

# Innovations in the Development of Environmental Care Character of Vocational High School in the 21st Century

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## ARTICLE INFO

## ABSTRACT

### Article history

Received Jan 23, 2024

Revised Feb 21, 2024

Accepted May 22, 2024

### Keywords

Character Education

Care Environmental

21st Century

This research explores groundbreaking innovations in fostering environmental stewardship within school institutions during the 21st century. In today's world, there is an increasing global emphasis on sustainable living and environmental stewardship, which necessitates the integration of these values into the educational structure, especially at the primary level. By examining various pedagogical strategies, curriculum enhancements, and community engagement initiatives undertaken by educators in Vocational High Schools (SMK), particularly SMK Negeri 1 Ampek Angkek, this study aims to foster a deep sense of environmental responsibility among students. Through a comprehensive review of contemporary practices, this research aims to identify successful models and best practices that contribute to effective environmental character development. The findings from this study not only offer valuable insights for educators and administrators at SMK Negeri 1 Ampek Angkek, but also contribute to a broader discussion on the integration of environmental education into the primary and religious education systems in the 21st century. Ultimately, this exploration serves as a catalyst for advancing environmental literacy and advocacy within educational settings, empowering students to become conscientious stewards capable of addressing the ecological challenges of our time. By nurturing a generation of environmentally conscious individuals, educational institutions can play a pivotal role in fostering a sustainable future for all.



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## Introduction

Environmental care entails adopting a mindset and taking actions to prevent harm to the natural environment while making endeavors to address existing damages. Neglecting environmental concerns can result in issues commonly observed in the sustainability of green spaces, frequently repurposed for construction, leading to heightened vulnerability to flooding due to insufficient water infiltration during rainfall.(Yampap and . 2023) This apathy becomes apparent in the transformation of green areas, like plantations, forests, and fields, into residential zones, offices, commercial establishments, recreational facilities, and the like. Addressing these environmental challenges involves cultivating character from an early age, with character development achievable through an education that prioritizes environmental consciousness. Integrating attitudes of environmental care into the learning process aims to instill awareness in students, fostering a sense of responsibility toward their natural surroundings. Initiating an environmental care mindset in students commences with upholding cleanliness within the classroom and school premises, encompassing proper waste disposal, active participation in classroom responsibilities, and tending to plants, among other activities.(Widodo et al. 2023)

Instilling environmental care character students encompasses the adoption of a clean and healthy lifestyle, playing a pivotal role in nurturing environmental care values. Maintaining cleanliness within the school environment is not exclusive to the students but extends to the responsibility of teachers and all members of the school community. However, the prevailing reality sees many schools neglecting their surroundings due to a lack of awareness about maintaining cleanliness.(Fahrudin, Saputro, and Sarwanto 2023) Teachers, serving as influential figures in the school environment, hold a significant role in shaping students' behavior. Consequently, teachers should lead by example, exhibiting proper conduct such as disposing of waste in designated areas. Character education at the primary level establishes the groundwork for shaping children's personalities and molding future generations in alignment with the objective of fostering good character. This encompasses instilling values related to environmental care and cleanliness. A prevalent concern within the school environment is waste management, necessitating heightened attention to the environment and individual consciousness to preserve it.(Harsari, Indriayu, and Triyanto 2020)

Environmental care initiatives play a pivotal role in upholding a clean environment. Character education assumes a critical role in fortifying the mental and moral aspects of future generations, aligning with the educational goal of instilling good character. Environmental care initiatives are

integral to nationalistic values, reflecting how individuals should conduct themselves, think, and act with loyalty, respect, and concern for the environment, economy, society, culture, politics, and the nation, transcending personal or group interests.(Fitri and Asrizal 2023) The success of character formation and education hinges on the continuity and harmony within the educational environment. Instructing students in environmental care character involves instilling habits like handwashing during breaks and before or after meals, proper waste disposal, and waste separation for recycling purposes. Teachers play a pivotal role in this process, and their active involvement is crucial in enhancing the quality of education and shaping the potential of human resources for development. Therefore, teachers should actively engage in promoting a clean and environmentally conscious lifestyle among students. ("The Effect of Environmental Volunteer Integrated with Service Learning (EV\_SL) to Improve Student's Environment Care Attitudes and Soft Skills" 2022)

