



Gendered Language Use in AI-learner Discourse: A Study of Iranian Upper-Intermediate EFL Learners' Interactions with Gendered AI Personas

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Abstract

Artificial intelligence now shows up regularly in language classrooms. People usually see it as just technical help, not as any social actor. Studies have given little notice to the way learners treat AI conversation partners as gendered figures or carry their usual cultural habits into those exchanges, especially inside EFL settings. The present work took that gap as its starting point. The study looked at Iranian upper-intermediate EFL learners while they held text chats with chatbots that carried clear male or female identities. Focus stayed on changes in word selection, stance toward the other speaker, and how learners placed themselves in the talk. Performance scores were never the point. The aim was to watch what happened to language once gender signals appeared in a non-human partner. Thirty learners joined, ages 18 to 35. Fifteen were women; fifteen were men. All shared upper-intermediate proficiency. Each person did two fixed chat sessions: one with the male AI, one with the female AI. Thirty full transcripts resulted. Tasks kept a set structure designed to push normal back-and-forth. The analysis leaned heavily on qualitative methods. Feminist Critical Discourse Analysis guided the work, along with Identity Theory and Intercultural Communication Theory. Frequency counts of selected features appeared only to back up the main observations. Gender registered fast. The female AI drew more polite forms, cautious phrasing, and friendly gestures. The male AI prompted blunt statements, less softening, and heavy task orientation. Iranian cultural patterns held firm. Indirect expressions, respect for status differences, and face-saving moves moved straight into the AI conversations. AI language practice does not wipe out gender or culture. Learners bring those frames along and keep using them. EFL programs that add AI without close inspection stand to lock in old gender expectations within supposedly modern tools. Close examination of these patterns remains necessary.

Keywords: feminist critical discourse analysis, gendered AI personas, identity positioning, intercultural communication in EFL

1. Introduction

Artificial intelligence has, in recent years, been a defining force in digital language learning ecologies, reshaping the way EFL learners interact with communicative tools, autonomous learning

platforms, and conversational agents. As AI-driven intelligent conversational agents, including ChatGPT, Replika, and other LLM-based technologies, continue to grow in adoption, the design of educational spaces on the internet has shifted drastically away from being exclusively task-based and toward being dialogic and social spaces where learner-constructed identities and collaborative negotiation occur (Fathi et al., 2010; Veletsianos et al., 2024; Wang et al., 2023; Yang et al., 2024). As such, these developments create additional opportunities for learners to engage with transformative ideologies that are embedded in both the design of those platforms and through the co-creation of interpersonal relationships with AI systems. However, despite this rapid integration, little is known about how learners themselves project gendered expectations onto AI interlocutors and how such expectations shape interactional behavior.

A growing body of evidence shows that the interaction between learners and AI reflects many of the established features of human communication. There are outcomes from the findings in AI-mediated conversations and human conversations that show the use of gendered language, politeness strategies, and identity cues in both types of conversations (Fathi et al., 2024; Veletsianos et al., 2024; Yang et al., 2024). These outcomes provide further support to a significant amount of research in feminist linguistics, indicating that language is used to convey social values and reinforce gender-based power relationships (Kiani et al., 2023; Lazar, 2005; Simon, 2003). Feminist critical discourse analysis places emphasis on how lexis, evaluative language, and discursive structure create gendered meanings within institutional and technological contexts (Kiani et al., 2023; Lazar, 2005; Wodak and Meyer, 2009). This sets up important questions as to how the gendered dynamics of AI systems shape learners' communicative experience.

In parallel investigations of translation science, computational linguistics, and AI ethics, it has been shown that prejudice embedded into extensive training sets is reflected in machine translation and generative language models (Al Sammarraie, 2024; Ghosh & Caliskan, 2023; Paolucci et al., 2023; Villanueva-Jordán & Sales-Salvador, 2024). The AI-generated language produced from these systems also reflects the cultural and societal context of the training sets that the AI system learned from. As a result, AI-generated language may reflect or perpetuate the ideological views that underlie the way humans communicate with one another. The artificial intelligence (AI) system creates stereotypes of individuals based on language usage, as well as where that person fits in the context of a conversation, when it is generating language (Lee, 2023; Mohamed et al., 2024; Soundararajan et al., 2023).

This phenomenon is particularly prevalent within cultures such as Iran, where gender norms, social hierarchies, and definitions of politeness create barriers for individuals when trying to interact with one another and to meet their communicative expectations. Sociocultural approaches to LS see that language is socially constructed and, as such, is a means for social investment (McKinney & Norton, 2024; Norton, 2013). Learners, for example, are exposed to AI-built personas in AI-mediated communication that display gendered linguistic cues that stimulate learners to reconsider how they identify and participate in reference to constructed gender-based identities (GodwinJones, 2024; Veletsianos et al., 2024). Gendered linguistic markers in AI output can thus affect the positioning of learners and their acts of alignment or resistance to the AI projected persona, and thus the resultant navigation of symbolic capital and interpersonal expectations within digital interaction (Fathi et al., 2024). These dynamics are salient particularly in Iran, where gendered communication norms and

politeness strategies are culturally codified and may influence learners' reactions to male and female AI personas. In the Iranian context, where gendered communication norms are embedded in everyday interaction, learners may transfer these expectations onto AI personas even in the absence of real human interlocutors.

Despite extensive work on AI bias and EFL digital interaction, no study has systematically examined how Iranian learners' gendered discourse patterns emerge in direct interaction with explicitly gendered AI personas. Despite the growing body of scholarship in AI-mediated learning, there are still a number of gaps that exist. Very little empirical work has been conducted that explores the mutual operation of these dynamics with respect to EFL learners working directly with gendered AI personas, especially within non-Western sociocultural environments. There is still a great deal to learn about how learners in Iran experience gendered AI discourse, identity negotiation, and cultural norms of communication, as little research has been conducted in this field. With the emergence of AI technology in class and the significance of being cognizant of communication approaches toward each other regarding gender, this specific aspect holds critical importance.

