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Inculcation of basic concepts of integrated water resources management based on video animation

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ABSTRACT

The younger generation can be competent in contributing to maintaining the continuity and quality of water resources; therefore, it is prioritized that they have an understanding of the basic concepts of integrated water resources management. This service activity collaborates with the Al-Mabrur Mosque madrasah and the Baleendah Permai Complex community to carry out integrated water resources management (PSDAT) outreach activities. This activity aims to instill basic concepts of PSDAT knowledge in madrasah children so that they will be ready to contribute to implementing PSDAT in their surrounding environment. This PSDAT integrated water resources management outreach activity uses the outreach method. The outreach media used is audio-visual media in the form of animated videos. The participants in this PSDAT educational activity were Al-Mabrur Mosque madrasah children who were still in elementary school. Counseling participants began to understand the knowledge and examples of activities regarding integrated water resources management. Participants were very enthusiastic about implementing the knowledge they had gained in the Baleendah Complex environment.

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ABSTRAK

Generasi muda dapat berkompeten dalam berkontribusi menjaga kelangsungan dan kualitas sumber daya air, oleh karena itu diutamakan mereka harus memiliki pemahaman tentang konsep dasar dari pengelolaan sumber daya air terpadu. Kegiatan pengabdian ini bekerja sama dengan madrasah Masjid Al-Mabrur dan masyarakat Komplek Baleendah Permai untuk melaksanakan kegiatan penyuluhan tentang pengelolaan sumber daya air terpadu (PSDAT). Kegiatan ini bertujuan untuk menanamkan konsep dasar pengetahuan PSDAT pada anak-anak madrasah, sehingga mereka nantinya akan siap untuk berkontribusi dalam penyelenggaraan PSDAT di lingkungan sekitarnya. Kegiatan penyuluhan pengelolaan sumber daya air terpadu PSDAT ini menggunakan metode penyuluhan. Media penyuluhan yang digunakan adalah media audio-visual berupa video animasi. Adapun yang menjadi peserta kegiatan edukasi PSDAT ini adalah anak-anak madrasah Masjid Al-Mabrur yang masih duduk dibangku sekolah dasar. Peserta penyuluhan mulai memahami dan mengerti pengetahuan beserta contoh kegiatan seputar pengelolaan sumber daya air terpadu, peserta sangat antusias untuk mengimplementasikan pengetahuan yang telah didapatkannya di lingkungan Komplek Baleendah.

Kata Kunci: Kuliah kerja nyata; KKN; sumber daya air; video animasi

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INTRODUCTION

In the 2016-2030 Sustainable Development Goals (SDGs), water resources are a key strategic issue in Indonesia's sustainable development. Indonesia now has the fourth-largest population in the world, with 240 million people. This situation has a significant impact on future water needs. If this issue is not addressed wisely from the outset, it could threaten the sustainability of development and life in various regions of Indonesia. Community contributions to support the achievement of the SDGs for clean water and sanitation in villages can take the form of material resources (goods and money), labor, and ideas, manifested through various activities such as building water resource management facilities (drilling wells, constructing rainwater storage tanks, installing water filters); building sanitation facilities that meet standards (building hand washing stations, building closed septic tanks); recycling waste; and participating in educational activities (Susanti & Kadarisman, 2021).

One of the challenges in water resource management is the limited contribution from the community and businesses. This is due to the lack of knowledge and understanding among the community and businesses regarding water resource management. This reduces involvement and attention toward conserving water resources and maintaining related infrastructure (Susilowati & Windiani, 2018). The significant participation of various parties, including village officials and the government, can ensure the sustainability of achieving the desired results (Affandi, 2020). Water resources are one of the most critical aspects of the survival of all living things. Water is commonly used for various purposes, including basic needs such as drinking water and sanitation (including bathing, washing, and toilet use), irrigation, and religious and economic needs. Abundant water can support other needs, such as agriculture, fisheries, or tourism (Setiawan *et al.*, 2023; Wiyatasari & Lathifah, 2019). Although water resources are considered a common good, it is not uncommon for individuals or groups to overuse them, potentially harming others or even damaging the surrounding environment. Therefore, integrated water resource management is necessary to ensure its availability and long-term benefits.