Previous research plays a crucial role in the development of knowledge and understanding in the field of Environmental Care Character. Through literature analysis, we identify key findings and significant contributions from previous research to guide further studies in this field. The research titled "E-Module Mangrove Ecotourism: Difference and Relationship Perception, Interest, and Environment Character Care Elementary Students" aims to explore the level of perception, interest in learning, and the character of students' environmental care. The study is based on an electronic module that is developed using local wisdom of mangrove ecotourism. the research seems to be focused on developing and evaluating the effectiveness of an electronic module based on local wisdom of mangrove ecotourism in improving students' perception, interest, and environmental care.(Asrial et al. 2022)

The research, "Environmental Education and Ecotourism for Sustainable Life: Literature Study" discusses the relationship between environmental education and ecotourism, focusing on their mutual support and the importance of environmental education in ecotourism development. The article emphasizes the importance of environmental education in ecotourism development and highlights the positive correlation between environmental knowledge and attitudes towards ecotourism. It also suggests that improving environmental education can lead to increased ecotourism and a more sustainable approach to tourism.(Aswita 2018)

The research, "Environmental Education, Knowledge, and High School Students' Intention toward Separation of Solid Waste on Campus" explores the relationship between environmental education, knowledge, and high school students' intention towards the separation of solid waste on campus. The study found that environmental education and knowledge have a positive impact on students' intention to separate solid waste on campus. The article also highlights the importance of Innovations in the Development of Envi ...(Syahrani, F. et al)

incorporating environmental protection information into courses and providing adequate facilities for waste separation.(Liao and Li 2019)

The research, "The correlation of environmental education, environmental knowledge, environmental involvement, and waste management behavior," examines the relationship between environmental education, knowledge, involvement, and environmental behavior in waste management. The study found that environmental education, knowledge, and involvement can predict student waste management behavior through campus programs. The article suggests that environmental education and knowledge lead to environmental involvement, which in turn affects waste management.(Ridayani et al. 2022)

The research, "Differences in behavior, engagement, and environmental knowledge on waste management for science and social students through the campus program," explores the dynamics of environmental education in higher institutions. The primary focus is on assessing the behavior, engagement, and environmental knowledge of students in science and social science disciplines, particularly in the context of waste management and the influence of campus programs. The study reveals a positive correlation among science and social science students between their environmental behavior, engagement, and knowledge. This means that students who exhibit positive environmental behavior are likely to also demonstrate higher levels of engagement and knowledge in waste management practices.(Yusuf and Fajri 2022)

The importance of environmental management is increasingly felt with the fact that the earth is aging and human needs for natural resources continue to increase in this 21st century era. Environmental issues have become crucial and cannot be ignored. Climate change is causing an increase in the frequency and intensity of natural disasters such as floods, droughts and storms. Forest destruction and water pollution impact human and ecosystem health. In this context, it is important to integrate environmental education in vocational high schools (SMK) as an essential part of the education curriculum. This is important because SMK students will become labourers in various industrial sectors that have an impact on the environment. Environmental education can equip students with the knowledge and skills to work in a sustainable and environmentally friendly manner. A more in-depth exploration of the urgency of environmental education in addressing increasingly complex contemporary environmental challenges is needed. Environmental education can help students understand and address the impacts of climate change. Students can learn about how to reduce their consumption of energy and natural resources. This article provides a more comprehensive picture of the important role of environmental education in shaping environmental attitudes and behaviours in the younger generation, especially students of SMK Negeri 1 Ampek

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Angkek. This will enrich the understanding of how schools can be an effective tool in shaping environmentally sound personalities in students in this modern era.

## **Method**

The research method used for the study is qualitative with a case study approach. (Ling, Chung, and Wang 2023) This research will focus on SMK Negeri 1 Ampek Angkek as a representative study example. (Denis-Robichaud et al., 2023) The research sample will be selected based on certain inclusion criteria, including teachers, students, and parents at SMK Negeri 1 Ampek Angkek who have implemented innovations in environmental care character development. Data collection techniques will include interviews with teachers, students, and parents, as well as observations during learning activities at SMK Negeri 1 Ampek Angkek. In addition, documentation in the form of lesson plans and training materials used in schools will be collected. A thematic qualitative analysis will be conducted on the collected data to identify key patterns related to the development of environmental care character at SMK Negeri 1 Ampek Angkek. Ensuring validity and reliability will involve data triangulation, involving multiple sources of information and involving independent researchers in the analysis process. The ethical aspects of the research will be maintained by obtaining informants' permission and consent from SMK Negeri 1 Ampek Angkek. In addition, the confidentiality of the data will be maintained in accordance with the research ethics guidelines. Findings from the research will be presented in the form of a comprehensive report, highlighting key findings, providing recommendations for further development, and contributing to the understanding of environmental care character at SMK Negeri 1 Ampek Angkek. This methodological approach aims to provide an in-depth and holistic understanding of innovations in the development of environmental stewardship character in Vocational High Schools in the 21st century, with particular emphasis on SMK Negeri 1 Ampek Angkek as the main case study.