To address this gap, the present study investigates how gendered linguistic features and identity positioning emerge when Iranian upper-intermediate EFL learners interact with male and female AI personas. In this study, gendered AI personas are operationalized through measurable linguistic cues—including lexical selection, interactional routines, address forms, and culturally recognizable discourse patterns—that enable learners to perceive an AI agent as “male” or “female.” In this study, gender was not treated as a visual or biological attribute but as a discourse construct, instantiated entirely through linguistic cues. Using three related theories to frame this research: Feminist Critical Discourse Analysis (FCDA) provides a lens through which to study discourse relating to gender and power relations; Identity Theory helps to describe the ongoing negotiation between learners as they develop the type of agency afforded by their own agency; and Intercultural Communication Theory allows us to understand better the way in which interactional expectations that are instilled by Iranian sociocultural norms (Hall, 1976; Kramsch, 1998; Scollon & Scollon, 2001) affect the interaction between learners and AI. These three theoretical frameworks will provide a strong analytical lens to examine how gendered AI communication impacts the linguistic behaviour of learners, their identity work, and their critical engagement with the technologies of the internet.

A population of Iranian upper-intermediate English learners was chosen for inclusion in this study because they possess enough command of English to be able to communicate effectively and demonstrate appropriate linguistic and pragmatic development. By virtue of this proficiency level, there is adequate syntactic and pragmatic variability in their production of English to enable the analysis of the features of gendered discourse without the potential for ceiling effects that might occur in studies of advanced language learners. This study investigates written, text-based exchanges in line with a micro-level analysis of lexeme choice, pronoun use, politeness markers, stance-taking, and identity cues embodied in the learner–AI discourse. The investigation recognizes its limitations, such as exclusion of paralinguistic features and the constant evolution of AI systems, by putting the emphasis on depth of qualitative interpretation consistent with discourse-analytic research traditions (Lazar, 2005; Wodak & Meyer, 2009).

By situating learner–AI discourse within a gendered, culturally specific framework, the study contributes to a more comprehensive understanding of how sociocultural ideologies are reproduced, challenged, or transformed within AI-mediated language interaction. This study demonstrates that with regard to EFL (English as a Foreign Language) education in culturally situated contexts, the effect of gendered AI avatars on learners’ engagement and digital literacy can be seen. Additionally, as an extension of this idea, how these technologies affect and intersect with Iranian cultural ideologies will help direct more detailed pedagogical and ethical considerations regarding the use of AI in language education. The current study aimed at determining specific linguistic forms employed to indicate the presence of gender patterns occurring within an interaction mediated by AI technologies. Particular emphasis was devoted to recurrent linguistic forms, such as politeness, mitigation, stance, and directives, depending on the selected gender persona of the AI dialog partner.

The second goal was related to identity work. In the study, the process by which Iranian upper intermediate EFL students constructed and negotiated their sense of self while interacting with male and female AI personas was explored, as well as the alignment, authority, and interpersonal positioning dynamics in specific contexts of interaction. The study examined the role of sociocultural background as well, focusing in particular on how Iranian social values and norms of intercultural interaction might guide learner responses to gendered AI discourse, where patterns regarding indirectness, hierarchy, and face management were considered to be of critical importance.

Lastly, the objective of this study was to assess whether the students reinforced or changed the prevailing gender ideologies during their interaction with the AI. This objective was used in the analysis of the occasions when the students conformed or did not conform to the various gender stereotypes.

2. Literature Review

Prior to today’s advancement of AI and human-to-machine communications technologies, gender-specific language (such as gender-neutral pronouns) was widely researched in the fields of gender linguistic studies, sociocultural linguistics, and critical discourse analysis. However, the Research focus is now shifting to include Technologies such as AI, exploring how individual (personal), group (collective), social (place), and belief (ideology) identities are created through interactions within digital environments (Bailey et al., 2024). The present review, therefore, weaves together three bodies of literature—gendered language, AI-mediated communication, and identity negotiation in EFL contexts—in order to lay the theoretical groundwork for the current study. Yet, despite the increasing presence of AI interlocutors in learning spaces, little is known about how learners themselves project gendered expectations onto these systems and how such expectations shape their linguistic behavior.

Early feminist linguistic research indicated that language was inseparable from the social construction of gender ideology. Discourse practices in Iran are primarily influenced by politeness, hierarchy, and indirectness, but to some extent, the conventions guide how discourse happens between individuals. Simon (2003) states that translation and textual mediation can reflect patriarchal ideologies embedded in our language. These understandings are particularly consequential for language technologies; AI systems inherit and reproduce these ideological patterns through corpora deeply rooted in human-generated texts.

Recent scholarship has therefore turned toward gender-neutral and gender-fair language alongside growing concern that AI may perpetuate discriminatory patterns. These concerns extend directly to human–AI interaction, where gender cues are not biologically given but linguistically constructed. For this study, gendered AI personas are defined as agents whose perceived gender is established through systematically observable linguistic cues, such as lexical choices, self-referential expressions, interactional routines, address forms, and culturally patterned discourse styles. These cues enable users to ascribe masculine or feminine identities to ostensibly neutral machines. This framing is in line with the empirical work highlighting that discriminatory translation practices persist in digital systems (Villanueva-Jordán & Sales-Salvador, 2024) and that institutional constraints inhibit the implementation of gender-fair linguistic practices (Paolucci et al., 2023).