Integrated water resource management is an effort to plan, implement, monitor, and evaluate the implementation of water resource conservation, information systems, water resource utilization, water damage control, and community empowerment. This requires efforts to increase public awareness of water resource management. The community needs to understand that community empowerment programs are an effort to harness existing potential (Indroasyoko *et al.*, 2023).

On the other hand, the population is also increasing, leading to higher water consumption. However, water resources are not growing or decreasing due to improper management. According to the Central Statistics Agency (see <https://bandungkab.bps.go.id/>), the population of Bandung Regency, particularly in Baleendah District, from 2020 to 2022 is shown in **Table 1** below.

Table 1. Population Data of Baleendah District

Year	Population
2020	263.724
2021	267.934
2022	272.914

Source: Bandung Regency Statistics Agency, 2020–2022

The data in **Table 1** shows that the population in Baleendah Subdistrict has been increasing yearly. As the population increases, so does the demand for water in the Baleendah Subdistrict. Therefore, water resources must be appropriately managed to meet the needs of every resident.

One of the reasons for this problem is the lack of knowledge and skills regarding integrated water resource management (PSDAT). However, having and understanding the basic concepts of knowledge and skills (in any field) will determine the sustainability and quality of that field. Therefore, the community needs to instill the basic concepts of PSDAT. People who do not understand PSDAT are likely to act solely in their own interests. Additionally, the general public typically relies on others or the government to maintain the sustainability of their water resources.

Improving knowledge of water resource management can be achieved through several means, such as analyzing the surrounding community's needs, forming water resource management teams, developing water resource management regulations, and providing assistance in water resource management (Abidin *et al.*, 2020). To improve the community's welfare, the construction and dissemination of water resource management facilities, such as water reservoirs and clean water installations (pipes), can be carried out (Mas'ud *et al.*, 2017). To facilitate the implementation of this concept, dissemination is carried out using animated videos.

Animated videos combine moving visual media (Hapsari & Zulherman, 2021). Animated videos illustrate the material to be conveyed, making it easier for children to understand the material provided. Animated videos are tools in the form of moving images that appear lifelike (Sunami & Aslam, 2021). Moving images can increase children's interest and attention to the conveyed material. Animated videos are a creative, effective, and efficient learning medium. With the development of technology, learning media have undergone many changes to improve the quality of learning (Dewi & Handayani, 2021). Interesting and innovative learning can help resource persons stimulate new desires and interests in the learning process (Hapsari & Zulherman, 2021).

The key to the success of water resource conservation is the active participation of the local community. This is because water resource management ultimately depends on the community's efforts to build synergy between water resources and the people in the area (Kospa, 2018). Education is essential to instilling and improving the community's knowledge and skills regarding water resource conservation. This education should be provided from a young age to create a generation of young people who are competent in contributing to the sustainability and quality of water resources. Through a community service program (KKN), the author collaborated with the Al-Mabrur Mosque Madrasah in the Baleendah Permai Complex to conduct educational activities on PSDAT. This activity aims to instill fundamental knowledge of PSDAT in madrasah students so they will be ready to contribute to implementing PSDAT in their environment. Hopefully, this will minimize water resource issues in the short and long term.

Literature Review

Water resources

Water resources are renewable natural resources essential for humans and other living creatures. The water demand is increasing in line with developments in various sectors, such as agriculture, fisheries, and daily needs. However, water is not managed effectively, leading to conflicts of interest within communities (Rasidi & Boediningsih, 2023; Jocom *et al.*, 2016). Water resources are vital in sustaining human life and other living organisms (Sallata, 2015). Water is an essential element that provides significant benefits to all living things.

Based on UU No. 7 Tahun 2004, the government defines water resource management:

“Pengelolaan sumber daya air adalah upaya merencanakan, melaksanakan, memantau, dan mengevaluasi penyelenggaraan konservasi sumber daya air, pendayagunaan sumber daya air, dan pengendalian daya rusak air.” Water resources have several properties, including (Sallata, 2015):

1. Still water always has a flat surface.
2. Water flows from higher to lower elevations.
3. Water has weight.
4. Water constantly adapts to the container it occupies.
5. Water has no odor and is neutral.