## **Result and Discussion**

### **Importance of Environmental Care Character**

Instilling environmental care character in students is of paramount importance in the 21st century. Beyond the immediate concerns of daily life, fostering a sense of environmental stewardship is crucial for developing responsible individuals who understand the interconnectedness between human actions and the health of the planet. Global challenges such as climate change, pollution, and biodiversity loss underscore the urgency for individuals, starting from a young age, to cultivate a character that prioritizes sustainable practices. Ethical responsibility also plays a significant role, encouraging students to develop a moral compass that guides their

decisions towards eco-friendly choices.(Gil 2022) By understanding the interconnectedness of ecosystems, students can grasp the impact of their individual actions on the environment, reinforcing the notion that responsible behavior contributes to the overall health of the planet. Moreover, the discussion extends to the quality of life, emphasizing the correlation between a healthy environment and the well-being of individuals. Instilling environmental care character is not merely about preserving nature but also ensuring a sustainable and prosperous future for humanity. In preparing students for the future, the focus on environmental awareness becomes essential, as the 21st century presents unprecedented environmental challenges that demand informed and responsible citizens.(Wibowo et al. 2023)

The relevance of environmental sustainability in various professions and industries further underscores the need to develop an environmental care character, providing students with skills valuable in a green economy. Moreover, cultivating a sense of civic engagement encourages students to actively contribute to positive environmental change, shaping policies, and participating in actions for environmental protection. Recognizing the intrinsic motivation that comes with a deep connection to the environment, instilling environmental care character creates a lasting impact, influencing students' behavior throughout their lives and contributing to the overall health and sustainability of communities and the planet.(Fahlevi\* et al. 2023)

The connection between environmental awareness and the broader concept of character development is integral to fostering well-rounded individuals with a holistic understanding of their role in society. Environmental awareness goes beyond acquiring knowledge about ecosystems, climate change, and conservation; it encompasses the development of values, attitudes, and ethical principles that form an individual's character. As individuals become environmentally aware, they inherently develop traits such as responsibility, empathy, and a sense of stewardship towards the planet. Character development, on the other hand, encompasses the overall moral, ethical, and personal growth of an individual. By integrating environmental awareness into character development, individuals learn to appreciate the interconnectedness of their actions with the well-being of the environment and society. This connection encourages the cultivation of virtues such as responsibility for one's ecological footprint, empathy towards other living beings, and a commitment to sustainable practices. Moreover, environmental awareness contributes to the development of a sense of global citizenship and a recognition of one's responsibilities to future generations.(Wajdi et al. 2022)

Individuals with a well-developed character grounded in environmental consciousness are more likely to exhibit traits such as resilience, adaptability, and a proactive approach to addressing Innovations in the Development of Envi ...(Syahrani, F. et al)

environmental challenges. This, in turn, contributes to the broader goals of character education by producing individuals who are not only academically proficient but also socially responsible and ethically conscious. In essence, the connection between environmental awareness and character development lies in the reciprocal reinforcement of values and behaviors. By integrating environmental principles into character development initiatives, educational institutions foster individuals who not only possess a deep understanding of environmental issues but also embody the virtues and values necessary for positive contributions to society and the planet. (Islami, Sidiq, and Kurniawan 2023)

In Islam teachings on environmental cleanliness include cleanliness in eating, drinking, homes, water sources, yards, and roads. According to the hadith of Prophet Muhammad SAW, cleanliness is part of faith. The meaning of cleanliness being a part of faith is a motto that should resonate in the world of education and related institutions. (Ginting, Mellyzar, and Lukman 2023) To initiate the practice of cleanliness as part of faith in SMK Negeri 1 Ampek Angkek, cooperation from various parties is required. Implementing this behavior necessitates the participation of all schools members and policymakers to collectively realize these aspirations. For schools environmental cleanliness, knowledge about the environment should be instilled from an early age to provide a profound understanding of the importance of the environment for humans, thus producing responsible citizens with environmental awareness. In connection with the above, SMK Negeri 1 Ampek Angkek has long implemented an environmentally caring character among students.

