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Evaluation of *Tatanen di Bale Atikan*-Based Extracurricular Environmental Education Program

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ABSTRACT: This study evaluates the Tatanen extracurricular program at Bale Atikan (TdBA) in Purwakarta elementary schools using the CIPP (Context, Input, Process, Product) evaluation model. The assessment examines program effectiveness, student impact, and resource efficiency through a mixed-method approach. A quantitative survey of 187 teachers from 12 schools was conducted alongside qualitative analysis via interviews, observations, and document studies. The findings indicate that the program aligns with the Merdeka Curriculum and Strengthening the Pancasila Student Profile (P5) and is supported by local regulations. The input aspect scored 4.78 (95.50%), highlighting strong curriculum design, student readiness, and instructor availability, though improvements in teaching materials and infrastructure are needed. The process evaluation yielded a 4.81 (96.11%) score, demonstrating effective project-based learning, though challenges in time management and teacher mentoring persist. In terms of product, TdBA significantly enhances ecological awareness (4.83 or 96.67%), fosters innovation (4.75 or 95.00%), and contributes to environmental preservation (4.88 or 97.50%), averaging 4.82 (96.39%). This study provides a framework for evaluating local wisdom-based programs and offers insights for policymakers to support environmental education and expand similar initiatives in other schools.

Keywords: CIPP, Evaluation, Extracurricular, Tatanen di Bale Atikan

ABSTRAK: *Penelitian ini mengevaluasi program ekstrakurikuler Tatanen di Bale Atikan (TdBA) di sekolah dasar Purwakarta menggunakan model evaluasi CIPP (Context, Input, Process, Product). Penilaian ini mengkaji efektivitas program, dampaknya terhadap siswa, dan efisiensi sumber daya melalui pendekatan metode campuran. Survei kuantitatif dilakukan terhadap 187 guru dari 12 sekolah, disertai dengan analisis kualitatif melalui wawancara, observasi, dan studi dokumen. Temuan menunjukkan bahwa program ini selaras dengan Kurikulum Merdeka dan Penguatan Profil Pelajar Pancasila (P5) serta didukung oleh peraturan daerah. Aspek input memperoleh skor 4,78 (95,50%), yang menyoroti desain kurikulum yang kuat, kesiapan siswa, dan ketersediaan instruktur, meskipun masih diperlukan perbaikan dalam bahan ajar dan infrastruktur. Evaluasi proses menghasilkan skor 4,81 (96,11%), yang menunjukkan pembelajaran berbasis proyek yang efektif, meskipun masih ada tantangan dalam*

manajemen waktu dan pendampingan guru. Dari segi produk, TdBA secara signifikan meningkatkan kesadaran ekologis (4,83 atau 96,67%), mendorong inovasi (4,75 atau 95,00%), dan berkontribusi terhadap pelestarian lingkungan (4,88 atau 97,50%), dengan rata-rata skor keseluruhan 4,82 (96,39%). Studi ini memberikan kerangka kerja untuk mengevaluasi program berbasis kearifan lokal serta menawarkan wawasan bagi pembuat kebijakan dalam mendukung pendidikan lingkungan dan memperluas inisiatif serupa di sekolah lain.

***Kata kunci**: CIPP, Evaluasi, Ekstrakurikuler, Tatanen di Bale Atikan.*

INTRODUCTION

Indonesia faces increasingly complex environmental issues, such as deforestation, water and air pollution, suboptimal waste management, and climate change that have a wide impact on ecosystems and people's lives. To overcome these challenges, education is a key pillar in supporting sustainable development, because it can instill ecological awareness, change people's behavior, and create a generation that cares more about the environment. In this context, elementary schools play an important role in shaping environmental awareness and the character of the younger generation. Early environmental education fosters a sense of responsibility and proactive behavior among students, equipping them to become future leaders in their communities (Liao et al., 2022). By integrating environmental concepts into the curriculum, elementary schools can significantly influence students' attitudes towards sustainability, thereby contributing to a culture of environmental management (Aulia et al., 2024).

One of the initiatives that has attracted attention is the local wisdom-based environmental education extracurricular program "Tatanen di Bale Atikan" (TdBA), which is regulated in Purwakarta Regent Regulation Number 103 of 2021 (Ismelani et al., 2023). This program aims to instill ecological awareness in students through an approach based on local wisdom and permaculture philosophy. Through TdBA, students are invited to learn from nature, respect the environment, and contribute to preserving it (Kartika et al., 2021). In addition, TdBA is designed to address three major gaps in the 21st century: ecological, social, and spiritual gaps (Scharmer, 2018).

The TdBA-based environmental education extracurricular program is recognized as an innovation in sustainable education. This program is in line with the Pancasila Student Profile (P5) in the Independent Curriculum and is expected to strengthen students' environmental competencies. However, the implementation of this program faces various challenges that have the potential to hinder its effectiveness. The main obstacles identified included limited resources, such as facilities and financial support, as well as a lack of training for teachers to implement the program effectively. Limited resources, such as green facilities and ecological-based teaching materials, hamper the effectiveness of direct practice in the TdBA program, so that students do not get an optimal learning experience. In addition, minimal teacher training and coordination between stakeholders causes variations in curriculum implementation, lack of mentoring in project-based learning, and low community involvement in supporting the sustainability of the program. In addition, the implementation of

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fragmented programs without strong coordination between various related parties also hinders the achievement of goals. Although TdBA extracurricular programs have been implemented in various primary schools, there has not been a comprehensive evaluation to assess their effectiveness in context, input, process, and product aspects. The absence of systematic evaluation makes it difficult to identify areas that need to be improved and ensure their impact both in terms of output and outcome. For this reason, a thorough evaluation is needed to ensure whether this program can run sustainably and provide long-term benefits.

The CIPP (Context, Input, Process, Product) evaluation model provides a comprehensive framework for assessing educational programs by examining four interrelated components that contribute to the overall effectiveness and relevance of the initiative. Evaluation using the CIPP model is able to identify the relevance, effectiveness of implementation, and impact of the program, which cannot be achieved comprehensively by other evaluation methods that are more focused on the final results alone. The context aspect evaluates the alignment of the program with the needs of the community and education policies, ensuring that the program addresses challenges and priority scales (Rahmayanti et al., 2021).

