

# Implementation of Integrated Science Learning Model Using the Webbed Type: A Systematic Literature Review

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## Abstrak

Meningkatkan kualitas pendidikan sains di sekolah tetap menjadi fokus penting dalam menemukan model pengajaran yang efektif yang dapat mengintegrasikan berbagai disiplin ilmu. Tantangan yang dihadapi meliputi kurangnya keterlibatan siswa dalam menghubungkan konsep-konsep sains dengan konteks kehidupan nyata, serta rendahnya tingkat berpikir kritis dan pemahaman mendalam terhadap konsep. Penelitian ini bertujuan untuk menganalisis dan mengevaluasi efektivitas model pengajaran sains terintegrasi webbed serta mengeksplorasi dampaknya terhadap kemampuan siswa dalam mengaitkan pengetahuan sains dengan konteks kehidupan nyata. Penelitian ini menggunakan metode systematic literature review (SLR), yaitu metode dengan mengumpulkan dan mengevaluasi penelitian relevan pada topik fokus tertentu. Data dikumpulkan dan dianalisis dari 30 artikel ilmiah. Instrumen penelitian yang digunakan adalah lembar penilaian literatur, dengan teknik analisis data yang diterapkan berupa analisis tematik. Hasil penelitian ini menunjukkan bahwa penerapan model pengajaran sains terintegrasi webbed memiliki potensi signifikan dalam meningkatkan kualitas pendidikan sains. Model ini membantu siswa menghubungkan informasi dari berbagai disiplin ilmu ke dalam konteks kehidupan nyata.

**Kata kunci:** Model Pembelajaran, IPA Terpadu, Tipe Webbed

## Abstract

Improving the quality of science education in schools remains a critical focus in finding effective teaching models that can integrate various disciplines. The challenges faced is the lack of student engagement in connecting scientific concepts with real-life contexts, as well as low levels of critical thinking and deep understanding of concepts. This study aims to analyze and evaluate the effectiveness of the webbed integrated science teaching model and to explore its impact on students' ability to relate scientific knowledge to real-life contexts. This research employed the systematic literature review (SLR) method. This method is used by collecting and evaluating relevant research on a specific focus topic. Data collected and analyzed from 30 scholarly articles. The research instrument used is a literature assessment sheet. The data analysis technique employed is thematic analysis. The results of this study indicate that the application of the webbed integrated science teaching model has significant potential in enhancing the quality of science education. This model helps students connect information from various disciplines to real-life contexts.

**Keywords:** Learning Model, Integrated Science, Webbed Type

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## 1. INTRODUCTION

In the modern era with the rapid development of technology as it is today, an integrated learning model is needed to help students acquire science literacy as a whole (Latif et al., 2022; Rahayu et al., 2023). Science education is very important to shape students' understanding and skills in facing global challenges in the modern era. Natural science education in schools continues to be improved to increase students' understanding of science concepts and science literacy (Anikarnisia & Wilujeng, 2020; Dragoş & Mih, 2015). Science education is one area that has an important role in shaping students' understanding, skills and attitudes towards natural science. The implementation of integrated science learning models has become the focus of attention in education to improve students' science literacy. This concept is considered an effective approach to improve students' science understanding. This article will discuss some research and theories that support the use of integrated science learning models to improve students' science literacy.

Every student has verbal-linguistic, logical-mathematical, visual-spatial and other intelligences (Korkmaz & Akçay, 2024; Setyorini et al., 2019). Different types of intelligence can be used in learning with an integrated science learning model, which allows it to meet the diverse learning needs of each student. The theory of constructivism states that interaction with the environment and learning experiences is one way that students can acquire their own knowledge. The integrated science learning model gives students the opportunity to be actively involved in the process of constructing their own knowledge through exploration, experimentation and discussion (Isro et al., 2021; Razzaq et al., 2024). In addition, this model encourages students to work together to solve problems scientifically. So that students learn in this case not only from the teacher but interaction among students. Critical and analytical thinking skills, as well as understanding of science concepts, can be improved through collaboration by these learners (Delgadova, 2015; Rosmawati, 2023).

The application of integrated science learning model is one of the methods considered effective to improve science literacy. The purpose of the integrated science learning model is to integrate various science concepts in an approach that is relevant to students' daily lives. Integrated learning involves students in a learning process that makes students active in exploring and discovering concepts (Asbar & Witarsa, 2020; Aulia et al., 2018). Integrated thematic learning will focus on themes with several themes that are related and connected to each other in each theme. Through integrated learning, students will get direct experience in the learning process so that it can increase students' abilities about the things they learn. Integrated learning is a learning model that combines various subject areas to provide meaningful learning experiences to students (Hermawan et al., 2009; Widharnati et al., 2022). Thus, integrated learning allows students to increase their ability about what they learn. In addition, the webbed model can be used as an important part of science learning.

Webbed type in science learning is an effective learning model that is able to integrate various disciplines and connect science concepts with real life contexts. A thematic approach that integrates subject matter can be used for integrated learning. This method begins its development by determining a particular theme. The theme can be determined through discussion among teachers or between teachers and students. After the theme is chosen, subthemes are then created based on its relationship with the subject area. From this subtheme, learning activities will be made (Kumandaş et al., 2018; Trianto, 2012). The webbed type emphasizes the relationship between various learning topics and is designed to provide a broad learning experience and is related to the real world. This model combines concepts from natural science fields, such as physics, chemistry, and biology, into a whole and meaningful lesson.

The webbed model is expected to increase student engagement, critical thinking skills and deep concept understanding. However, the reality in the field shows that many students still have difficulties in linking science concepts with practical daily applications. The lack of active engagement and low critical thinking skills indicate a gap in the learning methods currently used, which creates an urgency for further research to identify and develop more effective models. (Widharnati et al., 2022; Yaki, 2022). Previous studies have mostly highlighted in specific contexts for different levels (Herni, 2015; Wicaksono et al., 2022). The novelty in this research lies in the application of the webbed integrated science learning model in specific contexts, namely in primary, junior secondary and senior secondary schools in Indonesia, as well as a detailed assessment of its impact on critical thinking skills and the ability to relate knowledge to real contexts. Previous research may have explored the webbed model in general, but this study makes a new contribution by providing a more thorough and

in-depth understanding of the use of the webbed integrated learning model (Widharnati et al., 2022).