Large language models like ChatGPT have greatly revolutionized digital communication; simultaneously, however, they reflect those social biases that are integrated into their training data. Gendered meaning does not emerge by itself; it emerges from the interaction between linguistic choice, technological mediation, and expectations about gender roles. Empirical studies confirm that this is a serious concern: Ghosh and Caliskan (2023) show gender bias in AI translation tasks, and Soundararajan et al. (2023) point out how gender representation changes with respect to task design. The related field of translation studies evidences similar findings that AI-powered translation systems encode ideological assumptions entailed in their training corpora (Lee, 2023; Mohamed et al., 2024). Yang (2022) and Mohsen (2024) further confirm the presence of gendered linguistic bias in state-of-the-art models. While this is the case, few studies have investigated the actual effects of such biases on learners in pedagogical settings. Given Iran's culturally transmitted norms relating to politeness, hierarchy, and expectations regarding gender, these biases may manifest themselves differently in Iranian EFL learners' interactions with AI compared to those in Western contexts.

AI-facilitated environments have been found to enhance engagement, confidence, and communicative competence among EFL learners (Fathi et al., 2024; Yang et al., 2024). Simultaneously, the AI-mediated communication brings into effect new social spaces in which learners negotiate identities and agency. Godwin-Jones (2024) refers to this process as “distributed agency,” whereby control over discourse is shared between human and machine. Discourse-analytic approaches to technology-mediated communication reveal learners’ cognitive, affective, and strategic processes (Costley & Lange, 2016; Hemphill, 2010; Keskin et al., 2023). These, therefore, suggest that interactions with AI may constitute authentic forms of classroom discourse.

Particularly in English as a Foreign Language (EFL) research, there is evidence not only of lexical differences between male/female communicators, but also within other features of communication: Discourse Style, Rhetorical Strategy, Turn Management, and Pragmatic Norms (Almuhailib, 2023; Diabah, 2023). In addition to these differences within the way that male/female communicators communicate, there have also been documented differences between how men and women communicate in terms of Assertion, Rhetorical Option, and Stereotype Reproduction in Learner Discourse. Media Linguistics also illustrates the mechanisms of encoding gender Ideology through evaluative Language (Kiani et al., 2023). Such findings highlight the pertinence of investigating gendered discourse in human–AI communication.

Within language learning theory, identity is understood as dynamic, negotiated, and socially constructed (McKinney & Norton, 2024; Norton, 2013). Learner–AI interaction can therefore be

conceptualized as identity work in which learners position themselves in relation to gendered AI personas. FCDA enables an analysis of how gendered power relations appear in discourse; Identity Theory explains how learners align with or resist AI-projected identities; and Intercultural Communication Theory situates these processes within sociocultural norms governing communication in Iran (Hall 1976; Kramsch 1998; Scollon & Scollon 2001). In this study, identity is thus conceptualized as an emergent positioning practice visible through learners' linguistic choices during interaction with gendered AI entities.

In fact, Iranian sociocultural norms, such as collectivism, contextuality, politeness, indirectness, and communicative hierarchy, may shape the expectations of the learners entering into digital interaction. These might have an influence on how learners interpret, reproduce, or challenge gendered cues in AI communication. Empirical studies evidence that Iranian learners' discursive practice is built upon expectations related to respect, deference, and relational positioning (Alghamdy, 2024; Hall, 1976), further reinforcing the necessity for a culturally located analysis.

Recent research in AI-mediated language learning has further shown that while technologies such as virtual reality and AI-assisted translation systems offer new opportunities, they also reveal limitations in capturing pragmatic and cultural dimensions (Metwally et al., 2024; Prakash & Rajendran, 2022). Though interest in gender bias and learner identity in digital communication has increased, the empirical work considering gendered AI personas with respect to Iranian EFL learners remains scarce. Most studies currently focus either on technological bias or on pedagogical outcomes, leaving unexamined the intersection of gendered AI discourse, identity negotiation, and intercultural norms. This gap is of particular significance given that there are culturally specific expectations in Iran about politeness, hierarchy, and gender roles.

The aforementioned themes suggest that we need an integrated analysis of the ways in which gendered AI discourse influences the identity positioning of learners living within the socio-cultural framework of Iran. This area has received little theoretical or empirical attention. Therefore, this research will investigate how the upper-intermediate EFL learner of Iran interprets, reproduce, challenge, or reconfigure the gendered meanings communicated through AI personae during their interactions with AI. Put differently, the present study sits at the nexus between gendered linguistic practices, AI-mediated communication, and Iranian sociocultural norms in order to address this important gap in the literature.

3. Research Questions

The questions answered within this study are:

1. How did Iranian upper-intermediate EFL learners use and respond to gendered language when interacting with gendered AI personas?
2. How did cultural values and intercultural communication standards impact the gendered discourse and positioning of identity among the learners in AI-mediated communication?

4. Methodology

This study used a qualitatively driven research design underpinned by CDA, supplemented with thematic coding and descriptive quantitative counts. The qualitative orientation was necessary for

unpacking the identity positioning, gendered discourse features, and ideological assumptions embedded in learner–AI interaction phenomena that call for interpretive depths rather than inferential statistical testing (Costley & Lange, 2016; Veletsianos et al., 2024). Descriptive frequency counts were added as a supplementing analytical layer to trace systematic linguistic patterns across interactions with male and female AI personas, which allowed for comparative observation without shifting the epistemological grounding of the study. This mixed but qualitatively prioritized design enabled nuanced discourse interpretation while allowing transparent reporting of recurring features (Lee, 2023; Soundararajan et al., 2023).

