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The Interplay of Cognition and Emotion in Brain-Based Social Studies Classroom

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ABSTRACT

Purpose of the study: This study investigates how students' cognition and emotion are interrelated and interconnected in learning Social Studies through a brain-based learning approach. The results will contribute to the academic discourse on the role of brain science in transforming classroom practices in Social Studies to achieve the desired learning outcomes.

Methodology: A case study methodology was utilized to explore how brain-based Social Studies lessons influence students' cognitive and emotional responses. Data were collected through interviews, focus group discussions, and creative assessment tools such as emoticons, numerical ratings, and metaphors, enabling a comprehensive understanding of students' perceptions, engagement levels, and overall learning experiences within the classroom context.

Main Findings: Social Studies is a value-based discipline that necessitates the development of both cognitive and emotional skills among students. Therefore, the integration of emotion in teaching Social Studies should align with the subject's learning objectives. It should begin with enjoyment to activate students' brains, followed by surprise to help them see connections, and conclude with optimism, demonstrating how their learning can be applied to real-life situations. This dual focus is essential for fostering civic participation and cultivating active citizenship.

Novelty/Originality of this study: Brain-based learning, as an emerging approach in teaching Social Studies, posits that emotion and cognition are intertwined and inseparable. It provides solid scientific explanations for how the brain learns and achieves the desired learning outcomes of the subject. This approach may offer a long-awaited solution to the longstanding perception of Social Studies as a dull and unengaging subject.

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1. INTRODUCTION

Social studies is an integrated study of social sciences and humanities aimed at preparing learners for informed and active citizenship [1]. In the Philippine context, social studies, or Araling Panlipunan, plays a vital role in cultivating democratic values, national identity, and global awareness among students. Its goal is to develop Filipino learners' socio-civic skills, such as cultural tolerance, respect for diversity, and appreciation of human dignity and rights [2]. These values help nurture patriotic, nationalistic, and globally aware citizens committed to serving the nation. The subject also promotes a critical understanding of historical, geographical, socio-political, and economic issues in the Philippines within both local and global contexts, thereby preparing learners to become responsible and productive members of society. Despite its goal of promoting critical

thinking, citizenship, and respect for humanity, literature shows that social studies continues to face major challenges. Many secondary students, both locally and abroad, perceive it as dull, boring, and irrelevant to real life. Studies by Byford and Chiodo [3], Hoge and Zhao [4], and Alazzi and Chiodo [5] report that students often rank social studies as their least favorite subject. This negative perception is often linked to traditional, teacher-centered methods that fail to connect lessons with students' real-world experiences.

Within Social Studies, politics is a crucial area of study, equipping learners with the knowledge and skills necessary to understand governance, power relations, civic rights, and responsibilities. Recently, the study of politics has become increasingly interdisciplinary, incorporating fields such as biology, psychology, and neuroscience [6]. This development responds to numerous scholars advocating for the integration of social and natural sciences to uncover new insights. Many researchers argue that social sciences and natural sciences are inherently compatible and can enhance each other by aligning their approaches to explaining phenomena [7], [8]. Consequently, various disciplines within the social sciences are now exploring neuroscience for alternative explanations of human and social behavior, including political studies. A new subfield within political science, called neuropolitics, aims to merge neuroscience methods and findings to better understand political behavior and attitudes. Neuropolitics provides innovative frameworks for analyzing human political behavior by investigating how different brain regions respond to specific political contexts [6], [8], [9]. Incorporating neuropolitics into education is crucial, as it can aid teachers in developing pedagogical strategies that align with how students learn based on brain function. Thus, understanding brain-based learning becomes vital.

Brain-based learning is a new trend in education that refers to designing lessons, planning teaching methods, and restructuring school programs based on current findings from neuroscience about how the brain learns and processes information [10]. This approach to teaching and learning is grounded in the belief that all learning requires the brain. Consequently, teachers, regarded as "brain changers," must have a proper and precise understanding of how the brain receives, filters, consolidates, and applies learning and use that understanding to design instruction and engage with every student [11]. According to Connell, brain-based learning involves making connections between cognition and emotion [12]. These connections are essential in instructional planning, as they strengthen neural connections and networks. He further provides four facts about emotion based on brain-based studies: (1) Emotions reside in the brain, making them truly brain-based; (2) There are observable neural connections between human emotions and intellect; (3) Human emotions affect the ability to learn and make decisions; (4) Emotions are not separate from learning and teaching but integral to them [12]. This idea is supported by Hardiman, who stated that for students to learn content effectively, teachers must ensure that all aspects of learning—materials and treatments—have an emotional connection to the learners [13]. Since human memories and thoughts are closely tied to emotions, the more emotional engagement there is in learning, the more likely a student is to remember the event [14], [15]. Emotion drives attention, creates meaning, and builds memory pathways [16]. It also regulates human behavior and helps individuals organize and remember events [17]. Emotion is critical to learning and should be the primary consideration for teachers when planning lessons. As mentioned by Kelleher and Whitman, teaching is an emotional profession, and being a student is an emotional journey [11]. This is especially true in the context of teaching social studies. Emotion is key to successful learning in social studies since this subject relies on emotional engagement for remembering and creating memories, developing pride in one's nation, expressing beliefs and opinions, planning actions, and collaborating with peers [18]. When teachers and students make an emotional connection to the subject matter, it increases their intrinsic motivation. Additionally, when students feel an emotional connection with their teacher—because the teacher believes in them—it enhances their self-efficacy. On the other hand, when a student is bored, stressed, feeling threatened, or disconnected, not much learning takes place [11].