By combining these theories, it is expected that the application of integrated science learning models can make a significant contribution to improving learners' science literacy. The novelty of this study integrates science concepts from various disciplines, engaging learning experiences, collaboration between students, and emphasis on problem solving become a strong foundation for an adequate learning environment and to build a deep and relevant understanding of science for students. This study aims to analyze and evaluate the effectiveness of the webbed integrated science teaching model and to explore its impact on students' ability to relate scientific knowledge to real-life contexts

## 2. METHODS

This research employed the systematic literature review (SLR) method. This method is used by collecting and evaluating relevant research on a specific focus topic (Lusiana & M, 2018). One of the benefits of SLR research is the ability to identify, review, interpret, and evaluate all current research focused on an interesting topic (Northey et al., 2018; Triandini et al., 2019). Based on this explanation, as a research method, the researcher conducted an analysis of 30 scientific articles published from 2013 to 2023. The procedure used in the literature research can be illustrated in Figure 1.

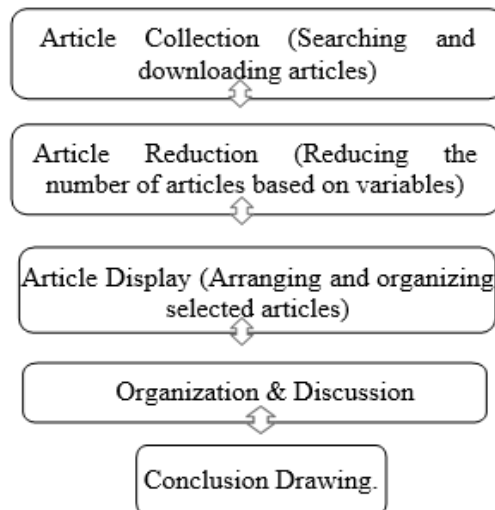


Figure 1. Stages of Literature Review

Article Collection (searching and downloading articles) is done by searching and downloading articles through Google Scholar by typing key words related to the topic or research title or research title. In this case, the key words are implementation of integrated learning in elementary schools. Next stage is Article Reduction (reducing the number of articles based on the variables). Article reduction means summarizing, selecting the main points, focusing on important things, looking for themes and patterns and discarding those that are unnecessary. Thus, the articles that have been reduced will provide a clear and make it easier for researchers to do further data collection and data collection and search for it if needed.

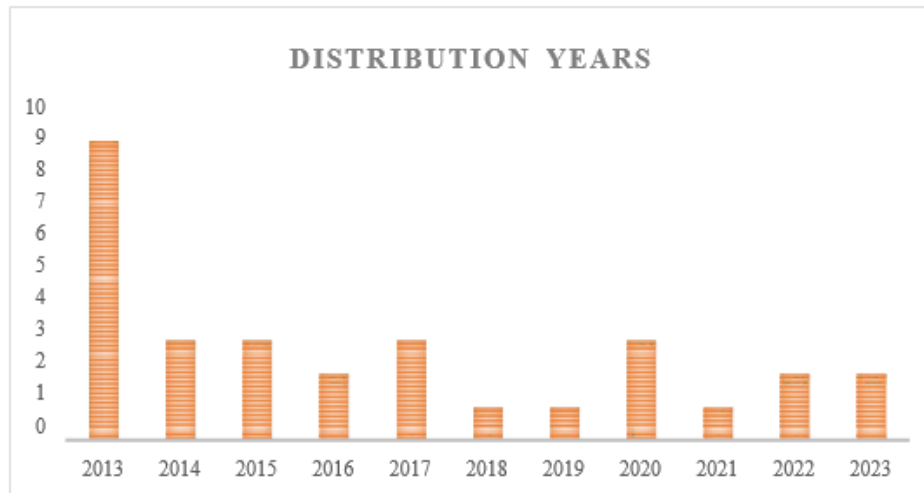
After the articles have been reduced, the next stage is to display or present the article. The presentation of this article is done in the form of tables, brief descriptions, and relationships between variables. Next stage is organizing and discussing discussion based on

the type of literature review used. In this case, the literature review chosen in the form of a theoretical study. Type of literature review in the form of this theoretical review is a special study where the author presents several theories or concepts that centered on one particular topic and compares the theories or concepts on the basis of their assumptions, logical consistency, and scope of explanation. Conclusions are drawn based on the results of organization and discussion that has been done before.

### 3. RESULTS AND DISCUSSION

#### Results

Based on the articles that have been read and used in Open Knowledge Maps, the researchers grouped them according to the year of publication, as shown in [Figure 2](#), covering the last 10 years (2013 to 2023).



**Figure 2.** Distribution Years

Based on [Figure 2](#), it can be observed that the trend of research on the webbed type of integrated science learning model shows fluctuations from 2014 to 2023 and an increasing trend in 2013. In each year of the past decade, there have been publications on the webbed type of integrated approach. It can be seen that 2013 had the highest number of publications, with a total of 9 articles on the webbed integrated approach for students. Meanwhile, 2018, 2019, and 2021 had the lowest number of publications, with only 1 article each. However, in 2022 and 2023, there was an increase in publications. Based on the articles that have been selected and used in Open Knowledge Maps, the researchers grouped them according to the type of research, as shown in [Figure 3](#).



**Figure 3.** Research Type

Based on Figure 3, it can be observed that this research trend includes several types of research, namely R&D, quantitative, qualitative, and SLR. Quantitative research articles have the highest number, with 18 articles, followed by R&D with 11 articles, and SLR being the least used research type. Based on the articles that have been selected and used in Open Knowledge Maps on the topic of the webbed type of integrated science learning model, the researchers grouped them according to the educational levels, as shown in Figure 4.

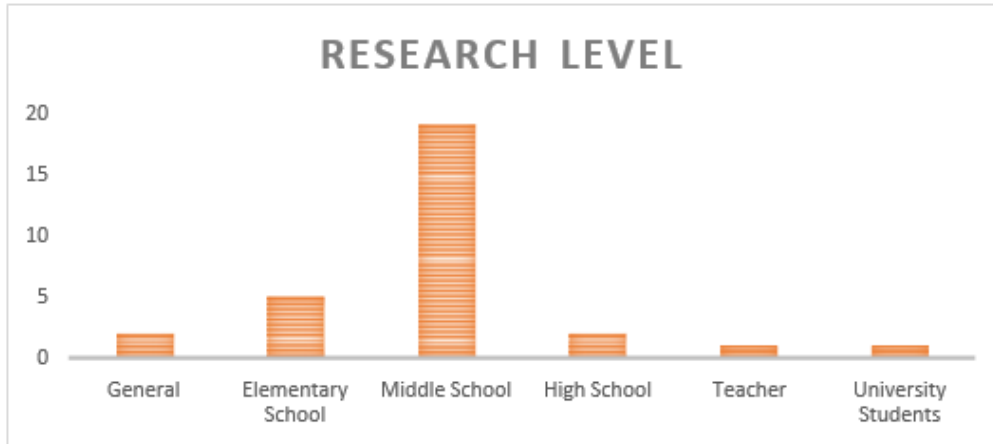


Figure 4. Research Level

Based on Figure 4, it can be concluded that this research trend spans various educational levels from elementary to high school. At the elementary level, there are 5 published articles. At the middle school level, there are 19 articles, making it the level with the highest number of publications. Next, at the high school level, there are 10 published articles. At the general level (multiple educational levels), there are 2 published articles. At the university level, there is 1 published article, making it the level with the fewest publications. This research also includes 1 article focusing on teachers' perceptions. The integrated science learning model and the webbed approach each play a role in developing and training students' abilities as well as maximizing the effectiveness of learning. Evidence that these learning models and approaches have a significant impact on students' abilities can be seen from previous relevant research results, which serve as a reference for this study. The result of article analysis is show in Table 1.

