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A critical analysis between learning style and academic performance of undergraduate students in District of West Tripura

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Abstract

Academic achievement is a fundamental goal of formal education systems, influencing students' career trajectories and broader societal progress. This study explores the relationship between learning styles and academic performance among undergraduate students in West Tripura District, India. Employing a correlational research design, data were collected from 150 students (81 females, 69 males) using the Learning Style Scale developed by Balhara and Mittal. The study aimed to (1) identify predominant learning styles, (2) analyze gender-based differences in academic achievement, and (3) examine the correlation between learning styles and academic performance.

Findings indicate that students exhibit diverse learning preferences, with visual learning (27.5%) being the most dominant style, followed by kinesthetic (25%), reading/writing (25%), and auditory (22.5%) learning. Analysis of gender-based differences in academic performance revealed that female students had a slightly higher mean score (118) than male students (114), but the difference was not statistically significant ($t = 1.52$, $p > 0.05$), supporting the null hypothesis (H01). Similarly, the correlation analysis ($r = 0.099$, $p > 0.05$) suggests no significant relationship between learning styles and academic performance, supporting the null hypothesis (H02).

These findings highlight the need for varied instructional strategies to accommodate diverse learning preferences. Moreover, the minimal impact of learning styles on academic achievement suggests that other factors, such as motivation and teaching quality, may play more substantial roles. The study underscores the importance of inclusive and flexible teaching methodologies to enhance student learning experiences in higher education.

Keywords: Academic achievement; Learning styles; Undergraduate students; Gender differences; West Tripura; Higher education

1. Introduction

Academic achievement is widely recognized as one of the most important objectives of formal education systems across the world. It is commonly measured through tangible outcomes such as test scores, grades, certificates, and degrees, which are seen as indicators of students' success in learning and acquiring knowledge. These academic benchmarks play a vital role in shaping not only students' educational careers but also their future professional and social trajectories. As Lawrence and Vimala (2012) emphasize, academic success is not merely a reflection of individual effort but is also intricately linked to broader educational goals. The pursuit of academic excellence is central to the functioning of educational systems at all levels, particularly within higher education, where students are expected to master complex content and apply their knowledge in real-world settings.

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The concept of academic achievement extends beyond personal success; it is a cornerstone of societal development and economic progress. In today's knowledge-based global economy, high levels of education are correlated with increased productivity, innovation, and social development. The role of educated individuals in contributing to the workforce, driving technological advancements, and influencing social policies cannot be overstated. It is therefore crucial to understand the factors that contribute to academic achievement and how educational institutions can create environments that foster students' academic success (Maryam et al., 2019). This understanding becomes particularly relevant in the context of undergraduate education, where students are preparing to make significant decisions about their future careers. At this stage, students not only gain specialized knowledge but also develop critical thinking, problem-solving, and interpersonal skills that will guide their professional lives. As a result, their academic performance during these years can have long-lasting consequences, influencing career opportunities, social mobility, and overall life satisfaction.

The importance of academic achievement has led to an ongoing focus on identifying the various factors that contribute to students' success. Among the many influences on academic performance, one of the most significant is a student's learning style. Learning styles refer to the preferred ways in which individuals process, interpret, and retain information. According to Pashler et al. (2008), learning styles encompass various cognitive and psychological approaches that students use to engage with learning materials. These learning preferences can range from visual methods, where students learn best through images and diagrams, to auditory methods, where students prefer verbal explanations and sound, to kinesthetic methods, where students engage most effectively through physical activity and hands-on experiences. Understanding these preferences is crucial because they can significantly affect how well students absorb and apply knowledge. If students are taught using methods that align with their preferred learning styles, they are more likely to achieve better academic results (Wang, 2007).

The concept of learning styles has gained considerable attention in educational research and practice. It is grounded in the belief that students are not homogeneous, and their learning needs can differ greatly from one another. Each student brings a unique set of experiences, cultural influences, and cognitive strengths that shape how they approach learning. This is particularly relevant in the context of undergraduate education, where students come from diverse backgrounds and bring different levels of prior knowledge and learning experiences to their academic endeavors. According to Yousefi (2011), various factors influence an individual's learning style, such as culture, gender, age, academic major, and personal experiences. For instance, students from different cultural backgrounds may have different learning preferences based on the educational systems they were exposed to in their home countries, while students with different academic majors might favor distinct learning strategies based on the nature of their disciplines. Understanding these diverse learning styles is essential for educators who aim to create inclusive and effective teaching strategies that cater to the needs of all students, ensuring that each student can succeed in their learning journey.

