

## Implementing a Paperless Lecture Learning Strategy at Tulungagung University to Support the SDGs in the Era of Society 5.0

Latifatul Isro'iyah<sup>1</sup>, Rachmad Gesah Mukti Prabowo<sup>2</sup>, Nurul Atikoh<sup>3</sup>,  
Achmad Roysul Rohim<sup>4</sup>

Tulungagung University, Indonesia<sup>1,2</sup>

Tribakti Islamic University Lirboyo Kediri, Indonesia<sup>3,4</sup>

E-mail: tifafufefo@gmail.com<sup>1</sup>, r.gesah.mp@gmail.com<sup>2</sup>, nurulatikoh82@gmail.com<sup>3</sup>,  
achmadroysul@gmail.com<sup>4</sup>

### Abstract

*Technological advances have changed the learning landscape in higher education. Traditional lecture methods using paper are starting to be abandoned and replaced by technology-based solutions that are more efficient and environmentally friendly. The challenges of the Society 5.0 era related to digital skills, low literacy in Indonesia, and high levels of deforestation every year are serious problems and require support from various parties. This research explores paperless lecture strategies in supporting the Sustainable Development Goals (SDGs) in the era of Society 5.0 at Tulungagung University. The research method is through a descriptive-qualitative approach. This research shows that implementing paperless lectures can efficiently reduce environmental impacts. In Society 5.0, digital technology is used to improve the learning process to be more interactive and innovative. This research also analyzes the challenges and opportunities faced in adopting this learning method and its impact on the quality of education and achievement of the SDGs. This research also shows that paperless lectures positively impact environmental conservation and cost efficiency and improve the quality of learning.*

**Keywords** | Paperless Lecture Strategy, SDGs, Era Society 5.0

### INTRODUCTION

Education should be a priority because education is a human right and important for achieving peace and sustainable development. Education provides regional and global leadership, responding to global challenges and strengthening national education systems. However, education still has several problems that must be resolved immediately, such as the challenges of the society 5.0 era in the use of technology and low literacy in Indonesia (Veidemane, 2022). The misuse of technology by the younger generation must be addressed immediately because technology should be used to develop skills and to read and search for information quickly. Good education can help people break the cycle of poverty (Fitriyadi et al., 2023). Education can reduce disparities and encourage people to live more sustainably and healthily by paying attention to the environment.

The environment is a concept that includes all parts of the universe that affect the lives of living things, including forests. Forests have an important role in the living environment, such as acting as the lungs of the world, producing oxygen, and as a habitat for various living creatures (Pinking & Hussin, 2023). The forest population in Indonesia is around 65.5% of Indonesia's land area, which reaches 125.7 million hectares. The forest area in Indonesia reaches 92 million hectares, the eighth largest in the world. However, there are many challenges in preserving forests in the current era. One of them is large-scale deforestation, an economy dependent on natural resources, expansion of agricultural areas, plantations, deforestation and forest degradation, mining activities, and the development of



the Indonesian Capital City (IKN). Deforestation and forest damage reaching 1.46 million hectares per year, climate change, increasing population density, overlapping forest management permits, and political decisions that do not prioritize forest conservation can hinder the progress of REDD schemes and forest conservation (Satria Ardhi, 2023). Unsustainable land use system. A lack of public awareness about the importance of forest conservation can influence forest conservation efforts (Jainuddin, 2023).

Education, as the main milestone in changing the nation's life for the better, should always be a solution to problems in various fields, including the environment. The environment is also an effective learning source for students. One of the innovative strategies that has emerged in facing this challenge is implementing paperless lectures, which aim to support the achievement of sustainable development goals (SDGs). This is also in line with the Era of Society 5.0, which makes technology a solution to human problems (Maryanti et al., 2022). Integration of education and society 5.0, which uses technology as a means of lecture infrastructure to reduce carbon waste due to the large use of paper and reduce the felling of trees used as raw material for paper for the sake of sustainable environmental preservation (Meigtaria Sanita, 2023). This research examines the strategies, challenges, opportunities, and impacts of implementing paperless lectures at Tulungagung University to provide comprehensive recommendations for educational development in this new era.

