BESTARI: Jurnal Pendidikan dan Kebudayaan
https://jurnalstkipmelawi.ac.id/index.php/IBPK
E-ISSN: 2746-8062

Development of Deep Learning-Based Student Worksheet on the Science Topic of Biodiversity for Elementary School Students

Farah Muthi Hermawati[*1], Hanifatul Umami[2], Atiqah Ulya Hayandi[3], Thoriqi Firdaus[4], Diki Riyadi[5]
[1,2,3,4]Science Education, Universitas Pelita Bangsa
[5]Elementary Teacher Education, Universitas Pelita Bangsa

Abstract

Indonesia's biodiversity is a natural asset that requires preservation. One way to foster greater student concern for biodiversity is through science education—specifically lessons on biodiversity—that utilizes a "deep learning" approach. Student worksheets have the potential to enhance the quality of science instruction at the elementary school level. This study aimed to develop deep learning-based science worksheets focused on biodiversity for elementary school students. The study employed a Research and Development (R&D) method using the ADDIE (Analyze, Design, Develop, Implement, and Evaluate) framework. The results indicate that the developed worksheets achieved a validity score, making them suitable for use in instruction. Developing deep learning-based worksheets on biodiversity helps students better understand Indonesia's biodiversity. The study concludes that the developed worksheets are suitable for use in science lessons at the elementary school level.

Keywords: biodiversity, deep learning, student worksheet

Submitted: 11 October 2026; Reviewed: 27 October 2026; Accepted: 31 October 2026
DOI: 10.46368/bjpd.v7i2.5478

Pengembangan Lembar Kerja Siswa Berbasis Deep Learning pada Materi Biodiversitas untuk Siswa Sekolah Dasar

Abstrak

Biodiversitas yang dimiliki oleh Indonesia merupakan salah satu kekayaan alam yang perlu dilestarikan. Salah satu cara untuk membuat siswa menjadi lebih peduli terhadap biodiversitas adalah melalui edukasi dengan pembelajaran IPA pada topik Biodiversitas dengan menggunakan pembelajaran berbasis deep learning. Penggunaan lembar kerja siswa berpotensi dapat membantu dalam peningkatan kualitas pembelajaran IPA pada siswa di jenjang sekolah dasar. Tujuan dari penelitian ini adalah untuk mengembangkan lembar kerja siswa berbasis deep learning terkait dengan IPA pada topik Biodiversitas untuk siswa SD. Metode penelitian yang digunakan dalam penelitian ini adalah dengan metode research and development dengan pendekatan Analyze, design, development, implementasi, and evaluasi (ADDIE). Hasil dari penelitian ini menunjukkan bahwa LKS yang dikembangkan memiliki skor dengan kategori valid sehingga layak digunakan dalam pembelajaran. Pengembangan Lembar kerja siswa berbasis deep learning pada topik biodiversitas memberikan manfaat kepada siswa untuk memudahkan dalam memahami keanekaragaman hayati yang ada di Indonesia. Kesimpulan dari penelitian ini adalah bahwa Lembar kerja siswa yang sudah dikembangkan dapat digunakan dalam pembelajaran IPA di jenjang SD.

Kata Kunci: biodiversitas, pembelajaran mendalam, lembar kerja siswa

[*] Corresponding Author: Farah Muthi Hermawati, farah.hermawati@pelitabangsa.ac.id, Universitas Pelita Bangsa, Bekasi, Jawa Barat, Indonesia.

INTRODUCTION

Biodiversity is a relevant topic in 21st-century learning because it represents a global issue. (Cham et al., 2022; Lang et al., 2026; Peters et al., 2026). Biodiversity represents an invaluable natural asset for future environmental sustainability. It is a subject that primary school students should study to help preserve the environment for the future. Indonesia is a country with exceptionally high biodiversity. This natural wealth encompasses natural resources, a diverse range of flora and fauna, and a tropical climate that supports numerous ecosystems across the region. Indonesia's flora and fauna exhibit distinct characteristics, categorized by the western (Asiatic), central (transitional), and eastern (Australasian) regions. The diversity of Indonesia's flora and fauna significantly contributes to global mega-biodiversity. (Oliveira Fiorini et al., 2023a; Peters et al., 2026). The topic of biodiversity should be studied by students, particularly at the elementary school level. This serves as an effort to conserve biodiversity from an early age. Implementing innovative teaching methods in elementary schools can be one way to support this goal. Such innovation can be achieved by developing instructional materials, for instance, in the form of student worksheets.