Table 1. Display Article

Number	Author	Contribution
1	(Herni, 2015)	This research emphasizes that adequate preparation and training are crucial for teachers to effectively implement the webbed model. The findings indicate that scientific literacy has increased, and educational institutions can further promote training focused on developing integrated curricula and relevant teaching strategies.
2	(Wali, 2020)	Enhancing Student Learning Outcomes, Developing Learning Models, Implications for Curriculum and Educational Policy, Teacher Training and Professional Development, Developing Learning Materials and Resources, and Strengthening Science Literacy and 21st- Century Skills.
3	(Novianti & Fitriani, 2015)	Validation of the effectiveness of learning models, development of effective lesson plans, enhancement of students' inquiry skills, utilization of waste as a learning theme, implications for

Number	Author	Contribution
		curriculum and educational policy, and teacher professional development.
4	(Ardianto & Rubini, 2016)	Deeper Understanding of Science Literacy, Development of Teaching Strategies, Curriculum Arrangement, Teacher Training and Professional Development, Enhancement of Students' Information Skills, Strengthening Evaluation and Assessment, and Improvement of Educational Policies.
5	(Niswatin et al., 2020)	Contributing to the development of better teaching practices by demonstrating specific techniques that can enhance science literacy. These findings can be utilized by teachers to implement or modify successful teaching strategies aimed at improving students' science learning outcomes.
6	(Elfi et al., 2023)	Contributing to the development of more interactive and engaging learning models. By demonstrating the effectiveness of using interactive PowerPoint in web-based learning, teachers can adopt and adapt these techniques to make the learning process more dynamic and enjoyable.
7	(Nurul et al., 2023)	Contributing to the development of teaching methods by demonstrating that the use of PBL in web-based integrated learning can enrich students' learning experiences. Educators can employ this approach to make learning more relevant and applicable.
8	(Sukma & Ibrahim, 2016)	The teaching method not only enhances cognitive, psychomotor, and affective aspects, but this research also supports the overall curriculum development. The curriculum can be designed to focus not only on theoretical knowledge but also on the development of practical skills and fostering a positive perspective on learning.
9	(Heru, 2014)	Contributes to the development of teamwork skills and student collaboration. Cooperative learning models teach students to cooperate, share information, and support each other to achieve learning goals. This is important for preparing students to face real-world challenges where they need to collaborate.
10	(Dewi, 2017)	To enhance student engagement in the learning process. This tool has the capability to increase students' interest and engagement in lessons by presenting engaging and relevant learning materials related to the theme "Society of Taneyan Lanjhang". This will create an active and collaborative learning environment.
11	(Lutfiah & Dyah, 2013)	Significant contribution to achieving students' learning outcomes. This research demonstrates that students achieve excellent levels of learning outcomes in various aspects. The study provides evidence that the applied teaching methods, together with the created learning tools, are effective in achieving learning objectives.
12	(Suryadi et al., 2020)	Significant contribution to the development of effective, high-quality learning materials. This research provides valuable guidance for developing learning materials focused on relevant



Number	Author	Contribution
		contexts and engaging learning experiences by demonstrating that context-based webbed integrated science handouts can enhance student learning outcomes.
13	(Dewi, 2017)	Significant contribution to the development of effective and innovative teaching practices. This research demonstrates that developing webbed integrated science learning tools focused on IPA can lead to good learning outcomes. The study also provides valuable guidance for educators in designing and implementing effective learning strategies.
14	(Zakiyatu Maulidina, Nuriman, 2018)	The development of students' character is also influenced by their improvement in problem-solving skills. In this process, students need to use creativity, perseverance, and hard work, which are highly valued qualities in daily life and work environments.
15	(Noviana et al., 2022)	Important implications for the development of more effective learning strategies. Understanding the relationship between learning motivation and mastery of concepts can assist teachers in creating and implementing better learning strategies that can enhance students' learning outcomes.
16	(Novitasari et al., 2023)	It has a significant impact on the process of creating learning strategies in the classroom. In integrated science learning, both webbed integration and connected integration approaches can be used. However, there is no evidence that either approach enhances students' science process skills or concept mastery better than the other.
17	(Sutrisno et al., 2022)	Important implications for improving the quality of learning, as this research shows that the use of effective lesson plans correlates with good student learning outcomes. This study provides valuable guidance for teachers and educational practitioners to enhance their teaching practices.
18	(Desilia et al., 2023)	This teaching material may enhance students' awareness of the importance of preparing for disasters and fostering a disaster response attitude. Integrating disaster response elements into the curriculum can help cultivate proactive attitudes among students when facing emergency situations.
19	(Wingert et al., 2014)	By integrating proven learning models that focus on student learning experiences, this integration can enhance students' learning outcomes in science subjects.
20	(Prasetyo et al., 2021)	The test results indicate that the Integrated Science E-Module significantly enhances students' scientific literacy. Improving students' understanding of natural sciences and their ability to process scientific data is crucial.
21	(Ahmadi et al., 2013)	Students' positive response to learning indicates success in creating a motivating and enjoyable learning environment for them. This contribution demonstrates that specific teaching methods are not only academically effective but also capable of sparking students' interest and enthusiasm for learning.

