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RESEARCH ARTICLE

Unravelling the Relationship Between Personality Traits and Learning Styles: Implications for Personalized Educational Strategies

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ABSTRACT

This study investigates the correlation between personality traits and learning styles among university students, with the aim of identifying patterns that can enhance personalized educational strategies. Drawing on the Myers-Briggs Type Indicator (MBTI) framework and VARK (Visual, Auditory, Reading/Writing, Kinesthetic) learning styles, the study analyzes data from 77 students to understand how their personalities align with specific learning preferences. Findings reveal a predominance of visual learners and highlight recurring personality types such as INFJ (Advocate) and ENTJ (Commander). The analysis emphasizes the need for diversified teaching approaches to foster engagement and learning outcomes across different learner profiles. This research not only fills the existing gap in educational psychology but also offers actionable recommendations for educators, providing a foundation for future studies on personalized learning environments.

INTRODUCTION

In modern education, personalized learning has emerged as a key objective for enhancing student engagement and academic performance. However, designing educational approaches that effectively cater to individual needs remains a challenge. Two important frameworks often used to understand individual differences are the Myers-Briggs Type Indicator (MBTI) for personality traits and the VARK model for learning styles. While these models are well-established, little research explores the intersection between them. Addressing this gap is critical to refining personalized teaching strategies and ensuring that diverse learning needs are met.

This study aims to explore the relationship between personality types and learning preferences among university students. Specifically, it investigates whether certain personality types, such as introverted (e.g., INFJ) or extroverted (e.g., ENFJ), correlate with particular learning styles. Understanding these correlations can offer educators actionable insights to adapt teaching methods, thereby improving student outcomes.

Problem Statement

The rapid evolution of education demands a shift from one-size-fits-all teaching approaches toward personalized learning strategies. While educators increasingly recognize that personality traits and

learning styles significantly affect student engagement and academic performance, these factors are often examined in isolation. This fragmented approach results in teaching practices that fail to accommodate the diverse needs of learners. Personality traits, as conceptualized by the MBTI framework, shape how students engage with content, make decisions, and interact with peers, while learning styles, defined through the VARK model, describe students' preferred methods for processing information. Without a deeper understanding of how these two factors interrelate, educational practices may unintentionally favor certain groups of students while leaving others disengaged.

Existing literature offers substantial insights into the role of personality traits in academic settings, showing, for example, that introverts prefer reflective activities, while extroverts thrive in collaborative environments. However, there is limited exploration of how these personality traits align with specific learning preferences. Similarly, while the VARK model offers practical guidance on teaching methods—such as using visual aids for visual learners or group discussions for auditory learners—it overlooks the dynamic influence that personality traits might have on learning preferences. This lack of integration leaves a critical gap in the application of these frameworks, as educators struggle to implement holistic strategies that address both personality and learning preferences simultaneously.

Furthermore, education systems often face challenges such as large class sizes, time constraints, and limited resources, which prevent instructors from tailoring instruction to meet individual needs. This is particularly problematic in university settings, where students come from diverse academic, cultural, and psychological backgrounds. Traditional teaching methods often do not accommodate these differences, resulting in inequities in student engagement and academic success. For instance, a teaching strategy designed to engage visual learners may fail to resonate with kinesthetic or auditory learners, especially if their personality traits also require specific learning environments.

Another key challenge arises from the rigid categorization of students into personality types and learning styles. While frameworks like MBTI and VARK offer useful starting points, they do not account for the fluid nature of human behavior and learning. Students may exhibit multiple learning preferences or change their preferences over time, depending on the subject matter or context. Likewise, personality traits are not absolute; they may shift in response to experiences or changing academic demands. Thus, an over-reliance on static models can result in ineffective teaching practices that do not align with the evolving needs of students.

The absence of integrated frameworks combining personality traits and learning styles leaves a gap in our understanding of how students learn best. Instructors are often left to make ad hoc decisions when designing learning activities, relying on partial information about their students. This lack of systematic guidance creates inconsistencies in teaching quality, making it difficult to ensure equitable learning outcomes. Consequently, students who do not fit neatly into established categories may become disengaged, leading to lower academic performance and increased dropout rates.

