The International Journal of Indian Psychology
ISSN 2348-5396 (Online) | ISSN: 2349-3429 (Print)
Volume 14, Issue 3, July- September, 2026
DIP: 18.01.065.20261403, DOI: 10.25215/1403.065
https://www.ijip.in

Research Paper

Exploring the Association Between Critical Thinking Disposition and Trust in Automation

Jigyasha Dixit[1]*, Prof. Preeti P. Masih[2]

ABSTRACT

With automated systems increasingly integrated into our decision-making on a daily basis, research into human trust in automation is therefore essential. A relationship between trust in automation and critical thinking disposition was examined in 50 participants who were administered surveys that measured those specific factors. The assessments used for measuring trust in automation and critical thinking disposition were Koober's Trust in Automation and Critical Thinking Disposition assessment (EMI). The variables were analysed using Pearson product-moment correlation. The overall critical thinking disposition showed a moderate positive relationship with trust in automation ($r = .467$, $p < .01$). Elements of critical thinking that showed a strong positive relationship with trust in automation included cognitive maturity ($r = .500$, $p < .01$) and cognitive engagement ($r = .483$, $p < .01$). The relationship between innovativeness and trust in automation was weak but significant ($r = .322$, $p = .011$). Additional variables, including beliefs in automation reliability, understanding of automated systems, and confidence in trusting automation correlated with critical thinking tendencies and confidence in automation. This indicates that individuals with good critical thinking skills have greater confidence and trust in automation.

Keywords: *Critical Thinking, Trust in Automation, Human-automation Interaction, Artificial Intelligence, Cognitive Engagement, Decision-making*

Automation has become deeply embedded in everyday life, from navigation and healthcare to education and professional decision-making. As technological systems increasingly take over tasks that once required human judgment, researchers have begun asking a pressing question: how much do people trust these systems, and what shapes that trust (Ulfert et al., 2024; Hoff & Bashir, 2015; Lee & See, 2004). Notably, adaptive automation can strengthen error management and reliability, though this tends to raise trust more than it raises confidence in one's own judgment (Moray et al., 2000). Within educational and workplace settings, reliance on AI and automated tools can cut both ways — it may enhance efficiency, but it can equally erode the habits of careful reasoning that professionals and students need. How people engage with automation is partly shaped by something more enduring than skill: their dispositional inclination to think critically. Critical thinking disposition is not simply about whether someone can think well, but whether they

[1]Research Scholar, Department of Psychology, St. John's College, Dbrau, Agra
[2]Head of Psychology Department, St. John's College, Dbrau, Agra
*Corresponding Author

Received: May 01, 2026; Revision Received: August 01, 2026; Accepted: August 06, 2026

are inclined to do so — that is, their habitual tendency toward reflective judgment, scepticism, and evidence-based reasoning (Butler, 2024; Quinn, 2012). This distinction matters when evaluating AI outputs, which require active scrutiny rather than passive acceptance. Research has increasingly flagged a worrying trend: many users accept AI-generated content uncritically, raising concerns about cognitive offloading and the erosion of epistemic engagement (Essenfelder, 2026). Given this context, examining how critical thinking disposition relates to trust in automation offers meaningful insight into how people psychologically navigate an increasingly automated world.

Operational Definitions

- **Critical thinking disposition-** In words by Rudd, Baker, and Hoover (2000), critical thinking is defined as, "A reasoned, purposive, and introspective approach to solving problems or addressing questions with incomplete evidence and information and for which an incontrovertible solution is unlikely"
- **Trust in automation-** Based on Mayer et al. (1995), trust in automation is defined as "the attitude of a user to be willing to be vulnerable to the actions of an automated system based on the expectation that it will perform a particular action important to the user, irrespective of the ability to monitor or to intervene." (Körber, 2019)

REVIEW OF LITERATURE

Hou et al. (2025) explored how critical thinking connects with the way people rely on AI systems. Their findings were telling: critical thinking was found to mediate the relationship between AI literacy, trust, and reliance behaviours. Interestingly, stronger critical thinking was associated with more selective — rather than indiscriminate — use of generative AI, suggesting that thoughtful engagement shapes how, not just whether, people use these tools.