Number	Author	Contribution
22	(Volante & Fazio, 2007)	Furthermore, the findings of this research can be utilized to reform teacher training programs. By gaining a better understanding of how teacher language development can impact student learning outcomes, training programs can be designed to focus more on developing communication skills and teaching strategies that promote critical thinking.
23	(Santoso & Ismono, 2013)	Students' positive responses to the learning environment indicate that the school has provided adequate support for the learning process. This response can serve as a basis for schools to continue strengthening a positive and inclusive learning environment, as well as promoting collaboration and active student participation in learning activities.
24	(Aini et al., 2013)	Because this learning model assigns students' tasks to solve problems and make decisions based on their own findings, there is a possibility that this model will enhance students' critical thinking skills. Students learn analysis, synthesis, and evaluation, which are crucial skills in everyday life and the workplace, and this research helps them do so.
25	(Akinoğlu & Tandoğan, 2007)	Science learning that utilizes a problem-based approach tends to increase student engagement in the learning process. Because students are actively involved in research and scientific discoveries, this contribution will enhance students' motivation and interest in learning.
26	(Nazila. & Suliyanah, 2013)	By emphasizing the theme of food and health, this research can help develop more meaningful and integrated thematic learning. This contribution includes strengthening the connections between ideas within the studied theme and students' daily lives, encouraging them to understand the topic as a whole.
27	(Lutfiah & Dyah, 2013)	Students' very positive response to the STAD cooperative learning model indicates that this approach aligns with their learning preferences and will enhance motivation and engagement during the learning process. Consequently, this can improve learning outcomes.
28	(Ristina et al., 2019)	The use of science literacy-based teaching materials helps strengthen the connection between language and science. One of the benefits of using these teaching materials is that students become better at conveying scientific concepts in an easily understandable and clear manner, as well as improving their ability to effectively communicate scientific ideas.
29	(Ulan & Ratna, 2022)	Because the PBL model requires students to actively participate in the learning process, as evidenced by their obligation to seek information, identify problems, and find solutions, the benefits of this model include enhancing students' intrinsic motivation to learn science and developing a sense of responsibility for their own learning.



Number	Author	Contribution
30	(Rt et al., 2015)	This research shows significant differences in science literacy skills between two groups of students. It provides a basis for schools and teachers to assess and improve the quality of classroom learning. Students are encouraged to use more integrated and contextual learning approaches when teaching science.

## Discussion

This research demonstrates that integrated science learning using a webbed approach can enhance students' science literacy skills better than classes that do not employ integrated science learning. It has been proven that integrated science learning is beneficial overall, both in terms of content and students' scientific processes. Moreover, the webbed model can be used for integrated learning that integrates subject matter through thematic approaches (Okoye et al., 2021; Wingert et al., 2014). The development of this approach begins with determining a specific theme, which can be decided through teacher-student consultations or peer discussions among teachers. Once the theme is established, sub-themes are created considering their relevance to the field of study. Learning activities are then developed based on these sub-themes (Rahelly, 2018; Trianto, 2012).

Other studies indicate that student learning outcomes can improve after implementing a webbed integrated approach (Wali, 2020). The discussion also mentions that implementing integrated learning can enhance students' understanding of concepts, cognitive and psychomotor skills, and increase their desire to learn. One integrated webbed learning model emphasizes the pattern of organizing integrated material combined with a theme. This theme is selected and developed beyond subjects but aligned with basic competencies and subject topics (A & Astuti, 2018; Widada & Herawaty, 2017). The thematic model is used as an alternative conceptual organizational pattern in education. The implementation of integrated learning principles significantly influences the success of implementing integrated learning models, closely related to integrated concept meaning, which means that subjects should be more easily understood and interpreted so that what students learn becomes an integral part of themselves (Afriana et al., 2016; D. L. Sari et al., 2016). In integrated learning, the determination of material is adjusted to specific learning objectives already associated with themes. As a result, extensive knowledge and understanding of the subject, along with a number of learning outcomes skills derived from basic competencies and related to the theme, are required. Thus, learning transfer is expected to occur. Therefore, do not lose learning orientation during the learning process. The basic skills are the actual goals to be achieved, not mastery of the material. The theme is a conceptual tool for achieving subject matter or skills.

Other studies examining webbed integrated approaches also obtained significant results. Students using integrated science learning models gained increased concept mastery (Suharjo & Sutrisno, 2017; Widia & Sarnita, 2020). This study also states that students are very enthusiastic about learning using this type because it connects learning with everyday reality as the teaching theme and is divided into several topics related to student experiences and worlds, making this model ideal for use. The research results of previous study show that teachers lack confidence in teaching integrated science learning (Ardianto & Rubini, 2016). This is due to a non-linear scientific background, lack of mastery of scientific concepts, and lack of teaching materials. Moreover, the majority of teachers believe that scientific literacy is the ability of students to search various sources about scientific concepts. Therefore, a science teacher professional development program is urgently needed, especially in developing science teacher competencies to teach integrated science in class, strengthen

mastery of disciplines, strengthen scientific literacy concepts, and provide them to students. Meanwhile, other research states that the analysis shows that students' science literacy skills increase after learning the project-based learning natural science model assisted by Integrated natural science magazine with webbed orientation SETS (Niswatin et al., 2020). By using the natural sciences magazine, it is expected that students can improve their ability to adjust their thinking logically, make it more interesting, and easier to understand the presented information. Thus, the IPA magazine can be used as a learning source (Astuti et al., 2022; Dewi, 2017).

The implementation of learning activities went well. Students can understand concepts well if in the Zone of Proximal Development (ZPD), because the ZPD allows students to solve problems and get help from teachers (Dewi, 2017; Fitriani & Maemonah, 2022). The implementation of learning outcomes significantly impacts the development of their knowledge because students can complete tasks with higher levels of complexity than their current knowledge development level. This is consistent with the opinions of the research that said that in the development of integrated learning teaching materials developed must be valid and practical and their implementation can work well (Admin & Sari, 2017; Fakhri et al., 2018). Student activities and responses to their implementation are also well-regarded, resulting in increased problem-solving skills that impact student learning outcomes. The implementation of webbed learning models utilizes the use of media and technology. By using this learning media, teachers will find it easier to impart knowledge to students so that the objectives of learning activities can be achieved. This also aims to make subject matter easier for students to understand. Similar research, states that the learning outcomes of science students in grade IV have been improved through the use of a webbed-based integrated model with interactive PowerPoint presentations (Elfi et al., 2023; Haling et al., 2022). In the context of developing the project based learning model, it has been proven to have a positive impact on learning outcomes, especially in webbed-based learning. The problem-based integrated approach must be managed according to syntax and monitor student activities through the psychomotor and affective domains of participants (Nurul et al., 2023; N. A. Sari et al., 2018). Studies also show that the psychomotor and affective aspects of students show significant improvement, but to achieve optimal results, innovation in material delivery is needed (Christantia, 2014; Heru, 2014).

