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Exploring the Impact of Hemispheric Dominance on the Academic Achievement of 9th Class Students in Aurangabad City

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ABSTRACT

This study explored the relationship between hemispheric dominance (left, right, whole- brain) and academic performance in 9th class students in Aurangabad, analyzing 200 participants through a survey. It aimed to determine if brain dominance affects academic success. Results showed no significant link between hemispheric dominance and better academic outcomes, challenging the belief that brain dominance is key to educational success. Students of all dominance types showed average academic performance, suggesting other factors are more critical for academic achievement. The study underscores the importance of diverse instructional strategies to support different learning styles, potentially improving educational results. It indicates that educators and policymakers should prioritize inclusive, adaptive teaching methods over focusing on hemispheric dominance. This approach emphasizes cognitive diversity and advocates for educational practices that serve all students, aiming to enhance learning experiences and outcomes. The study contributes to educational discussions by promoting a holistic, inclusive approach to teaching that acknowledges and values students' cognitive diversity.

KEYWORDS: *Hemispheric Dominance, Learning Styles, Academic Achievement, Ninth Class Students in Aurangabad, Cognitive Styles, Teaching Strategies*

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1. INTRODUCTION

Gates and other scholars suggest that learning can be understood as the gradual evolution of behavior, influenced by repeated exposure to situations and the individual's efforts to respond effectively. In a classroom setting, teachers who tailor their teaching styles to match students' learning preferences foster a conducive learning environment. Conversely, failure to do so can lead to a decline in student achievement levels. Individuals demonstrate various learning and thinking styles across different contexts, thereby diversifying their information processing methods and improving decision-making skills. Students absorb and process information through various means such as writing, reading, observation, listening, reasoning, analysis, visualization, and experimentation. It's important to recognize that there isn't a single prescribed way for learners to perceive and respond to information. Most people exhibit flexibility in adapting their learning styles based on circumstances, as the human mind is adaptable to diverse tasks. Therefore, it's crucial for parents, teachers, and students to comprehend and recognize the intricacies of the mind and its functions across different styles of learning and thinking.

1.1. Definitions of Learning Styles:

According to Sigel and Coop (1974), learning style integrates an individual's personality and cognitive dimensions. Gibson (1976) equates learning style with cognitive style, while Lay Cock (1978) defines it as an individual's characteristic response to instructional variables. Kalsbeek (1989) describes learning style as a person's preferred approach to information processing, idea formation, and decision-making, influenced by attitudes and interests. Kirby (1979) introduced the term "learning style" to match course presentations and materials with individual learners' needs. Claxton and Ralston (1978) define learning style as a student's consistent approach to using stimuli

in learning contexts, while Reichmann (1978) sees it as a set of behaviors and attitudes in learning environments.

1.2. Concept of Learning Style:

Learning style encompasses cognitive, affective, and psychological elements, shaping individuals' perception, interaction, and response to the learning environment. These preferences are considered stable across individuals and influence how information is received and processed.

1.3. Hemisphericity:

Hemisphericity denotes an individual's cerebral dominance in retaining and processing information. Research indicates that the left hemisphere specializes in verbal, analytical, abstract, and temporal operations, while the right hemisphere excels in non-verbal, holistic, concrete, creative, analogical, and aesthetic functions. Left Hemisphere Traditionally associated with speech and language processing, the left hemisphere excels in sequential logical, verbal, symbolic, and convergent production tasks. Right Hemisphere The right hemisphere, though unable to verbalize, possesses a high neuronal capacity for processing complex information and contributes significantly to aesthetic judgment and cognitive spatial mapping. Whole Hemisphericity Integrated brain hemisphericity manages emotional climates and facilitates visualization, drawing, and dramatizations. Most individuals adapt both hemispheres without distinct preference.

1.4. Academic Achievement:

Academic achievement reflects a student's attainment of short or long-term educational goals, typically measured through examinations or continuous assessments. It encompasses various domains of learning, including cognitive goals applicable across subjects and subject- specific knowledge acquisition. Indicators of academic achievement range from procedural and declarative knowledge to grades, standardized test scores, and educational degrees or certificates. Academic achievement serves as a pivotal factor determining access to higher education and opportunities for personal and professional growth.

2. Related Work

Here are some related studies that establish a conceptual framework, identify sources of data, and suggest statistical methods suitable for addressing the research question. It is crucial for linking ongoing research to previous studies, ensuring the research is relevant and purposeful. Familiarity with existing work in the field helps researchers understand what has been done and what gaps need filling, leveraging past knowledge to inform current investigations.