The properties of water mentioned above can benefit humans, but they can also pose risks. Therefore, water availability requires proper management.

Water resource management is a process that promotes integration in managing water, land, and other resources. Its activities aim to improve social welfare and maintain ecosystem sustainability (Rasidi & Boediningsih, 2023; Yuliana, 2018). Water is a vital resource, so it must be appropriately managed and provided to meet agriculture's drinking water, sanitation, and irrigation needs. Given the numerous demands, it is indisputable that water on Earth has limitations in its use.

Learning Media

Learning media is used to convey information to recipients so that they can gain knowledge, skills, and attitudes from the information disseminated. Educators can use media to support learning activities in the learning process. Learning media are typically associated with graphic and photographic tools to present information visually and verbally. This is reinforced by Hamalik's view in Maghfiroh (2021), who states that educational media are tools, methods, and techniques to enhance communication and interaction between educators and learners. According to Latif in Maghfiroh (2021), the types of educational media commonly used in Indonesia include:

1. Visual media, which are media that can be presented through visual communication symbols to convey messages to recipients and can be perceived by the sense of sight.
2. Audio media, which convey messages in verbal (spoken) form, thus being perceived by the sense of hearing; and
3. Still, projection media (audiovisual) present messages that can stimulate the visual senses. These messages must be projected through a projector so the recipient can see them. Audio recordings usually accompany audiovisual media, but sometimes, only visual elements exist.

The learning process using media extensively helps students receive lessons from teachers. The benefits of learning media, as outlined in Rejeki *et al.* (2020), include:

1. Effective learning media can enhance, simplify, and improve the learning process;
2. Increase students' motivation to learn;
3. Support self-directed learning tailored to students' abilities; and
4. Media is used as a direct means of conveying messages.

The learning process with learning media can proceed well and produce good knowledge for students, provided that students can utilize all their senses. This is based on Arsyad in [Rejeki et al. \(2020\)](#), who states that the more senses are used to receive and process information, the easier it is to understand and remember it.

METHODS

This integrated water resource management (PSDAT) education activity uses the extension method. Extension can be defined as the process of disseminating information related to efforts to achieve improvement or enhancement in a particular area. Another definition of extension is that it is a community development process through non-formal education systems ([Dayat, 2017](#); [Dacholfany, 2018](#); [Makmun & Faizal, 2021](#)).

The following are some aspects that must be present in an extension program:

1. The educational process
2. Learners
3. The development of awareness and competence among individual learners and groups of learners
4. The management of resources for life change

The educational media used is audiovisual media in the form of animated videos. Audiovisual media is selected for its various advantages as educational media, including clear presentation of verbal and written messages, overcoming limitations of space, time, and sensory perception, and suitability for tutorial learning ([Rahmatullah & Ampa, 2020](#)). Additionally, animated videos provided over a specific period can change attitudes, behaviors, and even lifestyle habits ([Aisah et al., 2021](#)).

The participants of this PSDAT educational activity were children from the Al-Mabrur Mosque madrasah who are still in elementary school. The educational activity was held on Thursday, July 21, 2022, on the 2nd floor of the Al-Mabrur Mosque in the Baleendah Permai Complex.

RESULTS AND DISCUSSION

The outreach program was conducted for 50 children from the Al-Mabrur Mosque madrasah by the presenter, who screened animated videos. Alhamdulillah, the activity room was equipped with video playback devices, which helped the educational session run smoothly, and the participants were very enthusiastic about participating in this activity. This educational session was conducted so that the participants could increase their knowledge about integrated water resource management, thereby becoming more empowered to raise their awareness and share their knowledge with their surrounding environment.



