

Character instrumentation of environmental care for children aged 4-5 based on digital media

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Abstract

Purpose: This study aims to explain how digital media can be used to foster environmental-care attitudes in preschool children at Firdausy Kindergarten and to identify the key factors that influence the success of such initiatives.

Methodology: A qualitative case-study approach was adopted, involving systematic collection of classroom photographs and direct observations of learning activities that leveraged interactive games and videos. Semi-structured interviews were conducted with kindergarten leaders and teachers engaged in the project, and relevant documents (lesson plans, activity logs) were reviewed. Data analysis followed three phases—data reduction, data visualization, and inferential synthesis—to surface themes related to media use and program efficacy.

Results: Findings indicate that incorporating digital media—specifically interactive environmental games and educational videos—significantly heightened children’s understanding of why and how to protect their surroundings. Moreover, the project’s success was bolstered by strong parental involvement, which extended learning beyond the classroom, and by carefully curated, high-quality teaching materials that complemented the digital content.

Applications/Originality/Value: By demonstrating a replicable model for integrating digital tools into early-childhood environmental education, this research provides actionable insights for curriculum developers and preschool educators. Its emphasis on stakeholder engagement (parents and teachers) and media quality offers a holistic framework for designing future programs that not only engage young learners but also build sustainable eco-responsibility from the earliest stages of schooling.

Introduction

We must face environmental problems in the world, such as climate change and ecosystem degradation. From an early age, education about protecting the environment is very useful. By instilling environmental protection values in early childhood, it is hoped that a generation will grow that has a responsibility towards environmental protection. Human nature is in everyone and is formed in the family since childhood. However, according to (Ismail, 2021), the individual is also in the individual. In line with this opinion, (Masyunita, 2015) also argues that instilling human knowledge in children from an early age is very important. As practitioners, the values that students have are knowledge, understanding and actions to apply the values of goodness and life to God Almighty, to themselves, to others, to the environment and the island. In addition, according to (Masykuroh & Fajriah, 2023), personality development is an educational program to instill positive values in everyday life. Environmental character development is carried out to equip children with the knowledge, skills and training needed to be responsible and sensitive to the environment so that they are able to care for and protect it. According to (Siti Aisyah et al., 2023), the environment is how children behave (Intan et al., 2022). If a child's environment is beneficial to him, then his character will be formed well. Labeling children, both positive and negative, can have a major impact on their behavior. In addition, environmental problems are increasing due to natural factors and human actions. If not prevented in time, this natural disaster will get worse. According to (Yulianti et al., 2014) that raising awareness of the environment from an early age is one way to reduce the risks that occur. However, environmental education for preschool children helps them understand the importance of protecting the environment from an early age and increases.

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Agree with the previous statement. Indonesia's natural conditions are very important because of human activities that damage the environment. Learning how to protect the environment from childhood is important because it helps children develop environmental awareness and prevent environmental damage (Ramadhani & Masykuroh, 2022). Due to the lack of knowledge and supporting structures needed to protect the environment, people still have little knowledge of the environment around them, and are less concerned about the environment (Ithof, 2019). And according to (Masykuroh & Wahyuni, 2023), waste is the re-mains of human activities, if not managed properly it will harm humans because it damages the environment. It is very important for children to have access to nature from an early age through various forms of media. This helps them devel-op good principles, attitudes and actions towards the environment..

According to (Sutrisno, 2021). Young people must learn to become the new generation of the nation. Early childhood education needs to develop in the 21st century. (Siti Fitriyani et al., 2024). Early childhood education has the power to inspire and encourage children from birth to six years to help them grow and develop physically and mentally. The goal of preschool is to prepare children to continue their education. According to (Shofia & Dadan, 2021). It is important to help young children understand the environment. The number of observations in this area is still small. Researchers consider it important to develop video-based products that can create environmentally sensitive characters. (Masykuroh & Wahyuni, 2023) stated that due to the increasing development of advanced learn-ing technology, children are becoming accustomed to technology. The purpose of this study is to find a learning method that can improve numerical skills through digital information. According to (Khotimah & Katoningsih, 2014). According to (Royani et al., 2023), considering that children are the generation that supports national development, human development must begin at an early age. Currently, children prefer to play with electronic devices than traditional games. The digital era also requires further research on topics related to important aspects of child development. One problem that often occurs is that not all Kindergartens (PAUD) use digital storytelling methods in their learning. According to (Shofia & Dadan, 2021).