This cooperative STAD-type approach should be tailored to ensure improvement in student affective and psychomotor aspects. Furthermore, another similar research states that there is a relationship between concept mastery and student learning motivation in the webbed-based integrated approach (Lutfiah & Dyah, 2013; Noviana et al., 2022). Learning tools created must be suitable for use and can strive for the learning process to run smoothly so that in their implementation they can achieve completeness in student learning outcomes. Research by previous study also said that increasing students' science literacy skills can be done by developing a webbed-based teaching material (Ahmadi et al., 2013). Research also highlights the effectiveness of guided inquiry-oriented learning processes in improving student learning outcomes in various aspects (Mansurotun, 2014). Furthermore, improvements in student learning outcomes in contextual approaches in webbed-based integrated approaches are also very effective (Suryadi et al., 2020). However, research results also indicate differences in effectiveness between several learning methods, as found in studies on Brain-based Learning (Meri & Wulan, 2019).

Developing integrated science teaching materials also plays a crucial role in improving student learning outcomes on diverse theme and development models. The quality of E-modules is also an essential factor in improving students' science literacy (Permatasari, 2013; Sudarman, 2021). Student responses to learning are also an important indicator, with life skills-oriented learning proven to improve students' social skills and train positive

character development (Ningrum & S.Y, 2013; Santoso & Ismono, 2013). Furthermore, improving student learning outcomes through various learning models such as project based learning and direct instruction is also effective (Nazila. & Suliyanah, 2013; Ulan & Ratna, 2022). Improving students' science literacy skills can also be applied to the project based learning model, while improving science literacy skills through nested-type integrated approaches has also been proven. The review of all articles showed that the webbed model is effective in increasing students' active engagement, critical thinking skills, and understanding of science concepts. The reviewed articles also revealed that this model facilitates the integration of various science disciplines into the context of students' daily lives. In addition, webbed learning also increases students' learning motivation and ability to link science theories with real-life practices. Overall, this model is considered successful in strengthening science literacy and providing a holistic learning experience.

This research provides contributions and implications of research results to the field of science studied; it can be seen from how the webbed type integrated science learning approach is able to improve students' understanding of science concepts more holistically. This approach allows learners to link different disciplines, so as to improve critical and creative thinking skills. This research also contributes to curriculum development, where the webbed approach can be an alternative learning model that is relevant to the demands of 21st century education. The strength of this research lies in the ability of the webbed approach to integrate various subjects and create more contextual and meaningful learning for students. In addition, this study enriches the literature on integrated learning in science education and also enriches empirical data related to the effectiveness of webbed learning in different educational contexts. However, there are limitations to this study, namely that its implementation may require greater time and resource adjustments than conventional learning models.

#### 4. CONCLUSION

Based on a literature review of 30 articles on the implementation of the integrated science approach using webbed, it can be concluded that this approach motivates students to think critically and analyze information from various sources. They are also taught to relate their knowledge to new contexts, thereby enhancing students' critical thinking skills. The implementation of this approach can also enhance learning activities, scientific literacy, character development, motivation, and student learning outcomes.

#### 5. REFERENCES

- A, A., & Astuti, Y. P. (2018). Pembelajaran Terpadu Tipe Webbed Berbasis Budaya Lokal Untuk Meningkatkan Hasil Belajar Siswa Kelas IV Sekolah Dasar. *Premiere Educandum: Jurnal Pendidikan Dasar Dan Pembelajaran*, 8(2), 185–195. <https://doi.org/10.25273/pe.v8i2.32>.
- Admin, & Sari, A. D. I. (2017). Pengembangan Perangkat Pembelajaran Terpadu Tipe Webbed Kelas IV Sekolah Dasar Untuk Meningkatkan Kemampuan Memecahkan Masalah. *DIDAKTIKA: Jurnal Pemikiran Pendidikan*, 23(2), 99–103. <https://doi.org/http://journal.umg.ac.id/index.php/didaktika/article/view/13>.
- Afriana, J., Permanasari, A., & Fitriani, A. (2016). Implementation Project-Based Learning Integrated STEM to Improve Scientific Literacy Based on Gender. *Jurnal Inovasi Pendidikan IPA*, 2(2), 202–212. <https://doi.org/10.21831/jipi.v2i2.8561>.
- Ahmadi, N., Tarzan., P., & Martini. (2013). Pengembangan Perangkat Pembelajaran IPA Terpadu Tipe Webbed Pada Tema Pencemaran Air Berorientasi Model Problem

- Based Instruction (PBI) Untuk Meningkatkan Hasil Belajar Siswa Kelas VII SMP. *Pensa E-Jurnal: Pendidikan Sains*, 1(3). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/3599>.
- Aini, N., Tukiran., & Ahmad, Q. (2013). Model Penemuan Terbimbing (Guided Discovery) Pada Pembelajaran IPA Terpadu Tipe Webbed Dengan Tema Biopestisida. *Pensa E-Jurnal: Pendidikan Sains*, 1(2). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/2502>.
- Akinoğlu, O., & Tandoğan, R. Ö. (2007). The effects of problem-based active learning in science education on students' academic achievement, attitude and concept learning. *Eurasia Journal of Mathematics, Science and Technology Education*, 3(1), 71–81. <https://doi.org/10.12973/ejmste/75375>.
- Anikarnisia, N. M., & Wilujeng, I. (2020). Need assessment of STEM education based based on local wisdom in junior high school. *Journal of Physics: Conference Series*, 1440(1). <https://doi.org/10.1088/1742-6596/1440/1/012092>.
- Ardianto, D., & Rubini, B. (2016). Literasi Sains dan Aktivitas Siswa pada Pembelajaran IPA Terpadu Tipe Shared. *USEJ: Unnes Science Education Journal*, 5(1), 1167–1174. <https://doi.org/10.15294/USEJ.V5I1.9650>.
- Asbar, R. F., & Witarsa, R. (2020). Kajian Literatur Tentang Penerapan Pembelajaran Terpadu Di Sekolah Dasar. *Jurnal Review Pendidikan Dan Pengajaran*, 3(2), 225–236. <https://doi.org/10.31004/jrpp.v3i2.1220>.
- Astuti, P. A. P., Rohmadi, M., & Nirmalasari, R. (2022). Analysis of Media Development Needs E-Magazine Material Inheritance OF Islamic Integrated Nature for Grade IX Students at Islamic Junior High Sschool. *Jurnal Penelitian Pendidikan IPA*, 7(1), 17–21. <https://doi.org/10.26740/jppipa.v7n1.p17-21>.
- Aulia, E. V., Poedjiastoeti, S., & Agustini, R. (2018). The Effectiveness of Guided Inquiry-based Learning Material on Students' Science Literacy Skills. *Journal of Physics: Conference Series*, 947(1). <https://doi.org/10.1088/1742-6596/947/1/012049>.
- Christantia, S. M. (2014). Penerapan Model Pembelajaran Kooperatif Tipe Numbering Heads Together (NHT) Pada Tema Pupuk Organik Mol Di Kelas VIII SMP Negeri 1 Larangan, Pamekasan. *Pensa E-Jurnal: Pendidikan Sains*, 2(1). <https://www.academia.edu/download/111801825/545.pdf>.
- Delgadova, E. (2015). Reading Literacy as One of the Most Significant Academic Competencies for the University Students. *Procedia - Social and Behavioral Sciences*, 178(November 2014), 48–53. <https://doi.org/10.1016/j.sbspro.2015.03.145>.
- Desilia, N. R., Lassa, J., & Oktari, R. S. (2023). Integrating Disaster Education into School Curriculum in Indonesia: A Scoping Review. *International Journal of Disaster Management*, 6(2), 263–274. <https://doi.org/10.24815/ijdm.v6i2.34867>.
- Dewi, I. Y. M. (2017). Pengembangan Perangkat Pembelajaran Terpadu Tipe Webbed Fokus IPA dengan Tema ‘Masyarakat taneyan Lanjhang’ Pada Sekolah Dasar Di Kabupaten Sumenep. *Jurnal Review Pendidikan Dasar: Jurnal Kajian Pendidikan Dan Hasil Penelitian*, 3(1). <https://journal.unesa.ac.id/index.php/PD/article/view/1652>.
- Dragoş, V., & Mih, V. (2015). Scientific Literacy in School. *Procedia - Social and Behavioral Sciences*, 209(July), 167–172. <https://doi.org/10.1016/j.sbspro.2015.11.273>.
- Elfi, I., Yanti, F., & Yeni, E. (2023). Efektivitas Model Pembelajaran Terpadu Tipe Webbed Berbantuan Power Point Interaktif Terhadap Peningkatan Hasil Belajar Ipa Siswa Kelas Iv Sekolah Dasar. *MODELING: Jurnal Program Studi PGMI*, 10(2). <https://doi.org/10.69896/modeling.v10i2.1621>.
- Fakhri, F., Hadromi, H., & Widjanarko, D. (2018). Practical Learning Model Assisted by Mobile Workshop for Enhancing Practical Skills and Entrepreneurial Spirit for