The input aspect assesses the availability and readiness of critical resources, including qualified educators, adequate infrastructure, and well-designed curriculum, which are critical to the successful implementation of the program (Liao et al., 2022). The process aspect focuses on the actual implementation of the program in the field, analyzing how well the activity is being carried out and whether the activity adheres to the planned strategy (Aulia et al., 2024). Finally, the product aspect measures the outcomes and impact of the program, including changes in student behavior and levels of ecological awareness, thereby providing insight into the effectiveness of the program in achieving its educational goals (Gül & Özdemir, 2022). By integrating these four dimensions, the CIPP model enables educators and policymakers to make informed decisions about program improvements and resource allocation, ultimately improving the quality of education and encouraging sustainable practices among students.

Previous research has shown that the CIPP evaluation model is effective in assessing educational programs. For example, Ratnaya et al (2022) show that the context aspect is often the basis for the success of environment-based education programs. On the other hand, research by Kurniawati (2021) highlights the importance of input aspects in determining the success of the implementation of extracurricular programs. However, this study offers a different study by specifically evaluating the extracurricular program of environmental education with local wisdom, especially those based on Tatanen in Bale Atikan using the CIPP approach, which is still very limited. Previous research tended to focus only on describing program implementation without a comprehensive evaluation study on the aspects of context, input, process, and product. This research gap is the main reason for conducting this study. By integrating the CIPP evaluation approach, this study aims to provide a comprehensive overview of the effectiveness of the TdBA

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program. In addition, this study also seeks to identify the factors that support and hinder the success of the program, and provide evidence-based recommendations to improve its implementation in the future.

This study aims to analyze and evaluate the relevance, resource readiness, implementation quality, and outcomes of TdBA-based extracurricular program in elementary schools in Purwakarta Regency using the CIPP evaluation model. In addition, this study also explores how the findings obtained can contribute to improving the quality of sustainable environmental education. The expected implications include theoretical contributions in educational evaluation studies as well as practical recommendations to improve the effectiveness of environmental-based education programs and support sustainable environmental conservation.

RESEARCH METHOD

This study uses an evaluation approach with the CIPP (Context, Input, Process, Product) model, which provides a comprehensive framework to assess the effectiveness of extracurricular programs based on Tatanen di Bale Atikan (TdBA" at the elementary school level in Purwakarta Regency. This model examines four main aspects: 1) context which includes the relevance of programs to policies and community needs; 2) program inputs that include resource readiness including teaching staff, facilities, and curriculum; 3) a process that includes the implementation of activities in the field; and 4) products that include the results achieved, both in the form of changes in student behavior and environmental impacts. This approach was chosen to provide a holistic and systematic evaluation of programs oriented to environment-based character education.

The research data in this study was collected using the concurrent embedded mixed method approach, which combines quantitative and qualitative methods simultaneously (Ramayenda, 2020). The concurrent embedded mixed method model is used in this study to combine a quantitative approach that measures program effectiveness statistically through surveys with an in-depth qualitative approach, such as interviews and observations, to explore the context and dynamics of program implementation. The use of both methods simultaneously allows for a more holistic and comprehensive approach in evaluating the success of the TdBA extracurricular program, as well as providing more complete insight into the factors that influence program outcomes.

The quantitative method involved 12 elementary schools that held Tatanen extracurricular activities in Bale Atikan in Purwakarta Regency. Quantitative data was collected by purposive sampling involving as many as 187 teachers using a survey in the form of a closed questionnaire. The feasibility of the instrument was evaluated through an expert judgment process involving three educational evaluation experts, followed by a validity test using the Pearson test and a reliability test using the Cronbach's Alpha test, which showed that the instrument was valid and reliable. For scoring purposes, the following interpretation guidelines are used (Wahyudin & Bk, 2022):

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Table 1. Interpretation of Questionnaire Score Achievement

No	Grade/Score Range	%	Criterion
1.	1,00 – 1,80	20% - 36%	Very Low
2.	1,81 – 2,60	37% - 52%	Low
3.	2,61 – 3,40	53% - 68%	Enough
4.	3,41 – 4,20	69% - 84%	Good
5.	4,21 – 5,00	83% -100%	Excellent

The qualitative method is designed to dig into more in-depth information through semi-structured interviews, structured observations, and document analysis (Sittika et al., 2022). Interviews were conducted with various stakeholders, such as principals, parents, teachers, students, and support staff, to understand the implementation of the program more comprehensively. Direct observation is used to observe the implementation of the program, student interaction, and the condition of facilities that support TdBA activities, while the study of the document aims to analyze official reports and related administrative data (Taufik, 2020).

In this study, Miles and Huberman's analysis stages were applied to analyze four aspects of the CIPP model. In the context, data was analyzed to understand the relevance of the program to policy and community needs, with data reduction grouping interviews from schools and communities to determine environmental policy priorities that need to be strengthened. For input, data related to the readiness of resources such as teachers and facilities were collected through observation and interviews, then reduced to identify the strengths and weaknesses of available resources. In the process stage, analysis was carried out to evaluate how the program was implemented, where data from observations of activity implementation were classified to find patterns of success and challenges. Finally, in the output, data on the results achieved, both changes in student behavior and environmental impacts, were analyzed and reduced to identify key themes, such as increased ecological awareness or challenges in policy implementation. These key themes were then determined through mapping the results of interviews and observations that focused on the concrete impacts of the program.

Data validity was strengthened through triangulation of sources, methods, and time, as well as member checking, where respondents were asked to verify the results of the interpretation. Source triangulation involves collecting data from multiple sources such as teachers, students, and principals to gain a more complete view. Method triangulation combines interviews, observations, and document studies to gain a deeper understanding of program implementation. For example, interview findings that some teachers felt the program lacked structure were confirmed by observational findings that revealed inconsistencies in curriculum implementation in the field. Time triangulation was conducted by comparing data collected at different points in time during program implementation to see changes or developments. Member checking was conducted by giving respondents the opportunity to verify the interpretation of

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the research results. For example, after interviews with teachers, transcripts of discussions were provided to respondents to ensure accuracy and representativeness of their views, thereby reducing interpretation bias.

RESULT AND DISCUSSION

Results

The context of the TdBA extracurricular program talks about the objectives, indicators and relevance of the program to national policies and regional autonomy in Purwakarta district. The survey results showed that the results of the evaluation of the extracurricular context of TdBA showed an average score of 4.82 (96.39%) with the category of "Very Good," indicating that this program has specific goals, is relevant to the independent and P5 curriculum, and contains clear indicators of learning competence.

