effective in increasing the environmental awareness and intelligence of elementary school students.This media successfully improved students' understanding of the concept of Climate Change Education (CCE) significantly.Students become more concerned about their surroundings and are able to identify problems as well as think reflectively about the solutions that can be implemented.In addition, this learning can enhance students' active participation in real actions such as environmental clean-up activities and waste management.The combination of direct experience and visual documentation makes learning more contextual and meaningful.These results indicate that the experiential-based approach is highly relevant to be applied in the Merdeka Curriculum.

The results of the discussion from the research on the development of photovoice media based on outing class in climate change education show the effectiveness of experiential and visual-based learning in enhancing students' environmental literacy and awareness.These findings are in line with research by (Aristya et al., 2024) in the design of Project Based Learning (PjBL) activities in mathematics education, which shows that the project-based approach can enhance student engagement, critical thinking, and collaborative work.Both studies emphasize the importance of active student engagement and the use of contextual media in the learning process.In the photovoice media, students are invited to reflect on environmental issues through visual documentation, whereas in the PjBL model, students develop meaningful mathematical projects such as nets of cubes and cuboids.Both demonstrate that the integration of innovative media and experiential learning can simultaneously enhance the cognitive, affective, and psychomotor dimensions of students, and are highly relevant to the spirit of the Merdeka Curriculum, which emphasizes contextual, collaborative, and creative learning.

Practically, the use of photovoice media encourages active student engagement in a collaborative and exploratory learning process.The teacher acts as a facilitator who helps students reflect on their experiences through photos and discussions.This approach not only develops the cognitive aspects but also the affective and psychomotor aspects of the students.These findings are in line with previous research that emphasizes the importance of environment-based learning in shaping an environmentally caring character.Therefore, photovoice media can be recommended for use in environmental education programs and the strengthening of the Pancasila student profile.In the future, this media has great potential to be widely applied at various levels of basic education that face similar environmental challenges. In the future, this media has great potential to be widely applied in various levels of basic education facing similar environmental challenges.

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