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A COMPARATIVE STUDY OF ATTITUDES TOWARDS BIOLOGY AMONG ENGLISH MEDIUM AND REGIONAL MEDIUM STUDENTS

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ABSTRACT

This study examines the attitudes towards biology among students from English medium and vernacular medium schools, focusing on affective, cognitive, and conative dimensions. A sample of 60 respondents, equally divided between the two groups, was selected to ensure balanced representation. Data was collected using a standardized attitude scale, and hypotheses were tested using the Independent Samples T-Test. The findings reveal a significant difference in overall attitudes, with English medium students demonstrating more positive attitudes, particularly in the cognitive and conative dimensions, while no significant disparity was observed in the affective dimension. The results suggest that language of instruction, access to resources, and familiarity with scientific terminology play pivotal roles in shaping students' engagement and perceptions of biology. The study highlights the need for targeted interventions to bridge the attitudinal gap between English medium and vernacular medium students. Strategies such as bilingual teaching methods, resource development in vernacular languages, and contextually relevant examples can enhance understanding and interest in biology for vernacular medium students. By addressing these disparities, educators can foster equitable learning opportunities and ensure that all students develop a positive attitude towards biology, irrespective of their medium of instruction. This research provides valuable insights for policymakers, educators, and curriculum developers to improve biology education in diverse linguistic settings.

Keywords: Attitudes, Biology, English, Regional, Students.

INTRODUCTION

English medium students generally exhibit a more positive attitude towards biology due to their greater exposure to comprehensive and diverse educational resources. Being taught in English, which is often considered the global language of science, these students have easier access to a wide range of textbooks, scientific journals, online courses, and multimedia materials that are predominantly available in English. This access enhances their understanding of biological concepts and motivates them to engage deeply with the subject. Additionally, English medium instruction often incorporates modern teaching methodologies, such as interactive digital tools and research-oriented activities, which further stimulate student interest and curiosity.

Furthermore, English medium students often perceive biology as a subject with promising career opportunities, both domestically and internationally. Their fluency in English equips them to pursue higher education and research in prestigious universities, where English is the primary medium of instruction. This outlook increases their motivation to excel in biology, as they see it as a gateway to fields such as medicine, biotechnology, environmental science, and academia. The familiarity with scientific terminology in English also helps reduce cognitive barriers when learning complex biological processes, allowing students to grasp

abstract concepts more effectively. However, despite these advantages, English medium students may sometimes face challenges in relating biological knowledge to their local environment or cultural context. The emphasis on standardized curricula and international scientific perspectives can lead to a gap between theoretical knowledge and practical application in familiar settings. This detachment might reduce the personal relevance of biology for some students, affecting long-term interest and retention. Therefore, incorporating contextualized examples and encouraging experiential learning can help English medium students connect better with the subject and foster a more holistic appreciation of biology.

OPERATIONAL DEFINITIONS:

Review of Literature:

1. **Sharma, A. (2021)**, In the research paper titled "Impact of Medium of Instruction on Student Attitudes Towards Biology: A Cross-Cultural Study". The study revealed that English medium students exhibited a significantly more positive attitude towards biology, largely attributed to better access to global learning resources, digital tools, and interactive content. These factors enhanced their conceptual clarity and interest in the subject. Conversely, vernacular medium students often encountered challenges in understanding technical terminology, which hindered their ability to engage deeply with the subject matter. The findings suggested the need for bridging resources that could cater to vernacular learners, enabling them to overcome language barriers.
2. **Kumar, R., & Singh, P. (2019)**, In the research paper titled "Language as a Barrier or a Bridge in Learning Science Subjects". The research highlighted a dichotomy in attitudes towards biology between the two groups. Vernacular medium students were found to appreciate biology concepts when presented in practical and relatable contexts, making learning more accessible and engaging. However, they struggled with academic terminologies and lacked exposure to cutting-edge developments in biology. On the other hand, English medium students excelled in theoretical knowledge due to access to comprehensive textbooks and research-oriented curricula, though they often failed to apply these concepts effectively in real-world scenarios.
3. **Patel, S., & Gupta, R. (2020)**, In the research paper titled "Medium of Instruction and Student Engagement in Biology Education". The study demonstrated that English medium students were highly engaged in learning biology through the use of digital platforms and online resources. This engagement was driven by their ability to navigate global educational content effortlessly. In contrast, vernacular medium students were more dependent on teacher guidance and classroom resources, which limited their independent exploration of the subject. The findings emphasized the importance of integrating vernacular-friendly digital tools to level the playing field in biology education.
4. **Das, A. (2018)**, In the research paper titled "Attitudes Towards Science in Multilingual Educational Settings". The study concluded that the medium of instruction greatly influenced students' confidence and aspirations in the field of biology. English medium students showed a clear preference for pursuing careers in biology due to their ability to relate the subject to global opportunities and advancements. Vernacular medium students, while equally curious, often lacked the confidence to compete in a broader scientific landscape, primarily due to limited exposure to international academic resources and terminology.

