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Student Behavioral Engagement in the Age of Artificial Intelligence: Implications for the Future of Higher Education Instruction

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Abstract

This study focuses on quantifying student behavioral engagement and investigating its key influencing factors against the background of rapid advancement in artificial intelligence. A quantitative approach was adopted using a validated engagement scale with a 10-point Likert format. A total of 4,700 questionnaires were distributed, yielding 3,992 valid responses. Data analysis was conducted using SPSS 17.0. The measurement scale showed satisfactory reliability with a high Cronbach's Alpha coefficient, acceptable validity supported by Pearson correlation analysis, and adequate suitability for factor analysis confirmed by KMO and Bartlett's test of Sphericity.Factor analysis identified seven core dimensions of behavioral engagement: practical attention, effort level, guidance, media, learning, attendance, and classroom interaction. Descriptive statistics indicated positive overall student evaluations across all dimensions, with significant positive correlations among them. Classroom interaction obtained the highest mean score, while effort level scored the lowest. Regression analysis demonstrated that each dimension positively predicted behavioral engagement; learning and attendance had identical predictive weights, whereas classroom interaction showed the smallest predictive coefficient.In the context of the AI-driven transformation of higher education, these findings provide empirical insights for optimizing instructional design, improving digital and intelligent teaching practices, and enhancing student engagement. The results carry important implications for innovating teaching models, promoting interactive and personalized learning environments, and advancing the future development of higher education instruction. Limitations of the study and directions for future research are also discussed.

Keywords: Student Behavioral Engagement; Artificial Intelligence; Higher Education; Instructional Innovation; Factor Analysis