A Student Worksheet is a learning resource containing key information regarding a topic to be studied by students. It provides an overview and guidance, enabling students to explore their own existing knowledge. The worksheet outlines the activities to be carried out and developed during the lesson, thereby ensuring that instruction remains focused on the objectives specified in the lesson plan. Student worksheets come in two forms: digital and conventional. The specific type used depends on various factors, as the formats differ from one another.

The use of student worksheets in the classroom is crucial for fostering innovation regarding the topics being studied, such as biodiversity. In primary education, the utilization of student worksheets remains insufficient. This is partly due to the heavy workload placed on teachers, as well as the continued reliance on teacher-centered instruction. If this persists, students will be unable to develop their exploratory skills. This aligns with research by Lestari et al. (2017) dan Yanto et al. (2025), which indicates that the use of student worksheets can support students in becoming independent and active learners. When students are directly and actively engaged in the learning process, it creates an enjoyable and meaningful educational experience, consistent with the principles of deep learning.

Deep learning is an instructional approach that prioritizes the thinking process based on three core principles: joyfulness, mindfulness, and meaningfulness. These principles encourage students to take an active role in their learning. Rather than simply sitting passively and listening to the teacher, students participate in comprehensive discussions, thereby making the learning experience more meaningful. Implementing deep learning effectively requires the integration of student worksheets (LKS) and instructional media tailored to the specific context. As an approach utilized within the Kurikulum Merdeka (Independent Curriculum), deep learning necessitates modifications to the way lesson plans are structured. (Angga & Sari, 2025; Fatmawaty, 2024; Nabila et al., 2025).

Several studies have been conducted regarding the development of student worksheets for various subject matters. For instance, Safnowandi and Ismail (2017) developed a student worksheet on the topic of biodiversity for junior high school students, which received a validity score of 75.86% (categorized as "Valid"). Furthermore, Desy et al. (2025) developed a digital-based student worksheet designed to foster critical thinking skills, achieving a score of 83.77% (categorized as "very good"). Additionally, Setiawaty et al. (2020) developed a STEM-based student worksheet for elementary school, which received an expert validation score of approximately 3.88, meeting the criteria for being "suitable for use."; however, this work did not address the topic of biotechnology. Previous research indicates that the development of instructional materials is crucial for fostering innovation in 21st-century education. Student worksheet serve as a tool that teachers can utilize to enhance their instructional capabilities. Instructional materials that facilitate active learning help improve students' learning outcomes. (Pramudia & Agustin, 2018; Sartika, 2019).

Other studies indicate that the use of student worksheets (LKS) significantly aids in providing more structured guidance for classroom instruction. Furthermore, research on "deep learning" suggests that this approach aligns well with the adaptive needs of 21st-century education, which prioritizes initiatives to enhance learning outcomes. Accordingly, the objective of this study is to develop deep learning-based worksheets focused on biodiversity within the Natural Sciences curriculum for elementary school students.

METHODS

This study was conducted in September 2026 at Universitas Pelita Bangsa, focusing on the development of a Student Worksheet. The study employed the Research and Development (R&D) method using the 4D approach, which comprises four stages: define, design, develop, and disseminate. This method is commonly used to ensure the development process is focused on learning. The first stage involved the definition phase—specifically, conducting a preliminary needs analysis for the development of the student worksheet regarding biodiversity. The second stage involved designing the deep learning-based student worksheet on the topic of biodiversity. The third stage involved the actual development of the deep learning-based student worksheet on biodiversity; this stage included a validation process involving media and subject matter experts. Validation by learning experts was conducted by two lecturers from Faculty of Education, The assessment aspects for the learning expert validation included (1) the presentation of the worksheets and (2) the use of language (Widyasti et al., 2020).

Once the experts have validated the developed product, the assessment scores are processed and the results are categorized. The validation outcomes from the experts are then classified based on the scores obtained, as outlined below.

