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The Needs of Teaching English Using Brain-Based Learning in 21st Century Era

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Abstract

Background:
In the context of 21st-century learning, effective engagement of students and accommodation of many learning styles depend on brain-based learning (BBL). This approach improves understanding, memory, and adaptability by matching instruction with cognitive science and educational needs. Therefore, BBL emphasizes matching teaching approaches to how the brain processes and remembers information, which improves language acquisition, as teaching English entails employing tactics that address cognitive skills such as memory, attention, and motivation.

Methodology:
This quantitative study involved 50 English teachers in Yogyakarta, Indonesia, aim to reveal the teachers' needs to teach English using BBL in this 21st-century era. The instrument of data collection was a questionnaire designed using the 5-Likert Scale that was interpreted using mean scores for each statement.

Findings:
The finding of this study revealed teachers need BBL in applying teaching scenarios, as well as the BBL represents Project-Based learning supported by audiovisual and critical thinking integration during the learning process. All those components are fitted with the characteristics of the balance of the right and left-brain sides.

Conclusion:
It is deemed essential since it directly affects the instructors' ability to effectively nurture student engagement and achievement, and the teachers should be consulted regarding the need for BBL. Incorporating educators into this conversation also guarantees that the tactics used are realistic and adapted to actual classroom situations. The knowledge and expertise of educators are crucial for improving brain-based learning strategies.

Originality:
This study can be a pioneer in exploring more opportunities for the needs of BBL and its relationship with learning success. Moreover, knowing brain balance contributes to a more inclusive and effective learning environment by accommodating different learning styles and boosting overall student well-being and academic achievement.

Keywords : needs; brain-based learning; English; 21st century

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1. INTRODUCTION

The educational landscape of the 21st century places significant emphasis on critical thinking, digital literacy, and teamwork, thereby transforming the requirements of English instruction. To effectively educate students, educators must incorporate technology, accommodate various learning preferences, and cultivate essential competencies such as problem-solving and communication (Kim et al., 2019; Teo, 2019). The current period necessitates the implementation of dynamic and interactive instructional methods that effectively involve students through multimedia and real-world or authentic applications (Herda et al., 2022). Accommodating these requirements guarantees the continued relevance and efficacy of English education, equipping students for a swiftly changing global environment and augmenting their linguistic aptitude in real-life scenarios.

For those reasons, teachers should consider students' brain balance because it impacts learning effectiveness and emotional well-being. A balanced brain supports optimal cognitive functions like memory, attention, and problem-solving, crucial for academic success (Chua et al., 2021). Addressing both hemispheres of the brain through diverse teaching methods can enhance engagement, comprehension, and retention. Recognizing and fostering brain balance helps accommodate varied learning styles, reduces stress (Dettweiler, 2023), and promotes a more inclusive and supportive learning environment, ultimately leading to better educational outcomes. BBL in English classrooms addresses cognitive processes like memory and attention, enhancing language acquisition. It integrates interactive and multimedia strategies, catering to diverse learning styles and improving engagement. This approach ensures more effective comprehension and retention of English, making lessons more dynamic and impactful.

Moreover, teachers develop teaching tactics based on brain balance learning by incorporating methods that engage both hemispheres. They create lessons that blend analytical and creative exercises, encouraging students to apply both logical reasoning and imaginative thinking (Ludvik, 2023; Wang et al., 2023). For example, including multimedia resources and interactive exercises promotes visual and auditory processing, whilst problem-solving and conversations promote critical thinking. Teachers also modify instructional tactics to accommodate diverse learning styles, which improves engagement and retention. Focusing on brain balance allows teachers to build dynamic, inclusive environments that satisfy cognitive and emotional requirements, resulting in more successful and holistic learning experiences.

The goal of brain-based learning in English classrooms is to improve student outcomes and instructional strategies by utilizing insights from neuroscience. In order to provide the best possible learning environment, this method places a strong emphasis on understanding how the brain absorbs, remembers, and processes information (Bada & Jita, 2023; Suwarto & Hidayah, 2023). Among the fundamental ideas is the idea that emotional ties are crucial to learning because happy emotions can improve engagement and memory recall. It encourages teachers to establish a nurturing environment that stimulates motivation and curiosity (Dwiputra et al., 2023). Furthermore, the idea of neuroplasticity emphasizes the brain's capacity for self-reorganization, implying that students can advance their abilities with effort and practice.

