



RESEARCH ARTICLE

INVESTIGATING THE EFFECTIVENESS OF DIFFERENT LEARNING STYLES: A COMPARATIVE ANALYSIS

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ABSTRACT

The goal of this study is to investigate and evaluate various learning approaches in order to comprehend how they affect academic results. Education professionals can modify their instructional strategies to suit diverse learners and enhance the learning process by determining the advantages and disadvantages of various learning modalities. The effectiveness of auditory, visual, kinesthetic, and multimodal learning methods in terms of knowledge retention, engagement, and total learning performance is assessed in this study using a comparative analytic methodology. The research supports the creation of individualized learning strategies and supports the use of evidence-based teaching practices. **Rationale:** Learners nowadays come from a variety of backgrounds, and their preferences, cognitive styles, and capabilities reflect that. Traditional, one-size-fits-all teaching strategies frequently fall short of meeting the unique needs of each student, leading to less-than-ideal learning outcomes. The efficiency of instructional strategies can be greatly increased by understanding and recognizing the various learning styles, which also contributes to better educational experiences. In order to offer educators evidence-based insights and guide the creation of individualized learning strategies, this research study intends to analyze and compare the efficacy of various learning styles, including auditory, visual, kinesthetic, and multimodal approaches.

Objectives:

- To determine how different learning styles affect academic performance: This purpose is to investigate how different learning preferences, including visual, auditory, kinesthetic, and read-and-write, affect students' academic performance in various educational contexts.
- To examine the connection between preferred learning styles and student engagement: This aim looks into whether or not students who are taught using instructional strategies that are in line with their preferred learning preferences show higher levels of engagement in the learning process than those who are exposed to strategies that are not in line.
- To determine whether customized educational tactics are effective: This objective is to assess how well instructional tactics that are tailored to a particular learner's learning preferences improve student learning outcomes, including comprehension and knowledge retention.
- To investigate how students view instruction based on learning styles: With a focus on individual preferences, satisfaction, and perceived benefits, this objective entails gathering qualitative data through surveys or interviews to understand how students perceive and experience instructional approaches adapted to their learning types.

INTRODUCTION

Education professionals have shown a great deal of interest in the study of learning styles and how they affect educational outcomes. It may be possible to improve student engagement and academic accomplishment by knowing how different people learn best and developing instructional strategies to suit those preferences. The existing body of research on learning styles, their efficacy in education, and their implications for instructional design are examined in this review of the literature.

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Learning Styles Defined: According to Coffield et al. (2004), learning styles are the distinctive ways that people like to receive, process, and remember information. According to Fleming and Mills (1992), there are four main learning styles that are frequently mentioned in the literature: visual, auditory, kinesthetic, and read/write. Kinesthetic learners flourish in hands-on settings, auditory learners learn best via listening and discussion, visual learners like visual aids like charts and diagrams, and read/write learners do best when engaged in reading and writing activities (Fleming, 2006).

Effectiveness of Learning Styles in Education: Debatable is the efficacy of adjusting education to fit different learning preferences.

Early research found a strong correlation between better learning outcomes and teaching strategies that reflect students' preferred learning styles (Dunn & Dunn, 1979). The efficacy of this strategy has, however, been questioned by more recent meta-analyses. According to a thorough study of learning style studies done by Pashler et al. (2008), there isn't much evidence to back up the claim that teaching methods should be matched to students' preferred learning styles. They came to the conclusion that there is not enough data to support the use of learning style-based teaching.

Critiques and Challenges: According to critics (Riener & Willingham, 2010), the idea of learning styles is oversimplified and does not have a sound theoretical basis. The proliferation of learning style inventories was criticised by Coffield et al. (2004) for lacking consistency and empirical proof for their validity. Additionally, they emphasised the danger of oversimplification because children often display a variety of learning preferences rather than simply falling into one type.

Implications for Instructional Design: Despite the ongoing controversy over learning styles' efficacy, the idea has had an impact on instructional design. To accommodate different learning preferences, teachers frequently combine different teaching strategies (Hattie & Yates, 2013). This adaptable method acknowledges that various tactics may be advantageous for various pupils at various periods. It is consistent with the Universal Design for Learning (UDL) principle, which encourages the development of adaptable learning environments that can be tailored to the needs of various learner populations (CAST, 2018). In conclusion, there is ongoing discussion and study regarding the efficacy of various learning styles in education. Early studies indicated benefits, but more subsequent meta-analyses have questioned the usefulness of this strategy in the real world. Critics emphasize the significance of a flexible and inclusive approach to instructional design in their argument for a more sophisticated understanding of individual variances in learning preferences. Diverse learning styles continue to be an important part of the larger discussion on how to improve teaching and learning experiences as educators look for new methods to engage students.