In addressing these challenges, it is essential to investigate the intersection between personality traits and learning styles. Understanding how these factors interact can provide actionable insights for educators, helping them design adaptive and inclusive teaching strategies that foster engagement for all students. The findings from this research will contribute to closing the gap between theory and practice, offering practical solutions for improving personalized education in university settings.

Research Objectives

To address the identified problem, this research seeks to explore the interrelationship between personality traits and learning styles within a university context. By systematically analyzing patterns between students' personality profiles and their learning preferences, this study aims to

provide practical recommendations for designing personalized teaching strategies. The following objectives will guide the research:

Objective 1: Identify the Most Prevalent Personality Types Among the Student Sample

Understanding which personality types are most common within the sample will help educators anticipate students' behavioral tendencies. This insight is essential for designing activities that align with the preferences of a majority of students while also accommodating less common personality types. For example, if a significant portion of students are introverted, it may be beneficial to include more independent learning activities in the curriculum.

Objective 2: Classify the Dominant Learning Styles Across Personality Types

This objective aims to map learning styles (visual, auditory, kinesthetic) to specific personality types, providing a deeper understanding of how personality influences learning preferences. For example, it may reveal that visual learners are more likely to belong to certain personality categories, such as INTJs, suggesting that visual materials might resonate better with them. This classification will inform the design of teaching strategies that integrate multiple learning modes.

Objective 3: Examine Patterns and Correlations Between Personality Traits and Learning Styles

Identifying correlations between MBTI personality types and VARK learning styles will provide insights into how these frameworks can be integrated. For example, the study may find that kinesthetic learning styles align with extroverted personality types, indicating the need for more hands-on, interactive classroom activities. By uncovering these patterns, the research aims to offer data-driven guidance for educators on how to design balanced and engaging teaching practices.

Objective 4: Develop Practical Recommendations for Personalized Teaching Strategies

Based on the identified patterns, the research will propose actionable strategies for implementing personalized learning in university settings. These recommendations will include suggestions for curriculum design, classroom activities, and assessment methods that align with both personality traits and learning preferences. For instance, courses with a large proportion of visual learners might emphasize visual aids and diagrams, while subjects with a significant number of auditory learners could incorporate more lectures and discussions. The goal is to ensure that all students remain engaged and have access to learning experiences that suit their individual preferences and personalities.

Objective 5: Address Implementation Challenges and Provide Scalable Solutions

Given the practical constraints faced by educators, this study will explore challenges in implementing personalized education and provide scalable solutions. The recommendations will consider factors such as class size, time constraints, and resource limitations, ensuring that they are feasible in real-world academic settings. This objective is crucial for ensuring that the proposed teaching strategies are not only effective but also sustainable and practical for educators to implement across diverse classrooms.

Significance of the Research

This research is significant because it bridges the gap between two widely used educational frameworks—MBTI personality types and VARK learning styles—offering a more holistic understanding of how students learn. The findings will contribute to the growing body of literature on personalized education by providing empirical evidence on the relationship between personality traits and learning preferences. This evidence can serve as the foundation for curriculum reforms and teacher training programs, equipping educators with the tools they need to create more inclusive and engaging learning environments.

Moreover, this research aligns with the broader goals of higher education institutions to promote equity, diversity, and inclusion. By understanding how personality and learning preferences intersect, educators can design teaching strategies that accommodate students from diverse academic, cultural, and psychological backgrounds, ensuring that all students have equal opportunities to succeed. This research also has implications beyond the classroom, as it offers insights into how students' personality traits and learning styles shape their career choices and professional development.

In summary, the problem statement and research objectives outlined here emphasize the need to integrate personality assessments and learning style frameworks into educational practice. By doing so, this research aims to contribute practical insights that will enhance personalized education and promote student engagement and success in university settings.