4.1 Participants

The participants consisted of 30 Iranian upper-intermediate (CEFR B2) EFL learners, purposively selected for rich and analyzable discourse data production. It was advertised in three private language institutes and one university-affiliated language center in Bandar Abbas through classroom announcements and online notices. Interested learners were filtered in by explicit inclusion/exclusion criteria, which aimed to ensure linguistic comparability for the survey participants while minimizing prior exposure to AI. To verify the participants' proficiency level, they were asked to take the Oxford Online Placement Test and then went through a brief oral interview (Mohsen 2024). As per the criteria in Gendered Discourse Analysis, the participants included only students who were at the B2 level, because this level allows for the completion of necessary tasks such as negotiating politeness and making a stance, as well as participating in Identity Work. Participants had to be between 18 and 35 years old, have Iranian citizenship, and have resided in Iran during the data gathering phase. They also had limited or moderate experience using AI chatbots. To qualify for inclusion, they could not have a level below B2 or above C1; they must not have lived in an English-speaking context for two or more consecutive years; and they must agree to have their interaction data analyzed in order to avoid creating ceiling effects on pragmatic performance in C1 students that can mask gendered discourse patterns, the higher-level (C1) student was not included in the final sample.

The sample consisted of equal numbers of 15 female and 15 male participants, with no non-binary individuals found in the sample. The participants' mean age was 23 years ($SD = 3.4$). Participants represented a range of educational backgrounds and occupational statuses. They had a range of degrees and jobs. Supplemental background variables collected to support contextual interpretation included English exposure, prior AI familiarity, and social media use (Keskin et al., 2023). Sample size allowed for diversity while maintaining manageability for CDA and identity-oriented qualitative interpretation (Crump, 2014; Silva, 2010). Gender distribution was balanced intentionally to enable clearer qualitative comparisons of discourse patterns across learner groups.

4.2 Instruments and Materials

The research employed three instruments: (1) gendered AI Personas, (2) interactive prompts, and (3) demographic questionnaires. Gendered personas were male and female; both had the same linguistic architecture (e.g., words), formatting (e.g., font and overall graphic layout), computational abilities (e.g., number of cores), and updated knowledge base (e.g., Wikipedia). The manipulated distinction (independent variable) experienced by participants was only related to gendered persona framing by way of self-introduction, name, first-person gendered references, and the use of gender-indexed examples. For instance, the female avatar used affiliative self-referential expressions like "I'd be happy to help" or "I'm glad you shared that." In contrast, the male avatar used more neutral task-

oriented variants like "I can assist with that" or "Please provide the text." Functional equivalence was preserved while introducing gender-indexed stylistic cues. There were no visual and/or sound clues; thus, any participant's perception of a given persona's gender was derived solely from linguistic presentation. To strengthen the internal validity of the research, non-gender aspects of both personas, such as tone, syntactic complexity, and length of response, were made similar through the iterative piloting phase. The open-ended discussion activities completed by the participants included discussing daily routines, personal experiences, imaginary scenarios, and working together to solve a problem. These topics were specifically selected because they give rise to personal stance-taking, politeness choices, evaluative language, and alignment strategies, fruitful sites for the observation of gendered discourse markers. Each interaction was approximately 15–20 minutes; to avoid sequencing effects, participants interacted with both personas in counterbalanced order. The open-ended tasks usually generated enough textual material for a CDA-based analysis.

A questionnaire, based on Yang et al. (2024), dealt with aspects such as the respondents' demographic information, their previous experiences in learning the English language, and their exposure to AI and social media. The results of the reliability analysis exceeded .80 (Keskin et al., 2023). EFL specialists verified the content validity of the prompts and persona scripts. In a small pilot with 4–6 learners and two experts, consistency across the personas was confirmed, with differences at the level of gendered stylistic cues.

4.3 Data Collection Procedure

Data collection followed four stages:

1. Orientation and Informed Consent: Participants were legally informed as to the research goals, methods, and ethical standards of the study and provided written consent.
2. Interaction Sessions: When participants were in a quiet, computer lab environment, they engaged in two text-based interaction sessions with individualized AI personas during which each participant spent 15–20 minutes completing identical task structures for both session types.
3. Data Extraction and Cleaning: The interaction logs are automatically saved and anonymized through pseudonymization. Light cleaning of typographical errors is also done. Cleaning procedures were strictly limited to surface corrections to preserve interactional sequencing and discourse integrity.
4. The background questionnaire was administered either before or after the interaction sessions. All data were safely stored in password-protected, encrypted files accessible only to the research team.

4.4 Data Analysis

The analysis combined thematic coding, feminist-oriented CDA, and descriptive quantitative counts. The study was qualitatively driven, with interpretive frameworks guiding the primary analysis.

A hybrid deductive-inductive coding approach was utilized (Almuhailib 2023; Silva 2010). Whereby deductive codes were obtained from literature regarding gendered discourse and identity positioning, and inductive codes were based on emergent patterns within the data. Coding was performed across three domains directly related to the research questions:

1. Linguistic features (e.g., pronouns, adjectives, politeness markers)

2. Identity positioning: alignment, resistance, and negotiation of gendered cues
3. Cultural/intercultural references reflecting Iranian sociocultural norms

CDA was then applied to examine how gendered power relations and ideological assumptions were constructed in interaction. Diabah (2023) and Simon (2003). Thus, combining micro-level linguistic scrutiny-lexical choices, stance markers, turn-taking patterns- with macro-level interpretation that is connected to broader gendered ideologies in Iranian culture, followed principles of feminist CDA (Lazar, 2005).

