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Implementation of the Brain-Based Learning Model in Developing the Creative Thinking Skills of Elementary School Students

Ratna Sri Wahyuliningtyas[1*], Yepi Sedya Purwananti[2], Imam Sujono[3]

[1,2,3]Master's Program in Social Science Education, Postgraduate School, Universitas Bhinneka PGRI Tulungagung, Indonesia

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Corresponding Author:
Author Name*: Ratna Sri Wahyuliningtyas
Email*: ratnawahyuliningtyas67@admin.sd.belajar.id

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ABSTRACT

This study aims to describe the implementation of the Brain-Based Learning (BBL) model in developing the creative thinking skills of elementary school students. The research used a descriptive qualitative approach, with the subjects comprising one teacher and fifth-grade students from SD Negeri 2 Wajak Kidul. Data were collected through observation, interviews, documentation, and analysis of the teaching module, with a focus on creative thinking indicators, including fluency, flexibility, originality, and elaboration. The results of the study show that the learning plan was systematically arranged according to the seven stages of BBL, utilizing visual media, educational games, and authentic assessments to stimulate students' creativity. The implementation of BBL created an interactive, contextual, and enjoyable learning atmosphere, encouraging active student engagement through discussions, projects, and presentations. Students showed an improvement in creative thinking skills, although the achievement in each indicator varied. The supporting factors of success included teacher readiness, student motivation, and school support. The main obstacles encompassed limited time, technological facilities, and students' initial adaptation to activity-based learning. In conclusion, the implementation of BBL proved effective in creating a conducive learning environment that aligns with the way the brain works, thereby optimizing the development of creative thinking skills in elementary school students. This model can serve as an innovative learning alternative to improve the quality of Science and Social Science (IPAS) learning in elementary schools.

Keywords: brain-based learning, creativity, students, IPAS

INTRODUCTION

Twenty-first-century education requires the mastery of higher-order thinking skills, commonly referred to as the 4C framework: critical thinking, communication, collaboration, and creativity [1]. John Dewey, as cited in [2], defines critical thinking as active, persistent, and careful consideration of a belief or form of knowledge accepted without doubt, which involves supporting reasons and rational conclusions. This provides an important foundation for equipping students with the ability to understand the complexity of a dynamic world and to become intelligent decision-makers. Another vital skill that students must possess is communication.

Communication is the process of delivering meaningful messages or information from one individual or location to another, intending to achieve mutual understanding [3]. Communication is a process in which two or more people are involved in the exchange of information, thereby developing a deeper mutual understanding. In the context of education, communication skills play an important role in achieving learning objectives [4]. The importance of communication cannot be overstated in developing individuals who are competent and able to thrive in various real-life situations. All of these competencies must be supported by collaboration.

Collaboration skills are very important in shaping the social character of students. Collaboration refers to coordinated interactions among students who work together to solve problems [5]. Collaborative skills involve the ability to work effectively with others, appreciate diversity within the team, demonstrate flexibility, and contribute through compromise to achieve common goals [6]. Collaboration encourages strong teamwork, joint problem-solving, and the achievement of shared goals. In this process, creative thinking skills play a crucial role, as they are essential for generating new ideas, designing innovative solutions, and adapting to team dynamics.

Creative thinking ability refers to an individual's cognitive skill to use imagination and thinking potential that emerge from interactions with ideas, other people, and the environment to build new connections and produce innovative and meaningful solutions, as cited by Bara in [4]. In a rapidly changing world, the ability to think creatively becomes the key to finding innovative solutions to complex problems. Encouraging students to

sharpen fluency, flexibility, originality, and elaboration constitutes an important investment in shaping a generation capable of facing challenges in a fresh, adaptive, and innovative manner.

Among the four twenty-first-century competencies, creative thinking ability holds an important role in facing global challenges that are dynamic, complex, and unpredictable. Through this ability, individuals can produce innovative and applicable alternative solutions from my research [7]. In response to this need, the Merdeka Curriculum in Indonesia emphasizes enjoyable and meaningful learning to foster critical and creative thinking, as stated in [8]. This curriculum places students at the center of the learning process, providing freedom for teachers and students to choose methods, materials, and learning pace according to their needs, as stated in [9]. This approach encourages the exploration of knowledge, the development of new ideas, and the application of creative thinking ability in problem-solving.