Table 2. Survey Results Data on the Context of TdBA-Based Extracurricular Programs

No	Aspects evaluated	Average	%	Category
1	The TdBA extracurricular program has a specific goal of describing the final achievement of the learning process	4.88	97.50	Excellent
2	TdBA extracurricular programs are relevant and support the achievement of the independent curriculum and P5 (Pancasila Student Profile Strengthening Project)	4.79	95.83	Excellent
3	The indicators of the TdBA extracurricular program contain specific learning competencies achieved by students	4.79	95.83	Excellent
Average		4,82	96,39	Excellent

The context of the TdBA extracurricular program at the Purwakarta elementary school level shows a strong relevance to the needs of environmental education and the principles of the Independent Curriculum. The determination of the Indicator refers to the Regulation of the Regent of Purwakarta Nmor 103 of 2021 concerning Tatanen in Bale Atikan. This is as explained by the TdBA extracurricular program development team as follows:

> "The determination of indicators for the success of the TdBA program is carried out carefully through a meeting to determine achievements and indicators guided by the TdA curriculum, in accordance with Regent

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Regulation Number 103 of 2021 concerning TdBA. In the meeting, the targets that students want to achieve at each grade level were discussed in depth, and clear indicators were set to measure the competencies that must be mastered. All of these processes are arranged based on the TdBA curriculum that has been set by the regent."

In the context area, the TdBA program is supported by clear regulations, namely the Purwakarta Regent Regulation Number 103 of 2021, which provides a legal framework for its implementation in schools. This regulation ensures that the goals and objectives of the program are aligned with the curriculum and local educational needs, as explained by Nuryanti et al (2020) that regulations are an important element in supporting the implementation of extracurricular programs.

TdBA extracurricular program inputs include various important elements that support the implementation of the program, such as curriculum design, teaching materials and resources, teaching human resources, facilities, and student readiness. The results of the evaluation of TdBA's extracurricular inputs showed an average score of 4.78 (95.50%) with the category of "Very Good," which reflects that the curriculum design, facilities, instructors, infrastructure, student readiness, and program planning optimally support the implementation and achievement of program goals. The results of the survey are reported as follows:

Table 3. Data from the TdBA-Based Extracurricular Program Input Survey

No	Aspects evaluated	Average	%	Category
1	The design and content of the curriculum of the TdBA extracurricular program supports the improvement of TdBA achievement at the school level	4.83	96.67	Excellent
2	The school facilitates the availability of effective learning materials and resources that support the goals of the TdBA extracurricular program	4.83	96.67	Excellent
3	Availability of instructors/teachers of extracurricular programs who have skills and have participated in IHT TdBA (certified by the Education Office)	4.83	96.67	Excellent
4	Availability of facilities and infrastructure, including land for TdBA activities	4.67	93.33	Excellent

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No	Aspects evaluated	Average	%	Category
5	Students have motivation and readiness to learn in participating in TdBA extracurricular activities	4.71	94.17	Excellent
Average		4.78	95.50	Excellent

Dimensions The implementation process of the TdBA extracurricular program runs in a structured manner, including planning, implementation, and evaluation of learning. The results of the evaluation of the TdBA extracurricular process showed an average score of 4.81 (96.11%) with the category of "Very Good," reflecting programmatic planning, management of inspirational learning activities according to the needs of the 21st century, and periodic program evaluations. This shows that the implementation of the program is effective and supports the achievement of learning objectives.

Table 4. Data from the Survey Results of the TdBA-Based Extracurricular Program Process

No.	Aspects evaluated	Average	%	Category
1	The existence of a programmed and administrative TdBA extracurricular learning agenda and planning	4.75	95.00	Excellent
2	The management of TdBA extracurricular learning activities meets the needs of 21st century learning and tribakti which is packaged with the inspiring and fun Pancaniti method	4.88	97.50	Excellent
3	Extracurricular programs are offered regularly and continuously	4.79	95.83	Excellent
Average		4.81	96.11	Excellent

The TdBA extracurricular program at the Purwakarta elementary school level has produced various positive impacts. This was confirmed by the teacher and the extracurricular development team in the following interview:

> "The results are really cool. Children are now more aware and concerned about the environment, not only at school but also at home. They are really agents of small changes for the environment. So, children don't just plant and take care of plants. They also make processed food products, such as telang flower tea and Sundanese cuisine from vegetables that they grow themselves. So, they can enjoy the fruits of their hard work. In addition to food, they also make handicrafts from materials around. For example, make

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decorations from ecobricks or dried leaves. Then, they also learned to make presentations on the process, from sowing, planting, nurturing, harvesting, to processing into products that have beneficial value. Children become more confident, can speak in public, and of course more creative. They learn critical thinking, problem solving, and teamwork as well. So, their learning is holistic. Many parents say that their children care more about the environment at home. They invite families to recycle, plant plants, and keep the home environment clean. So, the positive effect is not only at school but also at home."

The results of the evaluation of TdBA extracurricular products showed an average score of 4.82 (96.39%) with the category of "Very Good," which reflects the effectiveness of the program in increasing students' ecological awareness, preserving the school environment, and innovation in the form of processed products and handicrafts. This confirms that the program has succeeded in achieving learning objectives and has a positive impact on the environment and students' creativity.

Table 5. Data on the Results of the TdBA-Based Extracurricular Program Product Survey

No.	Aspects evaluated	Average	%	Category
1	TdBA extracurricular programs are effective in increasing students' ecological awareness	4.83	96.67	Excellent
2	TdBA extracurricular program is effective in improving school environmental preservation to create environmentally friendly schools	4.88	97.50	Excellent
3	The TdBA extracurricular program encourages innovation in the form of *handmade* (handicrafts) and processed products produced by TdBA	4.75	95.00	Excellent
Average		4.82	96.39	Excellent

Discussion

The findings related to the TdBA extracurricular program show significant conformity with the view of Gravett et al (2019), who emphasized the importance of considering the integration of various aspects in program design. TdBA's extracurricular programs have been designed with organizational structure in mind, through a collaborative process that involves teachers, principals, and various stakeholders in setting success indicators. This ensures that there is an integration between the program's objectives and local education policies, as stipulated in Purwakarta Regent Regulation Number 103 of 2021. In addition, the active participation of teachers in the preparation of programs through joint

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meetings reflects the importance of collaboration. Teachers are involved in planning success indicators that are tailored to the grade level and provide constructive feedback to improve the quality of activities, such as making liquid organic fertilizers, ecobricks, and planting seeds. The involvement of teachers in program preparation and planning allows for the creation of program designs that are authentic and relevant to student needs (Paramita et al., 2023). Furthermore, the involvement of teachers and stakeholders in the preparation of the program resulted in a strong agreement on the goals of the program, such as building student character which includes mutual cooperation, independence, and critical reasoning. This supports the argument of Vebrianto et al (2024) that collaboration in program planning can create activities that are relevant, sustainable, and have a positive impact on student development.