Thus, this study aims to investigate how students' cognition and emotion are interrelated and interconnected in learning social studies through a brain-based learning approach. This research was conducted to fill gaps in the existing literature on brain-based learning, which mostly focuses on the effects of this approach on students' cognitive performances without considering the role of emotion in student success [19], [20]. Additionally, existing literature shows that there is a lack of studies on the role of brain-based learning in the field of social studies; hence, this study will significantly contribute to advancing academic discourse on brain-based learning by specifically exploring its application in teaching social studies, thereby addressing both the emotional and cognitive needs of learners. Furthermore, the novelty of this study lies in its potential to provide curriculum designers with innovative strategies that enhance lesson engagement through emotional investment, ultimately leading to a deeper understanding and retention of complex concepts in social studies. It will also offer practical recommendations for educators, including professional development workshops and collaborative planning sessions, to support the implementation of these transformative strategies. Ultimately, this research aspires to foster a classroom atmosphere that balances emotional connections with academic rigor, thereby enhancing classroom practices and improving student outcomes.

2. RESEARCH METHOD

2.1. Research Design

A qualitative case study design was employed to explore the cognition and emotions of students in a brain-based Social Studies classroom. This research design is particularly suitable for examining complex educational phenomena within their real-life context, allowing for an in-depth understanding of participants' experiences and perceptions. This type of research provides rich insights into social processes by situating individual experiences within broader contextual frameworks [21], [22]. It allows researchers to explore multifaceted issues holistically, making it valuable in education research where cognitive and affective dimensions interact dynamically [23]. In this study, multiple qualitative data-gathering strategies were employed, including semi-structured interviews, focus group discussions, and the use of emoticons, numerical ratings, and metaphors to capture the students' emotional and cognitive responses during brain-based lessons. The interviews provided individualized accounts of how students processed and felt about the learning experiences, while focus group discussions facilitated the emergence of shared meanings and group perspectives. These strategies are effective in uncovering attitudes, perceptions, and collective interpretations [24]. The use of numerical ratings, emoticons, and metaphors as reflective tools allowed for the expression of emotions and abstract thoughts that may not be easily articulated verbally. These visual-emotive cues are effective in capturing affective dimensions in qualitative research [25].

2.2. Research Participants

As the study aimed to see how brain-based learning impacted the students' emotion and cognition inside the classroom, a census sampling technique was used, encompassing all students from both class sections scheduled for social studies at the Grade 11 level. The census sampling technique, or commonly known as total population sampling, refers to a non-probability sampling method in which the entire population is selected to participate in the research, rather than just a subset chosen through random or stratified procedures [26]. In this study, both class sections included all Grade 11 students available for the intervention; one section had twenty-nine students, while the other had twenty-three. Both sections underwent the five-day implementation of the developed brain-based lesson plans.

2.3. Research Instruments

To gather meaningful data on students' experiences with brain-based learning in Social Studies, the researcher developed a semi-structured interview questionnaire. The instrument aimed to elicit students' cognitive and emotional responses to brain-based lessons, their engagement in classroom activities, and their perceptions of learning relevance and enjoyment. Specifically, the interview questionnaire consisted of three main components: 1) Cognitive Dimension which focused on how brain-based strategies influenced students' understanding, retention, and higher-order thinking skills; 2) Affective Dimension which examined students' emotional reactions, motivation, and sense of connection with the lessons; and 3) Instructional Experience Dimension which explored how students perceived the learning environment, teaching methods, and overall classroom atmosphere under brain-based instruction.

To ensure content validity, the instrument underwent expert validation by three specialists: one in brain-based learning, one in Social Studies curriculum, and one in pedagogy and instructional design. Each validator assessed the questionnaire based on clarity, relevance, appropriateness, and alignment with research objectives using a 4-point rating scale. The interrater agreement among the three validators was calculated using the average of their ratings. Results showed a high level of agreement, with an overall mean validity index of 0.92, indicating that the instrument was highly valid and appropriate for data collection. Minor revisions were made to enhance question clarity and ensure that items captured both cognitive and affective aspects of students' learning experiences. The validated interview questionnaire was then finalized and used as the primary data-gathering tool to explore students' experiences in the brain-based Social Studies classroom.

2.4. Research Procedures

To achieve the objectives of this research, the researcher developed five brain-based lesson plans that reflected the identified lesson purposes. Since this study aims to explore students' emotions and cognitions within a brain-based social studies classroom, it incorporates all brain-based learning principles alongside pedagogical approaches and strategies offered by neuroscience to achieve desired learning outcomes, such as civic participation, respect for political diversity, rule of law, social justice, and nationalism.

The developed brain-based lesson plans were modeled after the brain-based lesson plan framework created by Hunter [27] and modified by Sousa [28], along with suggested strategies and approaches from other brain-based learning experts such as Jensen [29]. Using this framework, each lesson, referred to by Sousa as a "learning episode," was divided into three learning blocks, each lasting twenty minutes, following Sousa's concept of Primacy-Recency Effects. Each block consisted of prime-time-1, down-time, and prime-time-2. Additionally, identified strategies for achieving the targeted learning outcomes were incorporated into the lesson plans.