LITERATURE REVIEW AND RESEARCH GAP

Personality Traits and Academic Performance

The Myers-Briggs Type Indicator (MBTI) is widely used in educational psychology to assess personality traits by categorizing individuals along four dichotomies: Extroversion vs. Introversion, Sensing vs. Intuition, Thinking vs. Feeling, and Judging vs. Perceiving (Vedel, 2014). These personality traits significantly impact students' academic engagement and success. Research suggests that introverts tend to perform better in independent, reflective tasks, as they are more comfortable working alone and processing information deeply. In contrast, extroverts excel in group activities, benefiting from interactive discussions and collaborative environments (De Feyter et al., 2012). This distinction underscores the importance of aligning teaching strategies with students' personality profiles to optimize engagement.

A study by Ayoubi and Ustwani (2014) found a significant correlation between students' MBTI personality types and academic outcomes, with students favoring certain academic disciplines based on their personality traits. For example, sensing types preferred concrete subjects, while intuitive types gravitated towards abstract disciplines. Additionally, students with strong preferences for judging over perceiving were more likely to meet deadlines and perform well in structured academic environments, further demonstrating how personality influences learning behavior.

Despite these findings, most research in this field focuses primarily on the influence of personality traits on academic performance metrics such as GPA or project outcomes. Studies often overlook how these personality traits interact with students' learning preferences, leaving a gap in the practical application of these insights in personalized teaching strategies (Vedel, 2014; Richardson et al., 2012).

Learning Styles and Pedagogical Approaches

The VARK model categorizes learning styles into four distinct types: visual, auditory, reading/writing, and kinesthetic. Each category reflects how students best absorb and process information, with studies demonstrating that aligning teaching strategies with students' learning preferences enhances their academic performance (Pashler et al., 2008). Visual learners, for instance, benefit from diagrams and videos, while auditory learners thrive in discussion-based learning environments. Meanwhile, kinesthetic learners excel when engaged in hands-on activities, such as experiments and simulations (Pashler et al., 2008).

However, research also points to potential limitations of rigidly categorizing students by their dominant learning style. Students often exhibit multimodal learning preferences, shifting between learning styles based on context and subject matter. This challenges educators to create flexible teaching strategies that integrate multiple learning modes, rather than relying on a single approach (De Feyter et al., 2012). Additionally, critics argue that labeling students by their learning styles can

lead to over-simplified teaching practices, neglecting the dynamic nature of learning and individual variability (Pashler et al., 2008).

Despite these criticisms, the VARK model remains widely used in educational research due to its practicality and focus on individual learner needs. However, the model is rarely studied in conjunction with personality frameworks like MBTI, creating a significant research gap.

Research Gap

While personality traits and learning styles are well-documented areas of educational psychology, there is limited empirical research examining how these two frameworks interact (Vedel, 2014). Most studies focus on either the impact of personality traits on academic performance or the effectiveness of learning styles in improving comprehension, leaving the intersection between these dimensions underexplored.

The lack of integration between personality and learning style frameworks presents challenges for educators, who often rely on partial information when designing their teaching strategies. This gap becomes particularly evident in higher education settings, where students come from diverse academic backgrounds and exhibit varying personality traits and learning preferences. Without a holistic understanding of these factors, educators may unintentionally design curricula that cater to a limited group of students, excluding others who do not fit traditional teaching models (Ayoubi & Ustwani, 2014).

This study aims to fill the research gap by exploring the correlations between MBTI personality types and VARK learning styles among university students. By identifying patterns between these two frameworks, the research will offer actionable insights for personalized teaching strategies that accommodate diverse learner profiles. The goal is to provide educators with a comprehensive framework that integrates personality and learning styles, enabling them to create more inclusive and effective learning environments.

MATERIALS AND METHODS

Research Design

This study employs a quantitative research design, focusing on numerical data to establish correlations between personality traits and learning styles. The survey-based approach was chosen due to its efficiency in collecting standardized responses across a relatively large sample. A correlational study model was applied to analyze the strength of relationships between variables: personality types based on the Myers-Briggs Type Indicator (MBTI) and learning styles classified under the VARK model (Visual, Auditory, Reading/Writing, and Kinesthetic). The rationale behind using this design is that it allows for the examination of patterns that can inform future educational strategies, particularly in the realm of personalized learning.

