

Prediction of Students' Academic Satisfaction Using Deep Learning Algorithms Based on Self-Efficacy, Professor–Student Interaction, Mental Health, and Achievement Motivation

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1. Round 1

1.1. Reviewer 1

Reviewer:

The paragraph beginning “Among the psychological predictors of academic satisfaction, academic self-efficacy has consistently been identified...” contains substantial conceptual overlap with subsequent paragraphs reviewing self-efficacy literature. Several citations are repeated conceptually without sufficient synthesis. The review would benefit from more critical integration of findings rather than sequential summarization of studies. Specifically, the authors should clarify whether previous findings have shown direct, indirect, mediating, or moderating effects of self-efficacy on academic satisfaction.

In the section discussing teacher–student interaction, the manuscript alternates between the terms “teacher–student interaction” and “professor–student interaction.” Since the sample includes university students, the terminology should remain consistent throughout the manuscript. Moreover, the authors should justify whether the construct specifically assesses instructional support, emotional support, mentorship quality, or social connectedness, because these dimensions may have different predictive implications for academic satisfaction.

In the “Data Analysis” section, the authors state that “mean imputation within the relevant scale was applied when the number of missing items was within an acceptable range.” However, the manuscript does not define the acceptable threshold for missingness. Mean imputation can also distort variance and covariance structures, particularly in predictive modeling

contexts. The authors should justify this choice and discuss whether multiple imputation or expectation-maximization methods were considered.

Authors uploaded the revised manuscript.

1.2. Reviewer 2

Reviewer:

The statement “Mental health has also emerged as a fundamental variable associated with students’ academic experiences” introduces depression, anxiety, and stress as independent predictors; however, the manuscript does not explain why broader mental health constructs such as psychological well-being, resilience, or emotional regulation were excluded despite being discussed in the literature review. The selection criteria for psychological predictors should be clarified to improve construct validity and conceptual coherence.

In the paragraph beginning “Another important issue in contemporary educational research concerns the increasing complexity of interactions...,” the authors argue that traditional statistical methods are insufficient for modeling nonlinear relationships. However, the manuscript does not provide empirical justification for why deep learning was preferable to other machine learning methods such as Random Forest, XGBoost, Support Vector Regression, or Elastic Net regression. Including comparative rationale for algorithm selection would strengthen methodological justification.

The final paragraph of the Introduction identifies research gaps effectively, but the manuscript lacks explicit hypotheses or research questions. Even in predictive modeling studies, readers would benefit from clearly stated directional expectations such as “academic self-efficacy and professor–student interaction will positively predict academic satisfaction.” The absence of formal hypotheses reduces conceptual precision and makes interpretation of results less analytically rigorous.

In the “Study Design and Participants” section, the sentence “The statistical population included undergraduate and graduate students enrolled in public and private universities in Tehran...” lacks important demographic detail. The manuscript should specify how many universities participated, which institutions were selected, how clusters were formed, and whether disciplinary representation (e.g., humanities, engineering, medicine) was balanced. Without this information, the representativeness of the sample cannot be adequately evaluated.

The paragraph describing inclusion and exclusion criteria states that “patterned or careless answering” was removed, yet the manuscript does not explain how careless responding was identified. The authors should specify whether long-string analysis, Mahalanobis distance, response time analysis, or attention-check items were used. This is especially important because predictive machine learning models are highly sensitive to data quality.

In the “Measures” section, the description of the College Student Satisfaction Questionnaire states that the instrument contains 70 items and six dimensions, but the manuscript does not report reliability coefficients for each subscale in the present sample. Since the study employs multidimensional predictors and outcomes, reporting only total-scale Cronbach’s alpha may conceal dimensional inconsistencies. Subscale-level psychometric properties should be reported.

The description of the Student–Professor Interaction Scale notes that it includes a “validity scale,” yet the manuscript does not explain how this subscale was used analytically. If the validity scale was intended to detect inconsistent responding, the authors should report whether any participants were excluded based on it. If not used, its inclusion in the description may confuse readers regarding the operationalization of the construct.

Authors uploaded the revised manuscript.

2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.