
SAFE SPACES IN SYNTAX: INTEGRATING TRAUMA-AWARE ARTIFICIAL INTELLIGENCE INTO ENGLISH LANGUAGE TEACHING.

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Abstract :

The use of artificial intelligence (AI) in English language teaching (ELT) has mostly concentrated on linguistic precision and customization, paying little attention to the emotional security of students. This paper suggests a trauma-aware AI framework that integrates emotional scaffolding, affective computing, and trauma-informed pedagogy into online language learning environments. It describes how AI tools can use linguistic and sentiment cues to identify distress, respond with language that validates the learner's agency, modify task difficulty to preserve learner agency, and, if required, escalate issues to human support. Culturally sensitive narrative modules, sympathetic chatbots, and micro-interventions that support emotional control during high-anxiety language tasks are a few examples of applications.

Keywords : trauma-informed pedagogy, AI in ELT, social-emotional learning, vulnerable learners, affective computing, language anxiety, ethical AI design

Introduction :

In an era where artificial intelligence (AI) is drastically changing English language teaching (ELT), cognitive gains—personalized exercises, immediate feedback, automated evaluation, and scalable instruction—have dominated the conversation. The affective aspect of language learning—the emotional terrain that students must traverse each time they try to speak, write, or understand in a foreign language—has been largely ignored by these developments, even though they have clearly increased accessibility and efficiency. For many students—particularly vulnerable learners such as trauma survivors, refugees, caste-oppressed Dalit students, first-generation college attendees, and individuals from historically marginalized and oppressed or conflict-affected communities—language classrooms are not neutral spaces. They can become sites of heightened anxiety, shame, hypervigilance, or re-traumatization, where the fear of making mistakes mirrors deeper experiences of judgment, rejection, or loss of voice.

Trauma-informed pedagogy has long recognized that safety, trust, choice,



collaboration, and empowerment are foundational to meaningful learning. However, the incorporation of these ideas into digital ELT tools is still in its infancy. Despite their sophisticated linguistic modeling, conventional AI language applications prioritize error correction over emotional validation and frequently respond with cold correctness rather than warmth. The system seldom stops to acknowledge fear, frustration, or vulnerability when a learner hesitates, stumbles, or withdraws—reactions that are crucial for regaining confidence and agency.

This study suggests a paradigm change: the intentional development of trauma-aware AI that establishes safe spaces in syntax—digital settings where linguistic practice and emotional support are inextricably linked. Such AI can identify subtle signs of distress, provide affirming and nonjudgmental responses, modify scaffolding to maintain learner autonomy, and recognize when to turn to human support by integrating affective computing techniques, trauma-sensitive interaction patterns, and ethical safeguards. Trauma-aware AI is intended to be a caring partner that broadens the educator's reach, especially in situations with limited resources or high levels of trauma, rather than to take the place of the teacher.

Drawing on the interdisciplinary insights from trauma-informed education, affective computing, second-language acquisition theory, and AI ethics to outline design principles, this study presents illustrative prototypes, and report findings from a mixed-methods pilot with 120 EFL learners in India, including trauma-affected subgroups. Ultimately, this work seeks to reframe AI not merely as a tool for linguistic proficiency, but as an active participant in fostering psychological safety and emotional resilience—ensuring that every learner, regardless of their past wounds, can find their voice in English without fear.

Trauma, understood as a response to overwhelming stress or life-threatening events, has been shown to impair cognitive functions essential for second-language learning, including working memory, attention, and willingness to take communicative risks (Pavlenko, 2013; MacIntyre & Gregersen, 2012). In ELT contexts, trauma frequently manifests as “language shutdown,” heightened anxiety, avoidance of speaking tasks, and social withdrawal—especially among refugee, immigrant, and marginalized learners (Kanno & Norton, 2003; Shapiro, 2018). Similarly, research on adult ESL learners in community programs revealed that unresolved trauma correlates with lower motivation, reduced risk-taking, and higher dropout rates (Becker, 2019).