This research adopts a cross-sectional approach, where data were collected at a single point in time. The advantage of this approach is that it captures the participants' current preferences without requiring longitudinal observation, which can be time-consuming and resource-intensive. However, it must be noted that cross-sectional studies may not capture changes in personality traits or learning styles over time, which is a limitation of the research design.

Participants

The participants in this study were 77 university students from various academic programs. The diversity in academic backgrounds ensures that the data reflects a range of student experiences, helping to avoid skewed results toward a particular field of study. The participants were selected using convenience sampling, a non-probabilistic technique where individuals who were readily

accessible were included in the study. While convenience sampling limits the generalizability of the findings, it is often used in educational research to collect data efficiently within a defined timeframe.

Participants voluntarily completed both the MBTI questionnaire and the VARK learning styles assessment, and anonymity was maintained throughout the study. To ensure the integrity of the data, incomplete or inconsistent responses were excluded from the final analysis.

Instruments

MBTI Personality Assessment

The MBTI is a widely recognized personality framework that categorizes individuals into one of 16 personality types based on four dichotomies:

Extroversion (E) vs. Introversion (I)

Sensing (S) vs. Intuition (N)

Thinking (T) vs. Feeling (F)

Judging (J) vs. Perceiving (P)

The resulting personality types, such as INFJ (Advocate), ENTJ (Commander), and ENFJ (Protagonist), offer insights into individuals' behavioral tendencies, decision-making preferences, and interaction styles. For this study, a standardized MBTI questionnaire was used, with participants selecting responses that best reflected their behavior, preferences, and attitudes.

VARK Learning Styles Assessment

The VARK model assesses learning preferences by classifying students into four primary learning styles:

Visual Learners: Prefer visual aids, charts, and diagrams.

Auditory Learners: Learn better through listening and discussions.

Reading/Writing Learners: Process information best through reading and writing tasks.

Kinesthetic Learners: Benefit from hands-on activities and real-world experiences.

Participants completed a 30-item VARK questionnaire designed to identify their preferred mode of learning. Each question offered scenarios and asked participants to select how they would most likely engage with the information presented, allowing the identification of their dominant learning style.

Data Collection Procedure

The data collection process was conducted over a two-week period. Participants were recruited through university channels, including course groups, academic societies, and learning management systems. Both the MBTI and VARK assessments were administered online via Google Forms to ensure accessibility. Prior to completing the questionnaires, participants were briefed on the purpose of the study and assured that their responses would remain confidential and anonymous.

To encourage participation, the survey was designed to be user-friendly, with a completion time of 15-20 minutes. Automated reminders were sent to participants to increase response rates. The online format also facilitated data management, enabling seamless integration with analytical tools for further processing.

Data Analysis Methodology

The study involved descriptive statistics and correlational analysis to explore the relationships between personality types and learning styles. The following data analysis steps were employed:

Data Cleaning and Preparation

After collecting the raw data, it was subjected to a cleaning process to remove incomplete, duplicate, or inconsistent responses. The cleaned dataset was then imported into Microsoft Excel for initial exploration, and subsequently into IBM SPSS for advanced statistical analysis. Each participant was assigned a unique code to maintain anonymity throughout the analysis process.

Descriptive Statistics

Descriptive statistics were used to analyze the frequency distribution of both personality types and learning styles. Frequency tables were generated to display the prevalence of each MBTI type and VARK category. For example, counts of how many students identified as INFJ or ENFP, as well as how many preferred visual learning, were tabulated and expressed as percentages.

Cross-Tabulation and Correlation Analysis

To explore the relationship between personality traits and learning styles, cross-tabulation was performed. This technique allowed for the identification of patterns, such as which MBTI types were most likely to prefer visual learning. The strength of these relationships was further examined using Pearson's Chi-Square Test for independence, determining whether the association between personality type and learning style was statistically significant.

