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Future-Focused:

Educating in an Era of Continuous Change

Who trusts the bot more as a collaborator? Preliminary findings on demographic and professional characteristics effects on educators' trust in GenAI

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Generative AI (GenAI) offers transformative potential in education, yet the real-world adoption of (Gen)AI in education remains slow and uneven. This study aims to validate a new instrument measuring educators' perceived cognitive and socio-affective trust in GenAI as a collaborator and to investigate if this trust varies across teaching levels, experience and academic qualifications. Inferential analyses such as One-Way ANOVA, nested ANOVA and General Linear Modelling (GLM) were conducted on self-reported data from 212 educators in Singapore. The findings revealed that educators with doctoral degrees in professional/adult education demonstrated the highest cognitive and socio-affective trust, while educators at the primary education level reported the lowest. These findings challenge previous research that reported no significant demographic or professional differences in trust in AI, highlighting the need for designing GenAI and its adoption strategies that are tailored to educators' professional context and training. By identifying educators' trust as a key factor in GenAI adoption, this study advances a human-centred perspective on trust in GenAI, particularly within the context of human-AI collaboration in teaching practice.

Keywords: artificial intelligence, GenerativeAI, GenAI, human-AI collaboration, trust, educators, quantitative

Introduction

Since late 2022, OpenAI's ChatGPT, a Generative Artificial Intelligence (GenAI) application, has sparked enthusiasm and concerns among educators. Despite GenAI's potential, the real-world adoption of AI/GenAI by educators remains slow, partly due to users' trust in AI (Cukurova et al., 2023; Nazaretsky et al., 2022). Emerging studies (e.g., Viberg et al., 2024) suggest that trust in AI may not be uniform but possibly shaped by educator demographics. Therefore, this pilot study aims to validate a new instrument to measure educators' perceived trust in GenAI as a collaborator and to investigate if trust in GenAI varies based on their demographic profiles. While existing studies have examined educators' trust in AI (e.g., Viberg et al., 2024; Cukurova et al., 2023; Nazaretsky et al., 2022), there is insufficient research on trust in collaborative engagement with GenAI, especially within the context of teaching practice. This study seeks to advance the theoretical understanding in this area.

Human-AI Collaboration (HAIC) and Teacher-GenAI Collaboration (TGAIC)

Human-AI collaboration (HAIC) is broadly defined as two or more agents, one human and one computational agent, working together to achieve shared goals (Terveen, 1995). More recent definitions (e.g., Fragiadakis et al., 2024), attempted to differentiate interaction from collaboration, suggesting that authentic collaboration requires mutual goal setting, shared decision-making, co-management of tasks, shared progress tracking, learning from each other and adapting, processes that GenAI systems may only partially fulfil given their current capabilities. Fragiadakis et al. (2024) introduce a typology of HAIC modes, one of which is the symbiotic collaboration, closely aligned to TGAIC. However, in the teaching context, a balanced partnership in symbiotic

collaboration may be rare given GenAI's lack of pedagogical judgement based on real-world classroom context and learners' needs and, to some extent, overestimating current GenAI capabilities. This study conceptualises teacher-GenAI collaboration (TGAIC) as an asymmetrical form of symbiotic HAIC, where the roles and capabilities of humans (educators) and AI (GenAI) are not equally distributed. The asymmetry stems from the educators' agency in exercising pedagogical judgement based on real-world classroom context, which GenAI lacks. TGAIC focuses on how educators collaborate with GenAI through a "two-way interaction, shared decision-making, and a continuous exchange of feedback, aiming to achieve collective goals" (Fragiadakis et al., 2024, p. 4).

Trust in GenAI as a collaborator

Trust, defined as the willingness of a party (trustor) to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor (Mayer et al., 1995), is increasingly recognised as a critical determinant of technology acceptance, especially in contexts like HAIC (Cukurova et al., 2023; Glikson & Woolley, 2020; Nazaretsky et al., 2021, 2022). Trust becomes more salient in TGAIC due to the asymmetrical epistemic relationship between educators and GenAI. Scholars conceptualise trust as comprising both cognitive evaluations of reliability and emotional responses (Hoff & Bashir, 2015). The measurement of trust in this study draws on the conceptual framework by Glikson and Woolley (2020), who conceptualised trust in virtual AI agents like GenAI as comprising cognitive and affective dimensions. To situate trust in TGAIC, Glikson and Woolley's (2020) framework is complemented by Fragiadakis et al. (2024), emphasising elements of collaboration with GenAI. Together, these frameworks underpin this study's instrument design and address a gap in the literature on trust in GenAI in the context of TGAIC.

Aims

This study has two primary aims. First, to develop and validate a new instrument measuring educators' perceived cognitive and socio-affective trust in GenAI as a collaborator. This contributes to the theoretical understanding of trust in GenAI as a collaborator, within the context of teaching practice. Second, to examine if demographic factors such as educators' teaching level and qualifications relate to their perceived trust in GenAI. By addressing these aims, this study provides insights into the measurement of trust in GenAI and the design of targeted approaches for GenAI adoption strategies in education.