## LITERATURE REVIEW

The transition to paperless learning is a significant stride in educational institutions' efforts to align with global sustainability goals, particularly within the framework of the Sustainable Development Goals (SDGs). The concept of a paperless environment, especially in higher education, is grounded in the principles of sustainability, which emphasize reducing the carbon footprint, minimizing waste, and promoting responsible consumption of resources. In the context of the SDGs, specifically Goal 4 (Quality Education) and Goal 12 (Responsible Consumption and Production), the shift towards paperless learning strategies is not only environmentally beneficial but also economically viable.

### Paperless Learning in Higher Education

The adoption of paperless learning in higher education has been increasingly prevalent, particularly as universities seek to modernize their educational delivery in the face of technological advancements. Studies suggest that paperless learning enhances student engagement, fosters collaboration, and provides more flexible and accessible learning environments. For instance, Liu et al. (2020) found that digital platforms enable more interactive and personalized learning experiences, which are crucial in fostering critical thinking and problem-solving skills—key competencies in the era of Society 5.0.

### Society 5.0 and Education

Society 5.0, a concept introduced by the Japanese government, represents a vision for a super-smart society where digital transformation and artificial intelligence (AI) play pivotal roles in addressing societal challenges. In this context, the education sector is called

to innovate and integrate new technologies that not only enhance learning outcomes but also contribute to the broader societal goals of sustainability and inclusivity. The integration of digital tools in teaching and learning processes is seen as a critical element in preparing students for future challenges, aligning educational practices with the demands of Society 5.0.

### **Supporting the SDGs through Digital Transformation**

Implementing a paperless lecture strategy aligns with the broader objectives of the SDGs by promoting sustainable practices in educational institutions. The reduction of paper use directly contributes to environmental sustainability by decreasing deforestation and lowering greenhouse gas emissions associated with paper production and disposal. Additionally, the move towards digital learning materials supports SDG 9 (Industry, Innovation, and Infrastructure) by fostering innovation in educational practices.

Research by Tan and Pereira (2021) highlights that universities adopting paperless strategies often experience an improvement in resource management, cost efficiency, and a reduction in operational waste. Furthermore, the use of digital platforms for lectures, assignments, and assessments enhances transparency and accountability, contributing to a more efficient and ethical academic environment.

### **Challenges and Considerations**

Despite the numerous benefits, the transition to a paperless learning environment is not without challenges. Issues such as digital inequality, resistance to change among faculty and students, and the need for substantial infrastructure investment are significant barriers that institutions must address. However, these challenges can be mitigated through comprehensive planning, stakeholder engagement, and continuous training and support for both educators and students.

In conclusion, implementing a paperless lecture learning strategy at Tulungagung University represents a forward-thinking approach to education that aligns with the global agenda for sustainable development. By embracing digital transformation in the learning process, the university not only supports the SDGs but also prepares its students for the realities of Society 5.0, where digital literacy and sustainability are key to success.

### **METHOD**

This research method uses a qualitative approach with field research and library research. Qualitative research emphasizes the quality aspects of the entity being studied. This approach starts with field data, and the theory built from this data is used to support previous theories. The data used in this approach includes narratives, story details, expressions, and construction results from respondents or informants. This research data collection technique used observation, interviews, and in-depth literature (Sepriyanti, 2023).