A correlation matrix was generated to assess the strength and direction of the relationships between personality traits and learning styles. The Pearson correlation coefficient (rrr) was used to determine the degree of association, with values closer to 1 or -1 indicating stronger relationships, and values near 0 suggesting weak or no correlation.

Ethical Considerations

This research adhered to ethical guidelines for educational research. Participants were informed about the purpose of the study and provided informed consent before participating. They were also assured that their data would be handled confidentially, with results reported in aggregate form to prevent identification of individual respondents. No sensitive or personally identifiable information was collected beyond the matrix numbers provided for internal use. Ethical approval was obtained from the relevant university committees to ensure compliance with institutional research policies.

Reliability and Validity of Instruments

Both the MBTI and VARK assessments have been widely used in educational and psychological research, offering reliable and valid measures of personality traits and learning preferences. However, it is essential to acknowledge the potential limitations of these instruments. Critics argue that the MBTI oversimplifies complex personality traits and that learning styles are not static but may change over time or across contexts. To mitigate these limitations, the study incorporated multiple-choice questions with scenario-based responses, ensuring that the assessments captured nuanced aspects of both personality and learning preferences.

Limitations of Methodology

Despite the robust methodology, this study has several limitations. First, the use of convenience sampling may introduce selection bias, limiting the generalizability of the findings to other populations. Additionally, the cross-sectional design captures a snapshot of students' personality traits and learning styles at a single point in time, making it difficult to assess how these traits might evolve. Furthermore, self-report questionnaires may be subject to response biases, such as social desirability bias, where participants may provide answers they believe are more socially acceptable.

This detailed methodology lays the foundation for understanding the correlation between personality traits and learning styles. By employing descriptive statistics, cross-tabulation, and

correlational analysis, the research aims to provide actionable insights that educators can use to develop personalized learning strategies. The ethical considerations and limitations outlined ensure transparency in the research process, highlighting areas for future exploration.

RESULTS

This section presents a detailed examination of how personality traits, as classified through the MBTI framework, align with learning styles categorized by the VARK model. The research findings highlight significant patterns and correlations between personality profiles and learning preferences, providing insights to inform personalized teaching strategies in higher education.

Personality Types Distribution

The MBTI assessment results revealed a distribution leaning towards introverted personality types. Out of the 77 students, the most prevalent categories were:

INFJ (Advocate): 15 students (19.5%)

ENTJ (Commander): 12 students (15.6%)

ENFJ (Protagonist): 10 students (13%)

INFP (Mediator): 6 students (7.8%)

ISFJ (Defender): 8 students (10.4%)

Other types (e.g., INTJ, ENFP, ESFP): 26 students (33.7%)

The higher presence of INFJ and INFP types reflects a population that prefers introspection, in-depth analysis, and structured independent tasks. According to research, introverted learners, such as INFJs, typically perform well in settings where they can work alone, focus deeply on content, and engage in reflective assignments (Vedel, 2014). This suggests that curricula designed to accommodate this personality type would benefit from offering independent research projects, reading-intensive modules, and essay-based assessments.

On the other hand, extroverted types like ENTJ and ENFJ tend to thrive in collaborative environments where interaction, debate, and leadership opportunities are present. ENTJs are associated with strategic thinking and leadership, often excelling in structured group projects and activities where they can take charge (Ayoubi & Ustwani, 2014). This insight underscores the need for balancing independent and collaborative learning environments to engage both introverted and extroverted students effectively.

Learning Styles Distribution

Using the VARK model, students' learning preferences were categorized as follows:

Visual Learners: 50 students (65%)

Auditory Learners: 15 students (20%)

Kinesthetic Learners: 12 students (15%)

The prevalence of visual learners aligns with existing literature, which shows that most students process information best through visual stimuli such as diagrams, videos, and mind maps (Fleming, 2001). This preference highlights the importance of integrating visual aids into lectures, such as slides, charts, and infographics, to maximize student engagement.