The implementation of character education in Vocational Schools is evident through the incorporation of strategies, nature-based learning approaches, and the provision of supporting facilities and infrastructure. (Muharlisiani et al. 2021) This is attested by ourselves as observers who are actively involved in the schools. As teachers at SMK Negeri 1 Ampek Angkek, we consistently apply this practice every morning to instill the habit in students. Our activity involves cleaning the schools grounds by collecting trash. Although it was challenging initially, with conviction and starting from ourselves, especially as teachers, Alhamdulillah, this routine activity is now consistently carried out well. Every morning, teachers supervise students in cleaning the schools grounds. It is evident that if a teacher has not arrived yet, students who arrive early immediately look for brooms to sweep the classrooms and schools grounds.

The development of an environmentally caring character is crucial because, besides being applied in the schools, students can also get accustomed to it at home and in public places. In addition to collecting trash in the morning before learning activities begin, during breaks, they are also reluctant to litter. If they have leftover food waste, before finding a trash bin, they keep it in Innovations in the Development of Envi ... (Syahrhani, F. et al)

their pockets, and once inside the classroom, they dispose of it in the designated trash bin. SMK Negeri 1 Ampek Angkek also teaches students dining etiquette. As teachers and observers, we tirelessly remind students not to eat while standing. Eating should be done sitting, reciting Bismillah, using the right hand. Alhamdulillah, these dining etiquettes have become a habit among the students of SMK Negeri 1 Ampek Angkek.

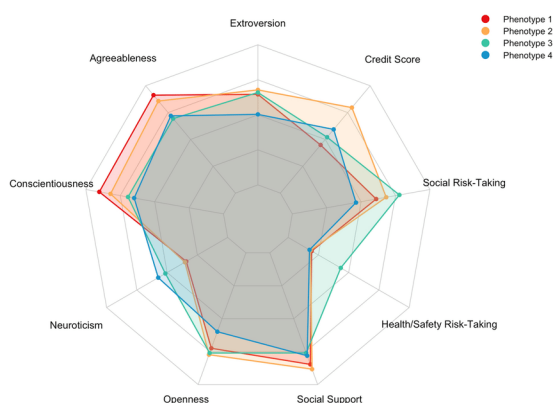


Fig 1: Factors of a Healthy School Environment

Based on our observations, apart from the morning hours, breaks. At the time of going home, SMK Negeri 1 Ampek Angkek students do not just leave, they picket the class, sweeping their respective classrooms. For the outside yard, it is difficult to find artificial waste, mostly waste from nature, because the location of SMK Negeri 1 Ampek Angkek is surrounded by trees. So most of the rubbish is fallen leaves. And that is cleaned by students who are controlled by the teacher every morning. The teacher is the closest motivator to the students. Students learn from what they see. So it would be nice if teachers could invite and give examples to their students about maintaining cleanliness in order to create a clean and comfortable environmental atmosphere. The way SMK Negeri 1 Ampek Angkek creates a healthy schools environment includes:

1. Ergonomic design and learning, including comfortable chair and desk arrangements and modern learning facilities,
2. Classroom hygiene and wellbeing, including maintenance of cleanliness and comfortable spatial arrangements and adequate lighting,
3. Mental health and psychological support, by providing counselling rooms and self-development programs,
4. Green environment and outdoor facilities, such as tree and plant planting, and open spaces for physical activities,



5. Sports and health facilities, including maintenance of sports fields and health promotion through sports programmes,
6. Sanitation facilities and waste management, with clean toilets and sanitation facilities and waste management programmes, and
7. Security, supervision and community involvement, including increased physical security, close supervision and active involvement of parents and guardians in school activities and community meetings.

Integrative efforts to create a healthy school environment and support student well-being include aspects such as ergonomic and learning design, classroom hygiene and well-being, mental health support, green environment and outdoor facilities, sports and health facilities, sanitation facilities and waste management, as well as security, supervision and community engagement. All of these contribute holistically to create an optimal learning environment and support students' all-round growth. Supervision of students outside the school is less optimal due to teachers being limited to monitoring activities within the school premises. Outside the school the responsibility for supervision falls on parents, as teachers have constraints in overseeing students beyond the school boundaries.(Amilda et al. 2023) With a commitment to these principles, SMK Negeri 1 Ampek Angkek provides assurance that its school environment not only creates excellent educational opportunities, but also prioritises the well-being and safety of students and involves the active participation of parents and guardians in every aspect of school life.