- Prospective Vocational High School Graduates. *Journal of Vocational and Career Education*, 3(2). <https://doi.org/10.15294/jvce.v3i2.16704>.
- Fitriani, F., & Maemonah, M. (2022). Perkembangan Teori Vygotsky Dan Implikasi Dalam Pembelajaran Matematika Di Mis Rajadesa Ciamis. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, 11(1), 35–41. <https://doi.org/10.33578/jpkip.v11i1.8398>.
- Haling, A., Sudirman, S., Nasruddin, N., Syamsuddin, S., & Halik, A. (2022). Development of Character-Based Science Teaching Materials Using the Webbed Model to Improve Students' Creative Thinking Skills. *Journal of Educational Science and Technology (EST)*, 8(3), 172. <https://doi.org/10.26858/est.v8i3.39360>.
- Hermawan, R., N., & Andayani. (2009). *Pembelajaran Terpadu Di SD*. Universitas Terbuka.
- Herni, S. (2015). Penerapan Pembelajaran IPA Terpadu Menggunakan Model Webbed Untuk Meningkatkan Literasi Sains Siswa Pada Tema Kalor Dan Perubahan Suhu. In *Prosiding Seminar Nasional Fisika* (p. 4). <https://www.academia.edu/download/91733293/pdf.pdf>.
- Heru. (2014). Penerapan Pembelajaran IPA Terpadu Tipe Webbed Menggunakan Model Pembelajaran Kooperatif Tipe STAD Pada Tema Roket Air Di Kelas VIII Smp Negeri 1 Dlanggu Mojokerto. *Pensa E-Jurnal: Pendidikan Sains*, 2(1). <https://www.neliti.com/publications/250374/>.
- Isro, A. L., Anggraito, Y. U., & Bintari, S. H. (2021). Description of Students' Critical Thinking Skills in Integrated PjBL STEM Learning Environmental Change Material. *Journal of Innovative Science Education*, 10(3), 237–243. <https://doi.org/10.15294/jise.v10i1.43920>.
- Korkmaz, M., & Akçay, A. O. (2024). Determining digital literacy levels of primary school teachers. *Journal of Learning and Teaching in Digital Age*, 9(1), 1–16. <https://doi.org/10.53850/joltida.1175453>.
- Kumandaş, B., Ateskan, A., & Lane, J. (2018). Misconceptions in biology: a meta-synthesis study of research, 2000–2014. *Journal of Biological Education*, 3(1), 55–64. <https://doi.org/10.1080/00219266.2018.1490798>.
- Latif, A., Pahru, S., & Muzakkar, A. (2022). Studi Kritis Tentang Literasi Sains dan Problematikanya di Sekolah Dasar. *Jurnal Basicedu*, 6(6), 9878–9886. <https://doi.org/10.31004/basicedu.v6i6.4023>.
- Lusiana, & M, S. (2018). Metode SLR Untuk Mengidentifikasi Isu-Isu Dalam Software Engineering. *Satin: Sains, Teknologi Dan Informasi*, 3(1), 1–11. <https://doi.org/10.33372/stn.v3i1.347>.
- Lutfiah, H. N., & Dyah, A. (2013). Penerapan Model Pembelajaran Kooperatif Tipe Student Teams Achievement Division (STAD) Dengan Pembelajaran IPA Terpadu Materi Bahan Aditif Pada Makanan Di Kelas Vii Smp Negeri 2 Jatirejo. *Pensa E-Jurnal: Pendidikan Sains*, 1(3). <https://www.neliti.com/publications/249654/>.
- Mansurotun, S. (2014). Pengembangan Perangkat Pembelajaran IPA Terpadu Tipe Webbed Berorientasi Inkuiri Terbimbing Tema Rainbow Cake Untuk Siswa SMP/MTS Kelas VIII. *Pensa E-Jurnal: Pendidikan Sains*, 2(1). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/7155>.
- Meri, Y. N., & Wulan, A. R. (2019). Penerapan Model Pembelajaran Brain Based Learning Menggunakan Pembelajaran IPA Terpadu Tipe Webbed Dan Connected Pada Materi Pemanasan Global Untuk Meningkatkan Penguasaan Konsep Dan KPS. *Edusains*, 8(2), 128–35. <https://www.academia.edu/download/90802925/pdf.pdf>.
- Nazila., R. A., & Suliyannah. (2013). Penerapan Pembelajaran Langsung Pada IPA Terpadu Tipe Webbed Dengan Tema "Makanan Dan Kesehatan" Di Kelas VIII SMP Negeri 2 Jombang. *Pensa E-Jurnal: Pendidikan Sains*, 1(1). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/1333>.