Auditory learners benefit from environments that emphasize lectures, discussions, and verbal feedback (Pashler et al., 2008). This learning style suggests that instructors should not only rely on visual materials but also integrate opportunities for students to engage in interactive discussions,

debates, or podcasts. For example, a multimodal teaching approach—where students first watch a video and then participate in a discussion—can cater to both visual and auditory learners.

Similarly, kinesthetic learners thrive when involved in hands-on activities, such as laboratory experiments, role-play exercises, or real-world simulations. Given their preference for experiential learning, these students are more likely to excel in courses that offer practical components, such as fieldwork or internships (Jesús Maya et al., 2021).

Correlations Between Personality Traits and Learning Styles

The study reveals distinct correlations between personality traits and learning preferences:

INFJ (Advocate) and INTJ (Architect) students predominantly aligned with visual learning styles. These students engage best with structured and organized content presented visually, such as flowcharts and conceptual maps. This finding supports previous studies that show how introverted personalities prefer structured and self-directed tasks, where they can immerse themselves independently (De Feyter et al., 2012).

ENTJ (Commander) and ENFJ (Protagonist) types exhibited a dual preference for auditory and visual learning. These extroverted students excel in group discussions, but they also benefit from visual materials that support their strategic thinking processes. The versatility of these students suggests that they adapt well to multimodal teaching environments.

ENFP (Campaigner) and ESFP (Entertainer) personalities leaned toward kinesthetic learning, preferring experiential activities such as role-playing and practical tasks. Their preference for hands-on activities aligns with research showing that students with high energy and adaptability tend to benefit from interactive and physically engaging experiences (Jesús Maya et al., 2021).

These correlations illustrate that learning preferences are not isolated but interact with personality traits, reinforcing the need for differentiated teaching strategies that accommodate various learner profiles.

Implications for Teaching Strategies

The findings suggest that personalized teaching strategies should incorporate multiple modalities to ensure engagement across different learning styles and personality types. Visual learners can be engaged through infographics, videos, and mind maps, while auditory learners benefit from interactive lectures and group discussions. For kinesthetic learners, it is essential to integrate practical components into the curriculum, such as simulations, fieldwork, and lab exercises.

Additionally, the strong presence of introverted learners in the sample indicates that educators should offer independent tasks alongside group activities. For example, a project might include both an individual research paper and a group presentation, allowing students to engage with the material in ways that suit their personality profiles. Extroverted students, who thrive in collaborative settings, can be assigned roles such as team leaders or moderators, encouraging them to take on responsibilities that align with their strengths (Ayoubi & Ustwani, 2014).

These insights underscore the importance of flexibility in teaching practices, ensuring that no student is disadvantaged due to a mismatch between their learning style and the instructional methods used. Courses should be designed with built-in flexibility, allowing students to access content through multiple formats and engage with material in ways that align with both their personality traits and learning preferences (Fleming, 2001).

DISCUSSION

This section offers an in-depth critique and interpretation of the correlations identified between MBTI personality traits and VARK learning styles, emphasizing their implications for personalized

education strategies in higher education. The findings underscore the need for a nuanced understanding of the interplay between personality and learning preferences to enhance student engagement and academic success.

Evaluating the Influence of Personality Traits on Learning Outcomes

Research shows that personality traits, particularly those categorized under MBTI, significantly shape students' learning behaviors and preferences. Introverted learners, such as those with INFJ and INTJ profiles, display a preference for structured and solitary tasks, which aligns with their reflective tendencies. These students benefit from environments that offer asynchronous learning, such as pre-recorded lectures and reading materials, which allow them to study independently and at their own pace (Jesús Maya et al., 2021). This pattern suggests that online learning platforms designed for these learners should provide self-directed content modules with minimal need for real-time interaction.

Extroverted learners, such as ENTJ and ENFJ types, exhibit a strong inclination towards group-based learning. These students excel when engaged in collaborative activities and prefer environments where they can interact with peers and receive immediate feedback. Platforms that offer live video conferencing or structured breakout sessions facilitate their learning, reflecting the importance of dynamic, interactive environments (PLOS ONE, 2021). This insight suggests that blended learning environments—combining in-person sessions with online interaction—may optimize learning for extroverted students.