Table 1. Learning media validation categories

Percentage Score	Categories	Eligibility Statement
81 % - 100%	Very Valid	Can be used without repair
61 % - 80%	Valid	Can be used with minor improvements
41 % - 60%	Less Valid	Can be used with many improvements
21 % - 40%	Invalid	Must not be used
0% - 20%	Very Invalid	Must not be used

Source: Ningsih & Sutanto (2023)

The final stage is the dissemination of the student worksheet product developed in this study. This dissemination is directed at students of Jatimulya 02 State Elementary School. The dissemination stage ensures that the developed media can be used directly by the end-users—in this case, the students

RESULTS AND DISCUSSION

The student worksheets were developed based on a literature review of several articles discussing the limited use of instructional media in elementary schools within the research area. Ichsan et al. (2018) explain that the use of instructional media for elementary school students in the Bekasi Regency remains very low. Elementary school teachers frequently rely on conventional, teacher-centered instruction—a practice stemming from the heavy workload teachers face regarding both instructional and administrative responsibilities. The implementation of student worksheets covering the topic of biodiversity can assist teachers in the learning process. Furthermore, the development of these worksheets may serve to motivate elementary school teachers to create their own student worksheets.

This student worksheet is designed with several sections intended to assist teachers in explaining concepts related to biodiversity. Spanning four pages, the worksheet covers key topics concerning the concept of biodiversity and includes learning tasks focused on the diversity of flora and fauna. These sections are structured as a series of "missions" for students

to complete during the lesson. It is anticipated that incorporating such missions into the learning process will enhance students' motivation and interest in learning (Iliza & Hanif, 2025; Mahmubi & Homaidi, 2025). At the top, there is a section for student identification, including space for the student's name, class, and school. The first mission, titled "Pengenalan tentang Biodiversitas," provides an explanation of biodiversity and includes an activity in which students observe the animals and plants found around the school grounds (see Figure 1).

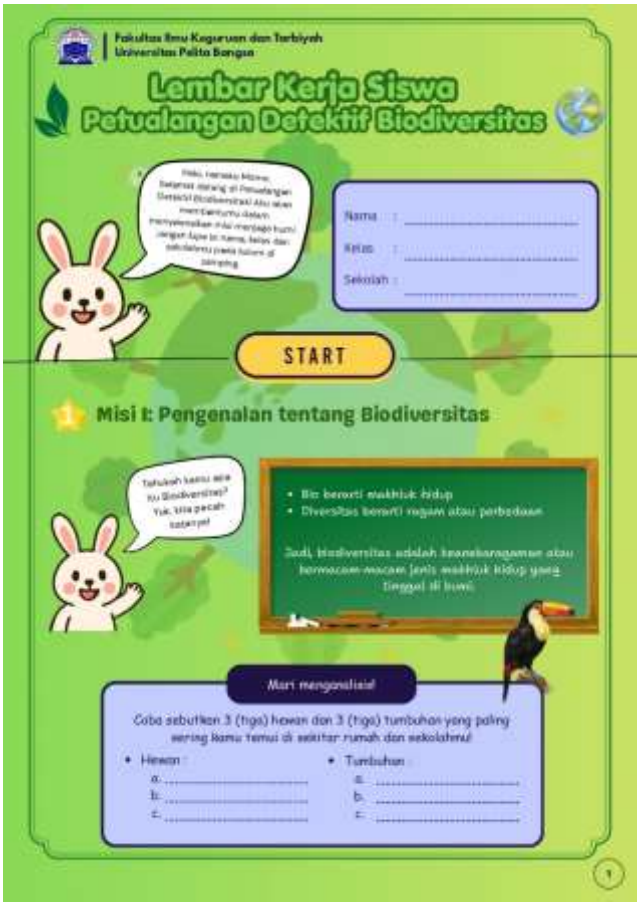


Figure 1. Results of the Student Worksheet development for the front section

The next section features the "Detektif Lingkungan" component, consisting of an observation sheet for examining the flora and fauna in the school's immediate surroundings (see Figure 2). This activity is part of a "deep learning" approach characterized by mindfulness, meaningfulness, and joy. The approach centers on learning outcomes derived from students' exploration of the school grounds, which are then recorded on student worksheets.

