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"I'M NOT READY for THIS METAMORPHOSIS": An ECOLOGICAL APPROACH to IRANIAN and ITALIAN EFL TEACHERS' READINESS for ARTIFICIAL INTELLIGENCE-MEDIATED INSTRUCTION

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The importance of artificial intelligence (AI) in second/foreign language (L2) education has recently captured the attention of several scholars. However, the current scope of literature lacks a cross-cultural investigation into teachers' AI-readiness. To bridge the gap, this study employed a semi-structured interview to unveil the perceptions of 40 Iranian and Italian English as a foreign language (EFL) teachers regarding AI-readiness and its ecosystem. The results of MAXQDA analysis indicated that Italian teachers were ready to integrate AI tools into their classes, while Iranian teachers reported a lack of readiness to do so. Furthermore, it was found that the participants of both contexts perceived AI-readiness to be composed of a gamut of micro, meso, and macro factors. Despite some similarities in enlisting micro and meso factors of AI-readiness, the participants varied at the macro-level factors. Iranian EFL teachers mostly highlighted the role of "economic requirements" and "technological infrastructures" in shaping their readiness, while Italian respondents stressed the "cultural beliefs/values," and "educational system". The study discusses the implications of AI injection into L2 classes for EFL teachers and educators and presents some future directions.

1. Introduction

The idea of artificial intelligence (AI) dates back to the Greeks and is fraught with both wonder and fear (Ouyang et al., 2022; Tlili et al., 2023). AI is now changing how we live and work (Adams et al., 2023; X. Huang et al., 2023). AI technologies are mingling with our lives and have become a heated topic of discussion among educators (Luckin et al., 2022; Yang, 2019). AI is used in various fields such as industry, finance, and education to promote innovation and efficiency (Ng et al., 2021). In education, AI has supported teachers' work by automatically tracking students' progress, evaluating their performance, and providing personalized support (Chounta et al., 2022; Derakhshan & Ghiasvand, 2024). AI-assisted systems can be developed to do complex tasks resembling what humans do (Mumuni et al., 2023). One such attempt is designing intelligent bots such as ChatGPT (Chat Generative Pre-training Transformer), which can comprehend and produce human language (Caldarini et al., 2022).

In education, AI has provided many solutions to complicated problems (Ouyang et al., 2022). It can create innovation, change teaching and learning practices, and accelerate progression (Adams et al., 2023). To improve educational practices, AI uses advanced mass data and analytics. AI technologies can produce a personalized learning system and integrate into the fabric of learning (Tlili et al., 2023). After the COVID-19 pandemic, a growing interest was raised among educators to integrate new technologies into education (Christopoulos & Sprangers, 2021). Accordingly, some influential studies in second language (L2) education have recently examined the contribution of AI to the mastery and development of different language skills and sub-skills (Fitria, 2023; Rusmiyanto et al., 2023; Suryana et al., 2020; L. Wu et al., 2021; Xiao & Hu, 2019; Yan, 2023). Most of these studies have scrutinized the facilitative role of AI in L2 learning, while teachers and teaching have been overlooked. Teachers are the forefront soldiers of all educational settings, hence to incur positive changes in this digitalized world, their readiness to acknowledge and apply AI is of paramount significance. Nevertheless, EFL teachers' readiness for AI has widely remained under-researched. As previous studies corroborate, technology acceptance, adoption, and integration into L2 classes depend on several internal and external factors.

One of the most important factors is variation in cultural background or contextuality of AI-powered education. It is argued that teachers in developed countries seem to show more readiness for technologies compared to their counterparts in developing countries (Pedro et al., 2019). To elucidate EFL teachers' readiness for AI-powered L2 education, this qualitative study cross-culturally scrutinized Italian and Iranian English language teachers' perspectives. Employing ecological perspective (van Lier, 2011), this study shows how L2 teachers' readiness for AI-powered instruction is influenced by the classroom context (micro-level factors), institutional issues (meso-level factors), and the sociopolitical world (macro-level factors). The critical rationale behind the study is that making L2 teachers AI-ready is only possible when the exact ecosystemic factors of AI-integration are mapped out. Hence, the study is significant for providing a tentative ecological model of AI-readiness for EFL teachers, which might be fruitful also for other settings. Moreover, by unmasking the ecology of AI-readiness, this study exponentially contributes to the implementation of AI technologies in L2 education.