Creative thinking ability is a core skill that students need to solve problems effectively and innovatively. Guilford [10] argued that it is defined as the ability to generate new ideas with fluency, flexibility, originality, and elaboration. Kim [11] argued that creative thinking involves unique and imaginative processes in responding to problems, while Rahman [12] argued that education must cultivate this ability to prepare a generation that is adaptive to global change.

The novelty of this research lies in its focus on the implementation of the Brain-Based Learning (BBL) model in Science and Social Science (IPAS) learning in elementary schools to develop students' creative thinking ability. Unlike previous studies, which generally measured the effect of BBL on learning outcomes or creativity in exact sciences subjects, this research comprehensively describes the processes of planning, implementation, student responses, as well as the supporting and inhibiting factors of BBL implementation. This approach is expected to generate new insights into how BBL can be adapted to the cognitive development characteristics of elementary school students to maximize brain potential and foster creative thinking ability in a sustainable manner [13].

Several previous studies have examined the Brain-Based Learning (BBL) model in various contexts. Darmawan et al. [14] and Aggraini et al. [15] argued that BBL can improve learning outcomes and motivate students, but their focus was limited to academic achievement without exploring the development of creative thinking ability in depth. Yarti [16] argued that studying BBL in mathematics learning found a positive effect on creativity, but did not elaborate on the classroom implementation process and its relation to the cognitive development characteristics of elementary school students.

BBL learning with the Whole Brain Teaching method is intended to improve mathematical creative thinking ability. However, the object of study is still limited to exact subjects and does not discuss Science and Social Science (IPAS) learning, which is multidisciplinary in nature.

Based on this gap, this study offers novelty by comprehensively examining the implementation of BBL in Science and Social Science (IPAS) learning in elementary schools, including the analysis of planning, implementation, student responses, as well as supporting and inhibiting factors. Thus, this study not only measures outcomes but also describes the learning process aligned with the way the brain works to develop students' creative thinking ability optimally and sustainably.

Creative thinking is the driving force behind exploration, development, and discovery in science and technology. Mardhiyana [17] argued that creative thinking plays an important role in life, because creativity is a resilient human resource. By enhancing creative thinking, students can develop themselves and find new ways to solve everyday problems, such as the challenges encountered in science learning. Science and Social Science (IPAS), or Natural and Social Sciences, is a discipline that studies living and non-living beings in the universe and their interactions, as well as human life as individuals and social beings who interact with the government [18]. Science and Social Science (IPAS) learning at the elementary level is designed to help students understand scientific concepts relevant to everyday life, such as natural phenomena, cause-and-effect relationships, and the application of simple technology [19]. However, IPAS learning often faces challenges in developing students' creative thinking skills.

One of the main challenges is the tendency of IPAS learning to focus on memorization and theoretical concepts, which can hinder students' creative potential. In fact, IPAS learning should not only emphasize the mastery of basic concepts but also encourage students to apply their knowledge in solving real-world problems in their environment [20]. Students who possess creative thinking skills are better able to integrate theory with practice, producing innovative solutions that are relevant to actual conditions. Deep understanding is reflected when students can articulate what they have learned and what they still question. Furthermore, students are considered to have internalized a problem when they can solve it fluently, provide a variety of logical solutions, and apply their creative thinking skills.

Developing creative thinking skills in students plays an important role, encouraging teachers and education practitioners to map and evaluate students' creativity development. One effective approach is the application of a learning model specifically designed to stimulate and assess the development of students' creative thinking. By selecting the appropriate model, teachers can not only deliver material conventionally but also create meaningful and challenging learning experiences aligned with brain function. Brain-Based Learning (BBL) is an example of such a model. This model provides a framework rooted in the principles of neuroscience, such as multisensory engagement,

meaningful context, and positive emotional reinforcement, which can enhance students' creativity while also helping teachers observe changes and improvements in students' creative thinking [21].