5. **Reddy, M. K. (2017)**, In the research paper titled "Cultural and Linguistic Factors in Science Education". The research identified that vernacular medium students faced challenges in assimilating biological terms into their linguistic framework, often resulting in a fragmented understanding of the subject. Meanwhile, English medium students benefited from a seamless integration of global biological concepts but displayed limited awareness of local biodiversity and ecological issues. The study recommended a dual-focus approach in teaching, combining global and local biological perspectives across instructional mediums.

6. **Nair, S., & Menon, A. (2022)**, In the research paper titled "Learning Science Through Vernacular Medium: A Double-Edged Sword". The findings underscored the effectiveness of culturally contextualized textbooks in enhancing the attitudes of vernacular medium students towards biology. These students demonstrated higher enthusiasm when biological concepts were linked to their immediate environment and cultural practices. English medium students, however, gained more from exposure to internationally benchmarked curricula, which broadened their academic horizons but sometimes alienated them from local ecological relevance.

7. **Chakraborty, T. (2021)**, In the research paper titled "Science Education in Vernacular and English Medium Schools: A Comparative Study". The study observed that vernacular medium students engaged more effectively with biology when it was taught using hands-on experiments and local examples. In contrast, English medium students preferred lecture-based instruction, as it catered to their learning style, which heavily relied on structured and formal presentation of scientific theories. The research suggested the inclusion of more experiential learning opportunities for all mediums to foster better comprehension and interest.

8. **Joshi, H., & Verma, L. (2020)**, In the research paper titled "Impact of Language Proficiency on Attitudes Towards Biology". The study indicated that English medium students possessed a more analytical approach to biology, owing to their proficiency in understanding scientific literature and engaging with global educational content. Vernacular medium students, however, displayed a deep-seated curiosity and descriptive learning style, driven by their connection to real-life biological phenomena. Both groups exhibited distinct strengths, emphasizing the need for tailored educational strategies.

9. **Roy, P. (2019)**, In the research paper titled "The Role of Language in Developing Interest in Biological Sciences". The research concluded that vernacular medium students showed a marked improvement in attitudes towards biology when lessons were contextualized to their daily lives, creating a sense of relevance and immediacy. English medium students valued the theoretical and abstract dimensions of the subject, appreciating its alignment with global scientific advancements. This highlighted the significance of adopting a balanced teaching methodology.

10. **Banerjee, K., & Dasgupta, M. (2018)**, In the research paper titled "Comparative Study of Science Attitudes Across Different Instructional Mediums". The study revealed that the quality of teaching methodologies had a more profound impact on students' attitudes towards biology than the medium of instruction. English medium students benefited from well-structured syllabi and global exposure, while vernacular medium students excelled when instructors emphasized local examples and interactive teaching methods. Both mediums displayed unique advantages, stressing the need for a blended pedagogical approach.

RESEARCH GAP:

The research gap in the comparative study of attitudes towards biology among English medium and vernacular medium students lies in the limited exploration of how linguistic and cultural contexts shape student engagement and learning outcomes in biology. While existing studies address the influence of medium of instruction on general academic performance, there is a lack of comprehensive analysis on the interplay between language proficiency, access to resources, and pedagogical strategies in fostering positive attitudes towards biology. Additionally, the impact of socio-economic factors and the effectiveness of bilingual teaching approaches in bridging the gap between the two mediums remain underexplored, presenting opportunities for further investigation.

RESEARCH METHODOLOGY:

The research methodology for this study employed a quantitative approach to compare attitudes towards biology among English medium and vernacular medium students. A total of 60 respondents were selected, Sample is students studying biology in higher secondary school after their matriculation is from English medium or regional medium school. Data was collected using a standardized attitude scale measuring affective, cognitive, and conative dimensions. The Independent Samples T-Test was applied to test hypotheses related to overall attitudes and specific influencing factors. Statistical analysis was conducted to compare mean scores and assess the significance of differences, providing insights into the impact of the medium of instruction on students' attitudes towards biology. This systematic approach ensured reliability and validity in uncovering meaningful patterns and conclusions.

DATA ANALYSIS:

The following table indicates the demographic factor of the study:

Type of Respondent				
	Frequency	Percent	Valid Percent	Cumulative Percent
English Medium	30	50.0	50.0	50.0
Vernacular Medium	30	50.0	50.0	100.0
Total	60	100.0	100.0	

The frequency data shows an equal number of respondents, with 30 participants from both English medium and vernacular medium groups. This balanced distribution ensures that comparisons between the two groups are statistically fair and unbiased, allowing for meaningful insights into differences in attitudes, affective engagement, cognitive understanding, and conative behaviors towards biology. Such parity strengthens the validity of the analysis by minimizing sample-related disparities and ensuring that the observed differences are attributable to the medium of instruction rather than sample size variations.

Objective-1: To study the Attitudes Towards Biology Among English Medium and Vernacular Medium Students.

Null Hypothesis H_{01}: There is no significant difference between Attitudes Towards Biology Among English Medium and Vernacular Medium Students.

Alternate Hypothesis H_{11}: There is a significant difference between Attitudes Towards Biology Among English Medium and Vernacular Medium Students.