Figure 1. Opening of the PSDAT animated video activity
Source: Author's documentation 2023

Figure 1 shows the opening of an educational activity through an animated video from the Community Service Program (KKN) of the Indonesia University of Education on Integrated Water Resources Management (PSDAT). In **Figure 1**, it is evident that the children have gathered in an orderly and neat manner, ready to listen to the speaker's presentation. The PSDAT outreach activity took place at the Masjid Al-Mabrur Madrasah. The outreach activity began with the speakers introducing themselves to the participants. Following that, the presentation of the material commenced.



Figure 2. Screening of the PSDAT animation video
Source: Author's Documentation 2023

Meanwhile, **Figure 2** shows that the children of the Masjid Al-Mabrur Madrasah were highly focused on watching the material presented in the form of an animation video related to integrated water resource management. The outreach session began with a definition of PSDAT, followed by an explanation and examples of PSDAT implementation, including water resource conservation, information systems, resource utilization, water damage control, and community empowerment. At the end of the session, participants were allowed to ask the presenter questions about PSDAT.



Figure 3. Question and answer session during the educational session
Source: Author's documentation 2023

Figure 3 shows that participants were actively engaged in the integrated water resource management educational session. This is evident from their focus during the animated video presentation and reinforced by their enthusiasm during the question-and-answer session. Additionally, the participants' attendance from start to finish indicates their interest in the activity. The presenter believes the participants lack sufficient knowledge about PSDAT, as evidenced by their questions and statements regarding the presented material. Occasionally, they asked questions outside the scope of the material, which served as feedback for the presenter to expand the coverage of future educational materials.

Discussion

The attractive visual and audio assets in Animaker software are very helpful in designing animated videos as educational media. Participants in educational programs can easily understand the material if the learning media are designed engagingly and appropriately. One of the key factors determining the success of the learning process is how the learning media are designed to be engaging, enabling students to focus on the material being presented (Rahmatullah & Ampa, 2020; Al Mawaddah *et al.*, 2021; Viviantini, 2015). The use of educational media in integrated water resource management (PSDAT) education positively impacts students' knowledge of water management at Masjid Al-Mabrur Madrasah. Additionally, multimedia-based education encourages students to interact more actively with the presenter and other participants (Harsiwi, 2020).

Innovative educational video animation-based learning media is an alternative option for educators as a contemporary medium that can capture students' attention during teaching and learning activities (Putri *et*

al., 2020; Nurhidin, 2017). This indicates that students prefer educational video animation media over conventional methods that merely rely on textbooks. Furthermore, based on the cone of experience theory, it is stated that some knowledge or learning experiences are obtained through the senses of sight and hearing in describing an object. Therefore, animated videos are an effective learning medium to help children learn about integrated water resource management (Ernawati, 2022).

No external obstacles were encountered during the implementation of the outreach activity. The school administrators, DKM Al-Mabrur, and the local RT chairman highly appreciated the activity, which provided flexible facilities and time according to the school schedule. The Baleendah Village Office and the Dean of the Faculty of Education, Indonesia University of Education (UPI), fully supported this activity by providing the necessary permits for implementing the PSDAT outreach program. Support from the community for the outreach program related to water resource management was demonstrated by the provision of space at the Al-Mabrur Mosque Madrasah. Additionally, the community's enthusiasm was evident in the large number of participants who attended the outreach activity, as the information disseminated was beneficial for the community in managing water resources (Kusumadinata *et. al.*, 2021).

CONCLUSION

The students of the Al-Mabrur Mosque madrasah who participated in the outreach program in the Baleendah sub-district began to understand and comprehend the knowledge and examples of activities related to integrated water resource management, water resource conservation, water resource utilization, water damage control, water resource information systems, and community empowerment. The participants are enthusiastic about implementing the knowledge they have gained in their environment. A shift in paradigm regarding integrated water resource management has a noticeable impact following the implementation of the awareness program. The participants' awareness of past mistakes in their experiences is a positive indicator of the program's effectiveness. Follow-up actions that can be scheduled at the KKN location include conducting another training session with more specific content, accompanied by practical field activities.

AUTHOR'S NOTE

The author states that there are no conflicts of interest related to the publication of this article and affirms that the data and content of the article are free from plagiarism.

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