Brain-Based Learning (BBL) is an instructional approach that activates students to construct their own knowledge by utilizing and optimizing their brain capacity [22]. Through this self-directed knowledge construction, students are encouraged to think more deeply, which leads to stronger understanding and mastery of the material. Furthermore, this model enables students to express their abilities and creativity, thereby fostering active and meaningful learning. Meanwhile, Agustina [23] argued that it aims to optimize students' brain potential by applying neuroscience principles such as multisensory engagement and meaningful context, which ultimately enhance learning effectiveness. Therefore, the Brain-Based Learning model not only enriches students' cognitive experiences but also continuously develops their creative thinking skills.

RESEARCH METHOD

This study used a descriptive qualitative approach to describe the implementation of Brain-Based Learning (BBL) and to measure students' creative thinking ability [24]. The variable examined was creative thinking ability with four indicators: fluency, flexibility, originality, and elaboration.

The research subjects were the fifth-grade teacher and the fifth-grade students of SD Negeri 2 Wajak Kidul. The teacher served as the implementer of the BBL model in learning activities, while the students were the primary focus of the research, particularly in relation to the development of their creative thinking skills. The object of the study was the process of implementing the BBL model in the Science and Social Science (IPAS) subject, as well as the achievement of students' creative thinking skills.

The sources of data in this study consisted of primary data and secondary data. Primary data were obtained through observation of teacher and student activities as well as semi-structured interviews with teachers and students, while secondary data were obtained from documentation in the form of learning tools, teaching modules, students' work, photos, and field notes. Data collection was carried out to obtain a comprehensive description of the implementation of BBL and students' responses to the learning.

Data analysis used the Miles and Huberman model, which includes three stages: data reduction, data display, and conclusion drawing. To measure students' creative thinking skills, the researcher used an assessment rubric containing four main indicators: fluency, flexibility, originality, and elaboration. Each student was then categorized into a Creative Thinking Skills Level (CTSL) on a scale of 1–4, where CTSL 4 indicates very creative, CTSL 3 creative, CTSL 2 fairly creative, and CTSL 1 less creative. The results of this measurement were combined with data from interviews and documentation to obtain a deeper understanding. Data validity was ensured through method triangulation and source triangulation.

RESULTS AND DISCUSSION

In the study, the learning plan, based on the Brain-Based Learning (BBL) model, was systematically arranged into seven main stages: pre-exposure, preparation, initiation and acquisition, elaboration, incubation, verification, and celebration. These seven stages were not only arranged theoretically but also integrated into the teaching module, which served as a guideline for classroom implementation. At the pre-exposure stage, the teacher prepared students with initial activities that were capable of attracting attention, for example, through a short story or a relevant trigger question from daily life. The preparation stage was then filled with activities such as icebreakers, and the learning activity began with Brain Gym, namely, simple movements that stimulate body and brain coordination. Thus, students are more prepared to engage in learning activities, creating an enjoyable learning atmosphere and reducing students' stress levels. At the initiation-acquisition stage, the teacher introduced new material through a multisensory approach, utilizing videos, pictures, and narratives that simultaneously stimulated students' senses. The implementation of the Brain-Based Learning (BBL) model in Science and Social Science (IPAS) learning for the fifth grade at SD Negeri 2 Wajak Kidul showed that the teacher was able to consistently carry out the seven learning stages, starting from pre-exposure, preparation, initiation-acquisition, elaboration, incubation, verification, and celebration. Each stage was integrated through various strategies, including the use of icebreakers, visual media in the form of videos and pictures, group discussions, and creative project assignments such as making posters, simple dramas, and group presentations. These activities created a fun and engaging learning atmosphere, motivating students to participate more actively in the learning process.

Students' responses to the implementation of BBL tended to be positive. The observation results showed an increase in student participation in group discussions, as well as an increase in the courage to express ideas and the ability to collaborate with peers. Students who were usually passive began to show active engagement, both in expressing opinions and in completing group tasks. In addition, students' self-confidence appeared to increase when they were asked to present their work in front of the class.