During the administration of the developed brain-based lesson plans, the researcher conducted interview and series of focus group discussion with the students to gather qualitative data about their experiences, feelings, learning gains during the lessons, encountered problems, and potential solutions. The students' responses during the focus group discussion were recorded using an audio recorder and transcribed verbatim. In addition, students were asked to raise emoticons representing their learning experience during the first learning block, rate their experiences on a scale from 1 to 10 to describe their learning experience during the second block, and provide a metaphor or object that best represented their learning experience during the third block. The students were asked to explain their answers in front of their classmates.

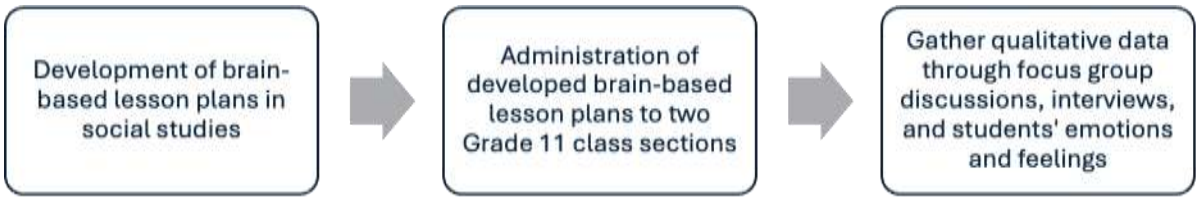

Figure 1. Flowchart of Research Procedure

2.5. Data Analysis

The thematic analysis framework by Braun and Clarke [30] was used by the researcher for a manual analysis of the qualitative data collected from interviews and focus group discussions. Moroever, to ascertain the validity and reliability of the qualitative data, the researcher applied the process of member checking by re-presenting the formulated categories back to the students to ensure the accuracy of the findings. This process also provided the researcher with the opportunity to conduct interviews after the survey, enabling participants to express their comments on the findings.

2.6. Ethical Considerations

To ensure ethical compliance, on March 2022, a communication letter was first sent to and discussed with the School Principal of Justice Emilio Gancayco Memorial High School to inform of the study's purpose, data-gathering procedures, level of student involvement, confidentiality measures, duration of the research, potential impact in the field of social studies, and benefits for both the researcher and other teachers of social studies in basic education in the Philippines. Approval was granted by signing the communication letter. Furthermore, to address ethical concerns and protect the rights of student participants, anonymity and confidentiality of their data were secured by using pseudonyms such as “student 1,” “student 2,” and so on when referring to their responses. This measure ensured that the data provided could not be traced back to individual students. Since the student participants were minors, the assent form was presented and discussed with them one week before the first administration of the study. The assent form was used to express the students’ willingness to participate, inform them about the study's purpose, and clarify their roles during the study. Additionally, a parental consent form was used to inform and obtain consent from the students’ parents or guardians. Similar to the assent form, the content of the parental consent form outlined the purpose of the study and the rights and roles of their child during participation. This form was sent to parents or guardians one week before the first implementation. The researcher discussed the form via call and text, and it was signed by the parents or guardians to give consent for their child's participation in the study.

3. RESULTS AND DISCUSSION

The results of this study are divided into three sections, corresponding to the three learning blocks of the brain-based lesson plan. In each learning block, the researcher employed various strategies to gather sufficient data regarding the students’ emotions and cognition for each lesson.

3.1. Learning Block 1: The Learning and Enjoyment Block

In learning block one, the researcher utilized the principles, approaches, and strategies of brain-based learning by incorporating engaging activities and brain exercises into the discussion. To assess how the students felt after this learning block, the researcher provided them with a set of emoticons representing six basic human emotions: happiness, sadness, fear, disgust, anger, and surprise. The students were tasked with choosing one emotion that best described their learning experience after the first learning block. The results indicated that the majority of students from the first to the fifth lessons reported feeling happiness during this learning block due to the engaging activities employed in the classroom, which activated their motivation to learn the essential concepts of the lesson. Students expressed that they learned these key concepts, which were primarily presented at the beginning of the lessons.

As shown in Table 1, students across both class sections shared a consensus regarding their emotions toward their learning experiences in the first learning block of brain-based social studies lessons. For instance, in lesson one, students reported enjoying learning about the nature and importance of politics, which was introduced through enjoyable learning activities. They also felt happy because the engaging activities helped them gain a deeper understanding of the concept of politics. In lesson two, the students again experienced happiness after learning about the differences between political ideologies. Some students noted that their knowledge of ideologies deepened due to the teacher's use of learning activities. Furthermore, in lesson three, students enjoyed learning about the supremacy of law and equality before the law. Some students stated that the rule of law must be obeyed at all times because every action has consequences. They also recognized that the importance of the rule of law in exercising power lies in its ability to set limitations on any decision or action an individual may take.

In lesson four, students expressed that they enjoyed learning about the current situations and realities of indigenous groups in the Philippines, realizing that respect is key to resolving differences in human society. They felt happiness from the activities employed, such as brain exercises, which enhanced their understanding of the lessons. Finally, in lesson five, students felt happy after learning about the various cultures of the Philippines, thanks to the engaging activities and games.

The results suggest that students often associate successful learning outcomes with the active and engaging learning activities implemented during the administration of brain-based lessons. This association can be explained by brain science, which indicates that the cerebral cortex is responsible for executive functions such as higher-order thinking, planning, vision, identifying and creating meaning, and pattern recognition [31]. These functions can be activated by incorporating engaging activities, such as novel movements, colors, music, and scents [14], [32], [33].