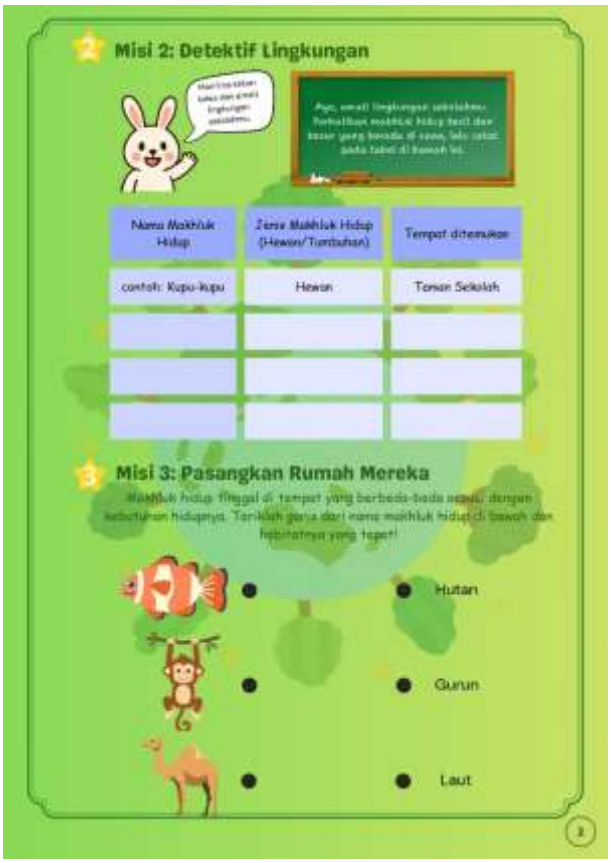


Figure 2. Results of the development of the student worksheet for the environmental detective section.

The next section includes a “Pasangkan Rumah Mereka” component, which features an observation exercise designed to analyze the relationship between living organisms and their habitats (see Figure 2). This activity encourages students to engage in processes related to mindfulness and the pursuit of meaning—key elements of deep learning. Such an approach helps teachers more effectively explain the nature of the habitats in which animals live.

The subsequent section focuses on the question, “Mengapa Biodiveristas Penting?” It presents students with specific case studies concerning biodiversity, accompanied by an analysis worksheet. Through this activity, students are tasked with proposing solutions to the given scenarios, thereby fostering the development of their problem-solving skills and logical thinking abilities.



Figure 3. Results of the development of the student worksheet on the importance of biodiversity.

The final section includes a component titled "Janji Penjaga Bumi" which consists of a reflection on students' behaviors after having studied the material on biodiversity. Through this rubric, it is hoped that students will develop an attitude toward protecting the environment and biodiversity. Additionally, the end of the worksheet features spaces for the date of completion, the grade, and the teacher's initials, serving as confirmation that the student has successfully engaged with the lesson as outlined in the worksheet.

The student worksheet was developed using the application Canva. The color green was chosen as the primary theme, as it aligns with the subject matter—biodiversity and the environment. The worksheet features an illustration of the Earth and a tree at its center, serving as a visual motif relevant to the topic of biodiversity. It also incorporates an animated rabbit character named "Momo," who acts as a guide to assist students in their learning. Furthermore, various other animals and plants are included to make the worksheet more engaging.



Figure 4. Results of the student worksheet development regarding student assignments.

One of the outcomes of developing these student worksheets is the inclusion of questions regarding the importance of biodiversity. These questions are intended to foster critical thinking skills in elementary school students. Analytical ability is crucial, given the need to enhance students' knowledge and improve the quality of science education at the elementary level; therefore, practicing thinking skills serves as an effective approach to strengthening analytical capabilities. Following their development, the student worksheets underwent validation by experts—specifically, a media expert and an instructional expert. The validation results indicate that the materials are suitable for use in learning activities (see Table 2).

Table 2. Validation results of the developed student worksheet

No	Validator	Score	Category
1	First-Learning Expert	87.50	Very Valid
2	Second-Learning Expert	92.50	Very Valid

Adapun untuk keterangan lebih lanjut dari detail skor dapat dilihat pada Tabel 3 berikut ini.