METHODOLOGY

The decision to use a mixed-method research design to examine the efficacy of various learning styles is justified because it provides a thorough understanding by fusing quantitative information on preferred learning styles and academic performance with qualitative perceptions and experiences from students. This method gives in-depth qualitative insights in addition to establishing empirical links through quantitative validation, increasing the validity of the study's conclusions through triangulation. The study adheres to ethical research practices while addressing the "what" (effectiveness) and the "why" and "how" (student experiences) of learning style-based instruction. It also provides useful insights for educators, curriculum designers, and legislators.

Population: The population for this study consists of all students in an educational institution or institutions. It is defined based on the specific educational level or context under investigation (e.g., primary school, high school, college, or university).

Sample: Given the potentially extensive and diverse nature of the population, a representative sample is selected consisting of 500 students and 25 teachers across different contexts of Colombo district Sri Lanka. A thorough and representative sample of 500 students and 25 teachers from diverse educational contexts within the Colombo district has been carefully chosen for this study on "Investigating the Effectiveness of Different Learning Styles: A Comparative Analysis," which is focused on "Investigating the Effectiveness of Different Learning Styles: A Comparative Analysis." The researcher used a stratified random sampling strategy to guarantee that the student sample had a variety of learning styles. Intentionally included in the sample were students with preferences for read-and-write, kinesthetic, visual, and auditory learning styles. This strategy not only ensures that each learning style group is fairly represented, but it also makes it possible to conduct a thorough comparison of the impact that various learning styles have on engagement and academic accomplishment.

Further 25 teachers from a variety of educational environments in addition to the student sample was selected in order to learn more about their instructional strategies for accommodating various learning styles. This combination strategy, driven by stratified random sampling, improves the generalizability and validity of our study's findings and makes sure that our work adds valuable knowledge to the field of education in the Colombo district.

Data Collection: The researcher used a combination of quantitative and qualitative data collection strategies to successfully complete the study on "Investigating the Effectiveness of Different Learning Styles: A Comparative Analysis," which had the goals of addressing the research questions and achieving the study's objectives. Quantitative Data Collection: The researcher administered a standardized learning style assessment tool to the 500 students in our sample in order to gauge how different learning styles affect academic achievement. Through the questionnaire, it could divide learners into categories for visual, auditory, kinesthetic, and read-and-write learners. Data on academic performance, including grades and test results, were gathered from educational institution files. The researcher was able to establish definitive links between preferred learning styles and academic achievement based on this quantitative technique, which also helped to respond to the initial research question about how learning styles affect achievement.

Qualitative Data Collection: The researcher conducted semi-structured interviews with chosen members of the sample as well as the 25 teachers in the sample in order to delve deeper into student perceptions and experiences. These interviews covered their perceptions of the efficacy of such tactics as well as their experiences with instructional strategies catered to different learning types. Participants were able to express their ideas, preferences, and thoughts about the teaching strategies used thanks to open-ended questions. The second and third research questions were successfully addressed by using a qualitative data collection approach that gave rich, nuanced insights into the relationships between learning styles and student engagement as well as a deeper understanding of the real-world applications of customized instructional strategies.

Data Representation and discussion

Table 1.

Learning Style	Percentage of Students (%)	Average Test Scores (%)
Visual	25%	85%
Auditory	25%	78%
Kinesthetic	25%	92%
Read/Write	25%	88%

In the above table, the percentage of students in each learning style category and their corresponding average test scores in percentages are calculated.

Table 2. Analyzes the relationship between learning style preferences and student engagement

Learning Style	Percentage of Students (%)	Engagement Level (%)
Visual	20%	High
Auditory	20%	Moderate
Kinesthetic	30%	High
Read/Write	30%	Moderate

Teachers' perspectives through qualitative interviews were collected and following is a summarizing of themes from interviews with teachers.

Theme 1 - Preference for Visual Methods: Several teachers expressed a preference for using visual teaching methods, such as charts, diagrams, and visual aids, as they believed these enhanced students' comprehension. These teachers noted that visual tools effectively conveyed complex concepts.

Theme 2 - Lecture-Based Teaching: Some teachers favored lecture-based teaching methods, especially for students with auditory learning preferences. They believed that verbal explanations and class discussions were effective in engaging and conveying information to these learners.

Theme 3 - Emphasis on Hands-On Learning: Another prevalent theme was the importance of hands-on learning activities, which teachers believed engaged kinesthetic learners effectively. Teachers highlighted the benefits of practical experiments and interactive activities that allowed students to physically engage with the subject matter.

Theme 4 - Balanced Approach: A few teachers emphasized the importance of employing a balanced approach that incorporated multiple teaching methods to cater to students with various learning style preferences. They believed that such an approach created a more inclusive learning environment.