TdBA's extracurricular programs are aligned with national education policies and local needs, as recommended by Eliyanti et al (2022), and are designed to complement the time constraints in the intracurricular curriculum through practical activities that allow students to learn first-hand about environmental issues. Based on interviews with teachers and principals, the program aims to build environmental love in students through practical activities, such as planting plants, recycling waste into ecobricks, and making compost, which not only increases students' understanding of the importance of protecting the environment but also hones their creativity in creating useful products from waste. In addition, this program is very relevant to the Independent Curriculum, which prioritizes strengthening the Pancasila Student Profile through project-based activities.

The TdBA extracurricular program is designed to overcome the limitations of Environmental Education (PLH) learning time in an intracurricular framework by providing practical-based activities that support the achievement of PLH competencies and goals more optimally. By providing practical-based activities, this program not only supports the achievement of PLH competencies more optimally, but also encourages students to be directly involved in activities that increase their environmental awareness (Moklis et al., 2020). Through this approach, students can learn about the importance of protecting the environment in a more interactive and applicable way, so that they can internalize the values of sustainability and social responsibility (Kartini et al., 2023). In addition, the program is in line with the principles of the Independent Curriculum which emphasizes flexible and contextual learning, allowing students to develop creativity and skills relevant to the environmental challenges faced today (Nuryansyah & Hermawan, 2021).

The TdBA extracurricular curriculum is designed based on Purwakarta Regent Regulation Number 103 of 2021 with a gradual approach according to the age and ability of students, including practical activities such as planting plants for grades 1 and 2, making compost for grades 3 and 4, to processing crops for grades 5 and 6. This program not only improves practical skills, but also instills the values of mutual cooperation, independence, and concern for the environment, in accordance with the needs of student development. With a focus on

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environmental learning and character values, the curriculum is locally relevant and shapes students' identities as individuals who care about the environment. This finding is in line with Fajarwati et al (2023) which also highlights that the implementation of environment-based extracurricular curriculum in accordance with educational regulations or policies makes a significant contribution to the achievement of extracurricular program goals by fostering practical skills among students and important values such as mutual cooperation, independence, and environmental concern. In addition, the educational pedagogy used in TdBA's extracurricular programs focuses on project-based and interactive learning, this allows students to learn through practical experiences, such as making liquid organic fertilizers, ecobricks, and planting seeds, which supports character development such as mutual cooperation, independence, and critical reasoning (Astutik & Aziz, 2023).

The success of environment-based extracurricular programs is highly dependent on the availability of adequate facilities, which support hands-on learning, student collaboration, and the development of values of independence and concern for the environment (Tsai & Tan, 2022). The survey results show that the facilities provided by the school in the TdBA extracurricular program are considered to be very supportive of the program with several areas that still need improvement, such as the provision of sufficient water resources during the dry season. Adequate water supply infrastructure not only supports students' physical well-being but also increases their involvement in environmental education programs by allowing them to participate in hands-on activities related to water conservation and management. When students are educated in an environment where water resources are managed sustainably, they are more likely to develop a sense of responsibility and awareness regarding environmental issues (Liu et al., 2019).

In the aspect of teaching material input, teachers feel facilitated by the Purwakarta Education Office with teaching materials in hardcopy and softcopy formats. However, the lack of special teaching modules for extracurricular activities makes teachers have to create their own modules to support activities. Extracurricular modules are essential for improving the quality of learning because they offer systematic content that aligns with curriculum standards, while encouraging student engagement in environmental issues through the development of critical thinking and problem-solving skills (Kasim et al., 2024). However, as highlighted by Sikhosana (2022), challenges related to the accessibility and adequacy of modules, as well as the lack of educator training, can hinder the effectiveness of environmental education and need to be addressed urgently to ensure the sustainability of extracurricular programs.

The lack of standard teaching modules for environment-based extracurricular activities has a significant impact on education, especially with the increasing workload of teachers having to design their own materials. This can lead to inconsistencies in the quality of teaching and potentially hinder the effectiveness of the program. For example, Fajarwati et al (2023) highlight that extracurricular activities are essential to develop certain aspects of the success of

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the curriculum, but without structured modules, their effectiveness is limited. In addition, Rojo-Ramos et al (2021) noted that teachers often use spontaneous activities rather than planned ones, thereby reducing the coherence of learning objectives. This problem is exacerbated by the lack of adequate training and resources for educators, as asserted by Rahayu & Dong (2023), who state that unorganized extracurricular activities can fail to achieve their maximum benefits. Variability in teachers' ability to design modules also creates disparities in the quality of education, which affects student engagement and learning outcomes (Mohamed Norok & Khairuddin, 2023). In addition, Lugg & Quay (2020) emphasized the importance of a cohesive environmental education framework to avoid fragmented learning experiences. Therefore, support in the form of structured training and resources is needed to empower teachers in providing effective and meaningful extracurricular programs.

Furthermore, the input of teaching human resources in the TdBA extracurricular program has been optimally prepared through training and certification, ensuring that they are competent to manage the program. Extracurricular teachers are required to have participated in *Tatanen-based education In House Training* in Bale atikan. The quality of educators involved in environment-based extracurricular activities is essential for the effectiveness and sustainability of the program, as it directly affects student engagement and learning outcomes (Fajarwati et al., 2023). The effectiveness of TdBA-based extracurricular programs can be compromised if teachers do not have adequate training and resources to engage students in meaningful environmental practices. It is important to underline that the quality of teacher performance is influenced by factors such as motivation and professional development, as noted by research showing that well-prepared and motivated teachers are more likely to provide high-quality educational experiences.

In terms of student input, students are very motivated and ready to participate in the program. The program's activities have successfully improved students' practical skills, 21st century skills such as critical thinking and collaboration, and ecological awareness. Intrinsic motivation is essential for students because it reflects their genuine interest in learning and a desire to master new competencies (Mikhaylova et al., 2023). When students are prepared and motivated, they tend to absorb more of the lessons provided through these activities, leading to better educational outcomes. This motivation is supported by students' involvement in hands-on activities, which not only develop practical and collaborative skills but also increase ecological awareness, shaping them into responsible citizens. However, the effectiveness of these programs depends on the quality of the teaching modules and the readiness of educators, so ongoing training and adequate resource allocation are needed to support the success of the program (Rudyshyn et al., 2024). With these well-designed inputs, the TdBA program has a strong foundation to achieve its goals and make a significant impact on students and the school community.