This study was conducted with the aim of strengthening environmental pro-tection in children aged four to five years at Ferdowsi University. Digital learning tools have become increasingly popular lately. Therefore, this study examines how Ferdowsi Kindergarten utilizes digital media to foster environmentally con-scious characters, factors that influence success and children's responses to these activities. The purpose of this study is to describe the nature of nature conserva-tion characters digitally. Be aware of factors that influence project success. Find out how children feel about the activities. This study is expected to contribute to the development of elementary school curriculum for children. Developing an innovative curriculum model to involve environmental activists in preschool. (Masykuroh & Wahyuni, 2023) stated that along with the development of ad-vanced learning technology, children are also increasingly familiar with technol-ogy. The purpose of this study is to find a learning method that can improve nu-merical skills through digital information. According to (Khotimah & Katoningsih, 2014) According to (Royani et al., 2023), considering that children are the generation that supports national development, human development must start from an early age. Currently, children prefer to play with electronic devices rather than traditional games.

Agree with the previous statement. The state of the environment in Indone-sia is very important because of human activities in environmental destruction. Learning how to protect the environment from childhood is important because it helps children develop environmental awareness and prevent environmental damage (Ithof, 2019). Due to the lack of knowledge and supporting structures needed to protect the environment, people still have little knowledge of the envi-ronment around them, and care less about the environment (Ithof, 2019). And according to (Masykuroh & Wahyuni, 2023), waste is the remains of human ac-tivities, if not managed properly it will harm humans because it damages the en-vironment. It is important for children to have access to nature from an early age through various forms of media. This helps them develop positive principles, attitudes and actions towards the environment. Modern life is highly dependent on education (Syaadah et al., 2023). Formal, non-formal and informal education are available for education. Formal education is provided in schools, informal education in the community, and informal education in the family. Therefore, non-formal education and non-formal education are often associated with educa-tion that is not part of the school system, or called non-formal education. One of the greatest gifts given by God Almighty to parents is children, who are the most important mandate and belief for them. Because every child is a gift from God Almighty, each child has their own advantages and disadvantages. According to (Nurrohmah, 2022) is the golden age of childhood throughout the years of human development. During this time, children are more likely to take inspiration from their environment. At this time, children are ready to participate in various activi-ties that aim to understand and understand their environment.

This study was conducted with the aim of strengthening environmental pro-tection in children aged four to five years in TK Firdausy. Digital learning tools are becoming increasingly popular lately. Therefore, this study examines how TK Firdausy utilizes digital media to foster environmentally conscious characters, factors that influence success and children's responses to the activities. The pur-pose of this study is to describe the nature of nature conservation characters digi-tally. Be aware of factors that influence the success of the project. Find out how children feel about the activities. This study is expected to help in developing a curriculum for PAUD. Developing an innovative curriculum model to involve environmental activists in preschool.

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Subsequent paragraphs, however, are indented.

Method

This study uses a descriptive method and aims to gain a better understanding of the learning process at TK Firdausy. This method was chosen because it allows researchers to create methods: develop a general understanding of experiences, views and methods related to learning at university from the perspective of teachers, children and parents. Understanding of place: evaluate the learning situation in the dynamic and complex social context of TK Firdausy. Flexibility: During the research process, change tools and questions to explore emerging issues. The location of the research is TK Firdausy which is located close to. Is-lamic Mathematics No. 21 in the Sokoharjo game. The total number of students is ninety students. The place is in the middle of the city. TK Firdausy was chosen as the research location because this kindergarten faces the following problems or challenges: Children do not yet understand the purpose of the environment and the impact of their behavior. Saving water or throwing garbage in its place is an environmental practice that has not taken root.