- Ningrum, Y., & S.Y, R. (2013). Penerapan Pembelajaran IPA Terpadu Tipe Webbed Berorientasi Kecakapan Hidup (Life Skill) Pada Tema Suara Kelas VIII SMP Al-Amal Surabaya. *Pensa E-Jurnal: Pendidikan Sains*, 1(1). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/1332>.
- Niswatin, S., Laila, M. K., Ana, W. Y. R., & Yuni, H. (2020). Peningkatan Kemampuan Literasi Sains Menggunakan Model PBL Berbantuan Majalah IPA Terpadu Tipe Webbed Berorientasi SETS. *Jurnal NSER*, 2(3). <https://doi.org/10.21107/nser.v2i3.13765>.
- Northey, G., Govind, R., Bucic, T., Chylinski, M., Dolan, R., & van Esch, P. (2018). The effect of “here and now” learning on student engagement and academic achievement. *British Journal of Educational Technology*, 49(2), 321–333. <https://doi.org/10.1111/bjet.12589>.
- Noviana, N., Sutarno, S., Parlindungan, D., Wardana, R. W., & Sakti, I. (2022). Hubungan Antara Motivasi Belajar Dengan Penguasaan Konsep Dalam Pembelajaran IPA Terpadu Tipe Webbed Pada Konsep Pelangi Siswa SMPN 9 Kota Bengkulu. *DIKSAINS: Jurnal Ilmiah Pendidikan Sains*, 3(1), 7–16. <https://ejournal.unib.ac.id/diksains/article/download/25763/11460>.
- Novianti, N., & Fitriani, A. (2015). Penerapan Pembelajaran IPA Terpadu Tipe Webbed Dan Shared Pada Tema Pemanfaatan Sampah Untuk Meningkatkan Penguasaan Konsep. In *Prosiding Seminar Nasional Fisika (E-Journal)*. <https://core.ac.uk/download/pdf/572667231.pdf>.
- Novitasari, Y., Fadillah, S., & Putri, A. A. (2023). Impresi Guru pada Penggunaan Media Digital dalam Pembelajaran Awal Bahasa Inggris Anak Usia Prasekolah. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, 7(3), 3745–3754. <https://doi.org/10.31004/obsesi.v7i3.4619>.
- Nurul, H., Alwen, B., Elfia, S., & Melva, Z. (2023). Pengaruh Model Pembelajaran Berbasis Masalah Terhadap Hasil Belajar Dalam Pembelajaran Terpadu Berbasis Webbed Di Sekolah Dasar. *Jurnal Penelitian Pendidikan IPA*, 9(11). <https://doi.org/10.29303/jppipa.v9i11.4298>.
- Okoye, K., Rodriguez-Tort, J. A., Escamilla, J., & Hosseini, S. (2021). Technology-mediated teaching and learning process: A conceptual study of educators’ response amidst the Covid-19 pandemic. In *Education and Information Technologies*. <https://doi.org/10.1007/s10639-021-10527-x>.
- Permatasari, R. (2013). Pengembangan Bahan Ajar IPA Terpadu Tipe Webbed Dengan Tema Tanggap Bencana Untuk Siswa Kelas VII SMPN 1 Pogalan. *Pensa E-Jurnal: Pendidikan Sains*, 1(2). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/2506>.
- Prasetyo, D., Marianti, A., & Alimah, S. (2021). Improvement of Students’ Science Literacy Skills Using STEM-Based E-Modules. *Journal of Innovative Science Education*, 10(2), 216–221. <https://journal.unnes.ac.id/sju/jise/article/view/43539>.
- Rahayu, I. T., Pramuswari, M. F., Santya, M., Oktariani, R., & Fatimah, S. (2023). Analisis Hasil Pengaruh Perkembangan IPTEK Terhadap Hasil Belajar Siswa SD/MI. *HYPOTHESIS: Multidisciplinary Journal Of Social Sciences*, 2(1), 97–110. <https://doi.org/10.62668/hypothesis.v2i01.645>.
- Rahelly, Y. (2018). Implementasi Kurikulum 2013 Pendidikan Anak Usia Dini (Paud) Di Sumatera Selatan. *JPUD - Jurnal Pendidikan Usia Dini*, 12(2), 381–390. <https://doi.org/10.21009/jpud.122.21>.
- Razzaq, F., Siddiqui, A., Ashfaq, S., Bin Ashfaq, M., & Muschert, G. (2024). Assessing the impact of a video literacy program on emotional intelligence and resilience to