Students' creative thinking skills were measured using a rubric containing four indicators, namely fluency, flexibility, originality, and elaboration. The measurement results showed that most students fell into the CTSL 3 category (creative), characterized by their ability to generate various relevant ideas and solutions. Some students even reached the CTSL 4 category (very creative) by presenting unique ideas and developing them in detail. A small number of students were in the CTSL 2 category (fairly creative), while no

students were in the CTSL 1 category (less creative). These data indicate that the implementation of BBL had an impact on improving the quality of students' creative thinking skills.

The supporting factors in the implementation of BBL included the teachers' readiness to design effective learning, students' enthusiasm for participating in activities, and the support of the principal and fellow teachers. The inhibiting factors found were the limited learning time and the lack of adequate technological facilities to support multimedia-based activities.

The results of this study confirmed that the implementation of BBL was effective in fostering the creative thinking skills of elementary school students. This is in line with the opinion of [25], which states that brain-based learning can maximize brain potential through a multisensory approach, emotional engagement, and contextual experiences. By involving visual media, physical activities, and social interaction, students not only learned cognitively but also integrated emotional and social aspects into the learning process.

The improvement of students' creative thinking skills in the CTSL 3 and CTSL 4 categories showed that they were able to generate diverse, unique, and detailed ideas. This finding is consistent with the study of [26], which stated that BBL can improve students' learning outcomes and creativity through active and enjoyable learning experiences. Similarly, [27] argued that the implementation of BBL significantly increased students' engagement in the learning process, which in turn had an impact on the development of creativity.

Students' positive responses to learning were also consistent with the study of [28] which showed that BBL not only fostered creativity but also developed affective aspects, such as learning motivation and self-confidence. In this study, students felt freer to express their opinions without fear of being wrong because of the supportive classroom atmosphere, which encouraged them to be confident in trying new ideas. This is important because creativity in education will grow if students are given space to innovate in a safe and enjoyable learning environment.

The supporting factors identified in this study, namely teacher readiness, student enthusiasm, and school support, revealed that a conducive learning environment has a significant influence on the success of BBL implementation. Jayadi and Supena [29] emphasized that teachers' perception and readiness regarding the concept of BBL play an important role in the effectiveness of its implementation in the classroom. Conversely, the limitations of facilities and time were the main obstacles, as also reported in the study of [30]. Therefore, better infrastructure support and effective time management are necessary for the implementation of BBL to run optimally.

The finding that most students were in the creative and very creative categories also reinforced the study of [31] which showed that brain-based learning produces better learning outcomes compared to conventional learning. This proves that BBL is relevant for promoting the mastery of twenty-first-century skills, particularly creativity, which is part of the 4C concept (critical thinking, communication, collaboration, and creativity).

Overall, this study confirmed that BBL can create a meaningful and active learning atmosphere that supports the development of students' creative thinking skills. The success of BBL implementation is determined by teachers' readiness in designing activities aligned with the way the brain works, the support of the school environment, and the availability of learning facilities. By overcoming existing limitations, BBL can serve as an effective alternative learning model for developing the creativity of elementary school students, particularly in the Science and Social Science (IPAS) subjects, which require the integration of natural and social knowledge with real-life contexts.

On the other hand, there were also several obstacles, including the limited time to carry out all stages of BBL ideally, especially when the lesson schedule was relatively short. Additionally, some students required time to adapt to project-based tasks, as they were not yet accustomed to a learning model that involves independence and creativity. The limitations of technological facilities, such as the availability of projectors or stable internet access, also posed their own challenges, although they could be overcome with teachers' creativity.

The results of the study showed that the brain-based learning planning applied in this research was in accordance with the theoretical principles proposed at the end of this study [32]. Both experts emphasized that effective learning must be based on the way the brain functions, including how it processes information, stores memories, and connects new experiences with previous experiences. The learning plan carried out by the teacher focused on stimulating students' emotional and cognitive development. Activities such as icebreakers and Brain Gym function to reduce stress and create a positive atmosphere, while group discussions and creative projects stimulate deep cognitive engagement. Thus, these strategies support long-term memory retention and encourage the emergence of creativity.

