The Relationship Between Learning Styles and Academic Performance Among University Students: A Study of American Degree Transfer Program Students in STEM and Non-STEM Majors Using Vermunt's Inventory Learning Styles (ILS)

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Abstract

Globalization and increased mobility in higher education has further diversified the demographic of its students with the emergence of students of different nationalities, cultural backgrounds, their learning expectations and ways of adopting and processing information. The students respond to different preferences and ways of learning that influence their academic performance and preparedness for progression and employment. Further to that, academic disciplines of STEM (Science, Technology, Engineering and Mathematics) and non-STEM (Business and Liberal Arts) require different cognitive skills and academic demands which shape students' motivation, engagement in studies and plan for life beyond graduation. Conventional one-size-fits-all pedagogy is ineffective to address the diverse students' learning styles. Responsive and style-sensitive instruction can enhance learning experiences so as to promote academic performance and hence foster lifelong learning. Consequently, there is a powerful force driving higher education systems to employ a variety of teaching strategies to support diverse cohorts to foster deep learning and strong academic performance. However, most empirical studies concentrated on single disciplines, and there is a notable lack of research that simultaneously explores the diversity of learning styles across multiple academic disciplines – particularly STEM and non-STEM fields. Therefore, it is timely and important for this study to identify learning styles in specific academic streams and examine how these learning styles correlate with academic performance across academic disciplines. This study employs the widely recognized Vermunt's Inventory Learning Styles (ILS) model as a guiding framework to examine the learning styles – process strategies, regulation strategies, learning orientations and mental model of learning among STEM and non-STEM major students from the American Degree Transfer Program (ADTP) at Taylor's University. By identifying and addressing learning styles, educators can design more inclusive teaching strategies in shaping a student educational journey and foster long-term broader development in a diverse and interdisciplinary university settings. Statistical results comparing STEM and non-STEM students reveal no significant differences in the four core learning dimensions: process strategies, regulation strategies, learning orientations and mental model of learning. This suggests that overall learning style preferences are not discipline-specific in this sample. However, STEM students scored significantly higher in the three key directed learning sub-components: deep processing, self-regulation and constructivist view. Statistical results showed a significant difference in the high adaptiveness sub-category: meaning-directed learning style with a combination of deep processing, self-regulation, intrinsic motivation and a constructivist view. STEM students scored higher than non-STEM students signifying that STEM students have a greater tendency toward meaningful and autonomous learning strategies. Correlation analysis showed no significant positive relationship between CGPA and learning styles among STEM and non-STEM students, implying that students' academic performance is influenced by a multitude of factors beyond learning style preferences. Overall, the data supports the research outcome that learning environments can influence style development, and that promoting meaning-directed strategies across all disciplines could enhance academic engagement and performance.

Keywords

Inventory Learning Styles, directedness of learning patterns, learning adaptiveness, meaning-directed learning styles, academic performance, academic disciplines.