Extracurricular planning is carried out through coordination meetings between school principals, teachers, and external parties such as the Education

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Office and TdBA experts. A collaborative approach allows for the integration of perspectives and expertise that supports the development of extracurricular programs that are structured and tailored to educational needs. Engaging external experts can also increase the school's leadership capacity and ensure programs are aligned with educational standards and community expectations (Eisenschmidt et al., 2024).

Each activity in the TdBA extracurricular is designed based on 21st century skills (4C: Critical Thinking, Creativity, Collaboration, Communication) and Tribakti values (devotion to oneself, nature, and others). The learning process is designed so that students get hands-on experience, such as planting, composting, and processing crops. These competencies are essential for preparing students to face complex global challenges and foster a sense of ecological responsibility (López-del-Toro et al., 2020). By being actively involved in these programs, students not only improve their practical skills but also foster a holistic understanding of their role in society and the environment, ultimately contributing to their personal development and the promotion of sustainable practices within their communities (Vlachopoulos et al., 2023). Students' involvement in TdBA's extracurricular activities helps them develop practical skills and environmental awareness in depth.

In the aspect of the process of 21st century skill-based extracurricular learning activities, as many as 87.5% of teachers consider the management of program activities to be very effective in meeting the needs of modern learning and Tribakti values. The integration of environment-based extracurricular activities reflects the principles of 21st-century learning by emphasizing the development of critical skills, such as collaboration, communication, and problem-solving, relevant to the dynamic modern world. Through a project-based learning (PBL) approach, students engage in hands-on activities, such as planting, composting, and recycling, which not only increase environmental awareness but also build social skills and character such as cooperation and self-reliance (Ghasya & Kartono, 2022). Contextual learning experiences, such as cooking crops or visits to plant nurseries, reinforce learning in relevant and meaningful ways (Aslamiah et al., 2021). Teachers are able to play a role in creating an interactive learning environment through creative competitions, which increase student motivation and creativity. This kind of teacher role encourages and prepares students to face future challenges with essential non-academic skills (Mertoğlu & Akman, 2020).

Program evaluations are conducted periodically to assess the progress and effectiveness of activities, with success indicators that include increased environmental awareness, student skills, and the quality of project outcomes. Program evaluations are conducted periodically to assess the progress and effectiveness of activities, with success indicators that include increased environmental awareness, student skills, and the quality of project outcomes. This is in line with research that shows that the evaluation of educational programs plays an important role in improving the quality of programs and ensuring that environmental education goals are achieved effectively (Partahian et al., 2024). By using clear indicators, such as increased environmental awareness, the evaluation

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can provide constructive feedback for continuous improvement, as well as help in identifying areas that need further attention (A. Wibowo et al., 2024). In addition, the skills of students who develop through the program can be measured through the practical projects they undertake, which in turn can improve the quality of the project's results and its impact on the environment. Therefore, a systematic and planned evaluation is essential to ensure that environment-based extracurricular programs are not only effective in improving students' knowledge and skills, but also contribute to the creation of a more sustainable and environmentally friendly school environment.

The implementation of ecology-based extracurricular programs in primary schools faces significant challenges, such as ineffective time management, where 75% of educators report schedule conflicts between extracurricular activities and religious school time. Potential conflicts arising from overlapping time commitments can lead to reduced student participation and involvement in both areas, ultimately impacting their overall educational experience (Darajat et al., 2022). Financial constraints are also a major issue, with 37.5% of teachers stating limited funds to provide the resources and materials needed. In addition, only 16.7% of teachers felt they had sufficient knowledge and skills to teach ecology content effectively, reflecting a lack of relevant professional training. Limited funding reduces the ability of schools to provide the resources needed, while the lack of training makes teachers less confident in teaching ecological content effectively (Aqilah & Lathifah, 2023; Earle & Hiz, 2020). Infrastructure challenges, such as water supply shortages during the dry season, also limit field activities such as gardening, while the lack of adequate teaching materials hinders student engagement (Ortiz-de-Urbina-Criado et al., 2022).

To overcome the obstacles in the implementation of the TdBA extracurricular program, the school arranges a flexible schedule, looks for financing alternatives such as fundraising, and holds training for teachers. Teachers also propose financial incentives to increase their motivation and creativity in guiding environment-based extracurriculars, as these incentives can serve as a motivation for educators to be more active and innovative in developing programs that support effective and sustainable environmental learning (Y. A. Wibowo et al., 2020). Intensive mentoring by expert mentors is also considered an important factor to support the sustainability of the program. With a structured approach and active participation from all parties, the TdBA program has shown success in making a positive impact on students and the school community, although there are still challenges that require further attention.

The survey results show that this program is very effective in increasing students' ecological awareness. Children not only learn about environmental theory, but also hands-on practices such as planting, caring for plants, composting, and recycling waste into ecobricks. Students show significant character changes, becoming more environmentally conscious, more creative, and more responsible. Products from the program, such as telang flower tea, Sundanese cuisine, and handicrafts made from recycled materials, reflect the students' ever-evolving creativity and skills. In addition, students also learn to think critically, work

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together in teams, and speak in public through project presentations, which strengthens their 21st-century skills. These findings are in line with Wijayanti et al (2021) and Pradini et al (2019) that environment-based extracurricular programs such as TdBA not only foster a sense of environmental responsibility among students, but also integrate practical activities that promote sustainable practices, such as waste management and biodiversity conservation. A critical analysis of extracurricular programs reveals that their success depends on aligning educational policies with the needs of the local environment, as well as students' active participation in hands-on projects that encourage collaboration and critical thinking (Castellanos et al., 2021).

TdBA's extracurricular program has also succeeded in creating a greener and more environmentally friendly school environment. The results of the survey showed that 87.5% of teachers considered this program to be very effective in improving the preservation of the school environment. Children actively maintain school cleanliness, utilize waste into resources such as compost and ecobricks, and plant various plants that make the school environment more beautiful. In addition to school, the impact of the program is also seen at home, where students bring their good habits by inviting families to plant and recycle (Martínez et al., 2020).

CIPP's evaluation of the TdBA extracurricular program shows that this program is designed with the integration of local policies, national curriculum, and 21st century learning principles, making it relevant to support the strengthening of the Pancasila Student Profile and environmental education. Supported by clear regulations, teacher collaboration, and a project-based learning approach, the program has succeeded in increasing students' ecological awareness, practical skills, and character, while creating a more environmentally friendly school environment.

