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Implementing a contextual pedagogical approach in junior high school science education

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ABSTRACT
Background: Science education at the junior high school level often faces challenges in enhancing student engagement and understanding of scientific concepts. A contextual pedagogical approach, which connects the subject matter to students' everyday experiences, is believed to improve the effectiveness of learning.
Aim: This study aims to implement a contextual pedagogical approach in science education and examine its impact on student learning activities, academic achievement, and student responses in a junior high school setting.
Method: This research employed a classroom action research method conducted in two cycles, each consisting of planning, action, observation, and reflection. The participants were eighth-grade students at a junior high school. Data were collected through activity observation sheets, learning outcome tests, and student response questionnaires. The data were analyzed using descriptive quantitative methods.
Results: The findings indicated a significant increase in student learning activity, from an average of 66.2% in the first cycle to 85% in the second cycle. The average post-test score improved from 73.2 to 80.2, with the mastery level increasing from 46.7% to 83.3%. Student responses were also positive, with 90% reporting that the lessons were more engaging and 86% feeling more confident in group discussions.
Conclusion: The contextual pedagogical approach proved effective in enhancing student engagement and comprehension in science learning. It is recommended that teachers consistently implement this approach to foster meaningful and relevant learning experiences for students.

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Introduction

Education in the 21st century demands a more complex teaching paradigm, one that extends beyond the mastery of academic content. Modern instruction must incorporate the development of critical thinking, communication, collaboration, and creativity into the teaching and learning process. In the context of science education, this approach is particularly vital, as science has the potential to foster scientific thinking and enhance students' environmental awareness. A major challenge in science learning across many schools lies in the use of instructional models that are often monotonous and overly theoretical. This can lead to a sense of disconnection among students from real-life contexts, thereby increasing the difficulty in understanding scientific concepts being taught (Sukiastini et al., 2024).

The relevance between subject matter and students' real-world experiences presents a significant challenge. Teachers often deliver information in a textual and abstract manner, making it difficult for students to relate the learning content to their everyday lives. When students fail to see these connections, their interest and motivation in learning can decline substantially. Non-contextual learning leads to low student engagement in the learning process (Saharuddin & Wahab, 2019; Widia et al., 2023). Therefore, there is an urgent need to develop instructional approaches that are more relevant and meaningful for students, enabling them to connect scientific theories with their daily experiences.

One widely discussed solution is the implementation of a contextual pedagogical approach, known as Contextual Teaching and Learning (CTL). This approach emphasizes the importance of students connecting the subject matter with their personal experiences. As explained by Susanto et al., CTL can create a more active and relevant learning environment, in which students are not merely recipients of

information but active participants in constructing their own knowledge (Susanto et al., 2024). This aligns with the principles of constructivist theory, which posits that learning is an active process of constructing meaning from experience (Nurhasanah, 2023). The CTL model holds strong potential for reinforcing the scientific thinking skills essential in science education.

Based on the existing literature, there are seven key components in the CTL approach that must be implemented: constructivism, questioning, inquiry, learning community, modeling, reflection, and authentic assessment. Each of these components serves to build a learning framework that is not only theoretically understandable for students but also applicable to real-life contexts. Contextual learning methods enable students to go beyond merely learning about pollution and environmental issues in theory—they also provide opportunities for direct observation and analysis in the field. This approach offers students a deeper and more meaningful learning experience (Irman et al., 2023; Susanto et al., 2024).

Practical implementations of the CTL approach in both primary and secondary schools have demonstrated improved conceptual understanding and the potential to enhance overall learning outcomes. Research indicates that when students are actively engaged in the learning process and are encouraged to ask questions and participate in discussions, their comprehension of the subject matter significantly increases. For instance, field observation activities allow students to directly witness environmental issues such as river pollution in their local surroundings. Students engage in deeper and more enjoyable learning, while also participating in environmentally based projects that generate positive impacts.

Despite the many advantages of implementing the CTL approach, several challenges arise in its practical application. Many educators, accustomed to traditional teaching methods, struggle to design and implement contextual learning activities. For example, limited time for lesson planning, inadequate infrastructure and laboratory facilities, as well as insufficient institutional support, present significant barriers to effective implementation (Astiti, 2023; Saharuddin & Wahab, 2019). In other words, although the contextual approach is highly necessary, its execution is often hindered by various external factors. It is essential to conduct empirical studies on the implementation of the CTL approach in science education to identify effective strategies and the challenges faced by teachers in the field (Othman et al., 2023; Susanto et al., 2024). Such research will not only provide insights into current practices but also evaluate their impact on enhancing student engagement and understanding. Therefore, the findings of this study are expected to serve as a valuable reference for other educators in designing more relevant and meaningful learning processes (Hakiki et al., 2025).