Table 1. Students' emotions and cognitions through emoticons

	Sample students' response
Lesson 1	*"happy po kasi na-enjoy ko yung lesson parang kuhang kuha ko yung pinopoint ng lesson and also sa activities lalo ako nakakapag isip at lalo ko syang naiintindihan hindi sya nakakabored.* [I'm happy because I enjoyed the lesson; I really grasped the main points of the lesson. Also, the activities made me think even more, and I understood it better—it's not boring at all]
	"happy kasi dati ang babaw ng tingin ko sa politics tapos nung nalesson na siya mas naging malalim na tingin ko sa politics." [I'm happy because before, my understanding of politics was shallow, but after the lessons, I now have a deeper perspective on politics]
Lesson 2	*"happy kasi sobrang ganda ang dami kong natutunan tungkol nga po doon sa ideologies yung kaibahan nila at ang ganda ng way of teaching mo ngayon sir."* [I'm happy because I learned so much about ideologies, their differences, and your way of teaching today is great, sir]
	"happy rin po nag enjoy po kasi ako ng sobra lalo na sa mga example na talagang related sa topic at nakakagana lalo yung mga activities." [I'm also happy because I enjoyed it a lot, especially with the examples that were truly related to the topic. The activities motivated me even more]
Lesson 3	*"happy kasi ngayon ko lang nalaman yung kinds of power and natutunan ko din yung dalawang principles of law at may mga realization ako tulad ng mga taong inaabuso nila yung kapangyarihan nila para matapakan yung ibang tao."* [I'm happy because I just learned about the different kinds of power, and I also learned about the two principles of law. I had realizations, like how some people abuse their power to trample on others]
	"happy dahil natutunan ko na when we use power there is always a consequence maaaring ito ay mabuti o hindi at pangit sa paningin ng iba, I realize na bago ka gumawa ng isang bagay pag isipan mo muna at kung ano ang magiging consequences." [I'm happy because I learned that when we use power, there are always consequences that may be good or bad in the eyes of others. I realized that before doing something, you need to think about what the consequences will be]
Lesson 4	*"happy kasi ang dami kong natutunan lalo na sa pagiging kapwa tao na kahit anong uri pa tayo ng nilalang kailangan parin natin sundin yung respeto at desisyon nila wag tayo gumawa ng desisyon na matatapakan yung kanilang karapatan."* [I'm happy because I learned that no matter what kind of person we are, we still need to respect others and their decisions. We shouldn't make decisions that would infringe upon their rights]

	"happy din po dahil dami kong na discover sa lesson, ang saya ng discussion nakaka buhay sya lalo na pag nag bebrain exercise at nalaman ko po na yung social justice dapat po pala laging nakakabit sa power." [I'm also happy because I discovered so much in the lesson. The discussion was lively, especially during the brain exercises, and I learned that social justice should always be connected to power]
Lesson 5	*happy kasi nalaman na may ibat- ibang kultura pala tayong mga Pilipino lang yung basta nalalaman lang natin bagkus meron pa palang iba, nakakatuwa lang po."* [I'm happy because I found out that we, Filipinos, have different cultures that go beyond just what we know. It's just amusing]
	"happy po masaya ako dahil dami kong natutunan at gusto ko pan lumawak yung kaalaman ko at ang laking tulong ng brain exercise nakakabuhay ng utak at katawan nagiging active ang lahat." [I'm happy because I've learned a lot and I want to expand my knowledge. The brain exercises are a huge help in energizing both my mind and body, keeping everything active]

The students' responses indicate that the essential concepts of the lessons were learned through novel learning activities that they perceived as enjoyable and interesting. Students also commended these learning activities, noting that they engaged them in collaborative and experiential learning. The strategies employed helped them work cooperatively, providing everyone an opportunity to express and share their ideas, opinions, and suggestions while accomplishing tasks. The learning activities were also viewed as exciting, enjoyable, and interesting because it allowed them to interact with people and understand the lessons.

Thus, this learning block demonstrates that all target learning concepts should be presented through enjoyable and interesting activities, moving away from the traditional methods of teaching Social Studies, where the teacher predominantly controlled the discussion through didactic pedagogy, lectures, and reading materials without follow-up activities.

3.2. Learning Block 2: The AHA Moment Block

In this learning block, students were asked to rate their learning experience on a scale from 0 (lowest) to 10 (highest). As shown in Table 2, the majority of students rated their learning experience as a 10 or 9, indicating a positive experience during this learning block. This enthusiastic response was echoed in students' statements, revealing that the brain-based lessons provided opportunities to connect the material to their own lives by recalling prior knowledge and experiences.

For instance, in Lesson One, some students disclosed that the activities prompted them to remind on the poor political decisions and actions of their parents. This realization made them more aware that previous practices in political participation by their parents were misguided and needed correction. They also contemplated what actions they could take to change the flawed political system in the country. In Lesson Two, nearly all students rated their experiences as a 10, stating that the lesson was an eye-opener regarding their earlier misconceptions about others, emphasizing the importance of respect for everyone. A similar pattern emerged in Lesson Three, where almost all students rated their experiences as a 10 because they gained a better understanding of the problems faced by people in their community due to this lesson. Conversely, some students shared painful memories as victims of injustice. For example, one student recounted her brother's death at the hands of a police officer in their barangay. Another student shared her experience from Grade 6 when a classmate inappropriately touched her, and when she reported it to her teacher, she was advised to keep it a secret because they were still young. Additionally, a student spoke about her family's experience when her brother, who has special needs, was falsely accused by a neighbor of threatening them. The barangay council sided with the accuser, as they were related. In Lesson Four, the majority of students assigned a rating of 10, reflecting on their past experiences helping marginalized Indigenous peoples. Finally, in Lesson Five, all students scored their learning experiences as a 10, realizing that they held misconceptions about society's pluralistic nature that required correction.

