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## Implementation of the E-Worksheet ‘Our Oxygen (O<sub>2</sub>) Friends’ to Enhance Elementary School Students’ Learning Motivation in the Era of Education 5.0

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### Abstrak

Penelitian ini bertujuan untuk menganalisis implementasi Lembar Kerja Peserta Didik Elektronik (*E-LKPD*) “Sahabat Oksigen (O<sub>2</sub>) Kita” dalam meningkatkan motivasi belajar siswa sekolah dasar di era Pendidikan 5.0. Penelitian ini dilatarbelakangi oleh rendahnya motivasi belajar siswa, khususnya pada mata pelajaran Ilmu Pengetahuan Alam (IPA) yang memuat banyak konsep abstrak sehingga memerlukan media pembelajaran yang inovatif, interaktif, dan kontekstual. Metode penelitian yang digunakan adalah kuasi-eksperimen dengan desain *One Group Pretest–Posttest*, melibatkan 27 siswa kelas V MI Muhammadiyah 1 Probolinggo. Instrumen penelitian berupa lembar refleksi berbasis indikator motivasi menurut Uno, meliputi ketekunan, minat, perhatian, antusiasme, tanggung jawab, dan keterlibatan. Hasil penelitian menunjukkan peningkatan motivasi belajar yang signifikan, dengan skor rata-rata meningkat dari 64,0 menjadi 83,2 (29,9%). Peningkatan tertinggi terdapat pada indikator minat (33,9%) dan antusiasme (33,8%). Temuan ini menegaskan bahwa *E-LKPD* mampu menciptakan pengalaman belajar yang lebih menarik dan menyenangkan sekaligus menumbuhkan kesadaran ekologi sejak dini. Oleh karena itu, *E-LKPD* Sahabat O<sub>2</sub> dapat dijadikan media pembelajaran inovatif yang relevan dengan tuntutan pendidikan abad ke-21.

Kata Kunci: E-LKPD, Motivasi Belajar, konten IPA, Pendidikan 5.0

### Abstract

This study aims to examine the implementation of the Electronic Student Worksheet (*E-LKPD*) “*Our Oxygen (O<sub>2</sub>) Friends*” as a tool to enhance elementary students’ learning motivation in the context of Education 5.0. The research was motivated by the low learning motivation observed among students, particularly in the Natural Science (IPA) subject, which involves numerous abstract concepts requiring innovative, interactive, and contextual learning media. A quasi-experimental design with a *One*

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### Kata kunci:

E-LKPD,  
Motivasi belajar, Oksigen,  
IPA, Pendidikan 5.0

### Keywords:

E-LKPD,  
Learning motivation,  
Oxygen, science, Education  
5.0

Group Pretest–Posttest approach was employed, involving 27 fifth-grade students at MI Muhammadiyah 1 Probolinggo. The research instrument consisted of a reflection sheet based on Uno’s learning motivation indicators, including persistence, interest, attention, enthusiasm, responsibility, and engagement. The findings revealed a substantial improvement in students’ learning motivation, with the mean score increasing from 64.0 to 83.2, representing a 29.9% gain. The most notable improvements were observed in the indicators of interest (33.9%) and enthusiasm (33.8%). These results indicate that the E-LKPD provides a more engaging and enjoyable learning experience while simultaneously fostering early ecological awareness. Consequently, the *Our Oxygen (O<sub>2</sub>) Friends* E-LKPD can be considered an innovative and effective learning medium that aligns with the objectives of 21st-century education.

Key word: E-LKPD, Learning Motivation, Science content, Education 5.0.

## Introduction

The rapid development of digital technology has influenced almost all aspects of human life, including education. This transformation is increasingly evident with the emergence of Society 5.0, where technology is not only utilized for efficiency but also integrated with human values to support sustainable living (Lestyaningrum, Trisiana, A, Pratama, & Wahana, 2022). In the educational context, the 5.0 era demands a more innovative, interactive, and student-centered learning system. Students are expected to become adaptive, creative, critical thinkers who can leverage digital technology in the learning process. This presents a new challenge for teachers to design contextual, engaging, and relevant learning experiences (Haqqi & Wijayati, 2019).