The primary focus of this study is to describe the processes that teachers must undertake in implementing the contextual approach, examine students' responses to this more active and interactive learning model, and assess improvements in engagement and conceptual understanding as indicators of instructional effectiveness. This approach is expected not only to foster student interest and motivation but also to enhance the overall quality of science education in schools. Ultimately, through more contextualized learning experiences, it is anticipated that future generations will become more sensitive to environmental issues and capable of thinking critically and creatively in addressing real-world challenges.

Given the importance of integrating a contextual pedagogical approach into teaching, it is essential for teachers to receive adequate training to fully understand this concept and how to implement it effectively. Such training is crucial to address the limitations in teachers' knowledge and to help them adapt their instructional methods to better meet the needs of today's students. Teachers should be encouraged to update their teaching materials and engage in pedagogical innovations in order to enhance the overall quality of education (Astiti, 2023; Mohamad et al., 2019). In this way, science education can serve not only as a means to achieve academic competence, but also as a vehicle for shaping students' proactive attitudes and behaviors toward environmental and social issues in their communities.

The demand for the development of contextual learning must also be supported by school and government policies that aim to enhance adequate infrastructure and facilities to ensure effective teaching and learning processes. For instance, the provision of laboratories that align with current advancements in science and technology would enable teachers to conduct experiments and practical activities more effectively. Furthermore, a flexible curriculum that supports the CTL approach can greatly assist teachers in implementing innovative and relevant instructional strategies (Nurhasanah, 2023)

Ultimately, in this era of globalization, it is imperative to prioritize education and strive to develop a system that is not only academically rigorous but also relevant to the real-world conditions and challenges faced by students. Accordingly, science education supported by a contextual pedagogical approach is expected to have a significant positive impact on shaping a generation that is both knowledgeable and environmentally conscious. Today's schools must equip students with skills and knowledge that are not only foundational but also comprehensive, preparing them to meet the challenges of the future with confidence and competence (Irman et al., 2023; Sukiastini et al., 2024)

Method

This study employed a Classroom Action Research (CAR) approach using the Kemmis and McTaggart model, which consists of four stages: planning, action, observation, and reflection. This approach was selected because it enables teachers to directly improve the learning process in the classroom through concrete actions and continuous evaluation. The study was conducted in two cycles, each comprising one meeting lasting 2 × 40 minutes.

The participants were 30 eighth-grade students from class VIII-B at SMP Negeri 5 Batanghari Nuban Satap during the 2024/2025 academic year. The research was carried out over a two-month period, from February to March 2025. Instruments used to collect data included: (1) student activity observation sheets to assess engagement during the learning process, (2) pretest and posttest to measure students' understanding of science concepts before and after the intervention, (3) student response questionnaires regarding the implementation of the contextual approach, and (4) teacher field notes to document key findings and reflections on the learning process.

The implementation of the intervention in this study was based on the seven core components of the contextual pedagogical approach: constructivism, questioning, inquiry, learning community, modeling, reflection, and authentic assessment. The teacher began the lesson by engaging students in direct observation of their school environment, focusing on issues such as waste and pollution. Students then analyzed their findings in groups, discussed their observations, and drew conclusions. The teacher facilitated the process by providing examples, prompting critical questions, and encouraging reflection. After the lesson, the teacher observed and recorded students' engagement and conducted a reflection to plan improvements for the next cycle.

Results

This study aimed to implement a contextual pedagogical approach in science instruction at the junior high school level. The research was conducted in two cycles using a classroom action research approach. Data were collected through student activity observations, learning achievement tests (pretest and posttest), and student response questionnaires regarding the learning process.

Cycle I

In the first cycle, the initial implementation of the contextual pedagogical approach involved environmental observation activities as a stimulus for learning. Student engagement during the learning process was generally active, although variations in participation levels among students were observed. Observation results indicated that the average level of student engagement reached 66.2%, which falls into the moderate category. In terms of learning outcomes, the average pretest score was 61.5, reflecting relatively low initial understanding of the subject matter. Following the contextual learning intervention,

the average posttest score increased to 73.2. However, the percentage of students achieving the minimum passing grade was only 46.7%, indicating that the majority had not yet met the expected competency level.