2. Literature review

2.1. Theoretical framework

This study rests on the ecological perspective proposed by Bronfenbrenner (1977), which underscores three levels (i.e., micro, meso, and macro) of factors that determine the ecology of human development. Originally, this approach belongs to the ecological systems theory that is a framework to scrutinize L2 education within social, cultural, and political contexts (van Lier, 2011). According to this framework, teachers' actions, emotions,

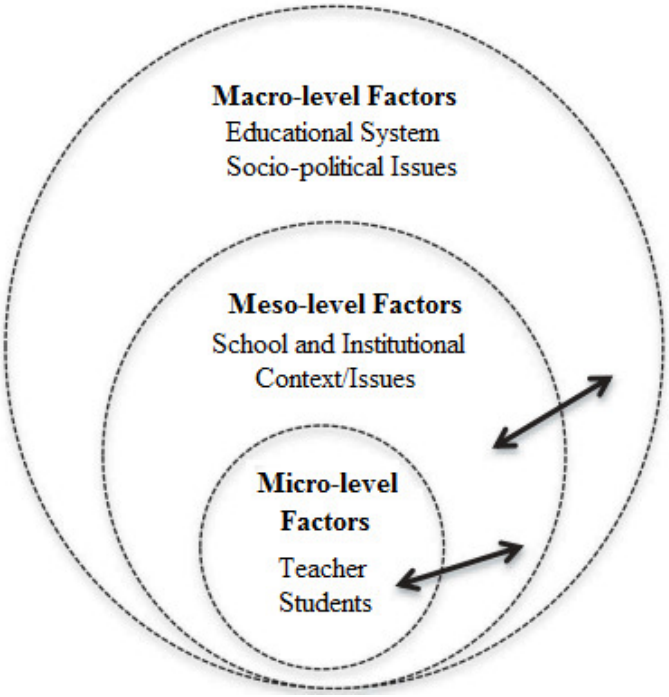

Figure 1. The ecological model (Bronfenbrenner, 1977)

identities, and behaviors are all mediated by micro, meso, and macro factors. The ecological model was selected in this study because L2 teachers' readiness to accept and apply AI tool does not develop in a vacuum, but instead emerges from an interplay of factors inside and outside the class (Brown et al., 2011). More specifically, micro-level factors pertain to the immediate classroom context and individuals (teacher, students), meso-level factors relate to school-related issues (e.g., policies, climate, relations), while macro-level factors have to do with the wider educational system/culture (Figure 1).

2.2. AI as a game-changer in education

AI has recently risen to the educational forefront with different merits and demerits (Luckin et al., 2022). It requires advanced programming skills and professional teachers to integrate it successfully (Adams et al., 2023; Mumuni et al., 2023). While AI demands literacy and funds to pay subscription fees, students from low-income families have accessibility difficulties (Viktorivna et al., 2022). Previous studies report that AI needs a large mass of data (Mumuni et al., 2023; Viktorivna et al., 2022), high initial and ongoing maintenance costs (Zhong et al., 2023), ethics (Mumuni et al., 2023), security and accuracy (Adams et al., 2023), communal acceptability (An et al., 2023), language standardization (Adams et al., 2023), security (Velander et al., 2023), and educational support investment (Mumuni et al., 2023).

Meanwhile, AI provides opportunities for teachers by fostering problem-solving teaching, evaluation, and prediction based on information (Adams et al., 2023; Chiu et al., 2023; Rahimi, 2023). It is also a source of support for learners (Mumuni et al., 2023). It provides smart content (Chiu et al.,

2023) and streamlines educational supervision and administration (Luckin et al., 2022; Velander et al., 2023). Having provided personalized learning opportunities, AI develops students' learning performance, particularly in the humanistic fields (Ouyang & Jiao, 2021) Thus, it is critical to examine teachers' readiness for integrating AI into their language courses.