To accommodate a variety of learning styles, instructional tactics frequently combine multimodal approaches, using visual, aural, and kinesthetic activities. Learning strategies include group projects, narratives, and practical applications to assist students in developing deep relationships with the subject matter. In English classrooms, teachers can promote deeper understanding and a love of language and literature by coordinating their activities with the way the brain naturally learns. The ultimate goal of brain-based learning is to develop a successful and interesting educational program that equips pupils for lifetime learning.

This study, *"The Needs of Teaching English Using Brain-Based Learning in the 21st Century Era,"* is unique as it specifically addresses the contemporary educational landscape, and evolving pedagogical theories through teachers' perspectives. Unlike previous research, it focuses on the implications of brain-based learning within the context of 21st-century skills, and examines the specific needs of English language teaching, considering diverse learner profiles and the necessity for adaptive teaching strategies. By aligning brain-based principles with current educational demands, the study offers fresh insights into future effective English language instruction.

Thus, this study aimed aim to reveal the teachers' need to teach English using BBL in this 21st-century era. It is considered crucial since the teachers should be consulted about their need for BBL because it directly impacts their effectiveness in fostering student engagement and achievement. Moreover, involving teachers in this dialogue ensures that the strategies implemented are practical and tailored to real classroom dynamics. Teachers' insights and experiences are invaluable for refining brain-based learning techniques, making instruction more relevant and impactful. Ultimately, addressing teachers' needs in this context promotes a more effective and adaptive learning environment, benefiting both educators and students.

2. LITERATURE REVIEW

2.1 The Concept of Brain-Based Learning

The brain has two hemispheres, namely the left hemisphere and the right hemisphere, each with its structures, functions, and unique characteristics (Nurasiah et al., 2022). The right hemisphere plays a major role in controlling EQ (Emotional Quotient), while the left hemisphere controls IQ (Intelligence Quotient) (Wahyuningsih & Abdurahman, 2023). Furthermore, they revealed that thinking styles are influenced by the dominance of the right or left brain. The right-brain is more intuitive, synthesizing, and subjective, while the left-brain thinking style is more logical, rational, objective, and analytical (Youcef & Chelgoum, 2020). This style of thinking greatly affects the information absorption process of each individual, including in the learning process. Optimizing the performance of the brain, which is the center of the main learning systems—namely emotional, social, cognitive, physical, and reflective—addresses the basic psychological needs of students to know, do, test, and explore. This optimization needs to be done to help students achieve the best learning outcomes (Nurasiah et al., 2022).

One of the learning models oriented toward balancing the right and left brain is the Brain-Based Learning (BBL) model. The purpose of this learning model is to gradually stimulate all brain cells both horizontally (from the back to the front) and laterally (from the right hemisphere to the left). Brain-based learning emphasizes cooperation, making learning fun (Erlita et al., 2020). Integrating activities that foster both logical and creative thinking into the learning process is a key component of a teaching strategy focused on right-left brain balance. An example of a left-brain activity in a course would be reading comprehension or solving math problems, while a right-brain activity might involve creating an illustration of a concept or coming up with an original idea during a group discussion. This approach enhances students' understanding and retention of the subject by requiring them to engage with the material on multiple levels (Suwarto & Arini, 2023).

BBL is based on several principles, such as: 1) The brain engages in parallel processing; 2) Learning encompasses all aspects of human physiology; 3) Finding meaning is a natural process; 4) Patterns are recognized when searching for significance (the brain looks for patterns to deduce meaning); 5) Emotions are critical patterns that influence learning; 6) The brain processes information both holistically and socially; 7) Perception, attention, and focus are essential for learning; 8) Learning results from both conscious and subconscious processes; 9) We recall and comprehend better when knowledge and skills are applied naturally in context;

10) There are at least two different types of memory: a memory system and a memorization system; 11) Challenges and threats activate learning; and 12) Every brain is unique (Salleh, 2021).

In accordance with Jensen's theory, the implementation of the brain-based learning model includes seven stages: a) Pre-exposure Stage: Learners receive an overview of the new lesson; b) Preparation Stage: The teacher explains the learning objectives and their relation to daily life; c) Initiation and Acquisition Stage: Teachers provide learners with opportunities to improve their abilities through hands-on learning and guidance; d) Elaboration Stage: The teacher helps students explore the learning activities they have completed to make connections between subjects; e) Incubation and Memory Encoding Stage: The teacher allows students time to relax and review the materials they have learned; f) Verification and Checking Stage: Teachers assess learners' performance to determine how well the learning objectives have been achieved; g) Celebration and Integration Stage: Teachers create learning experiences that make learners enjoy the lesson, influencing their current and future lives (Juliantini & Jampel, 2020).