The findings from this learning block strongly indicate that students' "AHA" moments predominantly occur as they integrate their previous knowledge with new insights. The term "AHA moment" has been referenced multiple times in various brain-based learning literature, such as studies by Dendy [34] and articles by Graham and Nisbet. Graham [35] describes this learning moment as an experience triggered by the firing of neurons in the brain, creating new patterns encoded as learning. Additionally, Nisbet [36] notes that this surprising moment for students can arise in a brain-based learning classroom through games and other activities.

While these sources describe the student learning moment, they do not specify when during the lesson these moments occur. This research fills that gap, revealing that students typically experience their "AHA" moments after connecting new knowledge to their prior knowledge and experiences. This claim aligns with the brain-based principle that emphasizes the human brain's motivation to create meaning through patterning [37]-[40]. Activating prior knowledge is critical to learning since the brain seeks to identify patterns or connections between incoming information and the data already stored in its long-term memory [11]. Jensen similarly states

that prior experiences influence new learning; the stronger the connection between past and new experiences, the greater the likelihood of improved retention [29]. When students relate their past experiences to new lessons, they unveil new insights, demonstrating that meaningful learning has occurred. Furthermore, during this learning block, students began to experience a range of emotions, including happiness and sadness, particularly when recalling past experiences. These emotions culminated in feelings of surprise due to their discoveries.

Table 2. Students' emotions and cognitions through numbers

	Sample students' response
Lesson 1	*10 po kasi naisip ko mali pala ginawa ng mga magulang ko na tumatanggap ng bayad pag eleksyon.* [I rate it a 10 because I realized that my parents were wrong for accepting payment during elections]
	9 kasi akala ko dati pag pulitika puro gobyerno lang, ngayon nalaman ko na kasama din pala tayong lahat kaya may kakayahan tayong ayusin ang pulitika natin. [I rate it a 9 because I previously thought politics was only about the government. Now I understand that we are all included, and we have the ability to improve our politics]
Lesson 2	*10 po dahil iba yung impact noong nalaman ko yung mga bagay na mali ako ng pananaw, respeto yung paraan para maging mapayapa ang mundo."* [I give it a 10 because the impact of learning about my previous misconceptions was significant. Respect is a way to make the world peaceful]
	"10 din po kasi nasuprise kasi ako because of this lesson nabago yung pananaw kong baluktot na nagagalit ako ng di parehas yung desisyon nila sakin and happy kasi ang dami kong natutunan." [I also give it a 10 because I was surprised; this lesson changed my twisted perspective. I was angry when their decisions towards me weren't fair, and I'm happy because I learned so much]
Lesson 3	*"10 kasi mas nakapag isip ako lalo sa mga binigay na mga activities ni sir at also realization na kung sino pa yung mga nasa itaas o mismong naka upo sa gobyerno karamihan sila pa hindi marunong sumunod sa mismong batas na dapat na mas pinapairal sa ating bansa."* [I rate it a 10 because I've thought more deeply about the activities given by sir, and I've realized that most of those in high positions or in government often don't follow the very laws that should be upheld in our country]
	"10 dami kong nalaman at realization like minsan ung mga nakakataas hindi nila ginagampanan ng maayos hindi nila ginagamit ng maayos ung trabaho nila, ginagamit pa nila yon para manapak ng tao." [I give it a 10 because I learned a lot and had realizations like how sometimes those in authority do not perform their duties well; they even misuse their jobs to step on others]
Lesson 4	*"10 kasi dahil sa lesson na to mas naging aware ako sa nangyayari sa paligid natin, sa ethnic groups. Tsaka nalaman ko kung gaano kahalaga yung power para magkaroon ng social justice."* [I rate it a 10 because because of this lesson, I became more aware of what's happening in our surroundings, especially regarding ethnic groups. I also learned how important power is for achieving social justice]
	"10 sobrang natuwa ako sa discussion, ang ganda ng topic dahil sa ganitong edad palang namin ay nalalaman na namin na may mga ganito pala talagang nangyayare, masaya din ako dahil sa mga activity at para sakin kakaiba yung way of teaching ni sir." [I give it a 10 because I was really pleased with the discussion. The topic is great, especially at our age, as we are learning that these things actually occur. I'm also happy with the activities, and I find sir's way of teaching unique]
Lesson 5	*"10 kasi po may hindi pa pala ako nalalaman na ngayon ko lang nalaman na hindi pala tayo magkakapare-pareho may iba't-iba tayong lahi, tradisyon, at kinagisnan."* [I give it a 10 because I learned something new today—I didn't know that we are not all the same; we come from different races, traditions, and backgrounds]
	"10, maganda yung topic ito para sakin lalo na sa ma katulad naming kabataan na naiiba na ang landas na may minumungkahi ang iba, tinuturo ang topic na to na mag balik tanaw sa sariling bayan." [I rate it a 10 because this topic is wonderful for us, especially for young people like us who are following different paths while being suggested by others. This topic teaches us to reflect on our own homeland]

3.3. Learning Block 3. The Emotional Learning Block

After executing all the brain-based lesson plans, students used metaphors to express how the lessons could be transferred to more authentic experiences through practice and other mental simulations, as shown in Table 3 below. These realizations, which mostly occurred after practicing the lessons in a more realistic way, were grouped into two categories: realizations about how reality contradicts the principles presented in the lessons, and realizations regarding the students' willingness to apply the lessons in real life.