The results of this study also reinforced the findings of previous research, such as Andini [33], who stated that the implementation of BBL proved effective in improving students' creativity. Through systematic planning and consistent implementation, students had the opportunity to develop creative thinking skills through various activities designed by the teacher. This confirmed that the theory put forward by experts can be practically implemented in the classroom, even at the elementary school level.

The effectiveness of BBL implementation became more evident when students showed increased participation and engagement in learning activities. Student participation was measured using an observation sheet that contained indicators of active involvement, such as the frequency of asking questions, expressing ideas, and participating in group discussions. In addition, students' creative thinking skills were

measured using an assessment rubric that included aspects of fluency, flexibility, originality, and elaboration. Data from the observations and the assessment rubric showed an increase in the average scores on almost all indicators, indicating that students were not only more active but also able to develop ideas in a more varied and original manner.

These results are consistent with the opinion of Permana [34] who emphasized that brain-based learning can optimize brain function through multisensory stimulation, thereby facilitating students' understanding and memory retention. The study by Solihat [35] has also been proven that the implementation of BBL significantly increases students' participation and learning motivation, as this approach integrates visual, kinesthetic, and auditory activities in a balanced manner. In addition, the findings of Wulandari [36] showed that providing incubation time in brain-based learning plays an important role in strengthening the consolidation of long-term memory, making it easier for students to remember and apply the concepts they have learned.

Thus, the findings of this study reinforce the empirical evidence that implementing BBL can improve students' active participation and problem-solving skills, particularly through a multisensory approach and structured incubation strategies. The impact of BBL implementation on students was seen not only in improved learning outcomes but also in psychological and social aspects. A positive learning environment encouraged students' confidence to express themselves without fear of making mistakes, highlighting the importance of a supportive atmosphere for fostering creativity. The creative projects assigned by the teacher proved to sharpen divergent thinking skills, specifically the ability to generate multiple possible answers, encompassing fluency, flexibility, originality, and elaboration. This finding aligns with studies showing that BBL can improve both students' motivation and learning outcomes.

However, the implementation of BBL faced several obstacles. One of the main obstacles was the limitation of time, because the stages of BBL ideally require a sufficiently long allocation of time so that each phase can be carried out optimally. The teacher addressed this issue by condensing several stages without reducing the essence of BBL. Another obstacle was the students' adaptation process, which still required support in dealing with project-based tasks. To address this issue, the teacher provided scaffolding or gradual support, allowing students to learn more independently over time. The limitations of technological facilities also became an obstacle; however, the teacher was able to find creative solutions by utilizing printed media or pictures as substitutes for videos, highlighting the importance of teacher flexibility in the use of learning media.

Overall, this study proved that the planning and implementation of learning with the Brain-Based Learning model were able to provide a positive impact on the development of elementary school students' creative thinking skills. Careful planning, consistent implementation, and the support of a conducive learning environment were proven to increase students' motivation, participation, and self-confidence. These findings also strengthened previous empirical evidence regarding the effectiveness of BBL in improving the quality of learning.

CONCLUSION

This study showed that the implementation of the Brain-Based Learning (BBL) model in Science and Social Science (IPAS) learning in the fifth grade at SD Negeri 2 Wajak Kidul was effective in developing students' creative thinking skills. The learning plan followed the seven stages of BBL, supported by visual media, educational games, and authentic assessment. Creative thinking skills were measured using a rubric containing four indicators: fluency (number of ideas), flexibility (variety of ideas), originality (uniqueness of ideas), and elaboration (level of detail). Data were obtained through observation, analysis of students' work, and interviews. The results showed an increase in scores on all indicators, with most students falling into the creative category (CTSL 3) and the very creative category (CTSL 4).

These findings are consistent with previous studies, which confirmed that BBL, through a multisensory approach, can significantly improve students' participation and creativity [37]. Thus, the effectiveness of BBL was proven not only to create an interactive learning atmosphere but also to be systematically measurable through assessment instruments of creative thinking skills.