The Role of Learning Styles in Educational Effectiveness

The findings highlight the relevance of the VARK model in understanding how students process information differently. Visual learners, who constituted the majority of participants in this study, excel when provided with visual representations of content, such as diagrams and videos (Fleming, 2001). This preference suggests that instructors should integrate multimedia tools into lectures to cater to these learners.

In contrast, auditory learners thrive in settings that emphasize verbal communication, such as discussions and podcasts. Studies show that these learners benefit from opportunities to engage in dialogue-based learning, reinforcing the need for instructors to incorporate discussion forums and Q&A sessions into course structures (Jesús Maya et al., 2021). Kinesthetic learners, though fewer in number, require hands-on activities to remain engaged. These students perform best in practical learning environments, such as laboratory settings or workshops, which allow them to physically interact with content.

The Complex Interplay of Personality and Learning Styles

The correlations between personality types and learning styles are more complex than previously assumed. For example, while introverted students gravitate toward visual learning, the study also reveals that many introverts enjoy written content, suggesting that they benefit from reading/writing-based tasks. This underscores the importance of providing flexible learning opportunities that allow students to switch between different modes based on their preferences and the subject matter (ResearchGate, 2021).

Moreover, multimodal learners, particularly those with ENFP and ESFP profiles, demonstrate a high degree of adaptability, thriving in diverse learning environments that incorporate visual, auditory, and kinesthetic elements. These findings suggest that a one-size-fits-all approach is ineffective. Instead, educators should adopt a differentiated instruction model, ensuring that multiple learning styles are represented in course materials (Pashler et al., 2008).

Challenges and Limitations in Implementing Personalized Learning

Although personalized learning offers significant benefits, it presents practical challenges. Instructors face constraints such as limited time and resources, which complicate efforts to design multimodal lessons. Furthermore, the diversity of personality traits and learning preferences within a single classroom makes it difficult to cater to every student's needs (Jesús Maya et al., 2021). In addition, over-reliance on personality assessments and learning style inventories can lead to stereotyping students, potentially limiting their opportunities for growth and adaptation (PLOS ONE, 2021).

Another challenge lies in the digital divide. While many introverted learners benefit from online learning platforms, students from disadvantaged backgrounds may struggle with access to technology, hindering their ability to engage with digital content effectively (Fleming, 2001). This issue underscores the importance of inclusive education policies that address technological disparities and ensure equal access to learning resources.

Recommendations for Future Research and Practice

To address these challenges, future research should explore adaptive learning technologies that personalize content delivery in real-time based on students' interactions and performance. Such systems could provide customized feedback and suggest tailored learning paths, ensuring that students receive support aligned with their personality traits and learning preferences (ResearchGate, 2021).

In practice, educators should adopt a blended learning approach that combines in-person and online elements to accommodate various learner types. For instance, a course could feature pre-recorded video lectures for visual learners, live discussions for auditory learners, and hands-on projects for kinesthetic learners. Additionally, professional development programs for instructors should focus on effective use of personality and learning style frameworks to enhance teaching strategies without reinforcing stereotypes (Jesús Maya et al., 2021).

CONCLUSION

This study underscores the need for a nuanced approach to personalized education that considers both personality traits and learning styles. While visual learning dominates, other preferences must not be overlooked to ensure inclusive education. Educators are encouraged to adopt a hybrid teaching approach, integrating visual aids, discussions, and hands-on activities to accommodate diverse learner profiles.

The findings highlight the value of understanding personality-learning style correlations for designing effective educational strategies. Future research could explore how these correlations impact long-term academic performance and student satisfaction. Expanding the sample size and including participants from diverse cultural backgrounds could provide more comprehensive insights.

This study contributes to the growing discourse on personalized education, offering practical recommendations for creating learner-centered environments. As education evolves, the integration of personality and learning style frameworks will become increasingly essential in fostering engagement and academic success.

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