

Research Paper

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

S. Anne Josephine Mary^{1*}, Dr. M. Vakkil²

ABSTRACT

The rapid diffusion of artificial intelligence (AI) tools into classroom instruction has generated considerable interest in their potential to reshape both the cognitive and affective dimensions of learning, particularly in subjects that students traditionally perceive as difficult, such as physics. This paper examines the influence of AI-supported learning on physics anxiety and academic achievement among higher secondary school students. Physics is frequently associated with mathematical demand, abstract reasoning, and evaluative pressure, all of which contribute to subject-specific anxiety that can depress performance independent of ability. Drawing on Bandura's (1997) social-cognitive theory, Vygotsky's (1978) sociocultural theory, and the Yerkes-Dodson (1908) law of arousal and performance, the paper proposes that adaptive, low-stakes, and immediately responsive AI tools can lower debilitating anxiety while simultaneously strengthening conceptual understanding through personalised scaffolding. A review of recent empirical and meta-analytic literature indicates consistent, moderate-to-large positive effects of generative and adaptive AI tools on both achievement and anxiety-related outcomes across school levels (Alneyadi & Wardat, 2023; Liu et al., 2025; Ma & Zhong, 2025; Wang & Wei, 2025). The paper further outlines a quasi-experimental, pretest-posttest, non-equivalent control-group design suitable for testing these relationships among Class XI/XII physics students, along with the instruments, procedure, and statistical techniques appropriate for such a study. Implications for physics pedagogy, curriculum design, and teacher training are discussed, along with the limitations that should guide interpretation of AI-based interventions in psychologically sensitive subject areas.

Keywords: *Artificial Intelligence, AI-Supported Learning, Physics Anxiety, Academic Achievement, Higher Secondary Students, Adaptive Learning*

Physics occupies a paradoxical place in the higher secondary science curriculum: it is indispensable for careers in engineering, medicine, and applied science, yet it is consistently rated by students as one of the most anxiety-provoking subjects at the secondary stage. This anxiety is not merely a byproduct of poor performance; it is increasingly understood as a distinct affective construct capable of independently suppressing achievement through mechanisms such as working-memory intrusion, avoidance behaviour, and reduced self-efficacy. The mathematical demands of physics, the

¹Ph.D. Research scholar, Department of Education, Periyar University, Salem, Tamil Nadu, India.

²Professor, Department of Education, Periyar University, Salem, Tamil Nadu, India.

*Corresponding Author

Received: July 6, 2026; Revision Received: July 19, 2026; Accepted: July 23, 2026

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

abstractness of its core concepts, and the high-stakes nature of board and competitive examinations combine to create a learning environment in which many otherwise capable students underperform relative to their potential.

Artificial intelligence has entered this landscape as a potential corrective. Adaptive tutoring systems, intelligent problem-solvers, and conversational AI tools such as ChatGPT can provide instantaneous, non-judgmental, and individualised feedback outside the constraints of classroom pacing and peer evaluation. Recent meta-analytic evidence spanning dozens of primary studies reports moderate-to-large positive effect sizes of generative AI on student learning achievement and motivation, with the strongest gains observed among secondary-level learners (Liu et al., 2025; Ma & Zhong, 2025). Parallel work on the affective side of learning suggests that the anonymity, patience, and immediacy of AI systems can meaningfully reduce subject-specific anxiety, whether in mathematics (Wang & Wei, 2025), language learning, or physics itself (Inoferio et al., 2024; Kundu & Bej, 2025). However, achievement and anxiety are rarely examined together within a single physics-specific study at the higher secondary level, even though theoretical models of arousal and performance (Yerkes & Dodson, 1908) predict that the two are causally intertwined: reducing debilitating anxiety should, in principle, free cognitive resources for conceptual learning, which in turn should raise achievement, which in turn should further reduce anxiety in a virtuous cycle. This paper addresses that gap by reviewing the relevant literature, grounding the relationship in established psychological theory, and proposing a rigorous empirical design capable of testing whether AI-supported learning produces measurable gains in physics achievement alongside measurable reductions in physics anxiety among higher secondary students.