2.2 Brain-Based Learning and Student Performance

To support students' holistic cognitive development, teachers need a teaching strategy that balances left- and right-brain processes (Ceylan & Esra, 2022). In general, the right brain is connected to creativity, intuition, and visual-spatial capabilities, whereas the left brain is linked to logical reasoning, analytical thinking, and language proficiency (Youcef & Chelgoum, 2020). Language teachers must have a solid understanding of brain hemispheres, including how the brain processes language, to create effective teaching and learning strategies. This knowledge can help teachers design lesson plans and materials, select teaching techniques, and develop engaging activities that truly enhance their students' achievement. In other words, BBL helps teachers become more adaptable and successful in the classroom.

Brain-based learning is achieved when students engage in group discussions to explore concepts, complete creative projects, and absorb knowledge from various sources (Allameh et al., 2024). According to Nasution (2020), BBL more effectively increases student achievement than traditional learning approaches. BBL enhances students' desire to learn and achieve goals based on their interests and aptitudes (self-regulation), improves students' collaboration and increases instructional interactions (peer relationships), explores students' new knowledge and enhances their learning experiences (self-direction), and recognizes their strengths, weaknesses, and talents (self-concept) (Rasmitadila et al., 2020). BBL can also improve discipline, honesty, independence, cooperation, and integrity by being guided by the five

learning systems in brain-based learning, namely emotional, cognitive, physical, and reflective (Suwarto & Arini, 2023). In addition, BBL effectively improves student learning outcomes in terms of knowledge, skills, and personal development (Syahri & Eliza, 2023). Students can create meaning and analyze the material based on their comprehension. When students become conscious of their learning preferences, they experience cognitive and emotional relaxation (Ceylan & Esra, 2022).

Furthermore, BBL has a positive impact on teaching and learning English. BBL improves the writing abilities and active learning involvement of low-ability ESL students (Wilson et al., 2024). The speaking abilities of students are also greatly enhanced by brain-based learning (Alrasyid, 2024). There is improvement in every area of speaking abilities, including vocabulary, grammar, pronunciation, fluency, and comprehension (Mima & Dian, 2023). By applying BBL, students' comprehension of vocabulary improves and increases significantly. This is evident when comparing the scores of students before and after treatment to those of the control group, which received instruction using the teacher's traditional approach.

BBL also has an effective impact on enhancing 21st-century learning skills. This method improves students' critical and creative thinking skills (Nasution, 2020; Nuraini et al., 2023) and higher-order thinking skills (Lusiana & Andari, 2020) by matching instructional strategies with the way the brain naturally processes information. Moreover, students' communication skills and self-confidence improve because the method allows them to participate actively in the classroom, develop their ideas, and simultaneously provides opportunities for them to lead group activities (Salleh, 2021). Through all of these activities, students have ample opportunity to engage in active communication and commit knowledge to long-term memory.

Additionally, several interesting teaching techniques are needed to integrate brain-based learning in the classroom. Teachers can, for example, employ storytelling to strengthen emotional ties and increase the relatability of literature. By including cooperative learning activities, teachers can help students work together and share knowledge, which promotes social interaction. On the other hand, multimedia presentations cater to many learning styles, while practical tasks encourage kinesthetic involvement. Over time, concepts can be reinforced through strategies like spaced repetition. Incorporating mindfulness activities can also help lower stress and improve attention. In this case, learning becomes more meaningful when

language skills are applied in real-world contexts, which promotes deeper comprehension and memory of the subject matter.

3. METHODOLOGY

The researchers conducted a quantitative study that gathers and examines numerical data to systematically investigate phenomena. The objective is to measure variables and identify patterns, correlations, or statistical trends by utilizing techniques such as experiments, surveys, and data analysis (Fraenkel et al., 2022; Gay et al., 2012). Additionally, quantitative studies offer valuable insights into the frequency and magnitude of particular events by concentrating on quantifiable data. The participants of this study were 50 English Teachers in Yogyakarta, comprising 15 males and 35 females. In this study, random sampling was employed to select the participants, ensuring that each member of a population has an equal opportunity to be included in the sample (Fraenkel et al., 2022; Gay et al., 2012). The reason why the researchers chose 50 participants was to ease the process of managing and analyzing data that was typically feasible within the constraints of time and resources, making it a practical choice for researchers.

The researchers distributed the online form questionnaire comprising 30 items using the 5-Likert Scale (Strongly Agree, Agree, Neutral, Disagree, and Disagree) to the teachers comprising statements to reveal the teachers' needs of using BBL. Then, the researchers calculated the mean score of each statement and interpreted using Pimentel's (2010) Likert five-point scale range interpretation as seen in Table 1.