Rekalde-Rodríguez et al (2024) revealed that the effectiveness of environment-based extracurricular programs such as TdBA is significantly influenced by their ability to integrate with formal curricula and align with local environmental needs, ensuring that their activities are relevant and impactful. In addition, the success of such initiatives often depends on the commitment of educators and school administrators to provide the necessary resources and support, as well as to foster a culture of sustainability within the school community. However, challenges such as limited funding, lack of training for educators, and lack of community involvement can hinder the implementation and sustainability of TdBA's extracurricular programs. Therefore, a comprehensive approach that includes continuous evaluation, community engagement, and professional development for teachers is essential to maximize the potential of environmental education extracurricular programs in creating a more sustainable school environment. The results of the CIPP evaluation provide an overview of environment-based extracurricular management, inspiring other schools and surrounding communities to implement similar practices. With a positive long-term impact, the TdBA program succeeds in building a generation that cares more about and is responsible for the environment and supports the sustainability of future generations.

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CONCLUSION

Based on CIPP's evaluation of the Tatanen extracurricular program at Bale Atikan (TdBA) in elementary schools in Purwakarta Regency, the program significantly meets the needs of environmental education and character building for students through project-based activities that support 21st-century skills. The program is highly relevant to the Independent Curriculum and the Pancasila Student Profile, with 93% of teachers reporting increased ecological awareness among students and 80% of students actively involved in environmental-based activities. Although the survey showed high scores (96.39%) related to the objectives, indicators, and relevance of the program, there are still shortcomings in the teaching modules that have not been standardized, forcing some teachers to create their own modules. In addition, 37.5% of teachers reported limited facilities, such as adequate water towers, which are the main challenges. In terms of input, the curriculum design and the availability of trained teaching resources (94% of teachers have participated in IHT) strongly support the implementation of the program, but further training related to the teaching modules is still needed. The program implementation process showed a high level of effectiveness (96.11%), despite challenges in time management and teacher mentoring, with 75% of teachers reporting difficulties in balancing extracurricular activities with core subjects. The program successfully increased students' ecological awareness, as seen in their creativity in making processed products and handicrafts, and brought good environmental habits home, with 94% of parents reporting behavioral changes. To strengthen the long-term impact, the study recommends increasing ongoing training for teachers, as well as improving field facilities. The findings also provide important contributions to the development of a local wisdom-based evaluation model that can be applied in other contexts, with policy recommendations to strengthen teaching modules and teacher mentoring to make the program more effective and sustainable.

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REFERENCES

Aqilah, S., & Lathifah, S. S. (2023). Implementation and Impact of Environmentally Sound Schools and Adiwiyata Program in East Java Province: A Literature Review. *Equator Science Journal*, *1*(1), 9–15. https://doi.org/10.61142/esj.v1i1.1

Corresponding author: Muhamad Taufik Bintang Kejora (muhamad.taufik@fai.unsika.ac.id)

Aslamiah, A., Abbas, E. W., & Mutiani, M. (2021). 21st-Century Skills and Social Studies Education. *The Innovation of Social Studies Journal*, *2*(2), 82. https://doi.org/10.20527/iis.v2i2.3066

Astutik, F. A. F., & Aziz, R. (2023). Strategi Pengembangan Karakter Peduli Sosial Melalui Aktivitas Kelas Pada Siswa Tingkat Sekolah Menengah Pertama. *Research and Development Journal of Education*, *9*(2), 852. https://doi.org/10.30998/rdje.v9i2.16152

Aulia, I., Sujana, A., & Sunaengsih, C. (2024). Application of the Climate Kids Interactive Web to Build Understanding of Concepts and Environmental Awareness of Class VI Students on Global Warming Material. *Jurnal Penelitian Pendidikan Ipa*, *10*(1), 246–253. https://doi.org/10.29303/jppipa.v10i1.6386

C. Otto Scharmer. (2018). *The Essentials of Theory U: Core Principles and Applications*. Berrett-Koehler Publishers.

Castellanos, P. M. A., Dios, A. Q., & Álvarez, L. G. (2021). Inclusion of Education for Sustainable Development in Environmental Engineering. A Systematic Review. *Sustainability*, *13*(18), 10180. https://doi.org/10.3390/su131810180

Darajat, I. R., Hartati, H., & Aryanti, S. (2022). Students' Interest and Motivation Survey on Basketball Extracurricular Activities at SMP Negeri 5 Indralaya Utara. *Journal Physical Education Health and Recreation*, *7*(1), 9. https://doi.org/10.24114/pjkr.v7i1.38886

Earle, A., & Hiz, D. I. L. la. (2020). The Wicked Problem of Teaching About Wicked Problems: Design Thinking and Emerging Technologies in Sustainability Education. *Management Learning*, *52*(5), 581–603. https://doi.org/10.1177/1350507620974857

Eisenschmidt, E., Kumpas-Lenk, K., Vanari, K., Arus, H., & Ivanova, K. (2024). Fostering Collaborative School Improvement in Estonian Schools. *Journal of School Leadership*, *34*(4), 341–366. https://doi.org/10.1177/10526846241245085

Eliyanti, W., Abdullah, G., Wuryandini, E., & Suharyadi, A. (2022). Manajemen Sekolah Hijau Di SD Negeri 05 Beji Kabupaten Pemalang. *Jurnal Manajemen Pendidikan Jurnal Ilmiah Administrasi Manajemen Dan Kepemimpinan Pendidikan*, *3*(2), 144–164. https://doi.org/10.21831/jump.v3i2.35663

Fajarwati, R., Triyanto, T., & Hartanto, R. V. P. (2023). Implementing the Caring Character Education Reinforcement Program Through Young Red Cross Activities. *Indonesian Journal of Multidisciplinary Science*, *2*(12), 4163–4169. https://doi.org/10.55324/ijoms.v2i12.663

Ghasya, D. A. V., & Kartono, K. (2022). Technical Guidance 21st Century Learning Application to Improve the Pedagogic and Professional Competence of Elementary School Teacher. *Abdimas Jurnal Pengabdian Masyarakat*, *4*(2), 753–759. https://doi.org/10.35568/abdimas.v4i2.1309

Gravett, S., Petersen, N., & Ramsaroop, S. (2019). A University and School Working in Partnership to Develop Professional Practice Knowledge for Teaching. *Frontiers in Education*, *3*. https://doi.org/10.3389/feduc.2018.00118

Gül, A. C., & Özdemir, N. (2022). Investigation of Turkish Elementary School Students' Environmental Awareness. *Education Quarterly Reviews*, *5*(4).