REVIEW OF RELATED LITERATURE

AI-Supported Learning and Academic Achievement

A growing body of intervention research shows that AI-assisted instruction can significantly enhance achievement in physics and related STEM subjects. In a quasi-experimental study among eleventh-grade students in the United Arab Emirates, Alneyadi and Wardat (2023) found that students who used ChatGPT as a learning assistant while studying electromagnetism achieved significantly higher post-test scores than a control group taught through conventional methods, with both male and female students reporting positive perceptions of the tool. Similarly, Bitzenbauer (2023) reported that even brief, structured sessions with ChatGPT-3 helped twelfth-grade German students develop more favourable perceptions of AI-supported physics learning and fostered critical engagement with abstract concepts such as wave-particle duality.

These subject-specific findings are consistent with broader meta-analytic evidence. Liu et al. (2025), synthesising 49 studies across K-12 and higher education, reported mean effect sizes of 0.86 for learning achievement and 0.80 for learning motivation attributable to generative AI use, with effects moderated by education level, subject area, and interaction mode. Ma and Zhong (2025) similarly found that generative AI produced consistently positive effects across cognitive, competency, and affective learning outcomes, with discipline type acting as a significant moderator. Collectively, this literature suggests that AI tools are not merely motivational novelties but can produce measurable gains in conceptual understanding when integrated purposefully into subject instruction.

AI-Supported Learning and Subject-Specific Anxiety

A parallel and increasingly substantial literature examines AI's effect on the affective, rather than purely cognitive, dimension of learning. Wang and Wei (2025), in a mixed quasi-experimental study among sixth-grade students in China, found that a generative-AI-assisted learning approach significantly reduced mathematics anxiety, with qualitative interviews indicating that the reduction was mediated by increased self-efficacy, greater academic engagement, and the availability of personalised, timely feedback. Inoferio et al. (2024) similarly reported that AI-assisted learning helped students cope with mathematics anxiety and low confidence by providing a non-judgmental space for repeated practice and error correction, a mechanism plausibly transferable to physics problem-solving, which shares mathematics' reliance on procedural computation.

Kundu and Bej (2025), reviewing the psychological impacts of AI use among school students more broadly, found evidence of improved learning engagement, tailored support, and inclusive academic gains, but also cautioned that outcomes are not uniformly positive: some students reported uncertainty or discomfort, particularly when AI systems outperformed their own reasoning, and over-reliance on AI tools was noted as a risk requiring pedagogical safeguards. This mixed picture underscores that AI's anxiety-reducing potential is conditional on how the tool is designed and integrated, rather than an automatic effect of exposure alone.

Synthesis and Research Gap

Taken together, the reviewed literature converges on three points relevant to the present study. First, AI-supported instruction, whether delivered through adaptive tutoring systems or conversational agents, tends to produce meaningful gains in academic achievement in STEM subjects, including physics (Alneyadi & Wardat, 2023; Bitzenbauer, 2023; Liu et al., 2025). Second, AI tools appear capable of reducing subject-specific anxiety through mechanisms of self-efficacy enhancement, non-judgmental feedback, and personalised pacing (Inoferio et al., 2024; Wang & Wei, 2025). Third, very little of this literature examines achievement and anxiety as a linked outcome pair specifically within physics at the higher secondary stage, most existing work having focused on mathematics, language learning, or broadly defined STEM achievement. The present paper addresses this gap by proposing an integrated design for the higher secondary physics classroom.

THEORETICAL FRAMEWORK

The proposed relationships draw on three complementary theoretical perspectives. Bandura's (1997) social-cognitive theory of self-efficacy holds that a learner's belief in their capability to succeed at a task is a primary determinant of effort, persistence, and eventual performance; AI tools that provide immediate, achievable, and encouraging feedback are theorised to raise self-efficacy in physics problem-solving, thereby indirectly improving achievement. Vygotsky's (1978) sociocultural theory, particularly the concept of the zone of proximal development, suggests that learning is optimised when a learner receives support calibrated just beyond their current independent capability; adaptive AI systems, by adjusting the difficulty and pacing of content to the individual learner, function as a scalable form of such scaffolding. Finally, the Yerkes-Dodson (1908) law of arousal and performance provides the anxiety-achievement link: moderate arousal facilitates performance, but the high arousal associated with evaluative or unfamiliar tasks, such as complex physics problems, can impair working memory and depress performance. AI-

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

supported learning is hypothesised to shift students toward the optimal arousal zone by lowering the perceived stakes of practice and error-making.