Table 2. Validation score of each aspect

No	Aspect	Score from Expert I	Score from Expert II
1	The instructions in the student worksheet are presented systematically.	4.00	4.00
2	The student worksheet contains core activities.	4.00	4.00
3	The instructions provided are relevant to project-based learning.	3.00	3.00
4	The student worksheet can be used across various relevant topics.	3.00	4.00
5	The activities presented can enhance Higher-Order Thinking Skills (HOTS).	4.00	4.00

No	Aspect	Score from Expert I	Score from Expert II
6	The language used adheres to established guidelines.	3.00	4.00
7	The language used is appropriate for the context.	3.00	3.00
8	The language used is communicative.	4.00	3.00
9	The sentences used are clear and easy to understand.	4.00	4.00
10	The sentence structures are complete and follow grammatical rules.	3.00	4.00

The revisions suggested by the experts confirmed that the develop ed worksheets reached a "Very Valid" status. Based on the media expert's feedback, the font color in sections 3 and 4 required adjustment to ensure better readability. Consequently, these sections were revised by c**hanging the font color to black (see Figure 5).**



Figure 5. Results of the student worksheet development after revision from expert validation

Developing Student Worksheets is crucial for diversifying instructional media in schools, as it represents an effort to enhance the quality of learning in alignment with 21st-century needs. The developed worksheets incorporate science content regarding biodiversity, aiming to broaden elementary students' understanding and equip them with the skills to analyze environmental issues. Indonesia's immense biodiversity offers significant potential for making the learning process more relevant by providing concrete, real-world examples. A key innovation of these worksheets is their specific focus on biodiversity issues, distinguishing them from other instructional materials. These worksheets serve as a flexible tool that can be tailored to the specific subject matter being taught. Furthermore, utilizing worksheets based on the "deep learning" approach effectively complements the curriculum by addressing the three core aspects of deep learning: joyfulness, meaningfulness, and mindfulness. (Angga & Sari, 2025; Mubarok et al., 2025; Pancasila dan Kewarganegaraan et al., 2025). Implementing deep learning-based instruction requires the teacher to play a role in facilitating students so that they can hone their problem-solving skills.

The efforts to boost the learning motivation of elementary school students through the use of student worksheet can be implemented by incorporating these materials into science lessons on biodiversity. The instructional approach adopted must offer a fresh perspective in terms of teaching methods, ensuring that students do not simply engage in the monotonous activity of reading text. (Astuti et al., 2020; Muammar & Suhartina, 2018; Purwanti, 2015; Widayanti & Yuberti, 2018) . Deep learning-based instruction can be employed to support elementary school students in understanding biodiversity concepts integrated into an integrated thematic curriculum, thereby enhancing their comprehension of Science and Social Studies. A key aspect of this approach is its emphasis on three core learning processes: making learning joyful, mindful, and meaningful. (Fatmawaty Fatmawaty, 2024; Maulidiya Nabila et al., 2025;

Mubarok et al., 2025; Prasetiya et al., 2025). Properly implementing the deep learning process will greatly help enhance students' analytical skills.

Biodiversity is a compelling topic for students, given the relevance of the material presented in the lesson. It is important for students to explore this subject in depth to enhance their science learning—specifically their problem-analysis skills—in alignment with the content of their worksheets. The material can be made more engaging through the use of supporting images, thereby capturing the interest of elementary school-aged students. By integrating biodiversity into a comprehensive science curriculum, students can gain a better understanding of the context of biodiversity in Indonesia. (Maroun et al., 2026; Oliveira Fiorini et al., 2023b) .

Learning innovations need not be limited to student worksheet; they can also take the form of instructional media integrated with those worksheets. Instructional media serve as a means to help students understand the material being taught. The difficulty level of the material also influences the type of learning innovation required for 21st-century education. Aligning instructional materials with the media used can facilitate improved learning outcomes and boost student motivation. A successful development initiative must effectively address the challenges students face during the learning process, thereby serving as a solution to those issues.

CONCLUSION

The study concludes that the deep learning-based student worksheet (LKS) focused on the science topic of biodiversity is highly valid and suitable for use in instruction. The findings indicate that this deep learning-based worksheet represents an innovation in elementary science education capable of enhancing student motivation and learning outcomes. Future research could integrate this worksheet with various media tailored to the specific biodiversity topics covered in the elementary science curriculum. A challenge encountered during the study was that biodiversity is not yet a primary topic in science instruction, necessitating specific planning for the implementation of the lessons..