### **Schools Environmental Care Character Building Strategy**

The integration of environmental education into the schools curriculum involves a multifaceted approach to ensure that students develop a comprehensive understanding of environmental issues and sustainable practices. This integration is crucial for fostering environmental awareness and a sense of responsibility among students within the context of their religious education.(Wang 2023) Several key strategies are employed to seamlessly incorporate environmental education into the schools curriculum: Firstly, environmental topics are strategically embedded within existing subjects. For instance, concepts related to ecological balance, resource conservation, and the ethical treatment of the environment can be woven into subjects like Islamic Studies, Science, and Ethics. This approach allows students to recognize the intrinsic connection between their religious teachings and environmental stewardship. Secondly, specialized environmental modules or courses may be introduced to the curriculum. These modules can cover topics such as environmental ethics in Islam, the significance of biodiversity, and the Islamic perspective on sustainable living. This

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dedicated focus ensures that students receive in-depth knowledge and understanding of environmental issues, reinforcing the importance of caring for the Earth within the framework of their faith. Thirdly, practical and hands-on experiences are integrated into the curriculum. This can involve outdoor activities, field trips, or community projects related to environmental conservation.(Fernando and Sarkity 2023)

These experiences provide students with tangible connections to the concepts they learn in the classroom, fostering a deeper appreciation for the environment and instilling a sense of responsibility. The use of relevant religious texts and teachings is emphasized. Integrating verses from the Quran and Hadiths that highlight the importance of environmental stewardship allows students to see the direct relevance of their religious teachings to the care of the Earth. This approach reinforces the spiritual connection between their faith and environmental responsibility. Furthermore, collaborative and interdisciplinary approaches are encouraged. Environmental education can be seamlessly woven into projects that involve multiple subjects, promoting a holistic understanding of environmental issues. This interdisciplinary approach mirrors the interconnected nature of environmental challenges and encourages students to approach problem-solving with a well-rounded perspective. The integration of environmental education into the schools curriculum is a dynamic process that requires thoughtful planning and collaboration among educators. By weaving environmental principles into existing subjects, introducing dedicated modules, providing practical experiences, emphasizing relevant religious teachings, and adopting interdisciplinary approaches, Schools ensure that environmental education becomes an integral and meaningful part of students' overall learning experience.(Kidman and Casinader 2019)

Schools employ a variety of innovative teaching methods to enhance environmental awareness among students. One effective approach is experiential learning, which includes nature walks and field trips to ecologically significant areas. These hands-on experiences enable students to directly observe and interact with the environment, fostering a deeper connection and understanding of nature. Project-based learning is another impactful method, involving students in environmental projects such as community gardens or waste reduction initiatives. This practical application of knowledge encourages problem-solving skills and a sense of responsibility. Outdoor classroom activities, conducted in gardens or green spaces, provide a dynamic learning environment, allowing students to appreciate natural surroundings while learning about environmental concepts. Technology is integrated through virtual simulations and augmented reality applications, providing visual representations of complex environmental scenarios.(Camangian and Cariaga 2022)

Guest lectures and workshops by environmental experts bring diverse perspectives and real-Innovations in the Development of Envi ...(Syahrani, F. et al)

world insights. Multimedia presentations, documentaries, and educational videos enhance comprehension and engagement, while role-playing exercises simulate environmental scenarios, helping students understand the complexities of decision-making in environmental management.

Furthermore, the integration of environmental themes with Islamic studies, such as discussions on Islamic eco-theology, emphasizes the compatibility of environmental stewardship with religious principles. Interactive games and community engagement activities, such as environmental service learning and art projects, contribute to a holistic and engaging learning experience. Lastly, storytelling and narratives that highlight environmental issues in a relatable manner capture students' attention and foster a deeper emotional connection to the subject. Through these innovative methods, Schools create a dynamic and engaging educational environment that not only imparts knowledge but also instills a sense of environmental responsibility and stewardship among students. (Hokayem and Jin 2019).