Gerlich (2025) raised a more cautionary note, finding that heavy reliance on AI for cognitive tasks was negatively associated with critical thinking ability. Younger users were particularly prone to this pattern, leaning on AI tools more readily while displaying comparatively weaker reasoning skills. These findings point to a potential cost of over-delegation: when people routinely outsource thinking to machines, their own cognitive capacities may gradually weaken.

A systematic review by Zhai et al. (2024), discussed in the broader educational context by Sidorkin (2026), drew on 14 studies to examine how heavy AI dependence affects cognition. The picture that emerged was nuanced: AI tools can support decision-making and improve productivity, but they tend to undermine critical and analytical thinking when students use them as a substitute for independent reasoning. The results showed that while AI tools might promote decision-making and increase productivity, they frequently result in diminished critical and analytical thinking abilities, particularly when students rely too much on AI-generated content.

Lucas et al. (2024) focused on how workers develop trust in automated systems in professional settings. Their research found that trust was built primarily through observable performance — workers paid close attention to how reliably a system operated and how well it handled errors. These factors, more than familiarity or design aesthetics, determined how much trust workers were willing to extend.

Sheridan (2019) reviewed the landscape of individual differences in automation trust, arriving at an intriguing conclusion: as automation becomes more sophisticated and human-

like in its behaviour, people tend to extend it a form of trust that resembles interpersonal trust — one that involves expectation, vulnerability, and even a degree of reciprocity between the human and the machine.

Suriano et al. (2024) offered a more optimistic perspective from their study of Italian university students using ChatGPT. Rather than cognitive decline, they observed growth: students who interacted positively with the AI — approaching it with confidence and a favourable view of its capabilities — demonstrated improvements in higher-order thinking. The implication is that the quality of human-AI interaction, not just the fact of it, determines its cognitive effects.

Chiou and Lee (2021) contributed a foundational review of trust in automation, arguing against treating trust as a fixed or uniform quality. Instead, they demonstrated that trust in automated systems is inherently dynamic — it shifts across contexts, evolves through repeated interaction, and depends heavily on how the system behaves relative to user expectations. Their work positions human-automation interaction as a genuine partnership, not a one-way dependency.

Körber (2018) investigated trust in automation experimentally using automated driving scenarios. A key finding was that trust is surprisingly malleable: simply providing different introductory information about the system influenced how much users trusted it, which in turn affected their performance. This suggests that first impressions and framing play a meaningful role in shaping the trust users bring to automated systems.

Kunze et al. (2019) took a counterintuitive approach by examining what happens when automated systems communicate uncertainty rather than projecting confidence. Their results were instructive: when systems acknowledged their limitations, users calibrated their trust more accurately, paid greater attention, and showed improved situational awareness. Transparency about uncertainty, it turns out, can be more trust-building than an illusion of infallibility.

METHODOLOGY

Research Design

This study used a quantitative, cross-sectional design to examine the relationship between critical thinking disposition and trust in automation. A quantitative approach was chosen because it allows for precise measurement of both variables and enables statistical testing of the hypothesised associations between them. The design is correlational in nature — the aim was to determine the strength and direction of the relationship, not to manipulate or control variables.

Population and Sample

Fifty participants were recruited using a convenience sampling approach, selected based on accessibility and voluntary willingness to participate.

Inclusion Criteria

1. Must be willing to participate in the study.
2. Must be a regular user of digital technology/AI tools

Exclusion Criteria

1. Incomplete questionnaires were rejected.

2. Lack of familiarity with digital technology/AI tools.

Variables of the study

- Independent variable- Critical thinking disposition
- Dependent variable- Trust in automation

Tools Used

1. **Critical thinking Inventory** (Lamm & Irani, 2025; Irani et al., 2007)**-** This inventory was developed based on the UF/EMI instrument, initially used to determine either high or low levels of critical thinking disposition. In the current research, however, the CTI instrument has been modified to measure critical thinking style rather than disposition. It measures engagement, innovativeness, and cognitive maturity, comprising 26 statements rated on a five-point Likert scale (ranging from "strongly disagree" to "strongly agree"). Reliability is 0.81 for CTI and is a good, valid construct. It is important to recognise that the CTI is measuring a critical thinking style, not a level at which the participant engages in critical thinking. (Facione et al., 1995; Facione et al., 1998)
2. **Trust in automation** (Körber, 2018; Körber, 2019)- This instrument comprises 19 questions within six scales: familiarity, intention of developers, trustworthiness, reliability, and competence. Each question is measured by using a five-point Likert scale, where some questions are negatively worded. The reliability of this measure is 0.85, while its internal consistency ranges from 0.71 to 0.83.