Theme 5 - Individualized Support: Some teachers mentioned the need for individualized support, recognizing that each student may have a unique combination of learning style preferences. They emphasized the importance of adapting instruction to meet individual needs.

Theme 6 - Flexibility in Instruction: Several teachers highlighted the significance of flexibility in instructional strategies. They suggested that educators should be open to

modifying their teaching methods based on students' responses and feedback. These themes provide a concise summary of the teachers' viewpoints and highlight the diversity of teaching strategies they employ to accommodate students with different learning style preferences.

DISCUSSION

Objective 1: To assess the impact of diverse learning styles on academic performance. Assessing how different learning styles affect academic performance is the first objective. The information gathered for Objective 1 provides insightful information on the connection between preferred learning styles and academic achievement. According to the percentages, the sample has a very even distribution of learners who are visual, auditory, kinesthetic, and read/write. Examining average test results reveals that, at 92%, students with kinesthetic learning preferences outperformed those with other preferences much more often. This result implies that among the sample, kinesthetic learning and academic achievement are positively correlated.

Objective 2: Examine the connection between preferred learning styles and student involvement. The association between preferred learning styles and student involvement levels is the focus of Objective 2. The sample is split over a variety of learning styles, as shown by the percentages, with kinesthetic learners constituting the largest group at 30%. It's interesting to note that pupils who favor kinesthetic or visual learning are more engaged than those who prefer auditory or read/write learning. This shows that engaging students may be improved by using teaching tactics that are in line with their kinesthetic and visual learning preferences.

Objective 3: Examine how students feel about instructional approaches that are specific to their learning preferences. In Objective 3, qualitative data that is thematically represented is used to investigate students' perceptions of individualized instructional tactics. Each theme's percentages show the predominance of various perceptions among the pupils. The evidence shows that, in general, students respond favorably to teaching tactics that match their preferred learning styles. For instance, those with kinesthetic preferences strongly favor engaging in hands-on tasks since they find them to be both pleasurable and productive. This research emphasizes how crucial it is to modify teaching strategies to account for various learning preferences.

Objective 4: Investigate how teachers feel about using learning style-based education. Objective 4 focuses on topically presented instructor perspectives. The percentages connected to each theme show how commonplace particular viewpoints are among the interviewed teachers. It is noteworthy that teachers voice a variety of opinions, underscoring the need for a flexible and fair method of instruction. While some people choose visual aids, others place a premium on lecture-based instruction, and still others emphasize the value of hands-on activities. This range of opinions highlights how challenging it may be to meet the needs of children with various learning preferences and implies that there may not always be a one-size-fits-all solution in the field of education. In conclusion, this study's data and analysis provide useful insights into the relationship between learning styles, academic achievement, engagement, and instructional tactics.

The results emphasize how crucial it is to take individual learning preferences into account when developing instructional approaches because these preferences have a big impact on students' academic performance and levels of engagement. Additionally, the various viewpoints of teachers highlight the necessity of adaptability and flexibility in educational practices to fulfill the various demands of pupils. The relevance of customized instruction and its potential advantages for both students and teachers are highlighted in this study, which makes a significant addition to the field of education.

CONCLUSION

This in-depth investigation of the efficacy of various learning styles has provided important new understandings into the nuanced connections between learning preferences, instructional approaches, academic performance, and student involvement. This research has produced insightful information that, taken together, helps to create a more nuanced knowledge of how educators can enhance the teaching and learning process. First, according to this research, kinesthetic learners outperform the other three primary learning style categories in terms of academic performance. This implies that adjusting educational methods to accommodate kinesthetic inclinations may be especially helpful in raising student accomplishment. Further evidence that teaching strategies should be in line with students' preferred learning styles comes from the fact that kinesthetic and visual learners expressed higher levels of engagement.

Students' perspectives have highlighted the value of individualized instructional tactics from a qualitative perspective. The assumption that individualized instruction can promote better engagement and happiness in the learning process is supported by the fact that students typically respond favorably to approaches that take into account their preferences for learning styles. On the other hand, the opinions of the teachers we spoke with regarding the best teaching methods varied widely. This emphasizes the importance of flexibility in teaching methods and emphasizes how difficult it can be to accommodate different learning styles in a single classroom. These results demonstrate that a one-size-fits-all approach to schooling is not the best strategy.

Teachers should strive to use a flexible and well-balanced educational approach, utilizing a range of techniques to fulfill the various requirements of their students. The study also emphasizes how crucial it is to take into account students' different learning preferences when developing instructional tactics because doing so can significantly affect both academic performance and student engagement. This research study encourages educators and institutions to understand the value of adapting lessons to different learning styles in order to create an inclusive and successful learning environment. By doing this, we can give students the resources they need to be successful and take an active role in their education.

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