However, the reality shows that elementary students’ learning motivation in Indonesia remains relatively low, particularly in Natural Science (IPA) subjects, which contain many abstract concepts ("EFEKTIVITAS MODEL PEMBELAJARAN INKUIRI UNTUK, n.d.) Topics such as the role of green plants in producing oxygen are often understood only theoretically, without meaningful and concrete learning experiences. This situation results in low interest, limited active participation, and reduced learning achievement. In fact, learning motivation is a key determinant of learning success. Highly motivated students tend to be more active, diligent, and enthusiastic in learning compared to those with low motivation (*Tanjung A, n.d.*)

One innovation that can address this issue is the use of the Electronic Student Worksheet (E-LKPD). E-LKPD is a digital version of conventional worksheets that leverages technology to provide interactive, flexible, and easily accessible learning media. Anjarwati, et al., (2021) E-LKPD can be easily accessed by students via Smartphone, Laptop and computer According to (Mustari, 2023) multimedia consisting of text, images, graphics, videos, animations, audio, and interactivity can provide a richer and more engaging learning experience, thereby supporting students' understanding of lesson materials. Furthermore, "the role of multimedia is one of the most reliable media in the learning process, as it contains more complex elements than conventional learning media" (Firma Kholifahtus & Aguk Wardoyo, n.d.)

One form of this innovation is the E-LKPD 'Our Oxygen (O<sub>2</sub>) Friends.' This E-LKPD focuses on the theme of oxygen as a vital element produced by green plants through photosynthesis. Through this E-LKPD, students not only read or listen to teacher explanations but also actively participate in interactive digital learning activities. As a result, students can understand the essential role of plants in daily life in a more contextual manner. This aligns with the findings of Cris Smaramanik Dwiqi et al (2020), which indicate that multimedia in the learning process can create an interactive, effective, efficient, and enjoyable learning environment, thereby enhancing students' learning motivation.

The urgency of this research lies in the importance of enhancing students' learning motivation through learning media that are relevant to current technological developments. While previous studies have largely focused on the development of general multimedia or digital worksheets, this study is distinctive in integrating environmental content—specifically oxygen as a vital element of life—into an interactive E-LKPD. Thus, the implementation of the E-LKPD 'Our Oxygen (O<sub>2</sub>) Friends' is expected not only to improve students' learning motivation but also to foster early ecological awareness.

Based on the above rationale, this study aims to analyze the implementation of the E-LKPD 'Our Oxygen (O<sub>2</sub>) Friends' to enhance elementary students' learning motivation in the era of Education 5.0. This research is expected to contribute to the development of technology-based learning media relevant to 21st-century educational needs while supporting the achievement of national education goals.

## Method

This study employed a quasi-experimental method with a One Group Pretest–Posttest design (Campbell & Stanley, 1963). The research subjects consisted of 27 fifth-grade students at MI Muhammadiyah 1 Probolinggo. The research instrument was a student reflection sheet based on (Uno, 2019) learning motivation indicators, including persistence, interest, attention, enthusiasm, responsibility, and engagement in learning. The research procedure was conducted in three stages: pretest, implementation of learning using the E-LKPD ‘Our Oxygen (O<sub>2</sub>) Friends,’ and posttest with reflection completion. Data were analyzed using descriptive statistics (Arikunto, 2019) to illustrate changes in learning motivation, supported by qualitative data from students’ reflections.