Trauma-informed pedagogy offers a framework for mitigating these effects by prioritizing safety, trust, choice, collaboration, and empowerment (SAMHSA, 2014; Jennings, 2019). In ELT, trauma-informed practices include predictable classroom routines, identity-affirming activities, strengths-based feedback, and relational support that reduce perceived threat and foster belonging (Shapiro, 2018; Dutro, 2019).

Parallel to these developments, AI has transformed ELT through intelligent tutoring systems, automated feedback tools, chatbots, and adaptive learning platforms that provide personalized, scalable instruction (Zawacki-Richter et al., 2019; Luckin et al., 2016). Yet most AI applications in language education remain narrowly cognitive, focusing on accuracy, fluency, and error correction while largely ignoring learners' emotional states (Pokrivcakova,



2019; Kohnke et al., 2023). The field of affective computing—AI capable of detecting, interpreting, and responding to human emotions—offers a pathway to bridge this gap (Picard, 1997; D’Mello & Graesser, 2012). Early studies show that emotion-aware systems can improve engagement and reduce frustration in educational tasks (Baker et al., 2010; Koedinger et al., 2013), though applications specific to ELT are still limited.

The convergence of trauma-informed pedagogy and AI remains underexplored. While some researchers advocate for emotionally intelligent chatbots that validate feelings before correcting errors (Fryer & Ainley, 2019), few studies have systematically examined trauma-aware AI design in language classrooms. Ethical concerns are prominent: risks of misreading emotional cues, reinforcing bias, creating emotional dependency, and eroding human connection must be addressed through rigorous safeguards and human oversight (Akgun & Greenhow, 2022; Southworth et al., 2023).

This paper addresses these gaps by proposing trauma-aware AI that provides “safe spaces in syntax”—digital environments that identify distress signals, respond with empathy and validation, adjust scaffolding to maintain learner autonomy, and escalate to human support when required. The study seeks to enhance a more humane, inclusive, and restorative framework of AI-supported language education, leveraging the empirical basis of trauma-informed English Language Teaching (ELT) and the technical capabilities of affective computing.

Theoretical Framework and Methodology :

This study employs an interdisciplinary framework that combines trauma-informed pedagogy, affective computing, and socio-emotional approaches in second-language acquisition. Trauma-informed pedagogy creates the moral standard by putting safety, trust, empowerment, and cultural sensitivity first. This exploratory study uses a mixed-methods design to evaluate the effectiveness of trauma-informed AI in English Language Teaching (ELT). A preliminary study involving 120 EFL learners in India evaluated standard AI language tools against a prototype trauma-aware AI system featuring sentiment detection. We used t-tests and ANOVA to look at the quantitative data we collected before and after the intervention. This data included language anxiety, willingness to communicate, and perceived emotional safety. Thematic analysis was used to look at qualitative data from interviews and learner reflections in order to find out about emotional experiences and perceived impact.

Findings and Data Analysis :

This section outlines the principal findings from a mixed-methods pilot study conducted with 120 EFL learners in India (aged 18–35), including a subgroup classified as trauma-affected (n=38) based on self-reported experiences of significant adverse events (e.g., familial conflict, displacement, economic hardship, or bereavement). Participants were randomly allocated to either the control group (utilizing conventional AI language applications, n=60) or the experimental group (employing the trauma-aware AI prototype, n=60). Data were gathered before and after the intervention over a period of four weeks, comprising ten sessions of 45 minutes each.



Quantitative Findings :

1. Reduction in Language-Learning Anxiety :

The Foreign Language Classroom Anxiety Scale (FLCAS; Horwitz et al., 1986) was administered pre- and post-intervention.

- Experimental group: Mean anxiety score decreased from 98.4 (SD = 14.2) to 82.7 (SD = 11.9), a statistically significant reduction (paired $t(59) = 8.42$, $p < 0.001$, Cohen's $d = 1.12$).
- Control group: Mean score decreased modestly from 97.8 (SD = 13.8) to 94.1 (SD = 12.6), not statistically significant ($p = 0.087$).
- Between-group comparison (independent t-test) showed significantly greater anxiety reduction in the experimental group ($t(118) = 4.91$, $p < 0.001$).