Procedure

Data were collected via an online survey hosted on Google Forms. Participants were reached through professional networks and social media platforms. Before the survey began, participants were provided with a brief overview of the study's purpose and given assurances of anonymity and confidentiality. Participation was entirely voluntary, and electronic informed consent was obtained from each respondent. The survey took approximately 10 to 15 minutes to complete. A total of 71 individuals responded; after screening for incomplete responses and applying the inclusion and exclusion criteria, 50 valid responses were retained for analysis.

Ethical Consideration

Ethical considerations were observed throughout the study. No personally identifiable information was collected from participants. Each respondent was informed that their data would be used strictly for academic research purposes and that they retained the right to withdraw at any time without consequence. All collected data were stored securely and accessed only by the researcher.

Statistical Analysis

Statistical software JAPS was used to analyse the collected data. Descriptive statistics were used to summarise descriptive variables and study measures. To test how the critical thinking disposition correlates with trust in automation, Pearson's product-moment correlation was used.

Objectives

1. To assess the relationship between trust in automation and critical thinking disposition.

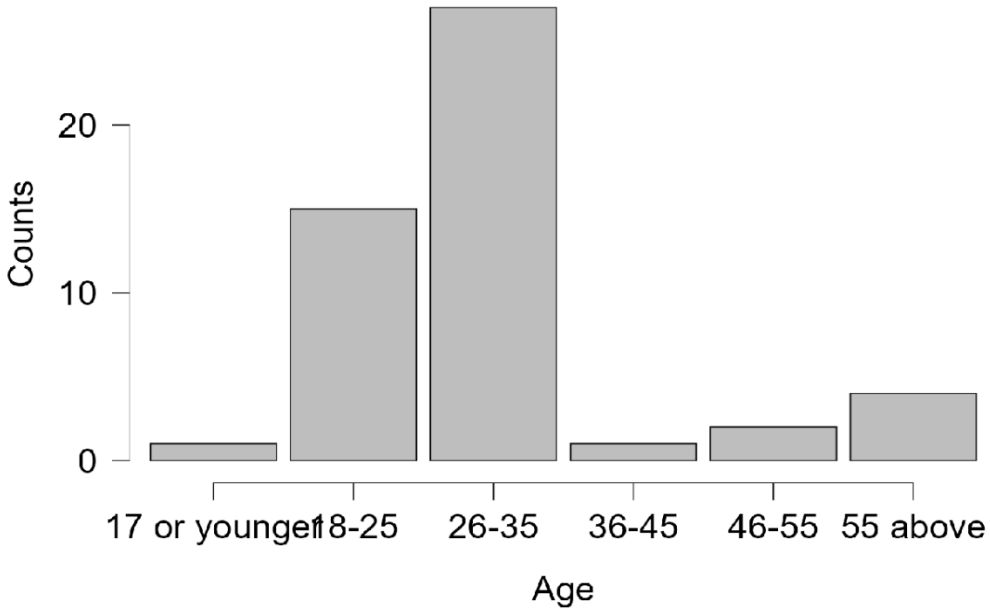
2. To assess the relationship between trust in automation, critical thinking disposition and its dimensions.
3. To assess the relationship between trust in automation and its dimensions with critical thinking disposition.

Hypotheses

1. Individuals who exhibit a stronger disposition toward critical thinking are expected to demonstrate higher levels of trust in automated systems.
2. Each underlying dimension of critical thinking disposition will show a meaningful positive association with overall trust in automation.
3. The individual dimensions constituting trust in automation will each reflect a significant positive relationship with overall critical thinking disposition.

RESULTS

Demographics



This graph shows the distribution of age.

Hypothesis 1- Critical thinking inclination and trust in automation are moderately positively correlated ($r=0.467$, $p<0.01$).

Table 1- Trust in Automation (TiA) and Critical Thinking Disposition (CTDA) have a Pearson correlation.

Variable 1	Variable 2	r	p-value	Significance
Critical thinking disposition (CTDA)	Trust in automation (TiA)	**0.467**	< .01	Significant

These results show that people who have a higher critical thinking disposition have higher trust in automation. Thus, hypothesis 1 was accepted.