Table. 1 Likert Five-Point Scale Range Interpretation

Mean Score	Adjectival Rating/Interpretation
1.00 – 1.79	Strongly Disagree
1.80 – 2.59	Disagree
2.60 – 3.39	Neutral
3.40 – 4.19	Agree
4.20 and above	Strongly Agree

In this case, researchers used the mean score to interpret the Likert scale responses because it provides a clear, quantitative measure of central tendency. The mean summarizes participants' attitudes or perceptions by averaging their ratings, allowing for easy comparison across different items or groups. Furthermore, using the mean facilitates statistical analysis, enabling researchers to apply various statistical tests to evaluate significance. Overall, the mean score is a straightforward way to distill complex data into actionable insights.

4. FINDINGS

This study aims to explore the needs of English language teachers in implementing Brain-Based Learning (BBL) in the 21st century learning era. Data collected through a Likert scale questionnaire revealed several important insights into teachers' perspectives on effective BBL implementation strategies. The results of the analysis showed general trends that explained various aspects of teaching needs related to the use of BBL.

One of the main findings was the strong support for the use of visual aids, such as pictures and diagrams, in explaining new concepts. With a mean score of 4.23, this result reflects a high agreement among respondents regarding the effectiveness of visual aids in improving student understanding. Visualization is considered an important component that helps students remember and understand material better. This is in accordance with the principles of BBL, which emphasizes the importance of multi-sensory involvement in the learning process. Visual aids not only support the logical understanding process that occurs in the left brain, but also encourage spatial processing carried out by the right brain, thereby strengthening information retention. However, further analysis is needed to explore the variation in preferences and effectiveness of these visual aids in various teaching contexts, as well as how these strategies can be adapted to meet the needs of different classes.

In addition, the study also found that group projects were highly recommended by teachers as a method to promote collaboration among students. Group projects received a mean score of 4.33, indicating a high level of support from teachers. They noted that group projects not only enhance the ability to work together, but also provide opportunities for students to engage their analytical and creative abilities. Such projects are in line with the BBL principle of encouraging cooperative learning, where students simultaneously engage both hemispheres of the brain—which is essential for the development of higher-order critical thinking and problem-solving skills. This agreement underscores the role of group projects in creating collaborative learning environments that mirror real-world problem-solving scenarios. However, as with the use of visual aids, further study is needed to understand how group projects can be optimally implemented in diverse learning environments.

Integrating critical and creative thinking skills into every aspect of teaching was also seen as an important need by teachers. With a mean score of 4.18, teachers agreed that developing these skills is essential in enhancing students' analytical abilities, which are increasingly needed in the face of the demands of modern education. This suggests that balanced learning, which stimulates logical thinking skills through critical tasks and encourages creative problem solving, is essential in developing adaptive and innovative

students. However, the variation in responses suggests that not all teachers find it easy to implement this approach consistently. This suggests a need for additional support, both in the form of resources and professional training, to better equip teachers to foster the development of critical and creative thinking skills in their classrooms.

Another interesting finding was the variation in views regarding the use of music and rhythm in English language teaching. While some teachers acknowledged the potential benefits of using music to enhance student engagement and cognitive functioning, there were also a number of teachers who were less confident or unfamiliar with implementing this method in their teaching. This variation, reflected in the mean score of 3.73, is likely due to differences in teachers' comfort levels with using music-based strategies or to different student preferences. Therefore, it is recommended that further research be conducted to explore specific contexts in which music and rhythm can be more effectively integrated into learning, as well as training for teachers to become more confident in implementing these techniques.

Overall, these findings underscore the importance of involving teachers in discussions about their needs regarding the implementation of Brain-Based Learning (BBL) strategies. By involving educators in this process, the strategies implemented can be made more relevant, practical, and appropriate to real conditions in the classroom. Adaptive BBL strategies that are tailored to diverse needs are expected to not only improve the effectiveness of English language teaching, but also create a more inclusive learning environment and support cognitive development.

5. DISCUSSION

This study highlights the significant role of Brain-Based Learning (BBL) in enhancing English language teaching, particularly in the 21st-century context. Teachers showed strong support for visual aids and group projects, demonstrating their belief in the effectiveness of these strategies for engaging both hemispheres of the brain. Specifically, average scores of 4.23 for visual aids and 4.33 for group projects reflect a high level of agreement on the value of these approaches in improving student comprehension and fostering collaboration.