To improve analytic reliability, two coders separately coded (20%) of the total transcript corpus independently, with the coders having discussion-based sessions that allowed them to modify and refine their respective codebooks. Coders achieved inter-coder reliability (Cohen's $\kappa > .80$) that demonstrated substantial agreement between coders. By using triangulation of transcripts of the interactions with questionnaires and notes from the field, the credibility of the data analysis was further verified (McKinney & Norton, 2024). "EFL expert peer debriefing" was also conducted in order to validate the interpretive claims generated from the data analysis. Here, twelve experts were involved who have proven expertise in the area of applied linguistics and language teaching and learning. The experts were comprised of three university professors from the departments of discourse analysis and sociolinguistics, five PhD researchers working in the area of second language studies, and four experts who have extensive experience in EFL teaching and learning. The experts included in the study were either holding a Ph.D. or an MA in linguistics and/or education, and they all have experience in their professional lives ranging between 8 and over 20 years, with an average of 12 years. Peer debriefing meetings concentrated on the examination of code segments, extracted themes, and analysis procedures. Comparative analysis of data segments was performed to ensure that themes obtained were data-based rather than theoretically based or assumed by human analysts. Inconsistencies were discussed to ensure that analytical thinking or thinking processes were explicit and professionally defensible. Idioms of gender relevance to linguistic features, for example, were frequency counted to generate heuristic data regarding thematic inference and/or repetition to qualify, to an extent, the analysis procedures employed. These frequency counts (e.g., Table 1) were presented as supportive, descriptive indicators of patterns identified through qualitative analysis and were not treated as inferential statistical tests. The analytical approach employed was similar to and aligned with recognized mixed-methods procedures used in discourse studies, where descriptive trends are used to enhance transparency to support analysis procedures.

5. Results

5.1 Results for RQ1: Linguistic Indicators of Gendered Patterns in AI-Mediated Interaction

Coding of the interaction transcripts revealed that the perceived gender of the AI persona systematically influenced learners' linguistic decisions. In referring to or addressing the chatbots, participants frequently used gendered pronouns and evaluative adjectives; these were used somewhat more often in interactions with the female AI (47 instances of gendered pronouns vs. 42 with the male persona; see Table 1). For the entire set of 60 learner–AI interaction transcripts (30 learners \times 2 personas), learner turns were coded for target features, with each "instance" representing a single occurrence of a gendered pronoun, politeness marker, or empathetic expression within a learner turn.

Accordingly, politeness markers (such as lexical items please and hedging devices) occurred more frequently in learners' discourse with the female persona than with the male persona (36 vs. 21 instances). There was an asymmetry found between two types of politeness markers (the ones used when talking to the male AI and the female AI) as well as the types of pronouns used to address those AI Personas during the different interactions described above. There were a total of 28 cases of assertive and task-focused words used with the male AI compared to 32 cases of empathetic or rapport-building statements made regarding the female AI, resulting in a total of 17 cases of assertive words used with that persona as well.

While the findings illustrate that learners engaged in a more functional approach to the male AI (i.e., more efficiency-focused when working with that persona) and somewhat more relational and emotionally oriented in their interactions with the female persona, the inconsistency observed in categorizing the AI gender and what types of social roles were attributed to the two personas suggest that learners had an implicit understanding of how to conceptualize the AI personas based on gender. Table 1 summarizes the connection between AI gender identity (not simply as a design consideration but rather as a semiotic resource) and learners' use of gender-based pronouns, evaluation language, politeness, and framing their responses according to the gendered persona of the AI. Each instance represents a single occurrence of a gendered pronoun, politeness marker, assertive expression, or empathetic/rapport-building expression within a learner's turn.

Table 1

Frequency of Selected Linguistic Features in Learner Interactions with Male and Female AI Personas (RQ1)

Feature	Male AI	Female AI
Gendered pronouns (<i>he/she</i>)	42	47
Politeness markers (<i>please</i> , hedges)	21	36
Assertive expressions	28	17
Empathetic/rapport expressions	15	32

The excerpts below illustrate how these patterns manifested in interaction.

Excerpt 1 (F-07, female AI)

Learner: Hi, how do you do today? Could you help me check my paragraph? I was wondering if it was rude, but I'm not quite sure.

AI (female persona): Of course, I'd be happy to help. Could you share your paragraph with me?

Learner: Thank you so much. Would it be possible for you to explain to me how I can make it more polite, particularly the last sentence?

Excerpt 2 (M-11, male AI)

Learner: Hi, could you just let me know the most appropriate structure for the problem-solution paragraphs? Thank you.

AI (male persona): Okay. An acceptable structure would be first to state the problem, followed by the causes of the problem, and then the proposed solution.

Learner: Alright, three examples, very clear, I don't need a long discussion, just an example I could use in an essay.

Excerpt 3 (M-03, male learner, female AI)

Learner: "You're very helpful. I feel more relaxed speaking with you because you explain everything very kindly."

AI (female persona): I'm glad to hear that. How else can I assist you with your writing today?

Learner: Perhaps you could indicate a more polite method of declining an invitation. I wouldn't want to sound impolite.

Excerpt 4 (F-10, female learner, male AI)

Learner: Can you verify that sentence? Will you tell me directly if the sentence is wrong? I don't want soft comments; I need a clear answer.

AI (male persona): The sentence is clear, but the grammar used in the sentence is incorrect. I think you should change the verb tense in this sentence.

Learner: Good. Just show me the correct version, please. I will copy it and then try to understand why it is better.

Taken together, the frequencies in Table 1 and the qualitative excerpts reveal a stark functional differentiation in learners' language use, with the female AI being treated more as a relational, supportive partner and the male AI being addressed more as an efficient, task-oriented collaborator. Such a division between the use of rapport-building language on the female persona and the use of instrumental, goal-focused language on the male persona resonates with previous research in EFL and media discourse, where female figures are typically attributed to providing affective support and emotional labor and males to authority and task orientation (Almuhailib, 2023; Diabah, 2023; Kiani et al., 2023). In this respect, language studied in terms of gender is not just about words, but also about "patterned expectations about stance, agency, and interactational roles," as Lazar (2005) has so aptly expressed.