Hypothesis 2- Trust in automation is positively correlated with critical thinking disposition dimensions.

Table 2. -TiA and Critical Thinking Disposition Dimensions have a Pearson correlation

TiA dimension	r	p-value	Result
Reliability	**0.539**	< .01	Significant
Understanding	**0.456**	< .01	Significant
Intention of developers	**0.263**	= .033	Significant
Propensity to trust	**0.335**	= .009	Significant
Familiarity	0.178	= .108	Non-significant

Thus, hypothesis 2 was also accepted.

Hypothesis 3- Trust in automation and its dimensions with critical thinking disposition have a positive correlation.

Table 3. CTDA and Trust in Automation dimensions have a Pearson correlation

CTDA dimension	r	p-value	Result
Cognitive maturity	**0.500**	< .01	Significant
Engagement	**0.483**	< .01	Significant
Innovativeness	**0.322**	= .011	Significant

These findings indicate a highly integrated critical thinking disposition structure.
Thus, hypothesis 3 was accepted.

DISCUSSION

The finding that critical thinking disposition positively predicts trust in automation is perhaps the most thought-provoking result of this study, and it aligns with Babiker et al. (2026), who similarly observed that psychological dispositions shape how people engage with automated systems. At first glance, one might expect critical thinkers to be more suspicious of automation — after all, scepticism is central to their disposition. Yet the data suggest the opposite: people with stronger critical thinking tendencies tend to place more, not less, trust in automated systems. The explanation may lie in what Álvarez-Huerta et al. (2022) describe as openness to evidence-based engagement: rather than blanket distrust, critical thinkers appear to develop well-calibrated trust that is proportionate to what a system actually demonstrates.

This interpretation makes intuitive sense: someone disposed toward careful, reflective thinking will naturally interrogate an automated system's outputs before accepting them, checking for consistency, plausibility, and relevance. The result is neither over-trust nor dismissal, but a measured reliance that adjusts to demonstrated performance. Also notable is how tightly the three CTI dimensions — engagement, innovativeness, and cognitive maturity — covaried with trust. Together they may constitute a kind of "cognitive-technology disposition" — a stable orientation toward engaging thoughtfully with complex systems. The findings show trust in automation as a multidimensional construct shaped by perceived reliability, comprehensibility, and beliefs about whether developers designed the system in users' best interests.

The strong correlation between perceived developer intentions and overall trust (r = .789) is particularly striking. It suggests that users are not simply asking whether a system works well — they are also asking whether the people who built it had their interests in mind. This points to an ethical dimension of human-automation trust that goes beyond technical

reliability: users want to feel that the design of the system reflects their values and needs, not just functional efficiency.

Similarly, the relationship between reliability, understanding, and trust reinforces what earlier literature has suggested: the more users feel they can make sense of a system's behaviour, the more comfortable they become trusting it. Comprehensibility is not a passive outcome of good design; it is an active ingredient in trust formation.

CONCLUSION

This study adds to the growing literature on human-computer interaction by establishing a meaningful connection between how people habitually think and how much they trust automated systems (Ekinci & Ekinci, 2017). Contrary to the assumption that critical thinkers would be wary of automation, the data consistently showed that a higher critical thinking disposition was associated with higher trust — not a credulous, unquestioning reliance, but a measured, adaptive form of trust grounded in evidence-based engagement.

One finding deserves particular attention: familiarity with automated systems did not significantly correlate with critical thinking disposition. This tells us that repeated exposure to technology, on its own, does not cultivate reflective engagement. Experience and disposition are distinct. As Wan & Cheng (2019) observed, both dispositional and cognitive factors shape how individuals respond to new technologies. These findings make a strong case for embedding AI literacy and critical thinking training within formal education — to develop people who can engage with automation thoughtfully, evaluate it honestly, and trust it appropriately. The aforementioned research has shown that thoughtful interaction with automation enhances people's cognitive capabilities and reinforces human-automation collaboration.

Implications of the Study

1. Adds behavioural disposition integration with trust.
2. It forms a link between behavioural psychology and AI.
3. Education systems should include AI-critical study.

Limitations of Study

1. The study size (N = 50) is not sufficient to statistically power and generalise.
2. Self-report measures were used in the study, which increases the possibility of common method bias.
3. Cause and effect are not permitted by the cross-sectional design.