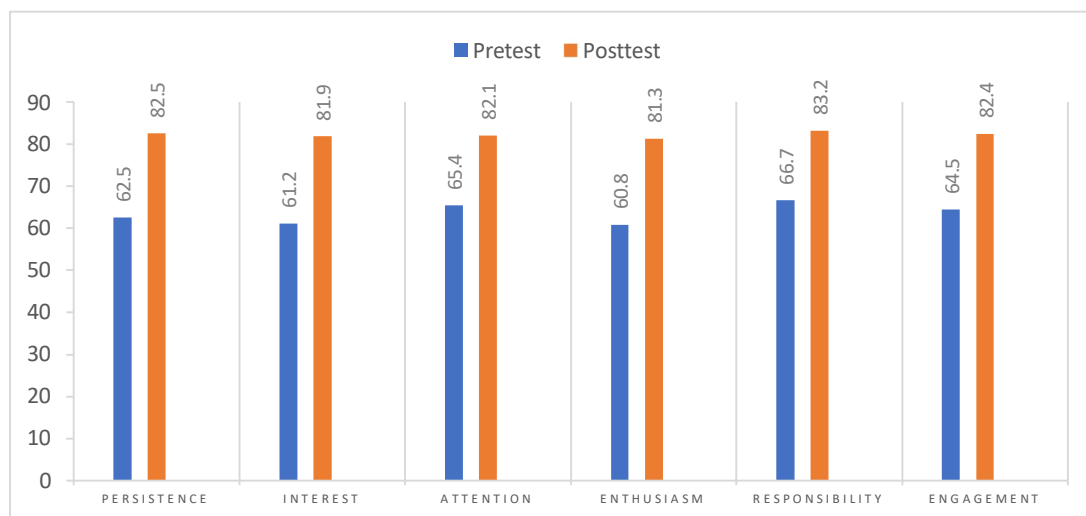
## Results and Discussion

This study aimed to examine the improvement of students’ learning motivation after implementing the E-LKPD “Our Oxygen (O<sub>2</sub>) Friends.” Learning motivation data were obtained from students’ reflection sheets based on (Uno, 2019) learning motivation indicators: persistence, interest, attention, enthusiasm, responsibility, and engagement.

**Table 1**  
**Improvement of Students’ Learning Motivation**

Motivation Indicator	Pretest Score	Posttest Score	Improvement (%)
Persistence	62.5	82.1	31.4
Interest	61.2	81.9	33.9
Attention	65.4	82.1	25.6
Enthusiasm	60.8	81.3	33.8
Responsibility	66.7	83.2	24.7
Engagement	64.5	82.4	27.8
Average	64.0	83.2	29.9

The data in Table 1 show that all learning motivation indicators increased after the learning process using the E-LKPD. The average score rose from 64.0 (medium category) to 83.2 (high category), with an average improvement of 29.9%. The highest increases were observed in the indicators of interest (33.9%) and enthusiasm (33.8%), while the lowest improvement was in responsibility (24.7%).



**Figure 1.** Comparison of Pretest and Posttest Learning Motivation Scores

The figure above illustrates that all motivation indicators experienced a significant increase. This indicates that the implementation of interactive digital media such as the E-LKPD can encourage students to be more interested, enthusiastic, and engaged in the learning process. These findings align with (Mustari, 2023) who emphasized that multimedia combining text, images, audio, and animation can create a more engaging and meaningful learning experience.

In addition to the quantitative data, students' reflections also showed positive responses to the learning activities. Most students reported that the E-LKPD made photosynthesis material easier to understand, made learning activities more enjoyable, and fostered a sense of responsibility to complete tasks. Thus, students' learning motivation improved not only in the cognitive domain but also in the affective and psychomotor domains.

Overall, these findings address the research problem by showing how students' learning motivation can increase through digital learning and reinforce the theory that technology-based

innovations can support contextual learning in the Education 5.0 era. Furthermore, this study provides a novel contribution by presenting an oxygen-themed E-LKPD that not only enhances learning motivation but also instills early ecological awareness.

## Conclusion

This study demonstrates that the implementation of the E-LKPD “Our Oxygen (O<sub>2</sub>) Friends” can significantly improve elementary students’ learning motivation. This is evidenced by the average motivation score increasing from 64.0 (medium category) to 83.2 (high category), with an average improvement of 29.9%. The highest improvements were observed in the indicators of interest and enthusiasm, showing that the E-LKPD successfully creates a more engaging, enjoyable learning experience while promoting active student involvement.

The novelty of this study lies in the development of an E-LKPD based on oxygen content as part of ecological awareness, so that, in addition to improving learning motivation, it also nurtures environmental concern from an early age. Therefore, the E-LKPD “Our Oxygen (O<sub>2</sub>) Friends” can serve as an innovative alternative learning medium in the Education 5.0 era. For future research, it is recommended that the E-LKPD be developed with automatic evaluation features and more varied multimedia integration to further strengthen students’ 21st-century skills.

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