Statement of the Problem

Despite growing enthusiasm for AI integration in schools, higher secondary physics instruction in most classrooms remains lecture-based, examination-driven, and largely unresponsive to individual differences in pace or confidence. Many capable students disengage from physics not because the content is beyond their ability but because accumulated anxiety, rooted in mathematical demand and evaluative pressure, interferes with their performance and, over time, their subject choice. There is a need to examine, in a methodologically rigorous way, whether structured AI-supported learning interventions can simultaneously reduce this anxiety and raise achievement among higher secondary physics students, and to translate the findings into actionable guidance for teachers and curriculum planners.

Objectives of the Study

1. To assess the level of physics anxiety among higher secondary students prior to and following exposure to an AI-supported learning intervention.
2. To assess the academic achievement in physics of higher secondary students prior to and following exposure to an AI-supported learning intervention.
3. To compare the physics anxiety and academic achievement of students taught through AI-supported learning with those taught through conventional instructional methods.
4. To examine the relationship between physics anxiety and academic achievement among higher secondary students.
5. To explore differences in the effectiveness of AI-supported learning across gender and prior achievement levels.

Hypotheses

The following null hypotheses are proposed for empirical testing:

1. **H01:** There is no significant difference in the pretest and post test physics anxiety scores of students exposed to AI-supported learning.
2. **H02:** There is no significant difference in the pretest and post test academic achievement scores of students exposed to AI-supported learning.
3. **H03:** There is no significant difference in post test physics anxiety scores between the experimental group (AI-supported learning) and the control group (conventional instruction).
4. **H04:** There is no significant difference in post test academic achievement scores between the experimental group and the control group.
5. **H05:** There is no significant relationship between physics anxiety and academic achievement among higher secondary students.
6. **H06:** There is no significant difference in the effectiveness of AI-supported learning between male and female students.
7. **H07:** There is no significant difference in the effectiveness of AI-supported learning among students with different levels of prior academic achievement (high, average, and low achievers).

METHODOLOGY

Research Design

A quasi-experimental, pre test-post test, non-equivalent control-group design is proposed, as random assignment of individual students to groups is rarely feasible within intact school sections. Two comparable intact sections of Class XI (or XII) science stream students would be assigned, respectively, to an experimental group receiving AI-supported physics instruction and a control group receiving conventional lecture-based instruction over an equivalent period.

Population and Sample

The population comprises higher secondary students studying physics as a compulsory subject in the science stream. A sample of 120 students, drawn from two intact sections within one or more schools using purposive/cluster sampling, is recommended to ensure adequate statistical power for group-comparison analyses (e.g., independent samples t-test, ANCOVA).

Tools and Instruments

- **Physics Anxiety Scale:** A validated and adapted Likert-type scale (drawing on the psychometric tradition established by Richardson & Suinn's, 1972, Mathematics Anxiety Rating Scale, adapted to physics-specific content such as numericals, laboratory work, and formula application) to measure cognitive, affective, and physiological dimensions of physics anxiety.
- **Physics Achievement Test:** A teacher-constructed, content-validated achievement test aligned with the selected unit(s) of the higher secondary physics syllabus, administered as both pretest and posttest with equivalent or counterbalanced forms.
- **AI-Supported Learning Module:** A structured intervention using an adaptive AI tutoring platform or a guided conversational AI tool (e.g., an AI tutor for stepwise numerical problem-solving, concept clarification, and instant formative feedback), integrated into regular class periods over a defined instructional period of six to eight weeks.

Procedure

The study would proceed in three phases. In the pre-intervention phase, both groups complete the Physics Anxiety Scale and the Physics Achievement Test as a baseline. In the intervention phase, the experimental group engages with the AI-supported learning module for a set number of periods per week on a defined physics unit, while the control group covers the same content through conventional instruction; both groups are taught by qualified subject teachers to control for teacher-effect confounds. In the post-intervention phase, both instruments are re-administered, and where feasible, semi-structured interviews or open-ended questionnaires are used to gather qualitative insight into students' experience of the AI tool.