Suggestions For Further Study

1. A longitudinal study can also be conducted
2. Mediator variables like psychological well-being, stress or cognition can be integrated into the study.
3. An AI integration intervention can also be studied.

REFERENCES

Aboodi, R. (2025), The Worrisome Potential of Outsourcing Critical Thinking to Artificial Intelligence. Educ Theory, 75: 626-645. https://doi.org/10.1111/edth.70037

Álvarez-Huerta, P., Muela, A., & Larrea, I. (2022). Disposition toward critical thinking and creative confidence beliefs in higher education students: The mediating role of

openness to diversity and challenge. *Thinking Skills and Creativity*, *43*, 101003. https://doi.org/10.1016/j.tsc.2022.101003

Anna-Sophie Ulfert, Pascale Le Blanc, Vicente González-Romá, Gudela Grote & Markus Langer (2024) Are we ahead of the trend or just following? The role of work and organizational psychology in shaping emerging technologies at work, European Journal of Work and Organizational Psychology, 33:2, 120-129, DOI: 10.1080/1359432X.2024.2324934

Babiker, A., Basel Almourad, M., AlShakhsi, S. *et al.* Do emotions matter in AI? The mediating role of emotional response between perceived risk and trust. *AI & Soc* (2026). https://doi.org/10.1007/s00146-026-02929-7

Butler, H. A. (2024). Predicting Everyday Critical Thinking: A Review of Critical Thinking Assessments. Journal of Intelligence, 12(2), 16. https://doi.org/10.3390/jintelligence12020016

Chiou, E., & Lee, J. (2021). Trusting Automation: Designing for Responsivity and Resilience. *Human Factors: The Journal of Human Factors and Ergonomics Society*, 65, 137 - 165. https://doi.org/10.1177/00187208211009995.

Ekinci, C. E., & Ekinci, N. (2017). A Study on the Relationships between Teachers' Critical Thinking Dispositions and Their Perceptions of Occupational Professionalism. Educational Process: International Journal, 6(2), 53-78.

Essenfelder, R. (2026). From Enchantment to Responsibility: Cultivating Ethical Action through Critical AI Literacy in Education. In Artificial Intelligence in Education - Creating an Equitable, Creative, and Effective Learning Environment [Working Title]. IntechOpen. https://doi.org/10.5772/intechopen.1012997

Facione, P. A., Facione, N. C., & Ginacarlo, C. A. (1998). The California critical thinking disposition inventory test manual (Revised). Millbrae, CA: The California Academic Press

Facione, P. A., Giancarlo, C. A., Facione, N. C., & Gainen, J. (1995). The disposition toward critical thinking. Journal of General Education, 44(1), 1-25.

Gerlich, M. AI Tools in Society: Impacts on Cognitive Offloading and the Future of Critical Thinking. Societies 2025, 15, 6. https://doi.org/10.3390/soc15010006

Hoff KA, Bashir M (2015) Trust in automation: integrating empirical evidence on factors that influence trust. Hum Factors: J Hum Factors Ergon Soc 57(3):407–434. https://doi.org/10.1177/0018720814547570 Hoff KA, Bashir M (2015) Trust in automation: integrating empirical evidence on factors that influ-ence trust. Hum Factors: J Hum Factors Ergon Soc 57(3):407–434. https://doi.org/10.1177/0018720814547570

Hou, C., Zhu, G., & Sudarshan, V. (2025). The role of critical thinking on undergraduates' reliance behaviours on generative AI in problem-solving. *British Journal of Educational Technology*. https://doi.org/10.1111/bjet.13613.

Irani, T., Rudd, R., Gallo, M., Ricke s, J., Friedel, C., & Rhoades, E. (2007). Critical thinking instrumentation manual. http://step.ufl.edu/resources/critical_thinking/ctmanual.pdf.

JASP Team (2026). JASP (Version 0.96.0) [Computer software]

Körber, M., Baseler, E., & Bengler, K. (2017). Introduction matters: Manipulating trust in automation and reliance in automated driving. *Applied ergonomics*, 66, 18-31. https://doi.org/10.1016/j.apergo.2017.07.006.