The subject is the teacher: As the main actor in the learning process, the teacher provides information about the curriculum, teaching methods and prob-lems. Children: Children always provide feedback on what they learn because they are the main objects of learning. Parents: As stakeholders, parents provide input regarding their expectations, opinions, and involvement in their children's education. Research has found that one of the reasons why young children are less environmentally friendly is because they are still developing their under-standing of abstract concepts such as the environment and how these things af-fect their actions. It may be difficult for them to understand the relationship be-tween everyday behavior and the long-term impact on the environment. Children tend to focus on things that make them happy, such as playing or eating. They may not realize how important environmental protection is to their lives.

Research data sources

Interviews, observations and documents are the data sources for this re-search. A systematic way of obtaining information through oral communication about the past, present and future is called an interview. Different types of inter-views are planned interviews and impromptu interviews. General interviews: used to broaden understanding of the experiences, observations and perspectives of the research subjects. We conducted interviews with the director, teachers and parents of Ferdowsi students. The attitudes of 4-5 year old children of Firdausy Kindergarten in protecting the environment Data collection by observing and recording the appearance and behavior of an object called a view. Participant observation: Researchers directly observe social interactions, learning processes and learning environments in daily activities at Ferdowsi University. Nana Sudjana said that observation, visualization and depiction of symbols are sys-tematically studied.

According to the Big Indonesian Dictionary (KBBI), literature is the act of collecting, selecting, processing and storing information related to the field of science. Documentation can also be interpreted as testimony, a collection of evi-dence and information such as photos, stories, newspaper clippings and other sources of information. To perfect the research data, documents such as syllabi, activity reports, children's activities and photographs were collected. In this study, the text presented was in the form of pictures of children's actions in main-taining the environment around the school and videos about people who care about the environment.

Interview instructions: Interview instructions were open and flexible so that subjects could read the answers in full. Learning perspectives, curriculum, social interactions, challenges and expectations were some of the topics discussed. Document sheets: Document sheets were used to track various aspects of learn-ing in schools, such as children's behavior, social interactions, use of learning media and the learning environment.

Thematic analysis: Recurring main themes were identified by analyzing data from observations, documents and interviews. These topics were then grouped and interpreted to produce research results. Triangulation: To increase the validi-ty of the findings, data triangulation was carried out by comparing the results of the analysis from various data sources (observations, documents, interviews).

Results and Discussion

Based on the research in the field that the author found regarding the instillation of environmental character in animated films, it can strengthen the following questions:

Table 1. Interview results with the principal.

No.	Question	Answer	Description
1	How do you understand the development of people who love nature in infancy?.	Instilling a sense of concern for the environment in childhood is an effort to foster awareness and an attitude of caring for the environment from an early age.	Demonstrating a general understanding of environmental education subjects. This is done through various educational activities that are fun and challenging for children.

2	2 In your opinion, what are the benefits of teaching young children how to protect the environment?.	There are many benefits, including creating a generation that cares about the environment, protecting the environment, and improving the quality of life.	In addition, it can also develop children's social and cognitive abilities. The importance of environmental education is emphasized for the future.
3	What are the challenges in instilling environmentally friendly characters in early childhood	The biggest challenge is making the story interesting and easy for children. In addition, limited facilities and resources are obstacles.	This shows the problems that arise in project implementation.
4	How did Firdausy Kindergarten start implementing the development of environmental protection features on digital platforms?	First, we see the great power of digital media in attracting children's attention.	We started by making a short animated video about the importance of maintaining environmental cleanliness. Explaining the background of using digital media.
5	What digital media is used at Firdausy Kindergarten to instill an attitude of caring for the environment?	We use various digital platforms such as cartoons, educational games, and educational programs.	In addition, we also use the internet to search for relevant information and learning materials. Showing the types of media used.
6	How is the development of environmental imagery in digital media applied at Firdausy Kindergarten?	We integrate digital media into daily learning activities. Explain how you can integrate digital media into learning.	Explain how you can integrate digital media into learning. For example, before watching entertainment, we play a video about the importance of maintaining environmental cleanliness.