- extremism in primary school children. *Humanities and Social Sciences Communications*, 11(1), 1–11. <https://doi.org/10.1057/s41599-024-04011-3>.
- Ristina, H., Linuwih, S., & Nuswawati, M. (2019). SETS Learning Efficacy to Improve Students Science Literacy Skills. *Journal of Innovative Science Education*, 8(2), 183–189. <https://journal.unnes.ac.id/sju/jise/article/view/27905>.
- Rosmawati, W. (2023). Efektifitas Penggunaan E-Book untuk Melatih Kemampuan Berpikir Kritis Peserta Didik. *Jurnal Didaktika Pendidikan Dasar*, 7(3), 979–1002. <https://doi.org/10.26811/didaktika.v7i3.1172>.
- Rt, K. M., Wahidin, W., & Yulia, G. R. (2015). Penerapan Pembelajaran Terpadu Tipe Nested (Tersarang) Untuk Meningkatkan Literasi Sains Siswa Pada Konsep Ekosistem Di Kelas X SMA Negeri 5 Kota Cirebon. *Scientiae Educatia: Jurnal Pendidikan Sains*, 4(2). <https://doi.org/10.24235/sc.educatia.v4i2.494>.
- Santoso, A. P. T., & Ismono. (2013). Pengembangan Perangkat Pembelajaran IPA Terpadu Tipe Webbed Pada Tema Pestisida Untuk Melatih Karakter Siswa. *Pensa E-Jurnal: Pendidikan Sains*, 1(1). <https://ejournal.unesa.ac.id/index.php/pensa/article/view/1388>.
- Sari, D. L., Rusilowati, A., & Linuwih, S. (2016). Pengembangan Bahan Ajar IPA Terpadu Berbasis Literasi Sains Bertema Perpindahan Kalor Dalam Kehidupan. *UPEJ Unnes Physics Education Journal*, 4(3), 2503–2313 2252–6935. <https://journal.unnes.ac.id/sju/upej/article/view/7432>.
- Sari, N. A., Akbar, S., & Yuniastuti. (2018). Penerapan pembelajaran tematik terpadu di sekolah dasar. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 3(12), 1572–1582. <https://doi.org/10.17977/jptpp.v3i12.11796>.
- Setyorini, R., Saddhono, K., Ermanto, Wildan, M., & Kirom, S. (2019). The Effort of Implementing of the Big Book as A Media to Improve the Intelligence of Linguistic Verbals for Early Childhood. *Journal of Physics: Conference Series*, 1339(1). <https://doi.org/10.1088/1742-6596/1339/1/012087>.
- Sudarman, F. F. (2021). Pengembangan E-Module IPA Terpadu Tipe Webbed Untuk Meningkatkan Literasi Sains Mahasiswa Pendidikan Fisika Dalam Perkuliahan Online Di Era Pandemi. *Omega: Jurnal Fisika Dan Pendidikan Fisika*, 7(2), 16–21. [http://eprints.unm.ac.id/28487/1/REFERENSI\\_SRL\\_K3\\_.pdf](http://eprints.unm.ac.id/28487/1/REFERENSI_SRL_K3_.pdf).
- Suharjo, & Sutrisno. (2017). Pengembangan Alat Penilaian Kemampuan Mengajar Dengan Pendekatan Pembelajaran Tematik Terpadu Dan Pendekatan Saintifik Di SD. *Sekolah Dasar: Kajian teori Dan Praktik Pendidikan*, 26(2), 169–174. <https://doi.org/10.17977/um009v26i22017p169>.
- Sukma, M. C., & Ibrahim, M. (2016). Developing materials for active learning of guided inquiry-integrated bowling campus on the topic of sense of hearing and sonar system of living organism. *Jurnal Pendidikan IPA Indonesia*, 5(2), 256–260. <https://doi.org/10.15294/jpii.v5i2.5981>.
- Suryadi, A. F., Sudarto, S., & Ramlawati, R. (2020). Pengembangan Handout Pembelajaran IPA Terpadu Tipe Webbed Berbasis Kontekstual Peserta Didik Kelas VIII Tema Makanan. *Jurnal IPA Terpadu*, 3(2). <https://eprints.unm.ac.id/22590/>.
- Sutrisno, Yuzni, S. Z., Sebayang, N., Lukman, M. F., Wijaya, K., Idris, I., Sari, R. A., & Yolanda, A. (2022). Design and Validation of Lesson Plan Development in Materials Technology Courses with an Outcome-Based Education Approach. *Proceedings of the 6th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2021)*, 591(Aisteel), 943–948. <https://doi.org/10.2991/assehr.k.211110.210>.
- Triandini, E., Jayanatha, S., Indrawan, A., Putra, G. W., & Iswara, B. (2019). Metode Systematic Literature Review Untuk Identifikasi Platform Dan Metode Pengembangan

- System Informasi Di Indonesia. *Indonesia Journal of Information System*, 1(2), 63–77. <https://doi.org/10.24002/ijis.v1i2.1916>.
- Trianto. (2012). *Model Pembelajaran Terpadu: Konsep, Strategi, Dan Implementasinya Dalam KTSP*. Bumi Aksara.
- Ulan, S. I. M., & Ratna, D. N. P. S. (2022). Penerapan Model Problem Based Learning (PBL) Pada Pembelajaran IPA Terpadu Terhadap Kemampuan Literasi Sains Peserta Didik SMP. *Sembio: Prosiding Seminar Nasional Biologi Dan Pendidikan Biologi*, 1(1). <https://doi.org/10.5281/zenodo.7112617>.
- Volante, L., & Fazio, X. (2007). Exploring teacher candidates' assessment literacy: Implications for teacher education reform and professional development. *Canadian Journal of Education*, 30(3), 749–770. <https://doi.org/10.2307/20466661>.
- Wali, M. D. (2020). Pembelajaran Terpadu Webbed Untuk Meningkatkan Hasil Belajar Siswa. *Mimbar PGSD Undiksha*, 8(3), 404–411. [http://risbang.unuja.ac.id/media/arsip/berkas\\_penelitian/12.pdf](http://risbang.unuja.ac.id/media/arsip/berkas_penelitian/12.pdf).
- Wicaksono, A. A., Depra, L., Maharani, S., Syahrial, & Noviyanti, S. (2022). Media Digital Dalam Memberdayakan Kemampuan Berpikir Kritis Abad 21 Pada Pembelajaran IPA Di Sekolah Dasar. *Jurnal Pendidikan Dan Konseling*, 4, 1349–1358. <https://doi.org/10.31004/jpdk.v4i3.4290>.
- Widada, W., & Herawaty, D. (2017). Dekomposisi Genetik tentang Hambatan Mahasiswa dalam Menerapkan Sifat-sifat Turunan. *Jurnal Didaktik Matematika*, 4(2), 136–151. <https://doi.org/10.24815/jdm.v4i2.9216>.
- Widharnati, W., Retnowati, R., Permana, I., & Ronä eviÄ, T. (2022). Webbed Type of Integrated Science Learning on the Theme of Environmental Pollution to Improve Students Scientific Literacy. *JSEP (Journal of Science Education and Practice)*, 6(2), 77–94. <https://journal.unpak.ac.id/index.php/jsep/article/view/5847>.
- Widia, W., & Sarnita, F. (2020). Desain Percobaan IPA dengan Bahan Dari Lingkungan untuk Meningkatkan Pemahaman Konsep Sisiwa. *Jurnal Pendidikan Dasar*, 1(2), 1–5. <https://doi.org/10.56842/pendikdas.v1i1.12>.
- Wingert, J. R., Wasileski, S. A., Peterson, K., Greden Mathews, L., Lanou, A. J., & Clarke, D. (2014). The Impact of Integrated Student Experiences on Learning. *Journal of the Scholarship of Teaching and Learning*, 14(1), 42–58. <https://doi.org/10.14434/josotl.v14i1.3938>.
- Yaki, A. A. (2022). Fostering Critical Thinking Skills Using Integrated STEM Approach among Secondary School Biology Students. *European Journal of STEM Education*, 7(1), 6. <https://eric.ed.gov/?id=EJ1363231>.
- Zakiyatu Maulidina, Nuriman, F. S. H. (2018). Pengaruh Model Pembelajaran Kooperatif Tipe Teams Games Tournament (TGT) Berbantuan Media Teka Teki Silang terhadap Hasil Belajar Siswa di SDN Tegalgede 01 Jember. *Jpsd*, 25(1), 141–147. <https://doi.org/10.26555/jpsd.v5i1.a12575>.