2.3. The concept of AI-readiness

Given the 21st-century digital developments, teaching approaches have considerably transformed (Chounta et al., 2022; Rahimi, 2023), particularly in the light of AI. Nowadays, educators play an integral role in embedding AI into schools and bridging AI policies and students' needs (Felix, 2020). Despite becoming aware of the potential of AI, many teachers may not be ready to implement AI-enhanced education (Wang et al., 2023). In fact, there is a significant gap between rapid advances in AI and teachers' readiness. This is largely because of their insufficient proficiency in AI technologies and relatively slow adoption (Wang et al., 2023). According to the literature, teachers' AI-readiness is defined as the degree of teachers' preparedness regarding the use of AI in education based on their cognition, ability, vision, and ethical concerns (Chounta et al., 2022; Luckin et al., 2022; Wang et al., 2022). Teachers with AI-readiness may be able to experiment with and adapt to opportunities offered by AI in the classroom (Luckin et al., 2022). The innovative efforts may lead to an improved work experience, resulting in higher job satisfaction (Bhargava et al., 2021) and behavioral intentions (Luckin et al., 2022). However, low teacher AI-readiness may make teachers feel threatened by AI technologies and alienated from innovations (Luckin et al., 2022; Wang et al., 2022). The Technology Acceptance Model (TAM) and the Theory of Reasoned Action (TRA) undergird the study of teacher AI-readiness in this study. TAM describes how a person's attitude (positive or negative) determines their behavioral intentions in relation to technologies (Davis, 1989). Similarly, TRA posits that one's behavior in a particular action is determined by their attitude and behavioral intention in a symbiotic manner (I. L. Wu et al., 2011). In light of these theories, it can be argued that teachers' readiness for AI-integration into L2 classes depends on their attitudes and intentions. Despite a firm position in other disciplines, AI-based education has just started its journey to L2 education, as described below.

2.4. Previous studies on AI and second/foreign language (L2) education

In pursuing the growing body of research on AI, one can recognize that there are various studies on its implementation in education in general and in L2 education in particular. For example, Roll and Wylie (2016) suggested AI systems be involved in communication between students and teachers in the school context. Popenici and Kerr (2017) examined the impacts of AI systems on both learning and teaching processes and found that there are potential conflicts such as changes in power structures, privacy issues, and oversight

between students and teachers. Using a mixed-method approach, Ebadi and Amini (2022) reported that teachers' presence and human likeness could shape Iranian EFL learners' language learning motivation while embedding AI in their class.

Guilherme (2019, p. 7) explained that AI systems "have a profound impact on the classroom, changing the relationship between teacher and student". Nazari et al. (2021, p. 1) examined the efficacy of a group format of an AI-mediated writing tool on postgraduate students in the English academic writing context. The 120 students who participated were randomly allocated to either a group equipped with AI writing tools or a group not equipped with AI writing tools. The results showed that AI-mediated writing tools are not useful in improving "learning behavior and attitudinal technology acceptance through formative feedback and assessment" of postgraduate students who use English as L2 in an academic writing context.

A quantitative study conducted by Divekar et al. (2021) indicated that integrating AI into language classes significantly enhanced language learners' vocabulary knowledge, receptive and productive skills. Likewise, Wang et al. (2022) underlined the benefits of AI for shaping language learners' higher-order social and cognitive processes that mediated their enjoyment of language learning. Moreover, Gayed et al. (2022) evaluated the impact of KAKU AI web-based application on EFL learners in reducing the cognitive barriers encountered when producing written texts in English. The results showed that AI KAKU is a useful tool for EFL learners, who need structured assistance rather than traditional word processors. It is also contended that AI requires language learners to possess emotional intelligence to succeed (Viktorivna et al., 2022). Moreover, studies reported the negative impact of AI on L2 education due to such factors as lack of privacy (Vaccino-Salvadore, 2023) and reduction in language learners' creativity (Viktorivna et al., 2022) and natural language learning process (Chicaiza et al., 2023). Yan (2023) explored students' reflections on their exposure to ChatGPT in the writing classroom. The findings revealed the potential applicability of this tool in L2 writing practicum. Prior research also corroborates the assumption that AI-integration fosters the development of language skills such as speaking (Rusmiyanto et al., 2023), reading (Xiao & Hu, 2019), writing (Fitria, 2023), and listening (Suryana et al., 2020). Moreover, Derakhshan and Ghiasvand (2024) conducted a phenomenographic research on Iranian research-active EFL teachers' perceptions about the use of ChatGPT and reported various influences of the AI bot on L2 teaching, learning, testing, and research domains.

In sum, the current body of scholarship is limited to AI contribution to L2 learning rather than teaching. An overall interpretation of the literature shows that (1) AI teacher readiness has been under-researched (Divekar et al., 2021; T.-H. Huang & Wang, 2021); (2) more documented studies are needed

on the contributions of teacher AI-readiness to language teaching (Divekar et al., 2021; Ermağan & Ermağan, 2022); and (3) how AI tools should be used to improve learners' language skills (Divekar et al., 2021; T.-H. Huang & Wang, 2021; Viktorivna et al., 2022; L. Wu et al., 2021) or their attitudes toward using it (An et al., 2023). Accordingly, the focus of our research is shifted from L2 learners to teachers and their readiness that shapes learners' attitudes and learning performance using ICTs (Rahimi, 2023). Further, we found no cross-cultural study that examined whether L2 teachers are adequately ready to integrate AI into their classes at micro, macro, and meso levels. It is necessary to explore how and what practical factors may affect L2 teachers' AI-readiness, as suggested by recent studies (Chiu et al., 2023; Felix, 2020; Wang et al., 2022). To this end, the researchers attended the above-mentioned gaps by posing the following research questions:

1. To what extent are Iranian and Italian EFL teachers ready for artificial intelligence-mediated instruction?
2. What micro-, meso-, and macro-level factors shape Iranian and Italian EFL teachers' readiness for artificial intelligence-mediated instruction?