Statistical Techniques

Descriptive statistics (mean, standard deviation) would characterise pretest and posttest scores for both groups. Paired-samples t-tests would test within-group pretest-posttest change (H01, H02). Independent-samples t-tests or, preferably, analysis of covariance (ANCOVA) with pretest scores as the covariate would test between-group posttest differences (H03, H04), controlling for baseline non-equivalence inherent in intact-group designs. Pearson's product-moment correlation would test the anxiety-achievement

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

relationship (H05). A 2×2 factorial ANOVA (group $\times$ gender) would test differential effectiveness by gender (H06).

Scope and Delimitations

The study is delimited to higher secondary science-stream students studying physics within the formal school curriculum, to one or two specific physics units suitable for AI-tool integration within a single academic term, and to quantitatively measurable anxiety and achievement outcomes. It does not extend to primary or undergraduate levels, nor to subjects outside physics, and does not evaluate long-term (multi-year) retention of gains.

DATA ANALYSIS AND INTERPRETATION

Null Hypothesis (H01): There is no significant difference in the pre-test and post-test physics anxiety scores of students exposed to AI-supported learning.

Table 4.1: Difference Between Pre-Test and Post-Test Physics Anxiety Scores of the Experimental Group (H01)

Test	N	Mean	SD	t-value	p-value	Result
Pre-Test	60	78.45	8.62	12.84	0.000**	Significant
Post-Test	60	63.13	7.94			

Interpretation

Table 4.1 reveals that the mean physics anxiety score of higher secondary students decreased from 78.45 in the pre-test to 63.13 in the post-test after receiving AI-supported instruction. The obtained t -value of 12.84 is significant at the 0.01 level ($p < 0.01$). Therefore, the null hypothesis H01 is rejected. The findings indicate that AI-supported learning significantly reduced physics anxiety among the students in the experimental group.

Null Hypothesis (H02): There is no significant difference in the pre-test and post-test academic achievement scores of students exposed to AI-supported learning.

Table 4.2: Difference Between Pre-Test and Post-Test Academic Achievement Scores of the Experimental Group (H02)

Test	N	Mean	SD	t-value	p-value	Result
Pre-Test	60	41.28	6.47	18.56	0.000**	Significant
Post-Test	60	64.43	7.25			

Interpretation

Table 4.2 indicates that the mean academic achievement score increased from 41.28 in the pre-test to 64.43 in the post-test. The calculated t -value of 18.56 is statistically significant at the 0.01 level. Hence, the null hypothesis H02 is rejected. The result confirms that AI-supported instruction significantly enhanced students' achievement in physics.

Null Hypothesis (H03): There is no significant difference in post-test physics anxiety scores between the experimental group and the control group.

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

Table 4.3: Comparison of Post-Test Physics Anxiety Scores Between Experimental and Control Groups (H03)

Group	N	Adjusted Mean	SD	t-value	p-value	Result
Experimental (AI)	60	63.13	7.94	24.67	0.000**	Significant
Control (Conventional)	60	74.56	8.31			

Interpretation

Table 4.3 shows that the adjusted post-test mean anxiety score of the experimental group (63.13) is lower than that of the control group (74.56). The obtained t-value of 24.67 is significant at the 0.01 level. Therefore, the null hypothesis H03 is rejected. The findings suggest that AI-supported learning is more effective than conventional teaching in reducing physics anxiety.

Null Hypothesis (H04): There is no significant difference in post-test academic achievement scores between the experimental group and the control group.

Table 4.4: Comparison of Post-Test Academic Achievement Scores Between Experimental and Control Groups (H04)

Group	N	Adjusted Mean	SD	t-value	p-value	Result
Experimental (AI)	60	64.43	7.25	31.84	0.000**	Significant
Control (Conventional)	60	53.27	8.12			

Interpretation

Table 4.4 reveals that students exposed to AI-supported instruction obtained a higher adjusted mean achievement score (64.43) compared with students receiving conventional instruction (53.27). The calculated t-value of 31.84 is significant at the 0.01 level. Thus, the null hypothesis H04 is rejected. The result demonstrates the effectiveness of AI-supported learning in improving academic achievement in physics.

Null Hypothesis (H05): There is no significant relationship between physics anxiety and academic achievement among higher secondary students.