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REFERENCES

[1] T. Taryono, D. Saepuzaman, M. A. Dhina, and N. Fitriyanti, "Penerapan Pembelajaran Berbasis Proyek dan Pembelajaran Berbasis Masalah pada Mata Pelajaran Fisika untuk Meningkatkan Keterampilan Abad 21 (4Cs) Siswa SMP," *WaPFi (Wahana Pendidikan Fisika)*, vol. 4, no. 1, 2019, doi: 10.17509/wapfi.v4i1.15825.

[2] R. F. N. Rusman, "Pengaruh Kemampuan Penguasaan Materi, Berpikir Kritis, Kreativitas, Komunikasi dan Kolaborasi Terhadap Kemampuan Mengajar Mahasiswa," *Journal of*

Social Education, vol. 4, no. 2, 2023, doi: 10.23960/jips/v4i2.96-102.
[3] M. Masdul, "Komunikasi Pembelajaran," *Jurnal Ilmu Kependidikan dan Keislaman* , vol. 13, no. 1, 2018.
[4] S. Lestari, "Pengembangan Orientasi Keterampilan Abad 21 pada Pembelajaran Fisika melalui Pembelajaran PjBL-STEAM Berbantuan Spectra-Plus," *Ideguru: Jurnal Karya Ilmiah Guru*, vol. 6, no. 3, 2021, doi: 10.51169/ideguru.v6i3.243.
[5] R. Virza Aulia Lestari, "PENERAPAN 4C (COMMUNICATION, COLLABORATION, CRITICAL THINKING, CREATIVITY) PADA KURIKULUM MERDEKA DI TINGKAT SMA," 2023, [Online]. Available: http://ejurnal.pps.ung.ac.id/index.php/Reduplikasi/
[6] D. Septi Nur Afifah, T. Indiyah, W. Dwi Winarti, and I. Sujono, "European Journal of Education Studies Students' Error In Statistical Problems Solving Based On The Onto-Semiotic Approach", doi: 10.46827/ejes.v7i10.3315.
[7] I. Andini, W. Karmila, and S. Achmad, "Penerapan Model Problem Based Learning (PBL) Untuk Meningkatkan Kemampuan Berpikir Kreatif pada Siswa Sekolah Dasar di Kabupaten Soppeng Application of the Problem Based Learning (PBL) Model to Improve Creative Thinking Skills in Elementary School Students in Soppeng Regency," 2023.
[8] M. Damiati, N. Junaedi, and M. Asbari, "Prinsip Pembelajaran dalam Kurikulum Merdeka," *Journal of Information Systems and Management (JISMA)*, vol. 3, no. 2, 2024.
[9] A. Annastawan, "Implementasi Kurikulum Merdeka dalam Pembelajaran PAI di SMPN 4 Purwokerto," 2023.
[10] J. P. Guilford, *INTELLIGENCE, CREATIVITY AND THEIR EDUCATIONAL IMPLICATIONS*, vol. 11, no. 1. 1968.
[11] K. H. Kim, "Can we trust creativity tests? A review of the Torrance Tests of Creative Thinking (TTCT)," *Creat Res J*, vol. 18, no. 1, 2006, doi: 10.1207/s15326934crj1801_2.
[12] F. Rahman, A. Y. Thobroni, and A. T. Farozdaq, "Pemaknaan kembali QS. Al-Hasyr: 18 Sebagai Tujuan Pendidikan Islam yang Adaptif dalam Menyongsong Generasi Khairu Ummah," *Jurnal Kependidikan Islam*, vol. 13, no. 1, 2023.
[13] I. Farida, "PENGARUH PENDEKATAN PEMBELAJARAN BRAIN BASED LEARNING (BBL) TERHADAP KEMAMPUAN BERPIKIR KREATIF MATEMATIKS TERHADAP SISWA," *TEACHING : Jurnal Inovasi Keguruan dan Ilmu Pendidikan*, vol. 1, no. 4, pp. 245–251, Dec. 2021, doi: 10.51878/teaching.v1i4.751.