3. Method

3.1. Participants and context

A total of 40 EFL teachers from Iran (n = 20) and Italy (n = 20) were recruited via convenience sampling procedure with a focus on data saturation and information power that determine how much data are enough for fulfilling the goal of the study. The ages of the sample ranged from 23 to 54 years old (M = 39.5, SD = 8.25). Concerning gender, in the Iranian sample, 12 were males and 8 were females, while, out of their Italian peers, 14 were males and 6 were females. The Iranian participants majored in applied linguistics, while Italian teachers reported studying English literature (n = 4), translation (n = 3), philology (n = 3), literacy studies (n = 3), and applied linguistics (n = 7). As for their working context, Iranians were learning English at Allameh Tabataba'i University, Tehran University, and Sharif University of Technology. On the other hand, Italian EFL teachers were taking TEFL courses at Turin University. Concerning their teaching experience, Iranian teachers had an experience of less than 3 years (n= 3), 5-7 years (n= 7), 8-11 years (n = 6), and 12-15 years (n = 4). On the contrary, Italian teachers' experience level was reported to be 5-7 years (n = 7), 8-11 years (n = 8), 12-15 (n = 2), and above 15 years (n = 3). Regarding the degree of familiarity with AI, all the participants reported having mid to high level of familiarity with AI and its corresponding tools/bots. Furthermore, they all signed a formal consent letter before attending the research project. The ethical concerns (e.g., privacy, confidentiality, freedom, and consent) and goals of the study were clearly explained and observed by the researchers.

3.2. Instruments

3.2.1. SEMI-STRUCTURED INTERVIEW

To capture the participants' perceptions about AI-readiness and integration into L2 education, a series of semi-structured interviews were held with EFL teachers in Iran and Italy. Specifically, eight interview questions were developed and delivered to three qualitative research experts in applied linguistics to examine their content validity. Beside each interview question, a rubric was designed for the experts to judge the clarity, relevance, and language suitability of each item on a scale of 1-5. After obtaining the experts' comments and revising the problematic parts, five interview questions were finalized. Next, a piloting phase was carried out with five EFL teachers to detect possible problems with interview questions before the main phase. This stage revealed that the questions were clear and relevant. Moreover, an interview protocol was developed in tune with the research objectives, which was to be carefully followed during the interviews. The interviews were audio-recorded, held in English, and organised during teachers' non-instructional time. Each interview lasted 25 minutes during which probing questions were asked from the respondents to clarify their responses. The third author conducted interviews in Italy using the guidelines developed by the Iranian authors of the study. Structurally, the interview comprised two sections. The first one requested the participants to report upon their demographic background and degree of familiarity with AI and its relevant tools/bots. The second section asked about the teachers' perceptions of AI-mediated L2 education and the factors influencing its successful integration (Appendix).

3.2.2. DATA COLLECTION PROCEDURE

The data of this descriptive qualitative study were gleaned from two countries (Iran and Italy) using semi-structured interviews. After reading recent studies on the linkage of AI and L2 education, the researchers developed interview questions in consultation with a panel of experts. Then an invitation letter was sent to the third author in Italy, to be shared with EFL teachers via social networking applications. The same letter was disseminated in Telegram groups in Iran inviting willing EFL teachers. After two weeks, 40 EFL teachers from both countries agreed to participate in the study. For the sake of comparison, two groups of 20 teachers from each context were finalized. The researchers made sure that no conflict of interest existed among researchers and respondents. They also fully explained the research goals and data collection process to the participants. The participants' ethical concerns were also ensured by the researchers prior to the commencement of the research. Afterwards, an interview guide was designed to be used in both research contexts monolithically. The interview questions, probing questions, environmental conditions of the interview, and recording procedures were specified in that interview protocol.