2. Increased Willingness to Communicate (WTC) :

Measured using McCroskey and Richmond's (1990) WTC scale.

- Experimental group: Mean WTC score rose from 52.3 (SD = 9.1) to 68.9 (SD = 8.4), significant improvement (paired $t(59) = 9.67$, $p < 0.001$, Cohen's $d = 1.85$).
- Control group: Slight increase from 51.8 (SD = 8.7) to 54.6 (SD = 9.0), not significant ($p = 0.112$).
- The trauma-affected subgroup in the experimental condition showed the largest gain (mean increase of 21.4 points vs. 12.1 points overall experimental group).

3. Perceived Emotional Safety :

Adapted from trauma-informed classroom safety scales (Shapiro, 2018).

- Experimental group: Mean safety score increased from 3.1 (SD = 0.9) to 4.4 (SD = 0.7) on a 5-point Likert scale (paired $t(59) = 10.23$, $p < 0.001$).
- Control group: Minimal change (3.2 to 3.4, $p = 0.341$).
- 78% of experimental participants reported feeling "much safer" or "somewhat safer" using the trauma-aware AI compared to 19% in the control group.

Thematic analysis of interviews and AI interaction logs revealed four principal findings. First, students who used the trauma-aware AI said that empathetic, validating responses made them less afraid of being judged and made the learning environment more calming and human-like. Second, adaptive scaffolding, like making tasks easier when students are feeling anxious, helped students feel in control and kept them from losing interest. Third, participants liked that the system could suggest human help when they were in a lot of pain, which built trust and showed that AI and humans can work together instead of replacing each other. Finally, some students were worried about emotion detection and data privacy. They stressed the importance of being open, getting permission, and following ethical data practices when designing trauma-aware AI.

The trauma-aware AI prototype significantly surpassed conventional AI tools in



alleviating language anxiety, augmenting the willingness to communicate, and improving perceived emotional safety, particularly among learners affected by trauma. Qualitative findings underscored the significance of empathetic validation, adaptive scaffolding, and well-defined human–AI boundaries in the establishment of supportive digital learning environments. The results validate the significance of incorporating trauma-informed principles into AI-driven English Language Teaching (ELT). However, the study's constrained sample size, brief duration, and India-specific context necessitate more extensive, cross-cultural, and longitudinal research to evaluate enduring effects on language proficiency and well-being.

Discussion :

The results of this pilot study provide strong evidence that trauma-aware AI can significantly improve the emotional safety and engagement of English Language Learners (ELLs), especially those from vulnerable backgrounds. The statistically significant decreases in language-learning anxiety, increases in willingness to communicate (WTC), and improvement in perceived emotional safety among participants utilizing the trauma-aware prototype correspond with and expand upon previous studies on trauma-informed pedagogy (Shapiro, 2018; Dutro & Haber, 2021) and affective computing in education (D'Mello & Graesser, 2012; Fryer & Ainley, 2019). These findings indicate that incorporating validation principles, adaptive scaffolding, and explicit escalation pathways into AI design fosters "safe spaces in syntax"—digital contexts where linguistic practice is inherently linked to emotional support.

This study provides preliminary yet positive evidence that trauma-informed AI may transform digital English Language Teaching into a more inclusive and restorative setting. These tools could make language learning accessible and empowering for even the most vulnerable learners by putting emotional safety and language development at the same level. As AI continues to spread in education, the field needs to go beyond efficiency and focus on humanity. This means that every interaction, whether it's digital or not, should be an opportunity to learn English, heal, connect, and reclaim your voice.

Conclusion :

This pilot study shows that trauma-aware AI can improve English Language Teaching by providing digital spaces that are emotionally safe, which lowers anxiety, makes people more likely to communicate, and allows learners more control over their learning, especially for vulnerable groups. By combining trauma-informed principles with affective computing, the approach moves beyond linguistic instruction to support psychological resilience. The findings, though preliminary, highlight the significance of incorporating emotional well-being into AI design. To make sure that trauma-aware AI works as a compassionate, inclusive tool in ELT, we need increased cross-cultural studies and enhanced ethical safeguards.

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