[14] W. Darmawan, W. I. Fauzi, A. B. Santosa, and J. Nisa, "Students' response to the implementation of brain-based learning (the BBL) approach in history teaching," *Cypriot Journal of Educational Sciences*, vol. 17, no. 9, 2022, doi: 10.18844/cjes.v17i9.8080.
[15] N. W. Y. Anggraini, N. P. Ristiati, and N. L. P. L. Devi, "Pengaruh model pembelajaran Brain Based Learning (BBL) dan model pembelajaran langsung terhadap pemahaman konsep siswa SMP," *JPPSI: Jurnal Pendidikan dan Pembelajaran Sains Indonesia*, vol. 3, no. 1, 2020.
[16] J. A. Yarti and H. Hasanuddin, "Pengaruh Penerapan Model Pembelajaran BBL (Brain Based Learning) terhadap Kemampuan Pemecahan Masalah Matematis ditinjau dari Self Efficacy Siswa SMK," *JURING (Journal for Research in Mathematics Learning)*, vol. 3, no. 1, 2020, doi: 10.24014/juring.v3i1.8966.
[17] D. Mardhiyana, "UPAYA MENINGKATKAN RASA INGIN TAHU MAHASISWA MELALUI PENERAPAN PEMBELAJARAN BERBASIS PROYEK PADA MATA KULIAH EVALUASI PROSES DAN HASIL PEMBELAJARAN MATEMATIKA," *Delta: Jurnal Ilmiah Pendidikan Matematika*, vol. 5, no. 1, 2017, doi: 10.31941/delta.v5i1.389.
[18] KemendikbudristekNo.09, *Keputusan Kepala Badan Standar, Kurikulum, dan Asesmen Pendidikan Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 009/H/KR/2022 Tentang Dimensi, Elemen, dan Sebelemen Profil Pelajar Pancasila Pada Kurikulum Merdeka*, no. 021. 2022.
[19] N. S. Salsabilla and M. Nurhalim, "PENGEMBANGAN MODUL AJAR KURIKULUM MERDEKA MATA PELAJARAN IPAS," *Tarbawi : Jurnal pemikiran dan Pendidikan Islam*, vol. 7, no. 1, 2024, doi: 10.51476/tarbawi.v7i1.497.
[20] A. Nanda. I. M. A. W. Septiana, "Analisis Kritis Materi Ips Dalam Pembelajaran Ipas Kurikulum Merdeka Di Sekolah Dasar," *Ilmiah Pendidikan Guru Sekolah Dasar*, vol. 1, no. 1, 2023.
[21] F. N. Kumala, K. Firdayani, and M. N. Hudha, "Keterampilan Berpikir Kritis IPA Siswa SD: Brain Based Learning (BBL) dan Problem Based Learning (PBL)," *Jurnal Inspirasi Pendidikan*, vol. 8, no. 2, 2018, doi: 10.21067/jip.v8i2.2641.
[22] N. Aisya, "BRAIN BASED LEARNING (PEMBELAJARAN BERBASIS OTAK) PADA ANAK USIA DINI," *Jurnal Kajian Anak (J-Sanak)*, vol. 2, no. 01, pp. 23–39, Dec. 2020, doi: 10.24127/j-sanak.v2i01.362.
[23] E. Agustina, "Memaksimalkan perkembangan Potensi Otak anak Sejak Dini," *Al Fitrah Journal Of Early Childhood Islamic Education*, vol. 2, no. 3, 2020.
[24] Sugiono, *Penelitian Kualitatif.pdf*. 2021.
[25] H. K. Rahmawati, "PEMBELAJARAN SHALAT PADA PENYANDANG DISABILITAS SENSORIK NETRA MELALUI PENDEKATAN MULTISENSORI," *Jurnal Pengabdian Masyarakat: Pemberdayaan, Inovasi dan Perubahan*, vol. 2, no. 4, 2022, doi: 10.59818/jpm.v2i4.272.
[26] J. Taliak, T. Al Farisi, R. A. Sinta, A. Aziz, and N. L. Fauziyah, "Evaluasi Efektivitas Metode

Pembelajaran Berbasis Proyek dalam Mengembangkan Kreativitas Siswa," *Journal of Education Research*, vol. 5, no. 1, 2024, doi: 10.37985/jer.v5i1.876.