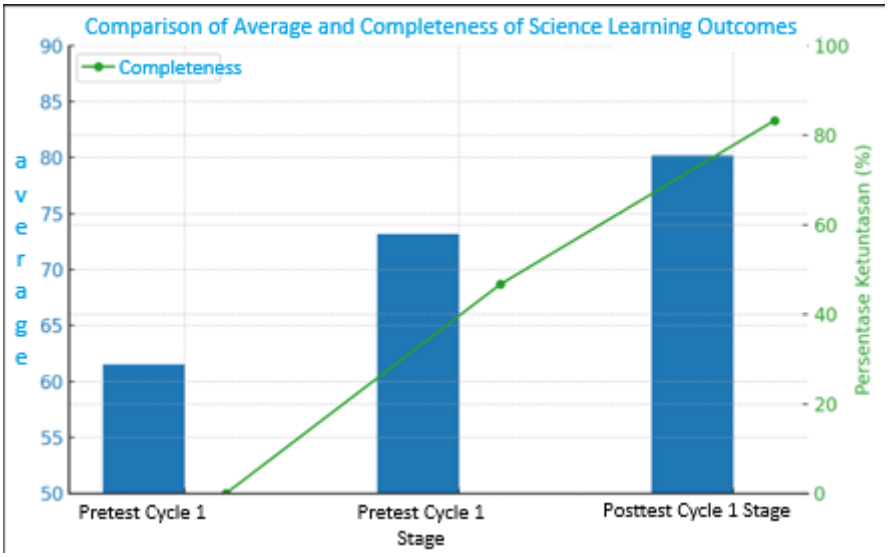

Figure 1. illustrates the improvement in learning outcomes from the pretest to the posttest in Cycle I

Students' responses to the learning process indicated interest in exploration and discussion activities; however, many still expressed confusion regarding group work instructions and the contextual problems presented. This served as the basis for planning improvements in the subsequent cycle.

Cycle II

In the second cycle, several improvements were made based on reflections from the first cycle. The teacher incorporated context-based instructional videos, provided clearer written guidelines for group discussions, and presented concrete examples of how science concepts apply to everyday life. As a result, student engagement increased significantly, with the average level of participation reaching 85%. The average posttest score also rose to 80.2, indicating a substantial improvement in students' understanding of the material. The learning mastery rate sharply increased to 83.3%, indicating that the majority of students had met or exceeded the minimum competency standards.

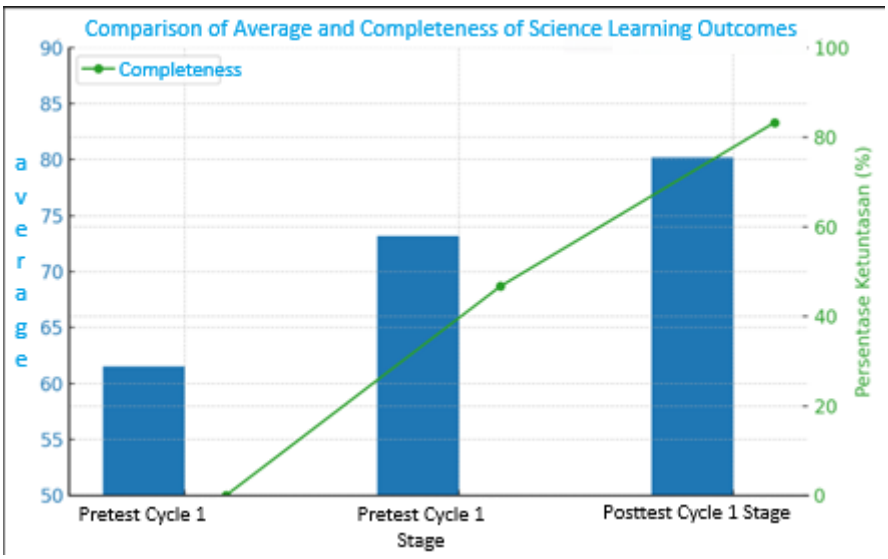

Figure 2. Comparison of students' learning outcomes between Cycle I and Cycle II

Student responses from the questionnaire indicated that 90% found the learning process more enjoyable and easier to understand. Additionally, 86% reported feeling more confident in expressing their opinions and actively participating in group discussions. These findings suggest that the contextual pedagogical approach can enhance motivation, conceptual understanding, and active student engagement in science learning.