Corresponding author: Muhamad Taufik Bintang Kejora (muhamad.taufik@fai.unsika.ac.id)

https://doi.org/10.31014/aior.1993.05.04.601

Ismelani, N., Mahmudah, R., & Rosmaladewi, O. (2023). Implementasi Kurikulum Merdeka dalam Mewujudkan Profil Pelajar Pancasila Melalui Program Tatanen di Bale Atikan Kabupaten Purwakarta. *Islamic Education Journal*, *5*(1), 17.

Kartika, D., Hamidah, I. N., Gaol, N. M. L., Hindun, S., Anggraeni, D. N., & Iskandar, S. (2021). Penyuluhan Tatanen dalam Meningkatkan Kompetensi Abad 21 Melalui Project Based Learning Berbasis STEM TDBA. *LENTERA KARYA EDUKASI Jurnal Pengabdian Kepada Masyarakat*, *1*(2), 70–81. https://doi.org/10.17509/lentera.v1i2.34552

Kartini, K., Andari, K. D. W., Agustina, D. A., & Bua, A. T. (2023). Kegiatan Sosialisasi Pendidikan Lingkungan Hidup Di Sekolah SDN 047 Tarakan. *Bima Abdi Jurnal Pengabdian Masyarakat*, *3*(2), 143–149. https://doi.org/10.53299/bajpm.v3i2.341

Kasim, I. R., Kawuryan, S. P., Saptono, B., Fathurrohman, N., Adiwardana, M. R., & Herawati, Y. (2024). The Ability of Prospective Elementary School Teachers in Developing Civics Learning Modules in Elementary Schools. *International Journal of Elementary Education*, *8*(1), 188–197. https://doi.org/10.23887/ijee.v8i1.68471

Kurniawati, E. W. (2021). Evaluasi Program Pendidikan Perspektif Model CIPP (Context, Input, Process, Product). *Jurnal GHAITSA Islamic Education Jurnal*, *Volume 2*(1), 24.

Liao, C.-W., Liao, Y.-H., Chen, B.-S., Tseng, Y.-J., & Ho, W.-S. (2022). Elementary Teachers' Environmental Education Cognition and Attitude: A Case Study of the Second Largest City in Taiwan. *Sustainability*, *14*(21), 14480. https://doi.org/10.3390/su142114480

Liu, D., Zeng, Y., Qin, Y., Shen, Y., & Zhang, J. (2019). Water Supply-Water Environmental Capacity Nexus in a Saltwater Intrusion Area Under Nonstationary Conditions. *Water*, *11*(2), 346. https://doi.org/10.3390/w11020346

López-del-Toro, P., Franquesa-Soler, M., Mora, F., & Barraza, L. (2020). Teenagers' Awareness About Local Vertebrates and Their Functions: Strengthening Community Environmental Education in a Mexican Shade-Coffee Region to Foster Animal Conservation. *Sustainability*, *12*(20), 8684. https://doi.org/10.3390/su12208684

Lugg, A., & Quay, J. (2020). *Curriculum in Outdoor and Environmental Education*. 1–6. https://doi.org/10.1007/978-981-13-1179-6_359-1

Martínez, L. C. V., Martín-Jaime, J.-J., Estrada-Vidal, L.-I., & Hurtado, J. C. T. (2020). Environmental Education to Change the Consumption Model and Curb Climate Change. *Sustainability*, *12*(18), 7475. https://doi.org/10.3390/su12187475

Mertoğlu, H., & Akman, E. D. (2020). Researching Eighth Grade Students' Science Achievement Based on 21st Century Skill Levels and Some Variables. *International Online Journal of Educational Sciences*, *12*(3). https://doi.org/10.15345/iojes.2020.03.018

Corresponding author: Muhamad Taufik Bintang Kejora (muhamad.taufik@fai.unsika.ac.id)

Mikhaylova, A., Kokodey, T., & Kurbangalieva, J. (2023). Environmental Engineering Students' Motivation Through Foreign Language Learning in the Context of Digital Teaching Realization (On the Example of Moodle Virtual Environment). *E3s Web of Conferences*, *431*, 9012. https://doi.org/10.1051/e3sconf/202343109012

Mohamed Norok, N., & Khairuddin, K. F. (2023). Conceptualizing Play Based Learning Method for Students With Special Learning Needs. *International Journal of Academic Research in Progressive Education and Development*, *12*(3). https://doi.org/10.6007/ijarped/v12-i3/18463

Moklis, G. M. E. P. M., Nabila, S. L., & Puspikawati, S. I. (2020). Evaluasi Pelaksanaan Program Adiwiyata Dalam Mewujudkan Sekolah Peduli Dan Berbudaya Lingkungan Di SDN Model Banyuwangi. *Jurnal Green Growth Dan Manajemen Lingkungan*, *8*(2), 63–79. https://doi.org/10.21009/jgg.082.01

Nuryansyah, H., & Hermawan, E. (2021). Perancangan Sistem Informasi Manajemen Ekstrakurikuler Berbasis Web Pada Sekolah Menengah Kejuruan Negeri 5 Kota Bandung. *Jurnal Sisfokom (Sistem Informasi Dan Komputer)*, *10*(3), 298–305. https://doi.org/10.32736/sisfokom.v10i3.1199

Nuryanti, L., Darmawan, D., & Hufad, A. (2020). The Implementation Model of Character Building in Curriculum 2013 Through the Scout Movement as a Required Extracurricular in Primary and Secondary Education. *Advances in Science Technology and Engineering Systems Journal*, *5*(1), 361–367. https://doi.org/10.25046/aj050146

Ortiz-de-Urbina-Criado, M., Mora-Valentín, E.-M., & Sánchez, J. J. N. (2022). Sustainability and Entrepreneurship: Emerging Opportunities for Business and Management Education. *Journal of Entrepreneurship in Emerging Economies*, *15*(5), 1071–1088. https://doi.org/10.1108/jeee-12-2021-0471

Paramita, P. P., Andriani, F., Handayani, M. M., & Rusli, R. (2023). Teacher Participation in Professional Learning Programs in Classroom Behavior Management. *Jurnal Prima Edukasia*, *11*(1), 96–105. https://doi.org/10.21831/jpe.v11i1.53637