[27] A. W. Utama, Z. Zulela, and E. Solihatin, "Penerapan Pendekatan Brain Based Learning Sebagai Upaya Meningkatkan Kreativitas Belajar Dalam Mata Pelajaran Ips Pada Siswa Kelas V," *Prosiding Seminar dan Diskusi Nasional Pendidikan Dasar*, 2018.

[28] P. Wulandari, Arifianto, and P. F. Senjani, "Faktor – Faktor Yang Berhubungan Dengan Kejadian Asfiksia Neonatorum Di Ruang Melati RSUD Dr.H.Soewondo Kendal," *Journal of Holistic Nursing Science*, vol. 3, no. 1, 2017.

[29] Jayadi and Asep Supena, "Brain Based Learning dalam Perspektif Guru di SD," *Jurnal Elementaria Edukasia*, vol. 6, no. 2, pp. 940–949, Jun. 2023, doi: 10.31949/jee.v6i2.5364.

[30] N. Febriana, "Asuhan Kebidanan Berkesinambungan pada Ny. DA Umur 28 Tahun dengan Kehamilan Persalinan Nifas BBL Neonatus dan KB IUD Post Plasenta di PMB Kuswatiningsih," *J Chem Inf Model*, vol. 53, no. 9, 2012.

[31] W. Widiana, G. Wira Bayu, I. Nyoman, L. Jayata, J. Pendidikan Guru, and S. Dasar, "PEMBELAJARAN BERBASIS OTAK (BRAIN BASED LEARNING), GAYA KOGNITIF KEMAMPUAN BERPIKIR KREATIF DAN HASIL BELAJAR MAHASISWA," 2017.

[32] S. Torro, N. Kasim, and A. O. T. Awaru, "Implementasi model problem based learning berbasis kearifan lokal dalam meningkatkan motivasi belajar siswa sekolah menengah atas," *JPPI (Jurnal Penelitian Pendidikan Indonesia)*, vol. 7, no. 2, 2021, doi: 10.29210/020211137.

[33] J. L. Mukaromah, S. Ibnu, and S. Subandi, "Dampak Model Pembelajaran BBL-Mind Map terhadap Kemampuan Berpikir Kritis Siswa dengan Kemampuan Awal Berbeda," *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, vol. 5, no. 5, 2020, doi: 10.17977/jptpp.v5i5.13487.

[34] A. A. Permana and I. Kartika, "Brain-Based Learning: The Impact on Student's Higher Order Thinking Skills and Motivation," *Jurnal Ilmiah Pendidikan Fisika Al-Biruni*, vol. 10, no. 1, 2021, doi: 10.24042/jipfalbiruni.v10i1.6908.

[35] E. Solihatin, "UPAYA MENINGKATKAN HASIL BELAJAR PENDIDIKAN KEWARGANEGARAAN MELALUI STRATEGI PEMBELAJARAN COOPERATIVE LEARNING TIPE TEAM GAME TURNAMEN (TGT)," *Jurnal Ilmiah Mimbar Demokrasi*, vol. 13, no. 1, 2013, doi: 10.21009/jimd.v13i1.9101.

[36] H. Sakura, P. Arga, and M. A. Wulandari, "Efektifitas Media Pembelajaran IPS Berbasis Vlog Terhadap kemampuan literasi Budaya di Era New Normal," *Journal of Empowerment Community*, vol. 3, no. 2, 2021.

[37] B. May, D. U. A. L. Tobing, N. S. Ritonga, J. Jamaludin, and S. Yunita, "Strategi Pembelajaran Kreativitas Media Bamboozle Untuk Mata Pelajaran Pendidikan Pancasila dan Kewarganegaraan Dalam Meningkatkan Minat Belajar Siswa," *IJEDR: Indonesian Journal of Education and Development Research*, vol. 2, no. 1, 2024, doi: 10.57235/ijedr.v2i1.1504.