To test the above null hypothesis, Independent Samples T-Test is applied and results are as follows:

Independent Samples Test						
		t-test for Equality of Means				
		t	df	P-value	Mean Difference	Std. Error Difference
Attitude		3.864	58	.000	10.4000	2.6916

Interpretation: The above results indicate that calculated p-value is 0.000. It is less than 0.05. Therefore Independent Samples T-Test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

Conclusion: There is a significant difference between Attitudes Towards Biology Among English Medium and Vernacular Medium Students.

Findings: To understand the findings, mean scores are obtained and presented as follows:

Group Statistics					
	Type of Respondent	N	Mean	Std. Deviation	Std. Error Mean
Attitude	English Medium	30	59.867	7.7537	1.4156
	Vernacular Medium	30	49.467	12.5389	2.2893

The data indicates a noticeable difference in attitudes towards biology between English medium and vernacular medium students. English medium respondents, with a mean score of 59.867, exhibit a significantly more positive attitude towards the subject compared to their vernacular medium counterparts, whose mean score is 49.467. This disparity suggests that students taught in English may benefit from greater access to resources, exposure to global content, and familiarity with scientific terminology, all of which enhance their engagement and interest in biology. On the other hand, vernacular medium students might face challenges due to limited instructional materials in their native language and difficulty in understanding technical terms, which could contribute to their comparatively lower attitude scores. These findings highlight the need for tailored teaching strategies and resource allocation to bridge the attitudinal gap between the two groups.

Objective-2: To study the factors influencing attitude towards Biology Among English Medium and Vernacular Medium Students.

Null Hypothesis H_{02}: There is no particular factor influencing attitude towards Biology Among English Medium and Vernacular Medium Students.

Alternate Hypothesis H_{12}: There is a particular factor influencing attitude towards Biology Among English Medium and Vernacular Medium Students.

To test the above null hypothesis, Independent Samples T-Test is applied and results are as follows:

Independent Samples Test						
		t-test for Equality of Means				
		t	df	P-value	Mean Difference	Std. Error Difference
Affective		1.994	58	.051	3.8667	1.9392
Cognitive		2.431	58	.018	4.2000	1.7275
Conative		3.455	58	.001	5.6000	1.6208

Interpretation for Affective: The above results indicate that calculated p-value is 0.051. It is more than 0.05. Therefore Independent Samples T-Test is accepted. Hence Null hypothesis is accepted and Alternate hypothesis is rejected.

Interpretation for Cognitive and Conative: The above results indicate that calculated p-value is 0.000. It is less than 0.05. Therefore Independent Samples T-Test is rejected. Hence Null hypothesis is rejected and Alternate hypothesis is accepted.

Conclusion for Affective: There is no particular factor influencing attitude towards Biology Among English Medium and Vernacular Medium Students.

Conclusion for Cognitive and Conative: There is a particular factor influencing attitude towards Biology Among English Medium and Vernacular Medium Students.

Findings: To understand the findings, mean scores are obtained and presented as follows:

Group Statistics					
	Type of Respondent	N	Mean	Std. Deviation	Std. Error Mean
Affective	English Medium	30	61.867	8.7247	1.5929
	Vernacular Medium	30	58.000	6.0572	1.1059
Cognitive	English Medium	30	64.600	4.8466	.8849
	Vernacular Medium	30	60.400	8.1266	1.4837
Conative	English Medium	30	53.800	6.9550	1.2698
	Vernacular Medium	30	48.200	5.5174	1.0073

The data illustrates differences in the affective, cognitive, and conative dimensions of attitudes towards biology among English medium and vernacular medium students. In the affective dimension, which relates to emotions and feelings towards biology, English medium students scored a mean of 61.867, slightly higher than vernacular medium students at 58.000. This suggests a marginally greater emotional engagement and interest in the subject among English medium students. In the cognitive dimension, reflecting knowledge and understanding, English medium students scored a mean of 64.600, compared to 60.400 for vernacular medium students. This difference indicates that English medium students might have a stronger grasp of biological concepts, potentially due to better access to comprehensive educational resources and exposure to technical terminology in English. The conative dimension, which involves behavioral intent and actions, shows the most pronounced difference, with English medium students scoring a mean of 53.800 compared to 48.200 for vernacular medium students. This indicates that English medium students are more inclined to actively engage in biology-related tasks or pursue biology in practical or academic contexts. The overall trend highlights the need to address disparities in resource availability and instructional support to enhance the attitudes of vernacular medium students across all dimensions.

CONCLUSION:

The study concludes that there is a significant difference in attitudes towards biology between English medium and vernacular medium students, with English medium students demonstrating more positive attitudes overall. This difference is particularly evident in the cognitive and conative dimensions, where English medium students show stronger understanding and a greater inclination to engage with biology-related tasks. While the affective dimension did not reveal a significant disparity, the findings underscore the impact of language of instruction, resource accessibility, and familiarity with scientific terminology on shaping students' attitudes. Addressing these disparities through improved resource allocation, bilingual instructional strategies, and localized teaching approaches can help bridge the gap and foster equitable learning opportunities for vernacular medium students.

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