In Lesson One, students recognized the importance of being aware of and participating in civic affairs. This lesson also challenged them to fulfill their duties and responsibilities within their society. In contrast, Lesson Two required the students to determine whether they identified as conservative or liberal on various issues in the Philippines, which confused some of them. Many students felt disheartened upon realizing that the lesson was difficult to apply due to widespread disrespect. The ongoing issue of disrespect among individuals has led to more problems in society, evident even within their own classroom, where differing beliefs and opinions often clash. This simple attitude is tough to address, as many people hold biases against others' beliefs, opinions, and ideas. A significant number of individuals seem uninformed about the importance of respect in fostering peace and unity within human society. Furthermore, in Lesson Three, some students experienced mixed emotions of sadness and fear after recognizing that power is often abused by those who possess it. They became aware of how power should be responsibly exercised to help others, particularly those who are deprived and vulnerable in society. In Lesson Four, students again felt saddened upon realizing that marginalized sectors of society—such as indigenous peoples, the poor, women, and children—are the most vulnerable to injustices. This realization fostered empathy for indigenous people and emphasized how power should be exercised according to the principles of social justice. Finally, in Lesson Five, some students felt sad upon acknowledging that although many are aware of the importance of respect in building unity among Filipinos, numerous individuals still disrespect others due to differences in language, ethnicity, religion, beliefs, and traditions. The students became conscious of the significance of respect in engaging with diverse cultures to foster unity among Filipinos, despite identity differences.

From initially harboring negative perceptions regarding how socio-political realities contradict the principles outlined in the lessons—such as civic participation, political diversity, rule of law, social justice, and nationalism—students progressed toward a more optimistic outlook on improving their social and individual situations, guided by the learnings from each lesson. For instance, in Lesson One, students became optimistic about their potential to participate actively in politics simply by fulfilling their duties as citizens. They learned that when one truly loves and honors their country, they commit to participating in civic affairs to transform society, promote unity by cooperating with others, and stay informed about their surroundings. The students also discovered that acting for the benefit of others is more meaningful than acting solely for oneself. This newfound sense of optimism indicated that students had achieved the main objectives of the lesson. Lastly, students learned the importance of acknowledging their limitations by admitting their imperfections and accepting the ideas of others in conflict resolution. Furthermore, in Lesson Three, students expressed eagerness to apply the lesson in real life by exercising power appropriately within the framework of the law. In Lesson Four, they recognized their potential to help others using their simple powers and realized that justice can only be achieved if everyone understands their rights and knows how to protect them with appropriate actions. We observed that these students absorbed a sense of social justice; they articulated the importance of awareness, participation in decision-making, and forming solutions to ensure a fair distribution of power and resources, access to social security programs, and the protection of one's rights and liberties. Finally, in Lesson Five, students concluded that they could greatly contribute to Philippine society by being open-minded, understanding, and respectful of the diverse Filipino culture. They acknowledged that respect is key to resolving conflicts and fostering unity and brotherhood among Filipinos, despite the multiplicity of religions, languages, traditions, and more. On a practical level, students proposed posting articles or pictures depicting respect among Filipinos on social media platforms. This way, students and other young people would be informed about respecting the various cultures that comprise the Filipino nation. They also learned that a true Filipino is someone who fulfills their duty to the State and fellow Filipinos by respecting differences to build unity and brotherhood among Filipinos despite variations in identity.

The results show that this learning block activates both the cognitive and emotional aspects of students, which Connell [12] referred to as "hot cognition." Activation of hot cognition, including emotional control (amygdala) and cognitive regulation (prefrontal cortex), is essential for achieving optimal integration of emotional and cognitive processing, which are important aspects of transferring students' learning. Transfer of learning is crucial for applying new knowledge in other contexts [41]. Moreover, for transfer to be successful, students must perceive the new knowledge as useful for both the present and the future [28], [42]. Hence, activating students' hot cognition is essential for internalizing and contextualizing the lesson, as students learn best when their emotions are engaged.

Additionally, this learning block is referred to by the researcher as the "emotional learning block" of the brain-based lesson plan, as it elicits a variety of student emotions by providing opportunities for reflection and

reminding them of past experiences. Depending on the issues at hand, it can trigger five common human emotions: happiness, sadness, anger, fear, and optimism. Among these five emotions, students are expected to cultivate a sense of optimism or a positive outlook that enables them to improve their situations based on the lessons learned. The researcher considers optimism to be the "highest type of emotion or outlook in life" that every student may experience by the end of each brain-based social studies lesson. Thus, teachers should facilitate reflective activities that allow students to share their realizations and reflections with the rest of the class.