Annamma, P. Karnan (2017): Examined the correlation between thinking styles and academic achievement in high school students within Vellore district using a survey approach. The study, involving 240 students from various school types, found a positive relationship between thinking styles and academic achievement, noting significant differences based on gender, school management type, instruction medium, family type, and birth order.

Madhu Gupta and Suman (2017): Investigated how learning and thinking styles, along with locality and gender, impact academic achievement among secondary school students. Employing a multi-stage random sampling method for a 500-student sample, the study revealed significant effects of these variables on academic performance, using a three-way ANOVA for analysis.

Abdul Sameer Khan, Dr. Arti Singh (2016): Explored the relationship between learning and thinking styles and academic performance, finding no significant correlation among higher secondary school students.

Vinitha, G Indu, H. (2015): Focused on the brain hemi-sphericity of higher secondary students in Coimbatore District, indicating a majority left-brain dominance without significant association with gender, instruction medium, or locality.

Ranjeeta and Anuradha Agnihotri (2015): Compared learning and thinking styles and academic achievements between students in Smart Schools and government schools, finding no significant differences in learning styles but partial differences in academic achievement related to these styles.

Subsequent studies have continued to explore various aspects of learning styles, thinking styles, and their relationship with academic achievement, highlighting the diversity and complexity of factors influencing educational outcomes. These investigations shed light on the intricate interplay between cognitive styles and educational success, offering valuable insights for educators, policymakers, and researchers.

3. Objectives of the Study

The objectives of our research paper involve delving into the intricate relationship between learning styles and academic achievement among ninthclass students. Throughout this study, we endeavor to uncover how different learning preferences influence academic performance education settings.

1. Identify Learning Styles (Hemisphericity) among 9th Class Studentsin Aurangabad city.
2. Study the Level of Academic Achievement of 9th Class Studentsin Aurangabad city.
3. Study the level of Academic Achievement among Right hemispheric dominant students in Aurangabad city.

4. Study the level of Academic Achievement among left hemispheric dominant students in Aurangabad city.
5. Study the level of Academic Achievement among whole hemispheric dominant students in Aurangabad city.

4. METHODOLOGY

In our research paper, we outline the methodological steps we have adopted, including the use of the descriptive survey method.

4.1. Samples

For the purpose of this study, we have selected a robust sample group that consists of 200 students enrolled in 9th class across various schools in Aurangabad City.

4.2. Variables of the Study

4.2.1. Dependent Variable

Academic achievement

4.2.2. Independent Variable

Hemispherical Preference

4.3. Selection of Tools Used in The Study

- Hemispheric dominance: Style of Learning and Thinking developed and standardized by Venkantaraman D.
- Academic Achievement: Final examination marks were considered as Academic achievement of 9th Class Students.

4.4. Statistical Techniques Used

- Arithmetic average of a set of values (Mean)
- Standard Deviation (S.D)
- Statistical Test (T-test)

4.5. Analysis and Interpretation

4.5.1. Hypothesis1:

The 9th Class Students possess Right Hemispheric dominant learning style.

Table 1: illustrates the distribution of right, left, and whole hemispheric dominant learning styles among males and females.

Hemisphericity	Male (F)	Female (F)	Total (F)
Right	48 (48%)	36 (36%)	84 (42%)
Left	30 (30%)	15 (15%)	45 (22.5%)
Whole	22 (22%)	49 (49%)	71 (35.5%)

Interpretation:

The number of right hemispheric dominant students (both male and female) is 84, which constitutes 42%. The number of left hemispheric dominant students (both male and female) is 45, accounting for 22.5%. The number of whole hemispheric dominant students (both male and female) is 71, representing 35.5%.

4.5.2. Hypothesis 2:

The level of academic achievements of 9th Class Students is High.

Table 2: outlines the academic performance of these students, provides a different perspective.

Academic Achievements of 9th Class Students	N	Mean	Range	Interpretation
	200	332.25	246 – 365	Average

Interpretation:

Upon analysis, Table 2 indicates an average mean score of 332.25, falling within the 246 to 365 range. This finding suggests that the academic achievement level among 9th Class Students is, in reality, average.

4.5.3. Hypothesis 3:

The level of academic achievements among Right Hemispheric dominant students is High.