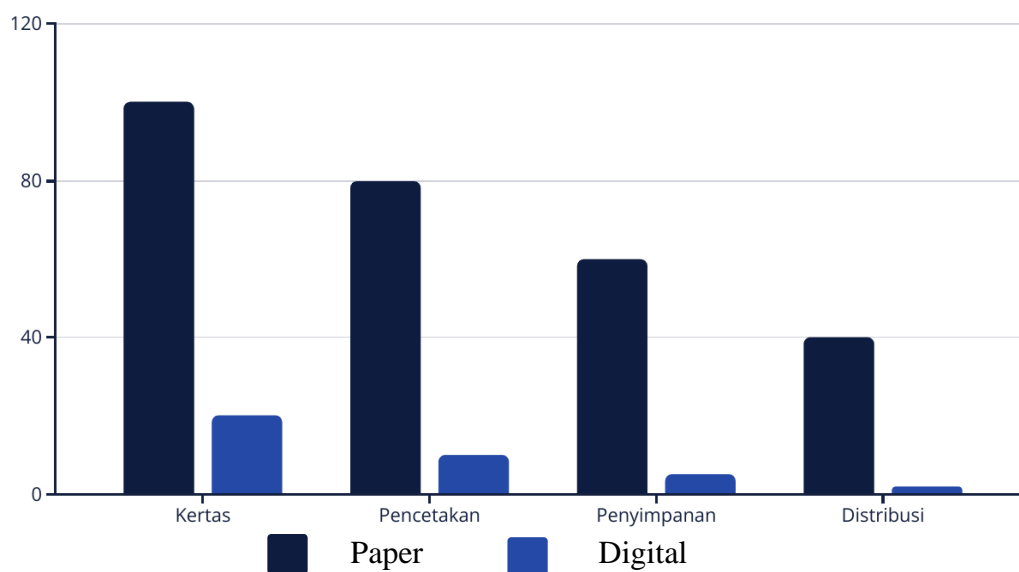


## RESULTS AND DISCUSSION

### Paperless Lecture Strategy

Most trees in Indonesia are raw materials for paper, such as Central Java, East Java, Nusa Tenggara, Sumatra, Kalimantan, Papua, and Southeast Sulawesi. PT Indonesian Paper Factory produces paper from teak wood obtained from forests in the area. The following are several types of trees that are often used as raw materials for paper: pine trees, eucalyptus trees, acacia trees, gerunggang trees, binding trees, jelutong trees, cypress trees, janga trees, birch trees, spruce trees, abaca trees, bamboo trees, lime trees, kapok trees, pulp trees, and exotic trees (Achmad Irfan, 2022).

Cutting down trees as raw material for paper certainly impacts the environment and surrounding communities. The impact of cutting down trees to make paper is the extinction of biodiversity, forests becoming denuded, the soil becoming infertile, the supply of clean air being reduced, flooding, environmental damage, loss of soil fertility, decline in water resources, and environmental damage (Santoso et al., 2022). The existence of digital technology can be an alternative in reducing paper waste and tree felling in several ways, namely by using e-books, using electronic mail/email, using digital documents, using digital signatures, using digital identities, using AI technology for early detection of logging wild, use of drones for field mapping (Agung, 2024).



**Figure 1.** Resource Use Efficiency Graph

The paperless learning strategy utilizes digital technology to replace conventional learning media, enabling faster access to information, easier collaboration, and safer data storage. Apart from that, this approach helps develop students' digital skills, which are necessary for the era of society 5.0. With the adoption of paperless lectures, a learning environment that is more environmentally friendly and innovative and supports the achievement of the SDGs can be created, especially regarding the quality of education and sustainable resource management (Uralovich et al., 2023). The paperless learning strategy

utilizes digital technology to replace conventional learning media, enabling faster access to information, easier collaboration, and safer data storage. Apart from that, this approach helps develop students' digital skills, which are necessary in the era of society 5.0. With the adoption of paperless lectures, a learning environment that is more environmentally friendly and innovative and supports the achievement of the SDGs can be created, especially regarding the quality of education and sustainable resource management. At Tulungagung University, implementing this strategy contributes to environmental preservation by reducing paper use and supports a more effective and efficient educational transformation. Some paperless learning strategies are: (1) Digitalization of teaching materials, (2) Use of E-Learning applications, (3) Interactive and Collaborative, (4) Creative Content Development, and (5) Socialization and Training.

The benefit of paperless learning is that it can help reduce costs, whereas by adopting a paperless learning strategy, institutions can save on expensive paper, photocopying, and storage of physical documents. Increasing sustainability, paperless learning supports sustainable development goals by reducing environmental impacts and increasing resource use efficiency. Ease of access: Digital learning materials can be easily accessed by students from anywhere and at any time, increasing their flexibility and engagement. Finally, regarding process efficiency, this strategy cuts the time and effort required to manage, distribute, and check academic assignments (Nisa Amalia Putri, 2024).

### **SDGs and Era Society 5.0**

Society 5.0 is a society that uses digital technology to improve the quality of life and achieve more equitable and sustainable social progress. Society 5.0 is a refinement of society 4.0, where technology becomes a part of humans to share information and help them live their daily lives. Society 5.0 emphasizes integrity, convenience, and speed and makes human life practical and optimistic so that technology does not dominate humans, but rather humans get a better and more comfortable quality of life (Lubis, 2023). Therefore, facing the challenges of the society 5.0 era, such as higher digital skills, high creativity, communication skills, technology development ethics, and digital literacy. Students are expected to be able to adapt by participating in implementing digital innovations that are beneficial for improving the quality of education, individual development, and sustainable development.