These results add to prior research on AI in gender bias, which has traditionally focused on gender bias in AI outcomes (Ghosh & Caliskan, 2023; Lee, 2023; Mohamed et al., 2024; Mohsen, 2024; Soundararajan et al., 2023; Yang, 2022). While large language models have indeed been shown to reproduce stereotypical gender associations in translation and generation tasks, the present study shows that learners themselves are active in reproducing and reinforcing gendered patterns in their interactions with AI personas. Both parties formed together the significance of gender-specific understanding in the dialogue between learners and AI. The AI had an underlying framework by which it was evaluated and received the learners' input based on what the learners were drawing from their previous experience and belief systems. AI use is, therefore, a reflection of how social context influences the development of technology; use of AI in communication does not neutralize the social context.

5.2 Results for RQ2: Sociocultural and Intercultural Norms in Learners' Interaction with Gendered AI Personas

As a result, one can see in the transcription of the recordings that the participants used different strategies for intercultural communication. Specifically, they consisted of more indirect requests and hedging devices (i.e., phrases, modal verbs, and expressions of qualification) with the female AI than they did with the male AI. The use of cultural references (i.e., customs/values/social expectations) was very evident in the interaction with the female AI, as was the case with the participants' use with the male. As illustrated in Table 2, there were more instances of deference being shown to the female AI (21) than the male AI (7) in the use of explicit terms of respect and references to social hierarchy.

Table 2

Frequency of Intercultural and Politeness-Related Strategies in Learner Interactions with Male and Female AI Personas (RQ2)

Strategy	Male AI	Female AI
Cultural references	12	15
Indirect requests/hedges	18	28
Deference markers	7	21

These patterns indicate that learners did not regard the AI as a culturally neutral tool but rather set it in an anaphoric relationship by situating it within an intercultural communicative space (Veletsianos et al., 2024). Accordingly, their language showed sensitivity to face concerns and hierarchical relations and culturally informed norms of politeness, especially when addressing the female persona. The next extracts show how cultural and intercultural norms have surfaced in the choices of learners.

Excerpt 5 (F-02, female AI)

Learner: Perhaps you could, if you don't mind, give me another example? I think my first answer is not very suitable, but I don't want to sound disrespectful to my teacher.

AI (female persona): Of course, I don't mind at all. Let me give you one more example for your class:

Learner: Thank you. I should be careful, though, since in our culture, politeness is a significant requirement, particularly in speaking to elderly individuals.

Excerpt 6 (M-09, female AI)

Learner: In Iran, when you want to refuse someone, you probably would not say "no" directly. You must explain some reasons.

AI (female persona): That's interesting. Would you like me to assist you in crafting a refusal statement in English?

Learner: Yes, please. Something that is socially acceptable in English but at the same time suits our Iranian style, so that the person will not find it offensive.

Excerpt 7 (F-05, male AI)



Learner: Sometimes, I don't know how to talk to my university professor in English. In Persian, we have to use more formal and respectful words.

AI (male persona): You can use phrases such as "Would it be possible..." or "I would appreciate it if...".

Learner: Yes, it does sound better. I want to be respectful because, in my culture, teachers hold a high status, and it is impolite to be too straightforward.

Excerpt 8 (M-13, female AI)

Learner: If that's alright with you, could I possibly have you reexamine my answer once more? I am not entirely sure it was polished enough for a foreign visitor.

AI (female persona): Of course. Well, I can assist you in making the text more friendly and suitable for an international setting.

Learner: Thank you very much. That would be great. We usually try to be very hospitable, and I don't want my English to sound cold and unfriendly.

Excerpt 9 (F-01, male AI)

Learner: Sometimes I feel I should be polite with you, like with a real person, because you answer like a teacher.

AI (male persona): I'm here to support your learning, so politeness is always appreciated but not required.

Learner: Still, I prefer to use polite language. It's part of our habit, and it makes me feel more comfortable in the conversation.

The data collected in Research Question 2 demonstrates no difference in the manner in which males and females utilized Intercultural strategies and politeness strategies to both male and female AI personas. However, females were more inclined to use indirect requests, hedging devices, cultural references, and markers of deference when interacting with the female persona, suggesting an emphasis on taking "Face" and preserving relational harmony into consideration. The examples in this study suggest that how learners perceived their positions relative to each other as a result of interacting with an AI is mainly determined by the learners' cultural background, as well as their intercultural knowledge and experience.

6. Discussion

In this respect, the results for Research Question 1 indicated that participants systematically distinguished between male and female AI personas by making consistent linguistic choices. Higher levels of politeness markers, mitigation strategies, and affiliative language belonged to learners interacting with the female persona. At the same time, maleness was co-constructed with more direct, more assertive, and more task-oriented formulations. Accordingly, these patterns emerged in consonant with Feminist Critical Discourse Analysis approaches, which theorize gender as enacted through stance-taking, evaluative language, and interactional positioning rather than fixed linguistic forms (Lazar, 2005; Simon, 2003). The findings corroborated recent 2025–2026 studies reporting similar 'gendered' role projections in digitally mediated discourse, even in non-human interactional settings. (Almuhailib 2023; Silva 2010). While most prior work emphasized bias encoded in AI-

generated output, the current findings revised earlier conclusions, whereby learners themselves were observed to actually produce gendered discourse. This suggests that, in AI interaction, gendered bias arose not solely from the model but also through users who draw on their culturally based expectations. Such a finding extends earlier EFL research by highlighting interactional performance rather than system behavior alone.