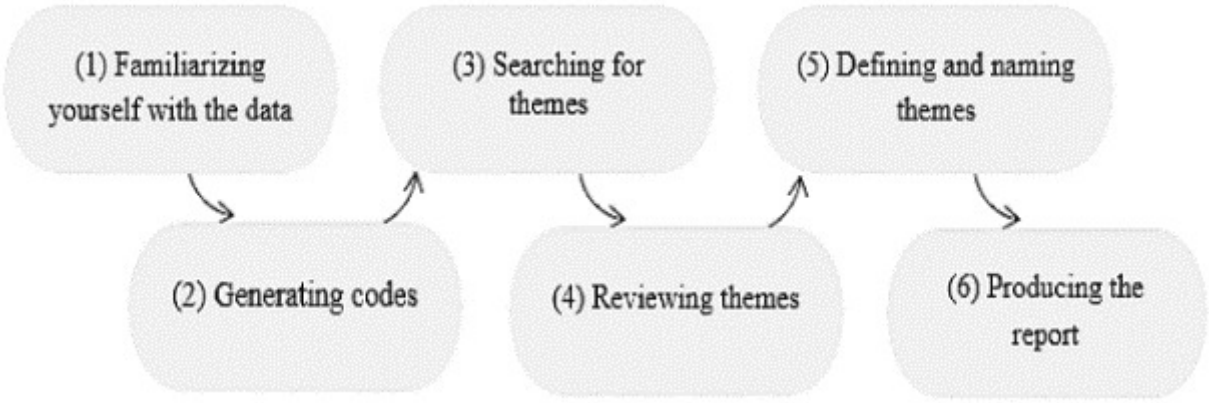

Figure 2. Stages of thematic analysis (Braun & Clarke, 2006)

After these initial steps, the main phase began with interviewing the participants during their free time in quiet rooms at their universities. Eight interview questions were asked in a row to the respondents during which they were asked for further clarifications. They were also free to use examples of their practical integration of AI into L2 education and intervening factors. The data of the Iranian sample were completed in two months, while those of Italian teachers took three months to be finalized due to the teachers' busy schedules. The whole data collection terminated on August 15, 2023. After conducting the interviews, the researchers carefully transcribed the audio files. They had online meetings to solve minor disagreements. Finally, both data sets were sorted per context and participant for the ultimate analyses.

3.3. Data analysis

To analyze the data, the researchers used a combination of content and thematic analysis to quantify and interpret the frequent themes/codes. In doing content analysis, the researchers just described the frequency of incidence in each theme/code without making interpretations. However, in the thematic analysis, Braun and Clarke's (2006) six-stage model was utilized (Figure 2). In the first stage, the researchers immersed themselves into the data by iteratively listening to the interview audio and reading their corresponding transcripts.

To generate codes, in the second stage, preliminary and exploratory notes were made beside each interview response. Different colors and font styles were used to separate initial codes. In the third stage, the researchers returned to the transcripts, notes, and memos once again and tried to develop initial themes alongside sample responses echoing each theme in a table. In the fourth stage, the extracted themes were reviewed to locate patterns and commonalities across the responses. Afterwards, the final themes were clearly labelled to reflect the respondents' views. In the last stage, the report was produced using sample quotes and responses from the original interviews.

To add rigor to the findings, the researchers ensured the principles of trustworthiness (Lincoln & Guba, 1985). Concerning credibility, the participants were invited to member check the interview data and extracted results. Another researcher was also asked to securitize the themes/codes to observe the maxim of inter-coder reliability. Notwithstanding minor disagreements, the researchers and the second coder reached an agreement index of .97, as calculated by Cohen's kappa coefficient. As the second coder was residing in Italy, a meeting was held online using Google Meet to solve discrepancies regarding extracted themes. Additionally, a thick description of the research site, participants, data collection, and analysis was provided to adhere to the maxims of dependability and transferability. This would permit other scholars to replicate the study in other settings. Regarding transparency, a research notebook was developed by the researchers to detail each stage of data collection and analysis. Finally, the researchers' positionality was determined by drawing boundaries between their own values and experiences of AI and L2 education and those of the participants. Since the researchers were EFL teachers, too, they were aware and reflective of AI pedagogies throughout the data collection and analysis procedures. However, they did their best to keep the study as objective as possible. Yet, being a qualitative study, this study unavoidably involved some subjectivity.