Körber, M. (2018). *Individual differences in human-automation interaction: A driver-centered perspective on the introduction of automated vehicles* [Doctoral dissertation]. Technical University of Munich, Munich. https://mediatum.ub.tum.de/1432904

Körber, M. (2019). Theoretical considerations and development of a questionnaire to measure trust in automation. In S. Bagnara, R. Tartaglia, S. Albolino, T. Alexander, & Y. Fujita (Eds.), *Proceedings of the 20th Congress of the International Ergonomics Association (IEA 2018): Volume VI: Transport Ergonomics and Human Factors (TEHF), Aerospace Human Factors and Ergonomics* (1st ed., pp. 13–30). Springer.

Kunze, A., Summerskill, S., Marshall, R., & Filtness, A. (2019). Automation transparency: implications of uncertainty communication for human-automation interaction and interfaces. *Ergonomics*, 62, 345 - 360. https://doi.org/10.1080/00140139.2018.1547842.

Lamm, A. J., & Irani, T. (2025). Critical Thinking Inventory manual. University of Georgia, Athens, CA

Lee JD, See KA (2004) Trust in automation: designing for appropriate reliance. Hum Factors 46(1):50–80 Lee JD, See KA (2004) Trust in automation: designing for appropriate reliance. Hum Factors 46(1):50–80

Lucas, G., Becerik-Gerber, B., & Roll, S. (2024). Calibrating workers' trust in intelligent automated systems. *Patterns*, 5. https://doi.org/10.1016/j.patter.2024.101045.

Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. Academy of Management Review, 20(3), 709–734. https://doi.org/10.5465/AMR.1995.9508080335

Meyer, T. R. (2024). *Purpose, performance, and process influence on airline pilot trust in automation technology: A quantitative study* (Doctoral dissertation). Liberty University. ProQuest Dissertations & Theses Global.

Moray, N., Inagaki, T., & Itoh, M. (2000). Adaptive automation, trust, and self-confidence in fault management of time-critical tasks. *Journal of experimental psychology. Applied*, 6 1, 44-58. https://doi.org/10.1037//1076-898x.6.1.44.

M. Sidorkin, A. (2026). AI-Enhanced Pedagogies: Rethinking Learning, Curriculum, and Human Potential in the Age of Intelligent Machines (1st ed.). Routledge. https://doi.org/10.4324/9781003675143

Ouahani, N.-e., & Mahraj, M. (2025). ChatGPT application in ELT: The international context, the Moroccan context, and future prospects. *Journal of English Language Teaching and Applied Linguistics*, *7*(1), 5. https://doi.org/10.32996/jeltal.2025.7.1.5

Quinn, Courtney E. (2012). Studies on critical thinking for environmental ethics. *ETD Collection for University of Nebraska-Lincoln*. AAI3512814. https://digitalcommons.unl.edu/dissertations/AAI3512814

RICKETTS, J. C. & Rudd, R. D. (2005). Critical thinking of selected you thleaders: The efficacy of critical thinking dispositions, leadership and academic performance. Journal of Agricultural Education, 46 (1), 33-44.

Rudd, R.D., Baker, M.T., & Hoover, T.S. (2000). Undergraduate agriculture student learning styles and critical thinking abilities: Is there a relationship? Journal of Agricultural Education, 41(3), 2-12.

Sheridan, T. (2019). Individual Differences in Attributes of Trust in Automation: Measurement and Application to System Design. *Frontiers in Psychology*, 10. https://doi.org/10.3389/fpsyg.2019.01117.

Suriano, R., Plebe, A., Acciai, A., & Fabio, R. (2024). Student interaction with ChatGPT can promote complex critical thinking skills. *Learning and Instruction*. https://doi.org/10.1016/j.learninstruc.2024.102011.

Wan, Z. H., & Cheng, M. H. M. (2019). Classroom learning environment, critical thinking and achievement in an interdisciplinary subject: a study of Hong Kong secondary

school graduates. *Educational Studies*, *45*(3), 285–304. https://doi.org/10.1080/03055698.2018.1446331

Zhai, C., Wibowo, S., & Li, L. (2024). The effects of over-reliance on AI dialogue systems on students' cognitive abilities: a systematic review. *Smart Learning Environments*, 11. https://doi.org/10.1186/s40561-024-00316-7.

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.

How to cite this article: Dixit, J. & Masih, P.P. (2026). Exploring the Association Between Critical Thinking Disposition and Trust in Automation. *International Journal of Indian Psychology*, *14*(3), 785-794. DIP:18.01.065.20261403, DOI:10.25215/1403.065