The findings for Research Question 2 showed that learners' sociocultural background strongly conditioned their interactional behavior with both AI personas. Iranian norms of indirectness, deference, and hierarchy sensitivity were transferred into AI-mediated communication as participants treated the AI as a socially positioned interlocutor rather than a neutral tool. These findings confirmed recent intercultural communication studies (Soundararajan et al., 2023; Yang, 2022) that identified persistent face-management strategies in digital learning environments involving learners from collectivist cultural contexts. At the same time, the present study refined these earlier findings by demonstrating that such cultural norms interacted with perceived AI gender to result in more highly deferential and relational work toward the female persona. Differences with studies conducted in individualistic contexts may be related to different cultural orientations of the participants, task design features, and expectations of learners about the research setting. The findings showed that AI-mediated interaction was one site where cultural ideologies were enacted and negotiated rather than neutralized, which resonated with situating AI use within local sociocultural frameworks.

The data collected relative to RQ1 indicates that participants consistently differentiated between the masculine and feminine AI personae. This differentiation was accomplished via explicit linguistic and interactional patterns used when interacting with the AI personae, i.e., the manner in which participants were polite, assertive, took a stance, and used evaluative language (See Lazar, 2005; Simon, 2003 for a Feminist Critical Discourse Analysis perspective of this). The data from the above analyses demonstrate that when participants interacted with the AI personae, they reproduced socially constructed and embedded gendered ideologies using familiar patterns of gender. The more mitigation strategies, rapport-building expressions, and affiliative comments used with the female persona, as opposed to more direct and task-oriented formulations with the male persona, reflect well-documented gendered communication tendencies described in earlier scholarship (Almuhailib, 2023; Diabah, 2023; Kiani et al., 2023). Overall, these findings extend previous research by suggesting that gendered norms from human–human communication were transferred onto AI personas, further demonstrating the persistence and portability of such norms.

However, the present study provides an important extension to existing research by showing that these gendered orientations appeared even though participants were fully aware that the interlocutor was artificial. While earlier studies have examined how AI generates biased content, participants in this study generated their own gendered texts rather than react to bias in generated text (Kiani et al., 2023). Therefore, an important conclusion of this work is the collaborative nature of gender bias during human-to-human and human-to-AI communication: AI generates cues and perspectives associated with a given gender, while at the same time that this occurs, users generate their own gendered texts based on their understanding of cultural ideologies. This contributes a new dimension to the field by shifting attention from bias in the model to bias in the interactional performance.

Identity Theory (McKinney & Norton, 2024; Norton, 2013) highlights how learners' stance-taking and interactional behavior involve context-sensitive identity positioning. The more instrumental, efficiency-oriented self-presentation with the male persona, and the more affiliative, relational self-presentation with the female persona, point to the learners' underlying assumptions about gendered roles and relational expectations. Such consistent emergence of these identity performances in a controlled, non-human communicative setting suggests that gender operates as a deeply lodged organizing principle within learners' communicative repertoires. The evidence extends the existing EFL discourse research by showing that AI-mediated settings do not neutralize gendered expectations but might, instead, amplify them and render hidden assumptions more visible. The extracts in the findings section show how these gendered orientations took shape in real interactional turns, rather than merely in aggregated frequencies, as learners sent softened requests, deferential thanks, or affiliative comments more frequently towards the female persona.

Caution is also required in interpreting these results. Individual differences in comfort with the experiment, expectations about interaction with the researcher, and personal preference will affect linguistic variation, among other variables; these should not be seen as only gender-based influences. Gendered orientations intersect dynamically with a range of personal and contextual factors.

The results for RQ2 also provide evidence that learners' cultural background strongly informed their interactions with both AI personas. The way the learners communicated with each other was influenced by the norms of politeness, indirectness, and hierarchically oriented sensitivity to each other. These norms are commonplace within Iranian conversational culture and correspond to the classifications of Iranian communication as being relational in nature and based upon high-context and harmony-seeking attributes (i.e., Hall, 1976; Scollon & Scollon, 2001). Thus, the learners viewed the AI not simply as a neutral tool for them to use, but rather viewed the AI as another person situated within a particular sociocultural milieu. Evidence of this was found in the interactions between the learners and the AI, where the learners demonstrated their understanding of their own culture (our culture) by refraining from using direct refusals, framing politeness within the concept of hospitality norms, etc. Thus, this study provides support for previous research examining the discursive behaviour of Iranian and Arab EFL learners, which shows that the communication of Iranian and Arab EFL learners is directed toward maintaining face, indirectness, and deference to perceived authorities (i.e., Khodabandeh, 2021; Alghamdy, 2024). While the AI personas involved in this research enjoyed no real hierarchical status, learners nevertheless engaged with them as if they did, and deference markers featured particularly highly with the female persona. The findings of this study indicate that the participants in this research transferred their cultural norms of politeness and gendered respect to the AI-mediated interaction. Thus, their local culture and the culturally embedded assumptions around gender shaped a communicative performance that included Iranian norms, English language, and AI-mediated cues.

By demonstrating how hybrid human–AI interactions can be viewed as sites of enactment for identities and relational practices rooted in culture, these findings add to the existing body of literature on digital intercultural communication (Kramsch, 1998; Veletsianos et al., 2024). By using explicit cultural references, such as rejection and hospitality norms, learners viewed the AI not merely as a technical tool, but rather as a social agent that could demonstrate culturally meaningful behavior. This aligns with emerging scholarship suggesting that digital tools, including AI systems, can function as

social participants within learners' identity formation processes (Prakash & Rajendran, 2022; Veletsianos et al., 2024).

Such trends have been observed specifically in the Iranian sphere of influence. Collectivist cultures, such as the one in Iran, have specific communicational trends that are based not only on assertiveness but also on the premise of harmony, hierarchy, and equilibrium in interaction, as opposed to individualist cultures. The results indicated that the distribution of both politeness and assertiveness was in line with these trends, especially in relation to perceived gender. The results were in stark contrast with an individualist sphere, which indicated an unequal distribution of assertiveness with regard to perceived gender. The results thus suggest that it is not AI-based communicational trends that are present, but are an extension of locally perceived cultures.