In line with these insights, the role of the teacher in adapting their teaching methods to the learning styles of their students becomes increasingly important. The idea of tailoring teaching approaches to meet individual learning preferences is rooted in the principle of differentiated instruction. When teachers are aware of the different learning styles in their classroom, they can design lessons that appeal to visual, auditory, and kinesthetic learners, ensuring that all students are engaged and can absorb the material effectively. Teachers who make an effort to incorporate a variety of teaching strategies, such as using visual aids, conducting discussions, and providing hands-on learning experiences, create a dynamic and inclusive classroom environment where all students feel supported. This approach not only helps students grasp content more effectively but also fosters a sense of inclusion and respect for diverse learning needs.

The relationship between learning styles and academic performance is particularly important in higher education, where students are expected to engage with complex material and apply their knowledge in practical settings. The West Tripura District, located in the northeastern region of India, presents an intriguing context for investigating this relationship. The district is characterized by a rich cultural and socio-economic diversity that can have a profound impact on the learning preferences of students. For instance, students in this region may come from different ethnic groups, with varying educational backgrounds and social experiences. These differences can influence how they approach learning and what methods they find most effective in understanding new material. Additionally, the socio-economic conditions in the district can impact access to educational resources and opportunities, which in turn can affect students' academic performance. Understanding how these socio-cultural factors interact with learning styles can provide valuable insights into how educational systems in the region can be improved to better support student success.

1.1. Statement of the problem

In Tripura, the diversity in socio-economic, cultural, and educational backgrounds, particularly in regions like the District of West Tripura, adds complexity to understanding the interplay between learning styles and academic

outcomes. The West Tripura District, with its unique demographic and educational context, presents a valuable setting for exploring these dynamics. However, despite its importance, limited research has been conducted to critically analyze how learning styles affect the academic performance of undergraduate students in this region.

Higher Educational institutions in West Tripura primarily follow traditional teaching methodologies, often overlooking the diverse learning preferences of students. This mismatch between teaching methods and students' learning styles may hinder their academic growth and performance. Understanding this relationship is vital to developing effective teaching strategies tailored to students' needs, thereby enhancing their academic success and overall learning experience.

This study aims to address the gap by critically analyzing the correlation between learning styles and academic performance among undergraduate students in the District of West Tripura. By identifying the predominant learning styles of students and examining how these styles relate to their academic achievements, this research seeks to provide evidence-based insights that can inform teaching practices and contribute to improved educational outcomes in the region.

Objectives

The objectives of the study are as follows:

- To identify the predominant learning styles used by undergraduate students.
- To investigate the differences in academic achievement between male and female undergraduate students.
- To examine the correlation between learning styles and academic performance among undergraduate students in West Tripura District.

Hypothesis

The following hypotheses are framed for testing:

- **H_{01}:** There is no significant difference in academic achievement between male and female undergraduate students.
- **H_{02}:** There is no significant correlation between learning styles and academic performance among undergraduate students in West Tripura District.

2. Methodology of research

In this study, the researcher was intended to study the 'A critical analysis between learning style and academic performance of undergraduate students in District of West Tripura'. A co-relational research design was followed by the researcher.

2.1. Population of the study

Tripura is divided into eight districts; West Tripura district was used for this research that means all the undergraduate students of west Tripura Districts are target populations of this study.

2.2. Sample and sampling

In this study simple random sampling were adopted for selection of sample. When employing the method of simple random sampling, a researcher not divides his population into subject wise, stream wise, area wise etc.

In the present study the sample was consisted of 150 students from the west District of Tripura. Students are selected by using simple random sampling technique. 81 girl students and 69 boy students were selected.

2.3. Tools and techniques of the study

A research tool plays a major role in any value during research because it is the only reason to determine the data and arrive at the perfect conclusion about the study.

2.3.1. The following tool was used to collect data for present study

In this study the data is collected through the tools "Learning Style Scale, developed by Dr. Anu Balhara and Mrs. Priy Mittal". The Learning Style scale has two tests-one in English and the other one in Hindi. These tests have been developed with a sole purpose of measuring learning style of secondary, senior secondary and college going students. Each of the two tests has four dimensions namely (i) Visual learning, (ii) Auditory learning, (iii) Reading Writing Learning, (iv) Kinesthetic learning.

2.4. Procedure of data collection

Data collection is an important part of the research work. Thus, assumptions or generalizations that are held temporarily may be rejected as valid or invalid. In order to gather the necessary information for a research problem, a sample of the population involved in the study must be given. Since it is not possible to cover the entire population to develop appropriate tools and techniques for measuring the relevant features and operate these tools in selected samples or samples for collecting relevant information. Data collected from different sources through standardized tools.