In table 1, the information is bolstered by pertinent pedagogical approaches and community involvement endeavors in Ampek Angkek, aiming to optimize the efficacy of strategies for developing a sustainable school environment. These strategies encompass the cultivation of student potential, fostering environmental consciousness, ensuring the upkeep of the environment, promoting the judicious utilization of natural resources, and instilling environmental awareness coupled with social responsibility. The development of environmental care character in SMK Negeri 1 Ampek Angkek involves various strategies and activities. These strategies include providing educational programs to stimulate students' potential in environmental awareness, integrating environmental-focused subjects into the curriculum, and enhancing extracurricular activities and conservation projects. (Kamal 2024) The school aims for students to gain heightened consciousness and knowledge about environmental responsibility.

Instilling a sense of environmental concern among students is achieved by embedding values through the curriculum, cross-disciplinary learning, and specific environmental activities. The integration of sustainability concepts contributes to students' understanding of the importance of sustainability and environmental care. To actively involve students in the preservation of the environment, the school implements programs such as greening initiatives, waste management, and encouraging student participation in environmental activities. This ensures that the school environment is well-maintained, and students actively contribute to environmental conservation efforts.

Table 1. Sustainable school environment development strategy

Development Aspect	Development Strategy	Implementation in Activities	Expected Results
Curriculum Integration	Alignment of curriculum with environmental issues	Development of environmental-based learning	Increased student understanding of the environment
Collaboration with NGOs	Collaboration with environmental NGOs for educational programs	Organization of workshops and seminars with NGOs	Active participation of the community in environmental preservation
Student Potential Development	Formation of study groups or environmental clubs	Conducting extracurricular activities related to the environment	Improvement of students' skills and knowledge in environmental management
Environmental Concern	Environmental awareness campaigns in schools and communities	Tree planting, environmental clean-up, and recycling	Increased awareness and attention to the environment
Environment Maintenance and Preservation	Establishment of school environmental cleanliness teams	Implementation of maintenance and planting activities at school	Clean, green, and sustainable school environment
Effective and Efficient Utilization of Natural Resources	Education on energy conservation and waste management	Implementation of energy-saving and recycling programs at school	Reduction of school energy consumption and waste
Environmental Awareness and Social Responsibility	Organization of social campaigns focusing on the environment	Participation in social and environmental activities in the community	Increased awareness and community participation in environmental preservation

The existence of educational support devices encompasses policies, guidelines, resources, environment, facilities and infrastructure, as well as the collective togetherness and commitment of stakeholders. Efficient and sustainable utilization of natural resources is a key focus, with the school integrating educational programs on resource management, energy efficiency practices, and conservation projects.(Dharmawan et al. 2022) This approach aims to instill in students the importance of sustainable and efficient use of natural resources. The school promotes environmental awareness and social responsibility among students through social campaigns, community service activities, and experiential learning. The goal is to nurture students with a strong sense of social responsibility towards the environment and the community. Overall, these initiatives align with SMK Negeri 1 Ampek Angkek's commitment to creating an environmentally conscious and resource-efficient school environment.

## **Interdisciplinary Approaches**

The implementation of interdisciplinary approaches that connect environmental themes with subjects like Islamic Studies, Science, and Ethics represents a strategic and comprehensive initiative within the schools curriculum.(Keijzer et al. 2022) In Islamic Studies, the curriculum integrates environmental ethics, delving into Quranic perspectives on humanity's responsibility as stewards of the Earth and exploring relevant Hadiths emphasizing conservation and environmental protection. Simultaneously, the Science curriculum infuses scientific principles related to ecology, biodiversity, and sustainability, providing students with a robust understanding of environmental issues and their ecological impact. The ethical dimensions of environmental decision-making are explored in Ethics classes, encouraging students to contemplate the moral implications of their actions on the environment and future generations. The curriculum emphasizes project-based interdisciplinary initiatives, fostering collaboration between subjects and allowing students to apply knowledge from both Islamic Studies and Science to address real-world environmental challenges. Integrated lesson plans ensure a seamless combination of Islamic teachings, scientific principles, and ethical considerations, reinforcing the interconnectedness of faith and environmental consciousness.(DeniŞ ÇeliKer and Kara 2020)