4. Findings

4.1. EFL teachers' readiness for AI-mediated L2 instruction

The second interview question was examined to answer this research question. The results of content and thematic analysis evinced that all the Italian EFL teachers (100%) were ready to utilize AI-mediated instruction in their classes (Figure 3). From their interviews, six themes/codes were extracted of which "I am ready for AI, but need more training" (n = 9, 45%) and "I am ready for AI given my prior technological experience" (n = 8, 40%) were the most frequent ones. In this regard, Teacher #4 maintained, "*Although I am completely ready for using AI tools in my L2 classes, still I need more training on how to apply new AI techniques and methodologies*". Additionally, several teachers ascribed their AI-readiness to their previous experiences of using technology in their careers. For example, Teacher #7 argued, "*I think I'm ready for AI because I am technology-wise and I have a solid IT background due to my previous exposure to technology in L2 classes*".

The roles of "AI in education" and "human ability enhancement" were the next frequently posed themes/codes by the Italian respondents (n = 7, 35%; n = 5, 25%, respectively). After conceding his readiness for AI, one of the respondents declared that "*I'm curious about AI tools and I would like to know their roles in education, as a whole*" (Teacher #3). Moreover, some teachers expressed their readiness and willingness to use AI in L2 education given the idea that "[i]*f AI is used properly and conscientiously, it can enhance our human abilities and make our life easier*" (Teacher #18). On the other hand,