Discussion

The implementation of the contextual pedagogical approach in science instruction at the junior high school level demonstrated a significant impact on students' learning outcomes. The findings indicate that teaching based on real-life contexts can facilitate deeper understanding and enhance student motivation. Contextual approaches, derived from a variety of instructional strategies relevant to students' daily lives, actively engage learners and help them connect theoretical concepts with real-world applications (Amin, 2021; Susanto et al., 2024). Students tend to grasp science concepts more effectively when they can see and experience the relevance of the content in their own lives (Romadhona et al., 2023; Syafani & Tressyalina, 2023). Contextual learning not only encourages active participation but also stimulates understanding grounded in direct experience (Nurhasanah, 2023).

The results from the first cycle revealed that although there was an increase in the average posttest scores, the overall mastery of learning outcomes remained low. This highlights the importance of proper guidance and consistency in applying the contextual approach to ensure that students are fully engaged and able to comprehend the instructional content. During the initial phase of implementation, students often struggled to adapt due to their prior exposure to conventional, more passive teaching methods (Susanto et al., 2024).

Following revisions in the second cycle, more substantial improvements were observed in both average scores and the percentage of students achieving mastery. The use of video-based instruction, real-life examples, and guided group discussions reinforced active and collaborative learning processes (Amin, 2021; Priyambudi, 2024). Observations over the two cycles showed that student engagement increased from 66.2% to 85%, indicating a significant shift in participation and motivation. An interactive and contextual learning environment was found to effectively foster higher levels of student involvement (Faiz & Purwati, 2023).

From a constructivist perspective, the success of learning is determined not only by cognitive outcomes but also by students' attitudes and social abilities in collaboration and problem-solving (Muti'ah et al., 2023). Teachers' strategies in designing relevant learning experiences such as environmental observation and problem-based discussions support Vygotsky's theory, which emphasizes the importance of social interaction and environmental context in knowledge construction (Muntamah et al., 2023; Wicaksono et al., 2020). By linking learning materials to familiar realities, students are able to construct more robust and scientifically grounded concepts.

Students' responses to the implementation of the contextual approach, as reflected in the questionnaire results, revealed that the majority found the lessons more enjoyable and easier to understand (Susanto et al., 2024; Syafani & Tressyalina, 2023). This suggests that the contextual approach is effective not only in improving learning outcomes, but also in fostering 21st-century skills such as collaboration, problem-solving, and critical thinking (Muttaqiin, 2023). These findings are supported by prior studies emphasizing the benefits of learning methods that are relevant to students' daily lives.

This success calls for more deliberate planning and refinement of the contextual approach to ensure the delivery of high-quality education. Future research should further explore the application of contextual pedagogy across different teaching contexts and assess its effectiveness in light of ongoing changes. Adaptive and responsive approaches, along with adequate instructional media, are essential not only to improve learning outcomes but also to enhance the overall quality of education (Sarbani et al., 2024).

Thus, the implementation of contextual pedagogy has demonstrated meaningful outcomes in transforming the learning process of junior high school students. Through appropriate strategies and supportive learning environments, students are not only taught to understand subject matter but also to apply their knowledge in realistic contexts, an essential aspect of effective education (Fajri & Wantika, 2022). The observed improvements in learning outcomes, motivation, and student engagement are key indicators of the quality of this approach and support its broader application across all levels of education (Usman et al., 2023). Finally, continuous research is essential for the further development of contextual pedagogical approaches in Indonesia. The findings of this study should serve as a foundation for best practices and for shaping educational policies that are more responsive to students' needs and societal expectations (Gitakarma & Tjahyanti, 2012; Julia et al., 2024).

Conclusion

The contextual pedagogical approach has proven effective in improving student learning outcomes and engagement in science education at the junior high school level. Over the course of two action research cycles, the average student score increased significantly from 61.5 (pretest) to 80.2 (posttest in Cycle II), with learning mastery rising from 46.7% to 83.3%. In addition to cognitive gains, students also demonstrated greater enthusiasm and active participation. This approach is highly recommended for broader implementation, as it successfully connects instructional content to students' real-life experiences, making learning more meaningful and contextual.