Field trips with an interdisciplinary focus provide students with the opportunity to observe and analyze environmental issues from both scientific and ethical standpoints, further linking their observations to Islamic teachings. Guest lectures from experts in Islamic environmental ethics, environmental science, and ethical philosophy expose students to diverse perspectives, enriching their understanding of the multidimensional aspects of environmental care. Continuous professional development for teachers ensures they are well-equipped to facilitate discussions across diverse subjects, while assessment strategies reflect the interdisciplinary nature of environmental education.(Kultsum 2020) Through these measures, Schoolss create a curriculum that not only imparts knowledge but also instills a holistic and interconnected understanding of environmental care within students.(Righi et al. 2021) Fatima Khalid's opinion Field trips with an interdisciplinary focus give students real-life experience to observe and analyse environmental issues from a scientific and ethical point of view.(Arshad et al. 2023) This not only strengthens students' understanding of environmental issues, but also relates their observations to Islamic teachings. This approach builds a bridge between science and religious values, creating a deep holistic understanding. According to Mohammad Rahman Lectures from experts in Islamic environmental ethics, environmental science, and ethical philosophy provide students with diverse insights. It opens up space for students to understand the multidimensional aspects of Innovations in the Development of Envi ...(Syahrhani, F. et al)

environmental care, including its relationship with Islamic teachings. Including different perspectives helps students see environmental issues in a broader global context. (Khan, Rahman, and Islam 2021)

Encouraging students to explore the interconnectedness of religious teachings and ecological responsibilities is a foundational aspect of fostering environmental awareness within the Schools curriculum. (Nurqozin, Samsu, and Putra 2023) Through this approach, students are prompted to recognize the intrinsic relationship between their faith and their role as stewards of the environment. Firstly, students are guided to delve into Islamic teachings that emphasize environmental stewardship. This involves a thorough examination of Quranic verses highlighting the creation of nature, biodiversity, and the ethical use of resources. By connecting these teachings to real-world scenarios, students gain a profound appreciation for the ecological principles embedded in their faith. Secondly, discussions within Islamic Studies classes revolve around the concept of fitrah (natural disposition) and its implications for environmental responsibility. Students explore how Islamic teachings guide them to maintain the balance and harmony inherent in the natural world, fostering an understanding that ecological well-being aligns with their spiritual journey. Moreover, the curriculum encourages students to explore the Prophet Muhammad's (peace be upon him) actions as an environmental role model. His practices, such as conservation of water, planting trees, and treating animals with kindness, serve as practical examples of how religious teachings translate into ecological responsibilities. Students are encouraged to emulate these actions in their daily lives. The Schools curriculum also emphasizes the interconnectedness of moral virtues and environmental ethics. (Oberdörfer et al. 2021)

Ethics classes provide a platform for students to reflect on the ethical considerations of their ecological footprint, promoting an awareness that responsible environmental behavior aligns with the broader ethical principles of their faith. Interdisciplinary projects, integrating Islamic Studies with Science and Ethics, offer students opportunities to practically apply their understanding of religious teachings to address contemporary environmental challenges. This experiential learning reinforces the interconnectedness between faith and ecological responsibilities, making the connection more tangible and applicable. (Tian et al. 2023) In essence, by encouraging students to explore the interconnectedness of religious teachings and ecological responsibilities, Schools aim to instill a profound sense of environmental consciousness rooted in the ethical and spiritual dimensions of their faith. (Kumar et al. 2023) This holistic approach not only enriches students' understanding of their role as stewards of the Earth but also fosters a lifelong commitment to sustainable practices guided by religious principles.

## Use of Technology

The incorporation of modern technologies, including virtual simulations and online resources, to enhance the learning experience in Schools is a progressive and impactful approach. These technologies offer dynamic tools that can engage students in a more interactive and immersive manner, particularly when exploring complex topics such as environmental awareness. (Syahriani, Yufriadi, and Fismanelly 2023) Virtual simulations provide a simulated environment where students can experiment with different scenarios related to environmental issues. For instance they can observe the impact of deforestation or explore the consequences of pollution in a controlled, virtual setting. This hands-on experience allows for a deeper understanding of cause-and-effect relationships, making environmental concepts more tangible and memorable. (Jung and Li 2023) In the context of digitization, school management members perceived better performance in the dimensions of Strategy and Leadership, as well as Pedagogical IT Support. In contrast, teachers deemed the areas of Digital Competencies, Attitudes, and Culture to be more advanced. Moreover, linear regression models indicate that the dimensions regarded as significant in assessing the current state of digital transformation vary between the two groups. (Rauseo et al. 2022)