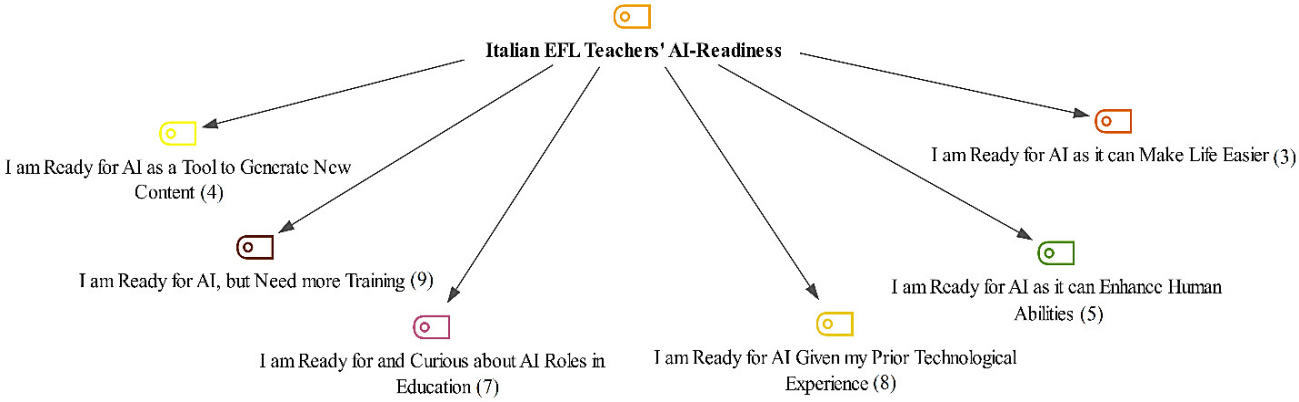

Figure 3. Italian EFL teachers' self-perceived AI-readiness

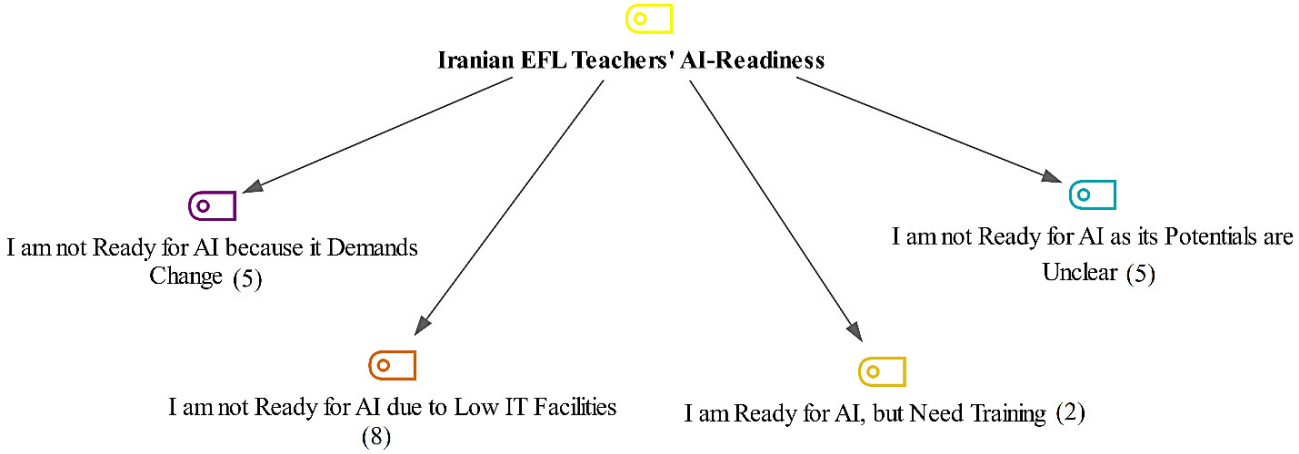

Figure 4. Iranian EFL teachers' self-perceived AI-readiness

Iranian EFL teachers were mostly unready for admitting and implementing AI tools in their L2 classes (n = 18, 90%). Of the Iranian sample, only two teachers (n = 2, 10%) admitted their readiness for AI provided that suitable training is offered in advance (Figure 4).

The participants referred to some reasons behind their perceived lack of readiness for AI in the interviews. For example, one respondent highlighted the role of technological facilities at academic centers in making teachers AI-ready. She confessed, "*I am not ready for AI tools because in our country there are insufficient IT facilities to properly employ novel technologies*" (Teacher #13). Teachers' lack of awareness of the potentials of AI tools was another cause of lack of readiness as evidenced by Teacher #8, who pinpointed, "*Many of the potentials of AI for L2 education are not clear to me. In fact, I don't know how it works to benefit the teaching and learning processes*". The last excuse concerned the demand of AI for teachers to change their teaching. In this respect, a respondent claimed, "*AI implementation requires me to change, but personally I am not ready for this metamorphosis*" (Teacher #19).

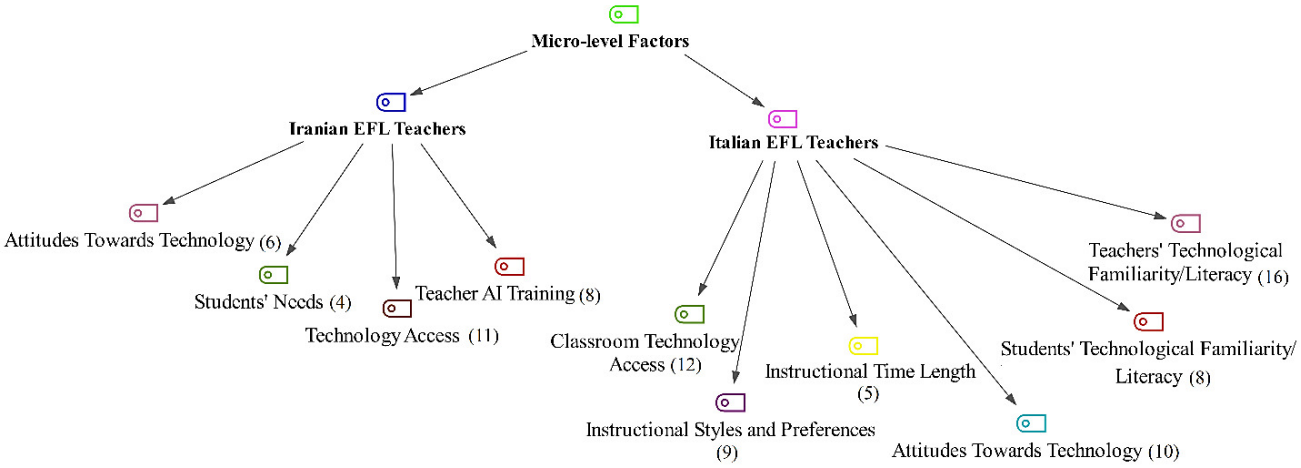

Figure 5. Micro factors influencing EFL teachers' AI-readiness

To conclude, the results of the interview analysis showed that Italian teachers were mostly ready for AI-powered L2 instruction due to their prior IT experiences and curiosity for realizing the roles of AI in education and human abilities development. They all claimed to be AI-ready, but highlighted the necessity of more training in this domain. On the contrary, Iranian EFL teachers mostly lacked readiness for AI (90%) because of "low IT facilities", "unclear potentials of AI for L2 education", and "AI demand for change". Only 10% of Iranian teachers stated their AI-readiness, but again called for more training on it.

4.2. Ecological factors shaping EFL teachers' readiness for AI-mediated L2 instruction

Considering the research question that probed into micro, meso, and macro factors influencing teachers' AI-readiness, interview questions three, four, and five were examined. Regarding micro factors, the results evinced that Iranian EFL teachers repeatedly perceived "technology access" and "teacher AI training" as influential classroom-level factors in their AI-readiness (55%, 40%, respectively). As reported by some respondents, "*teachers require access to various forms of technologies, especially AI and this demands sufficient AI training for EFL teachers*" (Teacher #8). Moreover, "teachers' attitudes towards technology" and "students' needs" were raised as other determinant factors in AI-readiness (Figure 5). In this regard, one participant mentioned:

"Teachers' readiness for AI depends on their attitudes towards technology and AI as well as students' needs for the course. Sometimes, the students have a different expectation of the course and show slight zests for AI. This influences our readiness for AI-integration" (Teacher #18).