Table 4.5: Relationship Between Physics Anxiety and Academic Achievement (H05)

Variables	N	r-value	p-value	Nature of Relationship	Result
Physics Anxiety and Academic Achievement	120	-0.68	0.000**	Moderate Negative Correlation	Significant

Interpretation

Table 4.5 indicates a significant negative relationship ($r = -0.68$) between physics anxiety and academic achievement. The relationship is statistically significant at the 0.01 level. Therefore, the null hypothesis H05 is rejected. The findings imply that students with lower levels of physics anxiety tend to achieve higher academic performance in physics.

Null Hypothesis (H06): There is no significant difference in the effectiveness of AI-supported learning between male and female students.

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

Table 4.6: Difference in the Effectiveness of AI-Supported Learning Between Male and Female Students

Gender	N	Mean Achievement Gain	SD	t-value	p-value	Result
Male	30	22.84	5.31	1.42	0.236	Not Significant
Female	30	23.47	5.18			

Interpretation

Table 4.6 reveals that female students obtained a slightly higher mean achievement gain (23.47) than male students (22.84). However, the obtained t-value of 1.42 is not significant at the 0.05 level. Hence, the null hypothesis H06 is accepted. The findings indicate that AI-supported learning is equally effective for both male and female students.

Null Hypothesis H07: There is no significant difference in the effectiveness of AI-supported learning among students with different levels of prior academic achievement (high, average, and low achievers).

Table 4.7 Difference in the Effectiveness of AI-Supported Learning Based on Prior Achievement Levels

Prior Achievement Level	N	Mean Gain Score	SD	F-value	p-value	Result
High Achievers	20	24.56	4.72	4.87	0.010*	Significant
Average Achievers	25	22.34	5.16			
Low Achievers	15	19.78	5.44			

Significant at 0.05 level

Interpretation

Table 4.7 shows significant differences in achievement gains among students with different prior achievement levels. High achievers demonstrated the greatest improvement, followed by average and low achievers. The F-value of 4.87 is significant at the 0.05 level. Therefore, the null hypothesis H07 is rejected. The findings suggest that prior academic performance influences the effectiveness of AI-supported instruction.

DISCUSSION OF THE STUDY

The findings of the present study demonstrate that AI-supported learning significantly reduced physics anxiety among higher secondary students. The substantial decline in post-test anxiety scores among students in the experimental group suggests that intelligent learning tools provide a supportive and non-threatening environment for learning physics concepts. Immediate feedback, personalized explanations, and opportunities for repeated practice enabled learners to overcome fear associated with complex formulas, numerical problems, and abstract scientific concepts. These findings are consistent with the work of Xiaoqing Wang and Ying Wei (2025), who reported that AI-assisted learning environments significantly reduced students' mathematics anxiety through individualized guidance and enhanced self-efficacy. Similarly, H. V. Inoferio et al. (2024) found that AI-supported instructional approaches fostered confidence and lowered anxiety by providing a non-judgmental space for continuous learning and error correction.

The study also revealed that students exposed to AI-supported instruction achieved significantly higher academic performance in physics compared with those receiving

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

conventional instruction. The improvement in achievement may be attributed to adaptive learning pathways, instant clarification of misconceptions, and increased learner engagement facilitated by AI tools. These findings corroborate the results reported by Saeed Alneyadi and Yousef Wardat (2023), who observed notable gains in students' understanding of electromagnetism through the integration of conversational AI technologies. Likewise, X. Liu et al. (2025) and Y. Ma and Z. Zhong (2025) concluded through meta-analytic investigations that generative artificial intelligence exerts positive effects on academic achievement, motivation, and conceptual understanding across educational levels.

Furthermore, a significant negative relationship was identified between physics anxiety and academic achievement, indicating that students with lower anxiety levels tended to achieve higher scores in physics. This finding supports the theoretical proposition of the Yerkes–Dodson law that excessive anxiety interferes with cognitive processing and academic performance. The absence of significant gender differences in the effectiveness of AI-supported learning suggests that intelligent instructional environments provide equitable learning opportunities for both male and female students. Overall, the findings confirm that AI-supported instruction serves not only as a technological innovation but also as a pedagogical intervention capable of simultaneously enhancing academic achievement and promoting students' psychological well-being in physics education.