REFERENCES

Angga, P. D., & Sari, A. J. (2025). Deep Learning: Bagaimana Implementasinya Pada Pembelajaran Pendidikan Jasmani, Olahraga dan Kesehatan (PJOK)? *Jurnal Ilmiah Profesi Pendidikan*, *10*(2), 1373–1391. https://doi.org/10.29303/jipp.v10i2.3227

Astuti, S. P., TW, A., & Handayani, S. (2020). Pemanfaatan media crocodile physics dalam pembelajaran untuk meningkatkan pemahaman konsep fisika. *Navigation Physics : Journal of Physics Education*, *1*(1), 1–5. https://doi.org/10.30998/npjpe.v1i1.189

Cham, H., Malek, S., Milow, P., & Song, C. (2022). Developing an ecological visualization system for biodiversity data. *All Life*, *15*(1), 500–511. https://doi.org/10.1080/26895293.2022.2066195

Fatmawaty Fatmawaty. (2024). Deep Learning : Sebuah Pendekatan untuk Pembelajaran Bermakna. *Harmoni Pendidikan : Jurnal Ilmu Pendidikan*, *1*(1), 71–85. https://doi.org/10.62383/hardik.v1i1.2121

Ichsan, I. Z., Dewi, A. K., Hermawati, F. M., & Iriani, E. (2018). Pembelajaran IPA dan Lingkungan: Analisis Kebutuhan Media Pembelajaran pada SD, SMP, SMA di Tambun Selatan, Bekasi. *JIPVA (Jurnal Pendidikan IPA Veteran)*, *2*(2), 131. https://doi.org/10.31331/jipva.v2i2.682

Iliza, I. N., & Hanif, M. (2025). Membangun Minat Dan Motivasi Belajar Peserta Didik. *Jurnal Pendidikan Islam*, *01*(03), 700–708.

Lang, F., Chen, C., & Matzdorf, B. (2026). Activating stated demand for biodiversity and ecosystem services through biodiversity credits: the case of private individuals in Germany. *Ecosystems and People*, *22*(1). https://doi.org/10.1080/26395916.2026.2734015

Lestari, A., Amelia, E., & Marianingsih, P. (2017). PENGEMBANGAN LEMBAR KERJA SISWA BERBASIS CTL (CONTEXTUAL TEACHING AND LEARNING) SEBAGAI

BAHAN AJAR SISWA SMA/MA KELAS XII SUBKONSEP KULTUR IN VITRO. *Biosfer: Jurnal Pendidikan Biologi*, *10*(1), 32–44.

Mahmubi, M., & Homaidi, H. (2025). Analisis Implementasi Pembelajaran Berbasis Gamifikasi Pada Peningkatan Motivasi Belajar Siswa. *Jurnal Al-Abshor: Jurnal Pendidikan Agama Islam*, *2*(1).

Maroun, W., Ecim, D., & Hassan, A. (2026). The emancipatory potential of biodiversity reporting: evidence from the United Kingdom and South Africa. *Accounting Forum*. https://doi.org/10.1080/01559982.2026.2650256

Maulidiya Nabila, S., Septiani, M., & Pendidikan Dasar, M. (2025). *Pendekatan Deep Learning untuk Pembelajaran IPA yang Bermakna di Sekolah Dasar* (Vol. 2, Number 1). https://jiwpp.unram.ac.id/index.php/primera

Muammar, & Suhartina. (2018). MEDIA PEMBELAJARAN BERBASIS TEKNOLOGI INFORMASI DALAM MENINGKATKAN MINAT BELAJAR AKIDAH AKHLAK. *Media Komunikasi Sosial Dan Keagamaan*, *11*(2), 176–188. http://ejurnal.iainpare.ac.id/index.php/kuriositas

Mubarok, A. S., Nurazizah, Z., Herawan, E., & Putri, D. P. (2025). Deep Learning with Project-Based Learning (PjBL) Model for Student Creativity. *Pedagogia : Jurnal Pendidikan*, *14*(2), 239–252. https://doi.org/10.21070/pedagogia.v14i2.1957

Ningsih, R., & Sutanto, A. (2023). VIDEO PEMBELAJARAN SEBAGAI SUMPLEMEN PRAKTIKUM PADA MATERI SISTEM JARINGAN. *Biolova*, *4*(2). http://scholar.ummetro.ac.id/index.php/biolova/