Table 3. Students' emotions and cognitions through metaphors

	Sample student response
Lesson 1	"*Salamin sa mata dahil noong ito'y isinuot ko nalinawan ako na hindi lang pala iyon, mas nadagdagan pa lalo ang aking nalaman sa lesson na ito."* [Glasses for the eyes because when I wore them, I realized that it's not just that; I learned even more from this lesson]
	"*Box kase diba pag naka-sara yung box kahit may idea tayo ay mababaw palang pero pag binuksan na natin ay pupwede natin maexplore yon. Gaya ng politics kung hindi natin ieexplore ay magiging mababaw yung tingin natin."* [A box, right? When the box is closed, even if we have an idea, it remains shallow, but when we open it, we can explore. Just like politics—if we don't explore it, our perspective will remain shallow]
Lesson 2	"*Eye Glasses, ito ay para sa mga matang nanlalabo ang mga mata, like me malabo ang paningin ko in terms of ideology, talagang hindi ko matanggap yung desisyon nila na alam kong mali sila but itong lesson na ito ay ang nag sisilbing salamin sa aking mga mata naging malinaw ang lahat, respeto din bilang tao sa kanilang desisyon."* [Eyeglasses, these are for those who have blurry vision, like me—I have a blurred perspective in terms of ideology. I really can't accept their decision, knowing they are wrong, but this lesson serves as a mirror to my eyes; everything became clear, including respect as a person for their decisions]
	"Suklay na para sa buhok na magulo na dapat ayusin, ito ang nag rerepresent ng learning ko, inaayos ng suklay yung magulo at maling pag iisip ko sa pag tanggap ng desisyon ng iba but masasabi ko ang dating magulo at maling pag iisip ko ay naayos na ng suklay dahil sa topic ngayon naging malinaw na at dapat laging respetuhin ang desisyon ng iba." [A comb for messy hair that needs to be fixed—this represents my learning. The comb organizes the mess and wrong thinking I have regarding accepting others' decisions, and I can say that my formerly messy and incorrect thoughts have been straightened out by this topic; it has become clear that we should always respect the decisions of others]
Lesson 3	*"Equal sign, natutunan ko po na ang batas po dapat patas sa lahat maging makapangyarihan man o maging katulad lang natin, at dapat gamitin natin yung power sa tama kasi sabi nyo nga po meron sya laging consequence and we need to consider it."* [An equal sign; I learned that the law should be fair to everyone, whether powerful or just like us, and we should use that power correctly because, as you said, there are always consequences, and we need to consider them]
	"Siguro macocompare ko to sa water bottle, kapag nilagyan mo ng tubig yung isang bote may limitasyon kung hangang saan lang dapat, kung gaano kalaki o kaliit yung bote mo. Kapag lumagpas ka sa limitasyon niyan aapaw yung tubig, sobrang puno nga ng bote mo pero mag cause yon ng problema sayo kasi tatapon na yung sobrang tubig na nilagay mo. [I could compare this to a water bottle. When you fill a bottle with water, there's a limit to how full it should be, depending on the size of your bottle. If you exceed that limit, the water will overflow. Your bottle may be too full, but that will cause a problem for you because the excess water you poured will spill out]
Lesson 4	*"Maihahalintulad ko to sa pag titimpla ng kape. Kapag sumobra yung pag lalagay mo ng kape, magiging mapait yung timpla. Sa topic na to, kapag sumobra yung power at nag kulang sa social justice walang peace na mangyayari. Don't ever use your power for fame, for yourself. Use it to gain social justice and peace. Hindi porket kape yung tinitimpla puro coffee powder na din yung ilalagay."* [I can liken this to brewing coffee. If you put too much coffee, the brew will become bitter. In this topic, if power exceeds while social justice is lacking, peace will not happen. Don't ever use your power for fame or for yourself. Use it to pursue social justice and peace. Just because you're brewing coffee doesn't mean you should put in only coffee powder]
	"Lapis, sumisimbolo po ito sa edukasyon dahil naniniwala po ako na kailangan ng bawat isa ito para

	malaman natin kung paano tayo kumilos at tumulong ng tama para sa mga lalong nangangailangan." [A pencil symbolizes education because I believe everyone needs this to know how to act and help correctly those who are in greater need]
Lesson 5	*"Rainbow, may ibat ibang kulay po pero magandang tignan parang tayo pong mga Pilipino, may ibat-ibang kultura pero maganda pa ring tignan dahil sa magandang katangian nating mga Pilipino lalo na sa pakikipag-kapuwa at pagkakaisa."* [A rainbow has different colors, but it looks beautiful, just like us Filipinos. We have different cultures, but we still look beautiful because of the wonderful traits we Filipinos have, especially in camaraderie and unity]
	"Kamay, dahil ito ang pwde nating gamitin para magkaisa tayong mga pilipino. Sa kabila ng pagkakaiba natin, pwde nating gamitin ang ating kamay para magbuklod tayo." [Hands, because these are what we can use to unite as Filipinos. Despite our differences, we can use our hands to come together]