Based on the results of the study, it can be concluded that: the principal has a general understanding of the importance of fostering an environmentally conscious society at a young age. They know that society must start learning from an early age to create a generation that cares about the environment. Most respondents agree that fun and interesting learning activities for children are an effective way to instill goodness in children. Mrs. Renita hopes that by instilling an attitude of protecting the environment from an early age, children will become environmentally conscious people who are able to protect the environment and have a better life. In addition, humanities education is also expected to develop children's social and intellectual skills. The results of this study are in line with previous studies which show that environmental education at a young age plays a very important role. Some facts that can be stated are: The importance of early childhood education: Childhood is a golden age for human development. By instilling values of protecting the environment from an early age, children will easily understand and apply these values in their daily lives. Effective learning methods: This study shows that fun learning methods and children's ability to instill a society to care about the environment are very effective. Some examples of techniques that can be used are: Children are asked to become living organisms in their environment and feel the importance of maintaining the balance of the ecosystem. Visiting nature: By visiting parks, gardens or forests, children can come into direct contact with nature and learn about life.

The Biggest Challenge: The biggest challenge in instilling environmentally friendly characters in early childhood is designing educational materials that are interesting and easy for children to understand. In addition, the lack of facilities and resources, such as the lack of interactive learning platforms and the lack of teacher knowledge about environmental education, are serious problems. Firdausy Kindergarten Initiative: Firdausy Kindergarten started a nature character development initiative in digital media by developing a short animated film. This video has proven to be effective in attracting children's attention and explaining the importance of maintaining a clean environment. The results of this study confirm that instilling environmentally friendly characters in childhood is difficult and full of challenges. Some things that need to be considered are: Cognitive development: Children in the early stages of their lives have an intellectual nature and are more interested in visual and interactive things. Therefore, teaching materials should be presented in a simple, interesting, and good way for their intellectual development. Insufficient resources: Lack of resources and resources such as modern learning platforms, open spaces and special staff can hinder the implementation of environmental education programs. Lack of teacher knowledge: Not all teachers understand environmental education. This can be caused by differences in learning styles and difficulties in presenting concepts correctly.

Types of digital media: Firdausy Kindergarten has used many types of digital media such as cartoons, educational games and learning programs to instill natural character in students. Integrating learning: Digital media is well integrated into daily learning. The use of animated films, for example, is effective in attracting children's attention and creating a basic understanding of the importance of environmental cleanliness. The use of digital media reflects Firdausy Kindergarten's efforts to meet the various educational needs of early childhood. This type of media allows children to learn in a fun and interactive way. This animated film is effective in conveying visual messages and attracting children's interest. Educational games: Educational games can motivate learning and encourage children to participate. Incorporating digital activities into daily learning is a great way to make environmental learning relevant and meaningful to children. In this way, children can connect what they have learned with real everyday experiences.

Table 2. Results of interviews with teachers.