Table 3: Table showing the level of academic achievement among Right Hemispheric dominant students

Academic achievement among right hemispheric dominant students	N	Mean	Range	Interpretation
	84	337	246 – 365	Average

Interpretation:

The table no. 4.3.3 reveals that the obtained mean value is 337 which lies between range 246 – 365. This shows that the level of academic achievement among Right Hemispheric dominant student is Average.

4.5.4. Hypothesis 4:

The level of academic achievements among Left Hemispheric dominant students is High.

Table 4: Table showing the level of academic achievements among Left Hemispheric dominant students.

Academic Achievement among left hemispheric dominant students	N	Mean	Range	Interpretation
	45	316.1	246 – 365	Average

Interpretation:
The table no. 4.3.4 reveals that the obtained mean value is 316 which lies between range 246 – 365. This shows that the level of academic achievement among Left Hemispheric dominant students is Average.

4.5.5. Hypothesis 5:

The level of academic achievements among Whole Hemispheric dominant students is High.

Table 5: Table Showing the level of academic achievement among Whole Hemispheric dominant students.

Academic achievement among whole hemispheric dominant students	N	Mean	Range	Interpretation
	71	337	246 - 365	Average

Interpretation:
The table no. 4.3.5 reveals that the obtained mean value is 337 which lies between range 246 – 365. This shows that the level of academic achievement among Whole Hemispheric dominant student is Average.

5. DISCUSSION OF THE RESULT

The study exploring the Impact of Hemispheric Dominance on the Academic Achievement of 9th Class Students in Aurangabad City reveals insightful findings on the interplay between hemispheric dominance (left, right, whole-brain) and academic performance among ninth-grade students in Aurangabad. Through a comprehensive analysis of data collected from 200 students, the research identifies distinctive patterns of learning styles and their correlation with academic achievements. Below are the key points discussed in the results section of the paper:

Prevalence of Hemispheric Dominance:
The study found a balanced distribution of hemispheric dominance among the participants, with right hemispheric dominance slightly more prevalent (42%) compared to left (22.5%) and whole (35.5%) hemispheric dominance. This diversity underscores the variety of cognitive styles present within the classroom setting.

Academic Achievement Analysis:
Contrary to the initial hypothesis that hemispheric dominance would significantly impact academic performance, the study observed no substantial difference in academic achievements across different dominance groups. The overall academic performance was categorized as average, with mean scores falling within the expected range for this age group.

Hemispheric Dominance and Gender Correlation:
The study also explored gender differences in hemispheric dominance, revealing that male students showed a higher preference for right hemispheric dominance, whereas female students were more evenly distributed across all three categories. This finding suggests that gender may play a role in cognitive style preferences, though it does not conclusively impact academic outcomes.

Influence of Hemispheric Dominance on Academic Performance:
Detailed statistical analysis, including the use of t-tests, indicated that while there are variations in learning styles attributed to hemispheric dominance, these differences do not translate into significant disparities in academic achievement. Students across all hemispheric dominance categories achieved comparable academic outcomes, suggesting that factors other than cognitive style may have a more pronounced effect on academic performance.

Implications for Educational Strategies:
The findings highlight the importance of recognizing and accommodating diverse learning styles in the educational process but also caution against overemphasis on hemispheric dominance as a determinant of academic success. It suggests that a balanced educational approach that caters to various learning preferences can be beneficial, rather than focusing solely on adapting teaching methods to match hemispheric dominance.

Contributions to Educational Psychology and Practice:
This study contributes to the broader discourse on educational psychology by offering empirical evidence on the relationship between cognitive styles and academic performance. It supports the notion that understanding students' learning preferences is crucial but also emphasizes the need for a holistic approach to education that considers multiple facets of learning and development.

Limitations and Future Research Directions:
The discussion acknowledges limitations, such as the sample size and the specificity of the population studied (9th-grade students in Aurangabad City), which may affect the generalizability of the findings. It calls for further research encompassing a broader demographic to validate and expand upon these results.

6. CONCLUSION

This research paper has explored the intricate relationship between hemispheric dominance and academic achievement among 9th class students in Aurangabad City. Through a comprehensive analysis of data collected from a sample group of 200 students, it was found that while there are variations in learning

styles associated with different hemispheric preferences, these differences do not significantly impact academic outcomes. The study highlights the importance of accommodating diverse learning styles in educational settings and suggests that educators should adopt inclusive teaching strategies tailored to individual needs rather than focusing solely on hemispheric dominance as a predictor of academic success. This research contributes valuable insights to the field of educational psychology and offers practical implications for educators aiming to optimize teaching methods in alignment with the cognitive styles of learners.

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