Ultimately, this study has found that not all Iranian learners follow the same pattern. Each learner's experience with AI is subject to various factors such as age, educational level, geographic origin, and their preferred global media sources. This is evident from the results of the current study, which found that Iranian EFL learners interacted with AI through a mix of overt and covert attitudes towards topics like gender roles, hierarchy, politeness, etc., shaped by their distinct socio-culturally based attitudes towards those subjects. Furthering previous investigations of the relationship between AI and intercultural communication, the current study showed that local cultural meanings are highly significant in determining how Iranian EFL learners communicate with AI, thus requiring researchers examining AI-mediated conversations to take into account both local culture and the architecture of the AI model. In addition, these findings suggest the potential benefits of critical awareness tasks, which make visible gendered assumptions in AI-mediated interaction. These tasks are in line with the potential of the Feminist Critical Discourse Analysis approach in revealing and problematizing normalized power relations in discourse and thus the potential of the learners to focus on the ways their own gender ideologies are being reproduced through their own linguistic choices in AI interaction.

7. Conclusions and Implications

This research studied how Iranian EFL learners interacted with gendered AI personas and how these interactions influenced their language choices, their positioning of identity, and their use of intercultural communication. Although this study took place in a controlled and non-human environment, the results indicate that the learner-AI experience continued to be a social experience and a culturally mediated experience. Rather than treating AI as a neutral conversational tool, learners oriented to the male and female personas as meaningful interlocutors, projecting gendered expectations and drawing on culturally patterned communication strategies typically observed in human–human interaction.

Through a Feminist Critical Discourse Analysis lens, the study demonstrates that gendered ideologies can be activated even in interactions with artificial agents. Learners' increased use of politeness, mitigation, and affiliative stance-taking with the female persona—and their more assertive, efficiency-oriented language with the male persona—suggest that gendered norms are deeply embedded in their communicative repertoires. Importantly, these patterns were not a direct response to biased AI output; rather, they were co-constructed by learners themselves, revealing that human–AI gender bias emerges through interactional performance as much as through model design.

The findings also extend Identity Theory by illustrating how learners repositioned themselves in response to gendered cues. Their shifts in stance, agency, and alignment reveal that identity work is being exercised even in perceived digital interactions. The influence of gendered frames could not be taken lightly, and individual factors such as technology, task, and person may have also played a role in creating different interactions. These factors are teased as alternatives to a singular influencer and assist in avoiding overgeneralization.

Intercultural communication theory provides further explanatory power. Learners' extensive use of indirectness, deference, and culturally situated explanations aligns with established characterizations of Iranian communication as relational, high-context, and sensitive to social hierarchy. Nonetheless, this research finds that Iranian culture does not exist in a uniform way; it varies based on geography, age, and educational level, and has a role in how a student interprets and applies cultural norms. Therefore, culture operates as a flexible resource available to learners to use rather than as a predetermined influence.

Additionally, the study shows that AI-mediated communication provides a unique setting that allows for gender-related, cultural, and identity resources to be made apparent during interactions. The consistency of the AI as an interlocutor allows for the social meanings, expectations, and assumptions of the learners to emerge more clearly. The relational traits given to the AI (its perceived personality, status, or gender) highlight the importance of both the effects and cultural aspects of AI on communication and relationships.

The findings of this paper will have a significant impact on both EFL education and the design of AI systems. AI-assisted language learning should not be viewed as a culturally neutral space, but as one in which learners actively reproduce or renegotiate gendered and cultural norms; rather, it provides learners with the opportunity to recreate or reinvent gendered and cultural norms through their interactions with AI. It would be useful to integrate critical awareness activities into EFL (English as a Foreign Language) education in order to help EFL learners identify the ideologies that underlie their use of language, and to increase the reflective, pragmatic, and intercultural competence of EFL learners. If there are no pedagogical frameworks that EFL educators can use while educating EFL students, they may continue to create or recreate a cultural representation of a gendered identity through language use. Thus, EFL Educators and AI Developers share responsibility for creating and developing Technology-Enhanced Learning (TEL) systems that encourage and support equitable, critical, and socially-responsible EFL learning environments instead of supporting or creating restrictive or cultural norms regarding gender in society. Numerous limitations present opportunities for future research. First, the study focused exclusively on binary-gendered AI personas. The inclusion of Gender-neutral or non-binary personas in future research would allow researchers to study how learners respond when traditional gender markers are absent or ambiguous.

In addition to this, only one cultural context was used in the research; therefore, cross-cultural, comparative research is necessary to explore different sociocultural norms on the learner's response to gendered AI personas.

Lastly, the interaction sessions between learners and AI personas were limited to only one per person; a longitudinal design would provide an opportunity to investigate how the learners' identity positioning and pragmatic behaviors transition over time as they become more familiar with the use of AI tools. In conclusion, this study focused on AI Interaction via Text Only; however, future research

on Multimodal AI Implementations, such as Voice-Interface Solutions, Avatar Integration, and Visual Gender Representation, will deepen the understanding of how learners interpret the gender(s) of AI when there are multiple contexts of representation, how learners interact with and understand many factors that influence AI. Cultural and Societal Influences, along with Technological Affordances, are important in the way learners understand AI communication. As these technologies continue to be integrated into the realm of EFL, we need to understand the influence of Gender, Identity, and Culture on learner interaction with AI. The findings reaffirm the need for sustained research into how AI-mediated communication reshapes language learning practices and how learners' own ideological frameworks shape the future of human–AI interaction.

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Authors' Contributions

All authors have conducted the study, collected data, analyzed and interpreted the data, and written up the manuscript.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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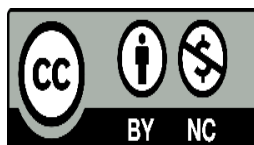
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