This study confirms that emotion and cognition are inextricably intertwined and are both critical factors in students' academic success in the Social Studies classroom. Learning does not take place in a vacuum separate from students' feelings; instead, emotions play an active role in influencing how learners process, retain, and use information. From the perspective of brain-based learning, the intentional use of emotions becomes a strategic part of lesson design and delivery. In this study, emotions were deliberately aligned with different phases of the lesson: to attain maximum engagement and learning outcomes, the primary target emotion at the beginning of the lesson is enjoyment. It generates a positive feeling, curiosity, interest, and enthusiasm, thus creating an inviting classroom atmosphere where students feel motivated to participate in the lesson. Enjoyment serves as an emotional catalyst as it decreases anxiety, opens the mind to new ideas, and activates the reward centers in the brain responsible for sustaining attention and engagement during the lesson. Once the students are engaged, the next target emotion would be surprise, a vital factor that deepens understanding. When teachers connect new knowledge to students' prior experiences, observations, or real-life contexts, they evoke surprise and wonder-emotions that stimulate cognitive processing and facilitate meaningful learning. When students see the relevance of what they learn, they become curious again and active constructors of knowledge rather than passive recipients of information. Finally, the lesson ends with the target emotion of optimism. Encouraging students to view learning outcomes in a hopeful and forward-looking attitude promotes transfer of learning-applying acquired knowledge to real-world situations. Optimism also nurtures the belief of students in their capacity to make positive contributions to society, reinforcing the value-laden nature of Social Studies as a discipline fostering citizenship, empathy, and moral reasoning. Collectively, these emotional phases-enjoyment, surprise, and optimism-emphasize that Social Studies teaching can best take place when the lessons integrate emotional involvement and mental challenge. They affirm that learning is not solely intellectual but also affective and that teaching approaches that recognize this duality can be most effective in increasing student participation, enhancing understanding, and long-term retention.

Notwithstanding these contributions, the study recognizes various limitations. First, the study is based on qualitative data from students' perceptions and experiences, not on experimental studies. Such findings hint at valuable insights into students' affective and cognitive experiences but do not empirically show how the effectiveness of brain-based strategies influences students' learning outcomes. Future studies should utilize experimental or quasi-experimental designs that establish causal links between brain-based learning and students' cognitive and emotional development. Second, the intervention was narrow, focusing on a few lessons and involving only one grade level. Future investigations should expand this research to other grade levels and other area of Social Studies in order to determine if similar emotional and cognitive patterns emerge. Third, the research was conducted in a single school setting, a factor that limits generalizability. Replicating the study across multiple schools and diverse contexts could build upon an understanding of how brain-based learning strategies perform across different educational contexts.

Despite these limitations, the research is highly academically and practically valid. The novelty of the research is that it tries to bridge the gap between neuroscience and pedagogy by evaluating how brain-based principles of learning recast the teaching of Social Studies. At the same time, it contributes to the emergent consensus of research that recognizes that emotion and cognition are interdependent in learning processes. For curriculum developers and educators, the findings underline the need for designing learning experiences that can elicit positive emotions besides knowledge transmission. Embedding strategies that build enjoyment, surprise, and optimism in learning can render Social Studies more relevant, dynamic, and personally meaningful for learners. This would further augment students' intrinsic motivation and help them connect to the values inbuilt into the subject as lifelong assets: critical thinking, social awareness, empathy, and civic responsibility. On practical notes, this study has implications for teacher development. Schools can conduct professional development programs or training sessions in brain-based instructional design that would enable teachers to

design lessons emotionally rich. Sharing of best practices in collaborative planning sessions among Social Studies teachers will ensure consistency in the implementation of brain-based learning strategies across classes and grades. This study, above all, provides the conceptual basis for developing a framework that embeds emotion and cognition in Social Studies instruction. By fostering a learning climate that values emotional engagement as much as intellectual rigor, educators can foster classrooms that are intellectually stimulating and emotionally enabling. This is indeed a holistic approach that promises to transform Social Studies education, rendering it more relevant, humane, and empowering for the learners it serves.

4. CONCLUSION

Contrary to the common notion that Social Studies is merely a fact-based subject, this study shows that Social Studies is, in fact, a value-based discipline requiring the development of both cognitive and emotional skills among students. These skills are intertwined and inseparable; one should not be compromised for the sake of the other. This dual focus is essential for fostering civic participation and cultivating active citizenship while instilling values such as respect for diversity, human rights, the promotion of social justice, and a sense of nationalism.

To effectively achieve these objectives, Social Studies teachers must integrate emotional engagement alongside cognitive instruction by utilizing principles of brain-based learning. This emerging pedagogical approach provides empirical and scientifically supported explanations of how the brain processes information and learns. By applying knowledge from neuroscience, social studies teachers can redesign their teaching strategies to align more closely with how students learn, making lessons more engaging and impactful.

Furthermore, understanding the interplay between emotion and cognition is critical. When students connect emotionally with the content—whether through discussions of social justice issues, explorations of diverse cultures, or reflections on human rights—they are more likely to develop a genuine commitment to becoming informed and active citizens. Therefore, this study argues that emotion and learning are intricately intertwined and inseparable in the teaching and learning of social studies. Teachers should possess a solid understanding of brain function and its implications for learning, incorporating effective strategies, approaches, and practices based on these principles. By doing so, teachers can not only achieve educational goals but also inspire students to engage thoughtfully and actively in their communities and the wider world.

In line with this, it is suggested that the findings of this study be used by curriculum and education experts as a reference in redesigning Social Studies teaching in Philippine basic education, as they illustrate how emotion and cognition can be used simultaneously for students' success. Finally, it is recommended that further studies similar to this one be conducted to verify its findings and to identify any patterns that would help refine how brain-based learning can be utilized in Social Studies classrooms. Future studies may also contribute to the development of a brain-based model for teaching Social Studies that could be adopted by the Department of Education in revisiting the Social Studies curriculum and instruction.

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