Author Contributions Statement

Alfian Erprabowo was responsible for the research design, instrument development, data analysis, and initial drafting of the manuscript. Eko Edi Sudjarwo contributed to data collection, literature review, validation of findings, and substantial revisions of the manuscript. Both authors have read and approved the final version submitted for publication.

References

Amin, N. (2021). Efektivitas Pembelajaran Inovatif Dengan Pendekatan Kontekstual Pada Mata Pelajaran Ilmu Pengetahuan Alam Terpadu Siswa MtsS Manongkoki Kabupaten Takalar. *Didaktika Jurnal Kependidikan*, *11*(3), 153–160. https://doi.org/10.58230/27454312.159

Astiti, K. A. (2023). Workshop Praktikum Bagi Guru IPA Di Kecamatan Nekamese. *Jurnal Pengabdian Kepada Masyarakat Nusantara*, *4*(3), 1978–1985. https://doi.org/10.55338/jpkmn.v4i3.1266

Faiz, A., & Purwati, P. (2023). Penerapan Pendekatan Konstruktivisme Dalam Metode Cerita Dilema Moral. *Jurnal Elementaria Edukasia*, *6*(3), 1358–1367. https://doi.org/10.31949/jee.v6i3.6000

Fajri, B. L., & Wantika, R. R. (2022). Pengaruh Model Pembelajaran Generatif Terhadap Hasil Belajar Siswa Kelas X SMA Negeri 1 Driyorejo. *Journal of Mathematics Education and Science*, *5*(2), 117–120. https://doi.org/10.32665/james.v5i2.505

Gitakarma, M. S., & Tjahyanti, L. P. A. S. (2012). Modifikasi Claroline Dengan Metode Pembelajaran Computer-Supported Collaborative Learning (CSCL) Berbasis Konstruktivisme. *Jurnal Nasional Pendidikan Teknik Informatika (Janapati)*, *1*(1), 37. https://doi.org/10.23887/janapati.v1i1.9764

Hakiki, A. F., Livana, A., Selvianti, I., & Febrianti, S. M. (2025). Kesulitan Mahasiswa pada Kalkulus Diferensial dengan Meningkatkan Kemampuan Berpikir Kritis. *Jurnal Pendidikan Matematika*, *2*(2).

Irman, M., Budiarti, I., & Kusdianto, K. (2023). Pengembangan Bahan Ajar IPA Pada Materi Perpindahan Kalor Terintegrasi Kearifan Lokal Bakar Batu Papua Untuk Meningkatkan Hasil Belajar Peserta Didik Kelas v SD. *Kalam Cendekia Jurnal Ilmiah Kependidikan*, *11*(3).

https://doi.org/10.20961/jkc.v11i3.82417

Julia, M. A., Fitriani, N., & Setiawan, R. (2024). *Proses Pembelajaran Konstruktivisme Yang Bersifat Generatif Di Sekolah Dasar*. *1*(3), 7. https://doi.org/10.47134/pgsd.v1i3.519

Mohamad, N., Ahmad, J., & Osman, K. (2019). Latihan Dalam Perkhidmatan Sebagai Medium Untuk Meningkatkan Tahap Tingkah Laku Kemahiran Berfikir Aras Tinggi Dalam Kalangan Guru Sains (In-House Training as a Medium to Enhance Science Teachers' Behaviour of the Higher Order Thinking Skills). *Jurnal Pendidikan Malaysia*, *44*(01SI). https://doi.org/10.17576/jpen-2019-44.01si-03

Muntamah, M., Roshayanti, F., & Hayat, M. S. (2023). Potensi Penerapan Pendekatan STEAM (Science, Technology, Engineering, Art, Mathematics) Pada Pembelajaran Projek IPAS (Ilmu Pengetahuan Alam Dan Sosial) Di SMK. *Jurnal Inovasi Pembelajaran Di Sekolah*, *4*(1), 77–83. https://doi.org/10.51874/jips.v4i1.79

Muti'ah, M., Juwita, R., Syahdatunnisa, A. A., Makmuri, M., & Aziz, T. A. (2023). Pendekatan Konstruktivisme Dan Miskonsepsi: Keterkaitannya Dalam Pembelajaran Matematika. *Jurnal Riset Pembelajaran Matematika Sekolah*, *7*(2), 56–64. https://doi.org/10.21009/jrpms.072.06