In the present research data were collected by administering learning style scale– Tool constructed and prepared by Dr. Anu Balhara and Mrs. Priy Mittal. This test were used to administer the college students in West district of Tripura. A simple random sampling technique was used to collection of data to the target sample of 150 students. The data were collected by the researcher personally by visiting college.

2.5. Procedure of data analysis

The collected data was analyzed both quantitatively and qualitatively using the different statistical methods. Like mean, median, mode, t-test correlation etc.

3. Analysis and interpretation

3.1. Objective -1

To identify the predominant learning styles used by undergraduate students.

Table 1 The predominant learning style

Happiness Factor	**Percentage**
Visual learning	27.5%
Auditory learning	22.5%
Reading Writing Learning	25%
Kinesthetic learning	25%

3.1.1. Interpretation

The primary aim of this objective was to identify the dominant learning styles used by undergraduate students. The findings indicate that the learning preferences among students are distributed across four distinct styles: visual, auditory, reading/writing, and kinesthetic learning. Visual learning emerged as the most predominant style, preferred by **27.5% of students**, suggesting that many learners rely heavily on images, diagrams, and visual aids to process and retain information.

Kinesthetic and reading/writing learning styles were equally preferred, with **25% of students** aligning with each. This indicates a significant inclination toward hands-on, experiential learning (kinesthetic) and a strong preference for textual-based learning, involving reading and writing.

Auditory learning, used by **22.5% of students**, was the least preferred style, signifying that fewer students depend on listening to lectures or verbal instructions for their learning. Overall, the data highlights a diverse range of learning preferences, with visual learning slightly more prominent.

3.2. Objective – 2

- To investigate the differences in academic achievement between male and female undergraduate students.
- **H_{01}:** There is no significant difference in academic achievement between male and female undergraduate students.

Table 2 The difference between two means

Sl. No.	Category	N	Mean	SD	df	't' value	Level of Significance
1	Male	69	114	19	148	1.52	0.05
2	Female	81	118	13			Not Significant

3.2.1. Interpretation

This objective sought to investigate whether male and female undergraduate students differ significantly in academic achievement. The hypothesis tested was: H01: There is no significant difference in academic achievement between male and female undergraduate students.

The results show that the mean academic achievement score for male students was 114 with a standard deviation of 19, while female students had a higher mean score of 118 with a smaller standard deviation of 13. Although there was a difference in the mean scores, the calculated t-value of 1.52 (df = 148) was not statistically significant at the 0.05 level.

This indicates that there is no significant difference in academic achievement between male and female students, supporting the null hypothesis (H01). Therefore, academic performance appears to be consistent across genders, suggesting that factors other than gender may play a more critical role in influencing academic success.

3.3. Objective -3

- To examine the correlation between learning styles and academic performance among undergraduate students in West Tripura District.

- **H_{02}:** There is no significant correlation between learning styles and academic performance among undergraduate students in West Tripura District.

Table 3 The relationship between learning styles and academic performance

Variable	No. of Students	r- Value	df	Level of Significance	Remark
learning styles	150	0.099	148	0.05	Slight Relationship
Academic performance				Not Significant	

3.3.1. Interpretation

The focus of this objective was to examine the relationship between students' learning styles and their academic performance. The hypothesis tested was: H02: There is no significant correlation between learning styles and academic performance among undergraduate students in West Tripura District.

The analysis yielded a correlation coefficient (r-value) of 0.099 with 148 degrees of freedom, which indicates a slight relationship between learning styles and academic performance. At the 0.05 level of significance, this correlation was not statistically significant, supporting the null hypothesis (H02).

Based on the interpretation of the r-value range, the relationship between learning styles and academic performance is minimal. This suggests that while learning styles might contribute to academic performance, their impact is relatively minor, and other factors may have a stronger influence on students' academic outcomes.

3.4. Summary

This chapter critically evaluates the relationship between learning styles and academic performance among undergraduate students in West Tripura District. It aligns with the objectives and hypotheses outlined in the study, focusing on the predominant learning styles, gender-based differences in academic achievement, and the correlation between learning styles and academic performance.

3.4.1. Major Findings

Objective 1: To Identify the Predominant Learning Styles Used by Undergraduate Students

The analysis reveals diverse learning preferences among students, with the following key findings:

- **Visual Learning**: Preferred by 27.5% of students, indicating a strong inclination toward visual aids like diagrams, charts, and videos for comprehension.
- **Reading/Writing Learning**: Preferred by 25% of students, emphasizing the role of textual engagement in learning processes.
- **Kinesthetic Learning**: Also preferred by 25% of students, showing the importance of hands-on, experiential learning approaches.
- **Auditory Learning**: The least preferred style at 22.5%, suggesting fewer students depend on lectures and verbal communication.