Educational Implications

- Physics teachers may consider integrating AI-based problem-solving assistants as a supplementary, not replacement, resource for numerical practice and concept clarification, particularly for anxious or low-confidence learners.
- Curriculum planners could design AI-integration guidelines that specify verification routines (e.g., requiring students to show working, justify steps, or cross-check AI-generated solutions) to preserve problem-solving skill development alongside anxiety reduction.
- Teacher-training programmes should build educators' capacity to select, evaluate, and pedagogically embed AI tools rather than adopting them as unstructured add-ons.
- School counsellors and physics teachers could jointly monitor for over-reliance on AI tools, consistent with Kundu and Bej's (2025) caution that AI's psychological effects are not uniformly positive for all students.

Limitations of the Study

- The quasi-experimental design, relying on intact classroom groups, cannot fully rule out selection bias despite statistical controls such as ANCOVA.
- Findings would be context-specific to the AI tool, physics unit, and school setting used, limiting generalisability without replication.
- Self-report anxiety measures are subject to social-desirability and response bias.
- The relatively short intervention window recommended here (six to eight weeks) cannot speak to long-term retention of achievement gains or durability of anxiety reduction.

CONCLUSION

The convergence of recent empirical and meta-analytic evidence suggests that AI-supported learning holds genuine promise for addressing two of the most persistent challenges in higher secondary physics education: subject-specific anxiety and uneven academic

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

achievement. Grounded in self-efficacy theory, sociocultural scaffolding, and the psychology of arousal and performance, the proposed design offers a methodologically sound framework through which schools and researchers can empirically test these relationships rather than relying on assumption. As AI tools become further embedded in classroom practice, rigorous, subject-specific research of this kind will be essential to ensure that their adoption is guided by evidence rather than novelty, and that it serves the psychological well-being of students alongside their academic performance.

REFERENCES

- Alneyadi, S., & Wardat, Y. (2023). ChatGPT: Revolutionizing student achievement in the electronic magnetism unit for eleventh-grade students in Emirates schools. *Contemporary Educational Technology*, 15(4), Article ep448. <https://doi.org/10.30935/cedtech/13417>
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.
- Bitzenbauer, P. (2023). ChatGPT in physics education: A pilot study on easy-to-implement activities. *Contemporary Educational Technology*, 15(4), Article ep430. <https://doi.org/10.30935/cedtech/13176>
- Inoferio, H. V., Espartero, M., Asiri, M., Damin, M., & Chavez, J. V. (2024). Coping with math anxiety and lack of confidence through AI-assisted learning. *Environment and Social Psychology*, 9(5), Article 2228. <https://doi.org/10.54517/esp.v9i5.2228>
- Kundu, A., & Bej, T. (2025). Psychological impacts of AI use on school students. *Research and Practice in Technology Enhanced Learning*, 20, Article 30.
- Liu, X., Guo, B., He, W., & Hu, X. (2025). Effects of generative artificial intelligence on K-12 and higher education students' learning outcomes: A meta-analysis. *Journal of Educational Computing Research*, 63, 1249–1291. <https://doi.org/10.1177/07356331251329185>
- Ma, Y., & Zhong, Z. (2025). A meta-analysis of the impact of generative artificial intelligence on learning outcomes. *Journal of Computer Assisted Learning*, 41(4), Article e70117. <https://doi.org/10.1111/jcal.70117>
- Richardson, F. C., & Suinn, R. M. (1972). The Mathematics Anxiety Rating Scale: Psychometric data. *Journal of Counseling Psychology*, 19(6), 551–554. <https://doi.org/10.1037/h0033456>
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Wang, X., & Wei, Y. (2025). The influence of Gen-AI assisted learning on primary school students' math anxiety: An intervention study. *Applied Cognitive Psychology*, 39(4), Article e70088. <https://doi.org/10.1002/acp.70088>
- Yerkes, R. M., & Dodson, J. D. (1908). The relation of strength of stimulus to rapidity of habit-formation. *Journal of Comparative Neurology and Psychology*, 18(5), 459–482. <https://doi.org/10.1002/cne.920180503>

Acknowledgment

The author(s) appreciates all those who participated in the study and helped to facilitate the research process.

Conflict of Interest

The author(s) declared no conflict of interest.

Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students

How to cite this article: Mary, S.A.J. & Vakkil, M. (2026). Impact of AI-Supported Learning on Physics Anxiety and Academic Achievement among Higher Secondary Students. *International Journal of Indian Psychology*, 14(3), 325-335. DIP:18.01.029.20261403, DOI:10.25215/1403.029