The positive response to visual aids is consistent with Caine's principles of BBL, which emphasize that the brain processes information more effectively when it is presented visually and holistically (Salleh, 2021). Visual tools, like images and diagrams, help make abstract concepts more accessible and easier to understand, enhancing students' ability to retain information (Erlita et al., 2020). This aligns with broader research suggesting that visual elements cater to diverse learning styles and improve engagement by making learning more

interactive and memorable. Visual aids not only support the left hemisphere's processing of logical and sequential information but also stimulate the right hemisphere, which is associated with spatial and holistic thinking (Nurasiah et al., 2022).

The strong endorsement of group projects, with an average score of 4.33, underscores their perceived value in developing students' collaborative skills and promoting active participation. Group projects are particularly effective in BBL as they create a dynamic learning environment where students can engage in both logical reasoning and creative thinking, thus utilizing both hemispheres of the brain (Ceylan & Esra, 2022). This approach is further supported by findings from Allameh et al. (2024), which show that BBL strategies that include group work can foster essential social competencies such as communication, cooperation, and conflict resolution—skills that are critical for students' success in and beyond the classroom.

However, the study revealed variability in teachers' perceptions regarding the use of music and rhythm, with an average score of 3.73. This suggests a mixed level of confidence and familiarity among teachers with integrating these elements into their teaching. While some educators recognize the benefits of these methods, others may lack the training or resources to implement them effectively. Research by Dettweiler et al. (2023) indicates that music can aid in regulating stress and enhancing cognitive function, which are crucial for creating an optimal learning environment. The mixed responses observed in this study point to a need for more professional development opportunities that empower teachers to explore and integrate music and rhythm confidently into their pedagogical repertoire.

One of the strengths of this study is its practical focus on strategies that align with teachers' real-world experiences, providing insights that are both relevant and immediately applicable in diverse educational settings. The study's alignment with established BBL principles strengthens its validity and relevance, offering a framework that teachers can adapt to their unique classroom contexts. Additionally, by emphasizing well-supported methods such as visual aids and group projects, the study offers clear, actionable recommendations that can enhance teaching effectiveness. However, the study also highlights some challenges, particularly in the variability of responses regarding music and rhythm. This suggests potential gaps in teacher preparedness and highlights the importance of ongoing professional development.

Further, the study primarily captures the perspectives of teachers, leaving an opportunity for future research to include student feedback, which could provide a more

holistic understanding of how these methods impact learning from the student's perspective. Incorporating student insights could help refine BBL strategies to better meet the needs of all learners, making the learning process more inclusive and effective. While the study affirms the value of core BBL strategies like visual aids and group projects, it also points to areas where further support is needed, particularly in the integration of music and rhythm. The findings suggest that successful implementation of BBL requires not only a solid theoretical foundation, but also practical, ongoing support tailored to the dynamic needs of the classroom. Future research should continue to refine these strategies by incorporating feedback from both teachers and students, ensuring that BBL methods effectively balance cognitive and emotional needs to foster a more inclusive and adaptive learning environment.

Teachers play a crucial role in brain-based learning by creating environments that deal with how the brain naturally learns. They foster engagement through interactive methods, promoting curiosity and motivation. Understanding cognitive development enables teachers to tailor instruction to diverse learning styles, ensuring that lessons resonate with all students. Additionally, teachers model critical thinking and emotional intelligence, which are essential for deeper understanding. By integrating real-world applications and collaborative activities, they help students make connections and retain information. Ultimately, skilled teachers are vital in translating brain research into effective strategies, enhancing the overall learning experience and outcomes for students.

6. CONCLUSION

In practicing English teaching, teachers should highlight students' brain balance in language acquisition because it promotes a whole-person approach to education that addresses both cognitive and emotional requirements. Balanced brain activity promotes a variety of cognitive tasks, including memory, attention, and problem-solving, all of which are essential for learning a new language. Additionally, teachers can improve their students' language understanding, retention, and application by adopting tactics that stimulate both hemispheres of the brain. This study focuses on the teachers' need to use BBL in the 21st-century era, and from the findings, it could be concluded that teachers need BBL in applying teaching scenarios, as well as the BBL represents Project-Based learning supported by audiovisual and critical thinking integration during the learning process. All those components are fitted with the characteristics of the balance of the right and left-brain sides. Moreover, knowing brain balance contributes to a more inclusive and effective learning environment by accommodating different learning styles and boosting overall student well-being and academic achievement. However,

this study still has limitations in the field of gathering information from the students' side. Hopefully, in the next study, the researchers can conduct the need analysis study emphasizing the students' voices.

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