These results highlight the need for varied teaching methodologies to address the diverse learning preferences within the student population.

Objective 2: To Investigate the Differences in Academic Achievement Between Male and Female Undergraduate Students

- The study examined gender differences in academic performance. Key results include:
- Male students had a mean academic score of 114 with a standard deviation (SD) of 19.
- Female students had a slightly higher mean score of 118 with an SD of 13.
- The calculated t-value (1.52) with 148 degrees of freedom was not statistically significant at the 0.05 level.

These findings support the null hypothesis (H01), indicating no significant gender-based differences in academic achievement. This suggests that academic performance is influenced more by individual factors than by gender.

Objective 3: To Examine the Correlation Between Learning Styles and Academic Performance Among Undergraduate *Students*

- The analysis explored the relationship between learning styles and academic outcomes, finding:
- A correlation coefficient (r-value) of 0.099 indicates a slight relationship.
- The relationship was not statistically significant at the 0.05 level.

The findings support the null hypothesis (H02), showing that learning styles have a minimal impact on academic performance. This suggests that other factors, such as motivation and teaching quality, may play more substantial roles in academic success.

4. Discussion

The results of this study provide significant insights into the complex dynamics between learning styles and academic performance. The findings highlight that students' preferences for learning methods vary widely, and the diversity of these preferences suggests that a one-size-fits-all approach to teaching is inadequate.

The predominance of visual learning, which is preferred by 27.5% of students, underscores the importance of incorporating visual aids such as charts, diagrams, and videos in instructional practices. This preference aligns with broader educational research, which shows that visual learners often excel when information is presented in a structured and visually engaging manner. Similarly, the equal preference for kinesthetic and reading/writing learning styles (25% each) points to the value of experiential learning and textual materials in fostering engagement and understanding. The hands-on approach associated with kinesthetic learning can help students grasp complex concepts

through practical application, while reading/writing learners benefit from detailed notes, reading assignments, and essays.

The relatively lower preference for auditory learning, at 22.5%, suggests a potential gap in the effectiveness of traditional lecture-based teaching methods. This could indicate that while auditory learning is beneficial for some students, many learners may struggle to retain information solely through listening. Therefore, educators should consider integrating interactive elements such as discussions, peer teaching, and multimedia content to better engage auditory learners.

The absence of significant gender-based differences in academic performance reflects progress in fostering an equitable learning environment. This challenges historical stereotypes that suggest disparities in academic capabilities between male and female students. The findings indicate that academic success is more closely tied to individual motivation, quality of instruction, and access to resources rather than inherent gender differences. This underscores the need for educational institutions to focus on providing equal opportunities and support to all students, regardless of gender.

Lastly, the minimal correlation between learning styles and academic performance suggests that while learning preferences are an essential factor, they are not the sole determinants of academic success. Other elements, such as cognitive abilities, emotional intelligence, study habits, and external support systems, likely play a more significant role. This finding advocates for a holistic approach to education, where diverse factors are considered to create an environment that supports all aspects of student development.

5. Conclusion

This study sheds light on the intricate relationship between learning styles and academic performance among undergraduate students in West Tripura District. The findings emphasize that students exhibit diverse learning preferences, with visual learning emerging as the most dominant style, followed by kinesthetic and reading/writing styles. The results also reveal no significant gender-based differences in academic performance, suggesting that academic success is not inherently tied to gender but rather influenced by other factors such as individual effort and educational support systems.

The lack of a significant correlation between learning styles and academic performance underscores the need for a more holistic approach to education. While learning styles provide a framework for understanding student preferences, they should not be viewed in isolation. Instead, educators must consider a combination of factors, including cognitive abilities, study habits, emotional well-being, and environmental influences, to foster academic success.

The implications of this study are far-reaching. Educational institutions and policymakers are encouraged to design inclusive curricula and teaching strategies that cater to the diverse needs of learners. This includes integrating visual, kinesthetic, auditory, and textual elements into classroom instruction to engage all students effectively. Moreover, the findings highlight the importance of promoting gender equity in education by ensuring equal access to resources and opportunities for both male and female students.

In conclusion, this study contributes to the growing body of knowledge on learning styles and academic performance, offering valuable insights for educators, researchers, and policymakers. By adopting a multifaceted and inclusive approach to education, stakeholders can empower students to achieve their full potential and create a more equitable and effective learning environment.

Compliance with ethical standards

Disclosure of conflict of interest

There is no conflict of interest to be disclosed.

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