Oliveira Fiorini, A. C., Rua Rodriguez Rochedo, P., Angelkorte, G., Diuana, F. A., Império, M., Silva Carvalho, L., Nogueira Morais, T., Vasquez-Arroyo, E., & Schaeffer, R. (2023a). Investigating biodiversity trends in different mitigation scenarios with a national integrated assessment model. *Journal of Integrative Environmental Sciences*, *20*(1). https://doi.org/10.1080/1943815X.2023.2239323

Oliveira Fiorini, A. C., Rua Rodriguez Rochedo, P., Angelkorte, G., Diuana, F. A., Império, M., Silva Carvalho, L., Nogueira Morais, T., Vasquez-Arroyo, E., & Schaeffer, R. (2023b). Investigating biodiversity trends in different mitigation scenarios with a national integrated assessment model. *Journal of Integrative Environmental Sciences*, *20*(1). https://doi.org/10.1080/1943815X.2023.2239323

Pancasila dan Kewarganegaraan, P., Handayani Togatorop, F., Polin Parsaulian Purba, B., Hadia Sihombing, A., S Lahagu, K. M., Manik, E., & Pangaribuan, F. (2025). *44 CIVIC SOCIETY RESEARCH and EDUCATION: Jurnal MEMANFAATKAN TEORI BELAJAR KOGNITIVISME UNTUK MEMPERKUAT PEMBELAJARAN DEEP LEARNING*.

Peters, A., Fredman, P., & Fuchs, M. (2026). The tourism biodiversity knowledge system: towards an integrated research agenda. *Tourism Recreation Research*. https://doi.org/10.1080/02508281.2025.2611769

Pramudia, R. P., & Agustin, A. A. (2018). Pemahaman Konsep Fisika pada Materi Termodinamika Mahasiswa Pendidikan Fisika Melalui Representasi Grafis. *Jurnal Riset Pendidikan Fisika*, *3*(1), 8–14.

Prasetiya, U. A., Rohman, A. D., Sari Asih, T. U., & Mahmudah, U. (2025). Strategi Deep Learning pada Pembelajaran IPAS Digital Berbasis Meaningful, Mindful, dan Joyful Learning. *Attadrib: Jurnal Pendidikan Guru Madrasah Ibtidaiyah*, *8*(3), 649–659. https://doi.org/10.54069/attadrib.v8i3.1052

Purwanti, B. (2015). Pengembangan Media Video Pembelajaran Matematika dengan Model Assure. *Jurnal Kebijakan Dan Pengembangan Pendidikan*, *3*(1), 42–47. http://ejournal.umm.ac.id/index.php/jmkpp/article/view/2194

Sartika, D. (2019). Pentingnya Pendidikan Berbasis STEM dalam Kurikulum 2013. *Jurnal Ilmu Sosial Dan Pendidikan*, *3*(3), 90–93.

Setiawaty, S., Imanda, R., Fitriani, H., Ratih, D., & Sari, P. (2020). Pengembangan LKS sains berbasis STEM untuk siswa Sekolah Dasar. *Pros. SemNas. Peningkatan Mutu Pendidikan*, *1*(1).

Widayanti, W., & Yuberti, Y. (2018). Pengembangan Alat Praktikum Sederhana Sebagai Media Praktikum Mahasiswa. *JIPFRI (Jurnal Inovasi Pendidikan Fisika Dan Riset Ilmiah)*, *2*(1), 21–27. https://doi.org/10.30599/jipfri.v2i1.161

Widyasti, N., Wiratma, I., & Muderawan, I. (2020). UJI VALIDASI PENGEMBANGAN LEMBAR KERJA SISWA BERBASIS PENDEKATAN SAINTIFIK. *Jurnal Ilmiah Pendidikan Dan Pembelajaran*, *4*(1).

Yanto, M. Y., Erlina, E., Enawati, E., Junanto, T., Sahputra, R., & Ulfah, M. (2025). EFEKTIVITAS LEMBAR KERJA PESERTA DIDIK (LKPD) BERBASIS KEARIFAN LOKAL DENGAN PENDEKATAN KONTEKSTUAL PADA MATERI BIOTEKNOLOGI. *Journal of Research and Education Chemistry*, *7*(1), 75. https://doi.org/10.25299/jrec.2025.vol7(1).20711