Indonesia must be ready to face challenges while taking advantage of the opportunities of the Society 5.0 era, which is filled with advanced technological advances, if it wants to continue to achieve the country's goals and aspirations, namely to make people's lives smarter. Two important components, education, and culture, determine where the nation will go. Education improves the intellectual abilities of the nation's children, while culture improves "soft skill" abilities. This second combination allows the formation of superior individuals ready to live in a society in the Society 5.0 era (Suherman & Firmansyah, 2024).

Sustainable Development Goals (SDGs) are a set of global goals agreed by the UN to create a better and more sustainable world by 2030. SDGs include 17 goals: eliminating poverty, quality education, and climate action. The 17 sustainable development goals came



into force in January 2016, and over the next fifteen years, these goals will drive international development work. The fourth goal of this agenda is quality education, which emphasizes quality education, ensuring equitable and inclusive education, and encouraging opportunities for lifelong learning. This agenda focuses on a fundamental shift in thinking and recognizes the dynamic relationship between the three elements, namely environmental, social, and economic, that drive integrated global development (Maryanti et al., 2022).

The success of paperless learning in achieving SDGs can be measured by (1) Measuring digital skills; paperless learning strategies allow students to use digital technology in the learning process. In measuring success, paying attention to students' abilities in using digital technology and how it can help them is necessary. (2) paperless learning strategies can enable students to think critically and creatively during the learning process by measuring critical and creative abilities. In measuring success, it is necessary to pay attention to how students can think critically and creatively in solving problems and adapting to changes in the era of society 5.0. (3) To measure cooperation skills, in this case, it is necessary to pay attention to how students can work together and share information. (4) Measuring adaptability, paperless learning strategies can enable students to adapt to changes in the era of society 5.0. Considering how students can adapt to change and think critically when solving problems is necessary. (5) Measuring social impact, paperless learning can make students play an active role in social life and positively impact society. Considering how students can play an active role and provide a positive social impact is necessary (Chankseliani & McCowan, 2021).

### **Impact of Paperless Lecture Learning**

The role of technology in this paperless learning strategy is more effective. With technology, students can learn using learning materials provided in digital formats such as PDFs, e-books, and online presentations. This can reduce the need to print teaching materials physically. Students can also submit their assignments and projects online through e-learning platforms. This eliminates the need to submit hardcopy. A cloud-based collaboration platform can also facilitate collaboration between lecturers and students in learning without distance constraints. In addition, providing digital feedback from lecturers to students and providing digital assessments allows for a more interactive and efficient learning process (Suherman & Firmansyah, 2024).

The positive impact of this innovation is, firstly, achieving the SDG 12 goal, which focuses on reducing waste and using natural resources sustainably because by reducing the use of paper, Tulungagung University can reduce negative impacts on the environment—second, increasing learning efficiency in lectures so that it can help SDGs 4 goals which focus on quality and accessible education for all (Crespo et al., 2017). This can also improve students' abilities to face the challenges of the 5.0 era of society. Third, paperless learning can help improve the ability of lecturers and students to use digital technology so that it can help achieve SDG 9 goals, which focus on infrastructure and technology industries. Fourth, there is an increase in student awareness and participation in achieving SDG 17, which focuses on global cooperation and participation to achieve sustainable development goals.

Fifth, character and literacy development can be done with paperless learning to improve critical thinking patterns and communicate effectively. This helps achieve SDG 4 goals, focusing on quality and accessible education for all.

**Table 1.** Comparison of Paperless Learning and Paper Learning

Learning With Paper	Paperless Learning
1. Classic and traditional feel	More efficient
2. Rich sensory experience	Instant access to information
3. Ease of focus and understanding	Digital collaboration and cost savings
4. Paper production has a significant negative impact on the environment. It requires massive tree felling, reducing forest availability, and increasing carbon emissions.	Digitizing academic content and documents can reduce negative environmental impacts. It can drastically reduce paper consumption, preserve natural resources, and reduce the carbon footprint.
5.	Access anywhere
6.	High portability
7.	Instant sync
8.	Facilitate collaboration between students and lecturers.
9.	Increase productivity
10.	Better quality of work

Every innovation definitely has its challenges in its implementation. The first challenge in implementing the paperless learning strategy is related to the completeness of technological infrastructure in each region, whether in cities, districts, or 3T areas, which must ensure the availability and readiness of adequate technological infrastructure, such as internet networks, electronic devices, and learning management systems. Second, changes in learning culture, the transition from conventional learning to paperless learning, require changes in the learning culture of both students and lecturers, which can be a challenge in implementation. Third, student digital literacy still needs to improve students' digital abilities and skills to adapt well to a technology-based learning environment.