Online resources ranging from educational websites to multimedia presentations, offer a wealth of information that complements traditional teaching methods. (Peñate, Padrón-Robaina, and Nieves 2023) They provide students with access to diverse perspectives, research findings, and real-world examples related to environmental care. Interactive online platforms also facilitate collaborative learning, enabling students to engage in discussions, share insights, and work on projects together. According to Jane Doe, the use of modern technology, such as virtual simulations and online resources, can open new doors for experiential learning. Not only can students see environmental concepts in theory, but they can experience them first-hand through simulations that provide an immersive experience. Online resources also allow access to current and diverse information, enriching students' understanding of global environmental issues. According to Ahmad Hasan the incorporation of modern technology in the Schools curriculum can provide a more engaging and contextualised learning experience. Students can see how their religious values relate to contemporary environmental challenges, making learning more relevant and meaningful. (Lytvyn et al. 2020) This integration of modern technology not only improves the quality of learning in Schools, but also opens up opportunities to support a deeper understanding of environmental issues and how they relate to religious values. (Jung, Wisniewski, and Hughes 2018) The significance of integrating Digital Technologies (DTs) and Sustainability in Vocational Education. It underscores the contribution of these elements to teaching core aspects of the course material, preparing future Innovations in the Development of Envi ... (Syahriani, F. et al)

construction professionals with essential skills for a dynamic and sustainable industry.(Vrysouli, Kotsifakos, and Douligieris 2023)

The utilization of technology to visualize complex environmental concepts and scenarios in Schools enhances the learning experience by making it more interactive and engaging. This approach leverages technological tools to simplify intricate environmental topics, providing students with a clearer understanding through visual representation.(Waluyo and Kharisma 2023) One key advantage is the ability to use multimedia presentations and interactive visuals that bring abstract concepts to life. For example, virtual models, 3D simulations, and augmented reality applications can be employed to illustrate environmental processes, ecosystems, and the impact of human activities on nature. This visual representation makes learning more engaging and allows students to grasp complex ideas more readily. Moreover, technology facilitates real-time access to up-to-date information and data, ensuring that students are exposed to the latest developments in environmental science. Online resources, documentaries, and interactive educational platforms provide a dynamic and ever-evolving source of information, allowing students to stay informed about current environmental issues and solutions.(Shahraki, Movahedi, and Farani 2016) The integration of technology also promotes active participation in the learning process. Students can explore virtual environments, manipulate digital models, and engage in interactive exercises that simulate real-world environmental challenges. This hands-on and participatory approach fosters a deeper connection to the subject matter, encouraging critical thinking and problem-solving skills. According Sarah Ahmed The utilization of technology enables students to visualize and interact with complex environmental concepts, fostering a more profound understanding. Interactive simulations, virtual models, and digital resources empower students to explore environmental scenarios in a way that traditional methods may not achieve. This not only enhances comprehension but also cultivates a genuine interest and concern for environmental issues.(Nabasumba et al. 2023) In summary, the incorporation of technology to visualize complex environmental concepts in Schools is a pedagogical strategy that enhances engagement, facilitates real-time learning, and empowers students to actively participate in their environmental education.(Carlsson 2017)

## **Conclusion**

The innovations in the development of the environmental care character of SMK Negeri 1 Ampek Angkek in the 21st century represent a crucial step towards fostering sustainable practices and instilling a sense of environmental responsibility among students. The integration of environmental education within the SMK Negeri 1 Ampek Angkek curriculum, along with the implementation of



innovative teaching methods and practical initiatives, plays a pivotal role in shaping the mindset of students and preparing them for the challenges of a rapidly changing world.

The emphasis on environmental care within SMK Negeri 1 Ampek Angkek not only aligns with global efforts to address climate change and ecological degradation but also serves as a testament to the adaptability and relevance of traditional educational institutions in contemporary times. The incorporation of modern technologies, such as virtual simulations and online resources, further enhances the learning experience and ensures that students are well-equipped with the knowledge and skills necessary to contribute positively to environmental conservation. Additionally, collaborative partnerships between SMK Negeri 1 Ampek Angkek, local communities, and environmental organizations contribute to a holistic approach in nurturing the environmental care character.

Through community engagement, students are provided with opportunities to apply their knowledge in real-world scenarios, fostering a sense of stewardship and connection to the natural world. As SMK Negeri 1 Ampek Angkek continue to evolve in response to the challenges of the 21st century, the development of the environmental care character becomes an integral part of holistic education. By instilling a deep-rooted commitment to environmental sustainability, SMK Negeri 1 Ampek Angkek contribute not only to the well-being of the planet but also to the development of conscientious individuals who are poised to make a positive impact on their communities and the world at large.

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