Partahian, P., Nisak, K., Lubis, L. H., Tihawa, T., & Hutagalung, R. (2024). Program Evaluation as a Foundation for Improving Program Quality in Educational Institutions. *Edumaspul - Jurnal Pendidikan*, *8*(1), 734–739. https://doi.org/10.33487/edumaspul.v8i1.7718

Pradini, I. K., Sudjanto, B., & Nurjannah, N. (2019). Implementasi Program Sekolah Adiwiyata Dalam Peningkatan Mutu Pendidikan Di SDN Tanah Tinggi 3 Kota Tangerang. *Jurnal Green Growth Dan Manajemen Lingkungan*, *7*(2), 122–132. https://doi.org/10.21009/jgg.072.03

Rahayu, A. P., & Dong, Y. (2023). The Relationship of Extracurricular Activities With Students' Character Education and Influencing Factors: A Systematic Literature Review. *Al-Ishlah Jurnal Pendidikan*, *15*(1), 459–474. https://doi.org/10.35445/alishlah.v15i1.2968

Rahmayanti, H., Soesilo, T. E. B., Sari, D. A. P., Ichsan, I. Z., Kurniawan, E., Titin, Dasmo, Hermawati, F. M., Singh, C. K. S., Rogayan, D. V, & Rahman, M. M. (2021). Analysis of Disaster Mitigation in Carita with Environmental Learning

Corresponding author: Muhamad Taufik Bintang Kejora (muhamad.taufik@fai.unsika.ac.id)

in Elementary School. *IOP Conference Series: Earth and Environmental Science*, *940*(1), 12001. https://doi.org/10.1088/1755-1315/940/1/012001

Ramayenda, N. (2020). *Social Emotional Development of Early Childhood Through Traditional Games in PAUD Terpadu Hauriyah Halum City of Padang*. *449*(Icece 2019), 13–16. https://doi.org/10.2991/assehr.k.200715.003

Ratnaya, G., Indriaswuri, R., Widayanthi, D. G. C., Atmaja, I. M. P. D., & Dalem, A. A. G. P. K. P. (2022). CIPP Evaluation Model for Vocational Education: A Critical Review. *Education Quarterly Reviews*, *5*(3), 1–8. https://doi.org/10.31014/aior.1993.05.03.519

Rekalde-Rodríguez, I., Barrenechea, J., & Zinkunegi-Goitia, O. (2024). Sailing Aboard the Training Ship Saltillo. An Extracurricular Experience in Education for Sustainable Development. *Journal of Outdoor and Environmental Education*. https://doi.org/10.1007/s42322-024-00173-5

Rojo-Ramos, J., Manzano-Redondo, F., Barrios-Fernández, S., García-Gordillo, M. Á., & Adsuar, J. C. (2021). Early Childhood Education Teachers' Perception of Outdoor Learning Activities in the Spanish Region of Extremadura. *Sustainability*, *13*(16), 8986. https://doi.org/10.3390/su13168986

Rudyshyn, S., Truskavetska, I., Romanyuk, S., Vakal, A., & Hnatyuk, V. (2024). The Role of Motivation Factors in Education for the Development of Student's Environmental Leadership in HEIs. *Journal of Education and Learning (Edulearn)*, *18*(1), 1–8. https://doi.org/10.11591/edulearn.v18i1.21016

Sikhosana, L. (2022). Reflections on the Integration of Environmental Education by a Primary School Teacher. *International E-Journal of Educational Studies*, *6*(12), 246–254. https://doi.org/10.31458/iejes.1198123

Sittika, A. J., Taufik, M., & Kejora, B. (2022). *Utilization of Google Glassroom in Islamic Religious Education in Higher Education during the Covid 19 Pandemic*. *11*(1), 62–70.

Taufik, M. (2020). *Strategi Role Of Islamic Religious Education In Strengtheing Characther Education In The Era Of Industrial Revolution 4.0*. *20*.

Tsai, A. Y. J., & Tan, A. Y. K. (2022). Analysis of Undergraduates' Environmentally Friendly Behavior: Case Study of Tzu Chi University Environmental Education Program. *Energies*, *15*(13), 4853. https://doi.org/10.3390/en15134853

Vebrianto, R., Hermita, N., Irawan, D., Mujtahid, I. M., & Thahir, M. (2024). Teachers' Experiences in Sekolah Penggerak Program: A Retrospective Case Study. *Journal of Education and Learning (Edulearn)*, *18*(1), 79–88. https://doi.org/10.11591/edulearn.v18i1.20908

Vlachopoulos, D., Thorkelsdóttir, R. B., Schina, D., & Jónsdóttir, J. G. (2023). Teachers' Experience and Perceptions of Sustainable Digitalization in School Education: An Existential Phenomenological Study of Teachers in Romania, Greece, Cyprus, Iceland, and the Netherlands. *Sustainability*, *15*(18), 13353. https://doi.org/10.3390/su151813353

Wahyudin, U. R., & Bk, M. T. (2022). *Sustainable Professional Development : Skills and Needs for Scientific Publication Training for Elementary School Teachers*. *11*(1), 142–153.

Wibowo, A., Suwarto, N., Lestari, E., & Rahayu, N. (2024). Challenges and

Corresponding author: Muhamad Taufik Bintang Kejora (muhamad.taufik@fai.unsika.ac.id)

Opportunities in Building Environmental Awareness in the Keduang Watershed Region in Indonesia. *Iop Conference Series Earth and Environmental Science*, *1302*(1), 12073. https://doi.org/10.1088/1755-1315/1302/1/012073

Wibowo, Y. A., Jordan, E., Elkasinky, A., Suryana, D. D., Putri, S. N., Puspitaningrum, H., Rahmawati, D., Lestari, D. D., Oktavia, E., & Kinthen, N. (2020). Pengembangan Bakat Dan Kreativitas Siswa Melalui Kegiatan Ekstrakurikuler Di MI Muhammadiyah Sabrang Lor, Trucuk, Klaten. *Buletin KKN Pendidikan*, *2*(1). https://doi.org/10.23917/bkkndik.v2i1.10939

Wijayanti, A., Hariri, H., Karwan, D. H., & Sowiyah, S. (2021). Principal's Strategies in Realizing Adiwiyata School: A Literature Review. *Eduvest - Journal of Universal Studies*, *1*(9), 841–849. https://doi.org/10.36418/edv.v1i9.114

Corresponding author: Muhamad Taufik Bintang Kejora (muhamad.taufik@fai.unsika.ac.id)