## CONCLUSION

The paperless learning strategy is an effective innovation and solves the problems of education, digital skills, and forest deforestation. However, this will only work well if it receives support from various parties, such as the role of youth organizations, local government, and volunteer activities in developing students' skills to contribute actively. The results of this research can increase student digital literacy, develop student digital skills,



improve the efficiency of learning time, improve educator performance, make wise use of technology, and reduce the felling of trees as the main material for making paper.

## REFERENCES

- Agung, F. C. W. (2024). Pemantapan Literasi Digital Oleh Pendidik Dan Peserta Didik Dalam Menghadapi Era Society 5.0. *Revorma: Jurnal Pendidikan Dan Pemikiran*, 4(1), 23–31. <https://doi.org/10.62825/Revorma.V4i1.103>
- Chankseliani, M., & Mccowan, T. (2021). Higher Education And The Sustainable Development Goals. *Higher Education*, 81(1), 1–8. <https://doi.org/10.1007/S10734-020-00652-W>
- Crespo, B., Míguez-Álvarez, C., Arce, M. E., Cuevas, M., & Míguez, J. L. (2017). The Sustainable Development Goals: An Experience On Higher Education. *Sustainability*, 9(8), 1353. <https://doi.org/10.3390/Su9081353>
- Fitriyadi, M. Y., Rahman, M. R., Azmi, M. R., Ilham, M. A., Aibina, O. I., Hesda, N., & Al, F. (2023). PENGARUH DUNIA IT TERHADAP PERILAKU REMAJA GENERASI Z. 1.
- Irfan, Achmad Mengenal Pohon Akasia, Bahan Baku Pembuatan Kertas, *Kompasiana*, 14 Oktober 2022.
- Jainuddin, N. (2023). Dampak Deforestasi Terhadap Keanekaragaman Hayati Dan Ekosistem.
- Lubis, D. S. W. (2023). Tantangan Dan Peran Sumber Daya Manusia Dalam Menghadapi Era Society 5.0. 5(1).
- Maryanti, R., Rahayu, N. I., Muktiarni, M., Husaeni, D. F. A., Hufad, A., Sunardi, S., & Nandiyanto, A. B. D. (2023). Sustainable Development Goals (Sdgs) In Science Education: Definition, Literature Review, And Bibliometric Analysis. 6.
- Meigtaria Sanita, Menyiapkan Diri Menghadapi Era Society 5.0, *Universitas Islam Indonesia*, 20 September 2023.
- Nisa Amalia Putri, Era Society 5.0: Manfaatnya Untuk Mendukung Kehidupan Manusia, *Telkom University*, 18 Januari 2024.
- Pingking, A., & Hussin, R. (2023). Cabaran Pemuliharaan Hutan Melalui Pendekatan Penglibatan Komuniti Dan Pihak Berkepentingan Di Malaysia Dan Indonesia: Tinjauan Literatur. *Journal Of Borneo Social Transformation Studies*, 9(1), 1–17. <https://doi.org/10.51200/Jobsts.V9i1.4754>
- Santoso, R., Ratnawati, H., & Riyanti, D. (2022). Klusterisasi Tingkat Deforestasi: Ekologi Kewarganegaraan Indonesia.
- Satria Ardhi, Kementerian Lingkungan Hidup Dan Kehutanan Ungkap Rumitnya Masalah Hutan Indonesia, *Universitas Gadjah Mada*, 6 Oktober 2023.
- Sepriyanti, N. (2023). Penelitian Kualitatif.
- Suherman, A., & Firmansyah, Y. (2024). Manajemen Sumber Daya Manusia Yang Efektif Dan Efisien Dalam Pendidikan Di Era 5.0.
- Uralovich, K. S., Toshmamatovich, T. U., Farkhodjon, K., Sapaev, I. B., Saylaubaevna, S. S., & Beknazarova, Z. F. (N.D.). A Primary Factor In Sustainable Development And Environmental Sustainability Is Environmental Education.
- Veidemane, A. (2022). Education For Sustainable Development In Higher Education Rankings: Challenges And Opportunities For Developing Internationally Comparable Indicators. *Sustainability*, 14(9), 5102. <https://doi.org/10.3390/Su14095102>