Method

This cross-sectional survey study consisted of 36 newly developed 5-point Likert-scale items. Thirty items were based on the subdimensions of Trust in virtual AI (Glikson & Woolley, 2020) - Tangibility (TG), Reliability (R), Transparency (T), Immediacy (I), Task Characteristics (TC, shown only to participants who declared they used GenAI for teaching) and Anthropomorphism (A). Six items on Tasks, Goals, Interactions and Task Allocation of HAIC (Fragiadakis et al., 2024) captured Collaboration (C) between educators and GenAI. Background questions included teaching level, teaching experience, qualifications, and GenAI familiarity. A short vignette was provided to all participants to give them some common context on GenAI in teaching practice. All items were formulated anew for this instrument. Two expert reviewers refined item clarity, scale consistency, and added attention checks for response validity. While existing trust in AI scales (e.g., TAI; Hoffman et al., 2023; TPA; Jian et al., 2000; Nazaretsky et al., 2022) were reviewed, these instruments present limitations as they were developed for non-educational contexts or for a specific teacher population and do not explicitly capture relational trust or the collaboration aspect for TGAIC.

The target population for this pilot study comprised educators across public and private institutions in Singapore, but not limited to Singapore citizens. Convenience sampling was employed via a survey company. Participation was fully voluntary with online consent, with the option to withdraw anytime except after the survey had been submitted, and the survey took less than 10 minutes to complete. Incomplete responses and

those participants who failed attention checks were excluded from the analysis. The final sample comprised 212 educators across diverse educational contexts in Singapore. Most participants taught at secondary (24%) and post-secondary (21%) levels, followed by primary (20%), pre-primary (17%), professional/adult education (14%) and others (3%). The majority held a bachelor's degree (54%), followed by a master's degree (24%) and a doctorate (8%). Teaching experience was similarly varied, with 43% having more than 10 years, 31% between 1-5 years, 23% between 6-10 years and 3% under a year.

Analysis

This pilot study employed Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to validate the structure of the new instrument, Trust in GenAI as a Collaborator scale. EFA was conducted in three phases using SPSS to explore the factor structure and internal consistency of the scale. Maximum Likelihood with Varimax rotation was used for the analysis. Factor loadings below 0.30 were suppressed to enhance interpretability. Listwise deletion was used to handle the missing data. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity were used to evaluate the suitability of the data for factor analysis. For the Confirmatory Factor Analysis (CFA), two models were tested - (1) a first-order 2-factor model and (2) a hierarchical second-order model of six trust subdimensions loaded onto two higher-order factors. The model fit was assessed using several criteria such as χ^2/df ratios (< 3) for adequacy, CFI and TLI (≥ 0.90) for comparative improvement and RMSEA and SRMR (< 0.08) for approximation error and residual size. Following CFA, the secondary analysis was conducted using SPSS to determine if educators' demographic and professional characteristics, specifically teaching level, teaching experience and academic qualifications, influence their perceived trust in GenAI as a collaborator. First, variable recoding was performed to teaching level, qualifications, teaching experience and GenAI familiarity to enable meaningful comparisons in ANOVA. Next, One-Way ANOVA was carried out to test for differences in cognitive and socio-affective trust across the six teaching levels. A separate One-Way ANOVA was also conducted to examine trust differences across the four groups of teaching experience. Assumptions of homogeneity of variances were tested using Levene's Test and confirmed. Significant omnibus F-tests were followed by Tukey HSD post-hoc comparisons to identify specific group differences. Next, a nested ANOVA was conducted within the highest trusting group to examine if there are any differences in their perceived trust in GenAI based on academic qualification. Lastly, a General Linear Model (GLM) was tested using teaching level, teaching experience and qualifications as fixed factors and both trust dimensions as dependent variables, assessing the main and interaction effects. GenAI familiarity was excluded as its purpose was to serve as a branching logic for the TC items.

Results

Factor structure

Phase 1 (N=84), with all items yielded an interpretable 2-factor structure comprising Cognitive (TG, T, R, I) and Socio-Affective (A, C, TC) factors, explaining 63.83% of the variance. Phase 2 (N=212), excluding TC items, yielded a clear 2-factor structure that emerged with items loading significantly on Cognitive trust (TG, T, R, I) and Socio-Affective trust (A, C). This 2-factor model is consistent with the cognitive and affective dimensions of trust outlined in Glikson & Woolley's (2020) framework and reinforces that trust in Fragiadakis et al.'s (2024) framework for human-AI collaboration is relational. Moreover, the KMO = 0.966 indicated an excellent adequacy, and the Bartlett's Test of Sphericity was χ^2 (465) = 5255.172, $p < 0.001$, confirming that the correlations between items were significantly large for EFA. Phase 3 (N=84), solely on TC items, yielded a strong single factor, suggesting that TC items are psychometrically cohesive and may function as a standalone construct, although conceptual overlap with Socio-Affective trust (phase 1) conflicts with Glikson & Woolley's (2020) theoretical perspective of TC as cognitive trust. Therefore, given the conceptual overlap and conflicting theoretical positioning, the TC items were excluded from the final CFA model and the finalised instrument. Internal consistency exceeded the threshold of 0.70 for all 3 phases (phase 1 a = 0.963; phase 2 a = 0.974; phase 3 a = 0.793). Based on these results, the phase 2 2-factor model, excluding TC items, was retained for CFA. The CFA confirmed the hierarchical 2-factor model, exhibited good fit based on χ^2 = 764.350, CFI = 0.934,

TLI = 0.928), and lower RMSEA = 0.061. Although best practice recommends using different sample sets for EFA and CFA, due to the study's exploratory nature and limited sample size, the same dataset was used for both EFA and CFA analyses.