Muttaqiin, A. (2023). Pendekatan STEM (Science, Technology, Engineering, Mathematics) Pada Pembelajaran IPA Untuk Melatih Keterampilan Abad 21. *Jurnal Pendidikan Mipa*, *13*(1), 34–45. https://doi.org/10.37630/jpm.v13i1.819

Nurhasanah, F. S. (2023). *Efektivitas Penggunaan Model Pembelajaran Kontruktivisme Terhadap Hasil Belajar Siswa Pada Mata Pelajaran Ipa*. https://doi.org/10.31219/osf.io/2hstj

Othman, N. N., Noor, M. S. A. M., & Ahmad, S. (2023). *The Development of the Sight Word Approach Among Pupils With Down Syndrome*. *1*(1), 82–104. https://doi.org/10.61388/mjar.v1i1.8

Priyambudi, S. (2024). Analisis Pembelajaran Diferensiasi Berbasis Konstruktivisme Di Pendidikan Dasar Dan Menengah: Gaya Kognitif, Self-Efficacy, Motivasi, Dan Self-Regulated Learning. *Jurnal Psikologi Wijaya Putra (Psikowipa)*, *5*(2), 103–112. https://doi.org/10.38156/psikowipa.v5i2.132

Romadhona, A. R., Prameita, A. E. D., Alvianita, M., Adha, E. A. W., & Iffah, J. D. N. (2023). Analisis Teori Belajar Konstruktivisme Dalam Pembelajaran Matematika Di Sma Budi Utomo Perak. *Laplace Jurnal Pendidikan Matematika*, *6*(1), 11–21. https://doi.org/10.31537/laplace.v6i1.1097

Saharuddin, S., & Wahab, M. (2019). Analisis Kesulitan Dalam Pemebelajaran Ipa Di SMP Negeri Limboro. *Jurnal Ipa Terpadu*, *2*(2). https://doi.org/10.35580/ipaterpadu.v2i2.11148

Sarbani, Y. A., Mulyati, H., & Astuti, S. I. (2024). Literasi Digital, Lansia, Dan Konstruktivisme. *Scriptura*, *14*(1), 72–81. https://doi.org/10.9744/scriptura.14.1.72-81

Sukiastini, I. G. A. N. K., Tika, I. N., & Artawan, P. (2024). Literature Review: Integrasi Model Pembelajaran Ipa Dengan Digitalisasi Dan Kearifan Lokal Untuk Menghadapi Tantangan Di Masa Depan. *Science Jurnal Inovasi Pendidikan Matematika Dan Ipa*, *4*(4), 318–327. https://doi.org/10.51878/science.v4i4.3343

Susanto, P. A., Hiltrimartrin, C., & Manulang, L. S. J. (2024). Penerapan Pendekatan Pembelajaran Kontekstual Sebagai Upaya Meningkatkan Hasil Belajar Peserta Didik Kelas 5 SD Pada Mata Pelajaran IPAS. *PTK Jurnal Tindakan Kelas*, *5*(1), 114–124. https://doi.org/10.53624/ptk.v5i1.470

Syafani, S. R., & Tressyalina, T. (2023). Penerapan E-Book Interaktif Berbasis Kearifan Lokal Dalam Pembelajaran Teks Biografi. *Educaniora Journal of Education and Humanities*, *1*(2), 16–22. https://doi.org/10.59687/educaniora.v1i2.27

Usman, A., Dewi, N. K., & Indraswati, D. (2023). Pengembangan Bahan Ajar E-Flipbook Berbantuan Aplikasi Flip PDF Corporate Edition Muatan IPS Kelas IV SDN 48 Cakranegara. *Jurnal Literasi Dan*

Pembelajaran Indonesia, *3*(1), 1–7.

Wicaksono, P. N., Kusuma, I. J., Festiawan, R., Widanita, N., & Anggraeni, D. (2020). Penerapan Pendekatan Saintifik Terhadap Pembelajaran Pendidikan Jasmani Materi Teknik Dasar Passing Sepak Bola. *Jurnal Pendidikan Jasmani Indonesia*, *16*(1), 41–54. https://doi.org/10.21831/jpji.v16i1.29774

Widia, W., Yustiana, Y. R., & Kaniawati, I. (2023). Analisis Keterlaksanaan Perkuliahan IPA Lingkungan: Field Study. *Jurnal Ilmiah Mandala Education*, *9*(3). https://doi.org/10.58258/jime.v9i3.5427