



# The Impact of Artificial Intelligence Use on Students' Innovative Behavior and Well-Being: The Mediating Role of Digital Literacy and the Moderating Role of Happiness

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### E d i t o r

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### R e v i e w e r s

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## 1. Round 1

### 1.1. Reviewer 1

Reviewer:

In the Introduction section, the authors repeatedly state that artificial intelligence can improve innovation and well-being, yet the construct “artificial intelligence use” itself remains conceptually vague. For example, the paragraph beginning with “Educational institutions increasingly employ artificial intelligence-based systems...” does not specify whether AI use refers to frequency of use, competency, trust, dependency, educational integration, or perceived usefulness. The manuscript requires a more precise operational definition distinguishing AI use from AI literacy and digital literacy.

The paragraph stating “Innovative behavior encompasses cognitive flexibility, creativity, idea generation, and the capacity to transform knowledge into practical solutions” conflates creativity and innovative behavior without sufficient conceptual differentiation. Since innovative behavior is typically considered a broader implementation-oriented construct beyond creativity alone, the authors should provide a clearer distinction between creativity, innovation, and innovative behavior to avoid conceptual redundancy throughout the manuscript.

The literature review relies heavily on supportive studies demonstrating positive effects of AI technologies, while counterarguments are discussed only superficially. For instance, the sentence “some scholars argue that excessive reliance on artificial intelligence may weaken independent thinking” is not sufficiently developed. The manuscript would be strengthened by a deeper critical synthesis of contradictory findings and by identifying the specific conditions under which AI use may become detrimental rather than beneficial.

The section introducing student well-being lacks sufficient justification for selecting Zheng et al.’s multidimensional model over alternative well-being frameworks commonly used in educational psychology. The authors should explain why psychological, social, and physical well-being were prioritized and whether other dimensions such as academic well-being, emotional exhaustion, or life satisfaction were considered but excluded.

The demographic section contains percentages for age and educational level, but the reporting lacks clarity and completeness. For example, the sentence “the majority of participants (37.60%) were 15 and 16 years old” is ambiguous because it combines two age categories into one percentage. The authors should present a detailed demographic table including exact frequencies and percentages for each subgroup.

Table 1 presents descriptive statistics, but the interpretation that the variables were “at a moderate level” lacks empirical justification. The authors should explain the basis for categorizing means as low, moderate, or high, especially when using Likert scales. Without predefined cutoffs or normative benchmarks, such interpretations may be arbitrary.

Authors revised the manuscript and uploaded the new document.

## 1.2. Reviewer 2

Reviewer:

The discussion of digital literacy is theoretically important, but the manuscript insufficiently explains how digital literacy differs from AI literacy. In several paragraphs, these concepts appear interchangeable. For example, the sentence “AI literacy and digital literacy are closely interconnected” suggests conceptual overlap, yet the model treats them as distinct constructs. The authors should provide a clearer conceptual boundary and justify why only digital literacy was included as the mediator.

The paragraph introducing happiness as a moderator would benefit from a stronger theoretical rationale. While the authors state that “positive emotions broaden cognitive processes,” they do not explicitly connect this statement to established theories such as Fredrickson’s broaden-and-build theory. The moderation hypothesis currently appears empirically plausible but theoretically underdeveloped.

The justification for selecting adolescents rather than university students is appreciated; however, the manuscript does not sufficiently address developmental considerations specific to adolescence. The sentence “Adolescence is a particularly sensitive period characterized by rapid cognitive, emotional, and social changes” should be expanded to explain why these developmental characteristics may alter the effects of AI use on innovative behavior and well-being.

In the Methods section, the sampling procedure is insufficiently described. Although the authors state that “stratified random sampling was employed,” the manuscript does not specify the strata used (e.g., gender, school type, grade level, district). Without this information, it is difficult to evaluate the representativeness of the sample and the rigor of the sampling process.

The manuscript reports that the validity of instruments was “confirmed through expert judgment by professors and specialists in the field of management,” yet the study concerns secondary school students and psychological variables. The authors should clarify why management experts rather than educational psychologists or psychometric specialists evaluated content validity. Moreover, no information is provided regarding the number of experts, CVR/CVI calculations, or item revision procedures.

The description of the pilot study is inadequate. The statement “Cronbach’s alpha coefficients... were all greater than 0.70” is overly general and does not provide actual reliability coefficients for each instrument. The manuscript should report exact alpha values and ideally include composite reliability and McDonald’s omega indices for stronger psychometric evidence.

The authors state that the Kolmogorov–Smirnov test indicated non-normality for all variables, yet they proceed with PLS-SEM without fully justifying this analytical choice. A more rigorous methodological explanation is needed regarding why SmartPLS was selected instead of covariance-based SEM, especially given the relatively adequate sample size of 367 participants.

Authors revised the manuscript and uploaded the new document.

## 2. Revised

Editor's decision after revisions: Accepted.

Editor in Chief's decision: Accepted.