No	Question	Answer	Description
1	How do you understand the concept of character building for early childhood?	Cultivating environmental awareness in preschool children means instilling environmental values from an early age, so that children are accustomed to behaving well towards the environment..	Demonstrating a basic understanding of the concept..
2	What is the role of digital media in promoting the environment in Firdausy Kindergarten?	Digital media plays an important role in motivating and socializing environmental education. Children find it easier to understand abstract concepts through visualizations and simulations provided by digital media.	Emphasizing the importance of digital media in learning..
3	What types of digital media are used in this character development program?	We use various digital media such as cartoons, educational games, and educational programs designed for children.	Showing the types of media used..
4	How do we integrate digital media into teaching and learning activities to create environmentally friendly humans?.	We usually play animated videos before starting entertainment to show the importance of environmental protection. In addition, we also use educational games to teach children to distinguish between organic and non-organic waste.	Explain how you can integrate digital media into learning.
5	What do you think are the benefits of using digital media to promote environmentalism?	Digital media makes learning more fun, intuitive and interactive.	Children find it easier to learn and remember the information presented. Emphasize the benefits of using digital media.
6	What challenges do you face in utilizing digital media to create environmentally friendly humans?	One of the challenges is limited access to the right devices and internet networks.	In addition, not all children have the same ability to use technology. Mention the problems they often face.

As a teacher at Firdausy Kindergarten, Mrs. Sri Sodalmi is very familiar with the concept of developing environmentally friendly characters in childhood. They understand that the purpose of this activity is to instill environmental values since childhood. The role of digital media: The role of digital media plays a very important role in the process of developing environmental character in Firdausy Kindergarten. This obstacle has proven to be effective in making learning fun, interactive and easy for children. The importance of instilling an attitude of caring for the environment from childhood. The results of this study emphasize the importance of instilling environmental protection values since childhood. Childhood is a golden age for personality formation. By instilling good values from an early age, children will find it easier to develop good and lasting habits. Digital media has proven to be a powerful tool in early childhood education. There are many reasons why digital media is effective in creating personality, including: Educational content is easy to present in an interesting way and easy for children to understand. Children can interact directly with learning materials, improving learning experiences and remembering. Easy and convenient access to various learning materials. Learning materials can be adjusted to the needs of children and educational needs.

The environmental character development program at Firdausy Kindergarten uses various digital media such as cartoons, educational games and learning programs. This type of media shows its ability to provide inspiration and motivation for children to learn. Digital media has been well integrated into daily learning. The use of cartoons as opening activities and educational games as activities shows an effort to connect educational content with children's real experiences. The use of various digital media shows a good understanding of the educational needs of early childhood. Every child learns differently, so various media can accommodate these differences. In addition, the use of varied media can prevent boredom and keep children interested in learning. This animated video is effective in conveying visual messages and attracting children's attention. Educational games can make learning a fun experience and encourage children to participate. The education plan provides structured content that can be adjusted to each child's learning needs.

The use of digital media in instilling environmentally conscious characters provides a number of significant benefits, such as increasing interest in learning, facilitating understanding of concepts, and making learning more interactive. Despite having many benefits, the use of digital media in this context also faces a number of challenges, especially related to technological accessibility and the digital divide. The results of this study confirm that digital media has great potential in transforming learning into a more interesting and meaningful experience. Some specific benefits that can be obtained from the use of digital media in instilling environmentally conscious characters include: Interesting visualizations, interactivity, and game elements in digital media can increase children's learning motivation. Digital media allows learning that is tailored to each child's learning style and speed. Through digital communication, children can access various environmental information from various sources around the world. Digital media encourages children to participate in learning, through games, simulations, or project creation. Despite having many benefits, there are many challenges in using digital media in education, especially in resource-poor environments. Some of the challenges they face are: Not all children have equal access to the right devices and internet networks. The digital divide between urban and rural children can be a barrier to

the use of digital media. This does not mean that teachers are not proficient in using digital technology in teaching. Providing hardware, software, and internet access is a huge expense for educational institutions.

Conclusion

This study shows that digital media can create environmental protection in children aged 4-5 years. Educational applications, videos, and environmental games have been shown to increase children's understanding and interest in environmental issues. Digital activities not only educate children but also focus on learning and learning better. Children who participate in digital learning show their understanding of the importance of a clean and healthy environment. It is important for parents and teachers to be involved in learning activities that have an impact on the development of environmentally conscious humans. The breadth and continuity of learning experiences are created from the interaction between home and school education. Parental support greatly helps children use natural methods in everyday life.

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