Demographics and professional characteristics effects on trust in GenAI

Significant group differences were found in cognitive trust ($F(5, 206) = 3.89$, $p = 0.002$) and socio-affective trust ($F(5, 206) = 6.56$, $p < 0.001$) across teaching levels. Educators in professional/adult education and post-secondary education reported the highest in both trust dimensions, while primary and pre-primary educators reported the lowest in both trust dimensions. Tukey HSD post-hoc tests confirmed that professional/adult education educators had significantly higher trust than primary educators in both dimensions ($p < 0.01$), and higher socio-affective trust than secondary and pre-primary educators ($p < 0.05$). Secondary educators ranked third in both trust dimensions but were not statistically different from other groups. In terms of teaching experience, a significant effect was observed for cognitive trust ($F(3, 208) = 3.01$, $p = 0.031$) and socio-affective trust ($F(3, 208) = 3.71$, $p = 0.012$). Educators with more than 10 years of teaching experience reported the highest levels of trust in both dimensions, followed by those with 6-10 years, while novice educators (< 1 year) reported the lowest trust. Post-hoc comparisons using Tukey HSD revealed that educators with over 10 years of experience had significantly higher trust than those with 1-5 years ($p < 0.05$).

Discussion

The secondary analysis findings suggest that prolonged teaching experience may contribute to increased trust when collaborating with GenAI, probably due to more established pedagogical, technological, content and contextual knowledge (TPACK; Mishra & Koehler, 2006) and stronger pedagogical judgement when working with novel technology. The nested ANOVA revealed that within the professional/adult education group of educators, those with doctoral degrees reported the highest in both trust dimensions. This suggests that in the Singapore context, professional role, context-specific pedagogical needs, and academic training may influence their perceived trust in GenAI as a collaborator. The GLM confirmed that both teaching level and academic qualifications had significant main effects but no interaction effect.

These findings contrast with those of Viberg et al. (2024), who reported no significant differences in teachers' trust in AI-EdTech based on demographic and professional characteristics such as age, gender, level of education, the subject they teach or experience using digital tools in education in a cross-national sample (Brazil, Israel, Japan, Norway, Sweden, USA). The divergence may reflect Singapore's more stratified educator roles and policy-driven emphasis through funding, such as SkillsFuture, to provide financial support for adults to be relevant and upskilled for future-ready workplaces. Moreover, the doctorate degree group may perceive GenAI's potential more clearly due to their research orientation and more experienced educators may have developed a clearer understanding of their instructional goals, making them more discerning yet confident to collaborate with GenAI. However, future research should consider including additional variables such as GenAI familiarity, subject-taught, and cultural orientation to better explain the variation in trust across contexts. Lastly, as Hoff and Bashir (2015) caution, early trust in technology may reflect a positivity bias due to the novelty rather than a tested understanding of capabilities. Thus, future research should not rely on cross-sectional, self-reported data to assess trust in GenAI by considering longitudinal studies collecting behavioural data on actual interactions.

Conclusion

Overall, this study has two significant contributions to this field. First, it validated a novel instrument measuring educators' perceived cognitive and socio-affective trust in GenAI as a collaborator underpinned by theoretical frameworks in human-AI collaboration and trust in AI. The hierarchical two-factor structure, revealed through EFA and CFA, demonstrates strong psychometric properties, providing a foundation for trust

in GenAI research. Second, the findings reveal that educators' perceived cognitive and socio-affective trust in GenAI as a collaborator is not uniformly distributed but varies significantly by teaching level and academic qualifications. These findings suggest that professional context and academic training play a role in influencing both the trust dimensions, diverging from prior cross-national research that reported no demographic differences. This study underscores the need for targeted, context-specific strategies to promote the meaningful and sustainable adoption of trustworthy GenAI in education.

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Appendix

The full survey used can be accessed via this link.

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Thilarajah, S., Ali, F. & Divaharan, S. (2025). Who trusts the bot more as a collaborator? Preliminary findings on demographic and professional characteristics effects on educators' trust in GenAI. In Barker, S., Kelly, S., McInnes, R., Johnson, T. & Dinmore, S. (Eds.), *Future Focussed. Educating in an era of continuous change*. Proceedings ASCILITE 2025. Adelaide (pp. 332-337). https://doi.org/10.65106/apubs.2025.2671