On the other hand, Italian EFL teachers pointed out six micro factors for AI-readiness among which "teachers' technological familiarity/literacy" (n = 16, 80%), "classroom technology access" (n = 12, 60%), and "attitudes towards technology" (n = 10, 50%) were the most frequently repeated codes/

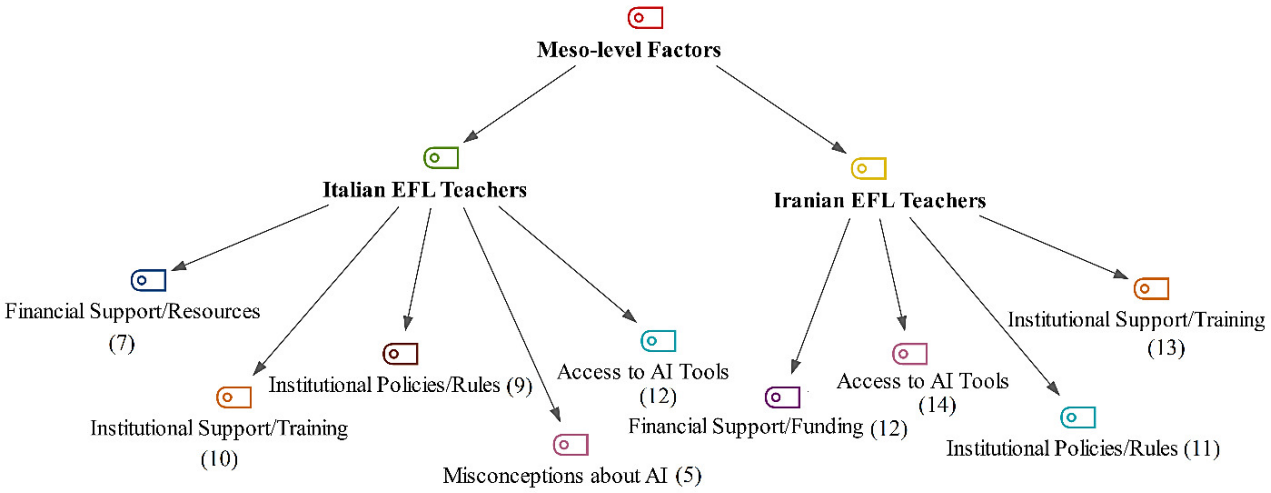

Figure 6. Meso factors influencing EFL teachers' AI-readiness

themes across the data set. Another participant mentioned, "*The degree of familiarity with technologies and AI tools and being literate in applying them to L2 classrooms shapes a teacher's AI-readiness*" (Teacher #7). Other than these preconditions, one respondent argued, "*Without technology access in the classroom it is not possible to be ready for the AI metamorphosis*" (Teacher #11). They also claimed that forming "*positive attitudes towards AI and other forms of educational technologies*" could prepare teachers for AI. Other frequent factors pertained to teachers' teaching style, students' technological literacy, and classroom duration. The commonality between the two samples was that they both highlighted the role of technology "attitude" and "access" in teachers' AI-readiness.

Concerning meso factors, the interview results revealed that EFL teachers of both countries had an analogous perspective by raising four equal themes/codes (Figure 6). More specifically, they considered "access to AI tools", "institutional support/training", "financial support/funding", and "institutional policies/rules" as meso or institutional-level factors affecting AI-readiness. For both Italian and Iranian EFL teachers, "access to AI tools" and "institutional support/training" were the most frequent factors. As one respondent put it, "*L2 teachers need to be trained and supported by the university or schools. They also need to have access to appropriate technological and AI resources*" (Iranian Teacher #4). The only point of divergence was that Italian EFL teachers considered "misconceptions about AI" as an important meso-level factor in AI-readiness. One teacher declared, "*There are some misconceptions around the use of AI (e.g., using ChatGPT to cheat in exams) that might discourage institutions from promoting the use of AI-mediated L2 instruction*" (Italian Teacher #17). In sum, both samples saw "AI access, support, training, and institutional policies" as crucial factors at the mesosystem of AI-readiness.

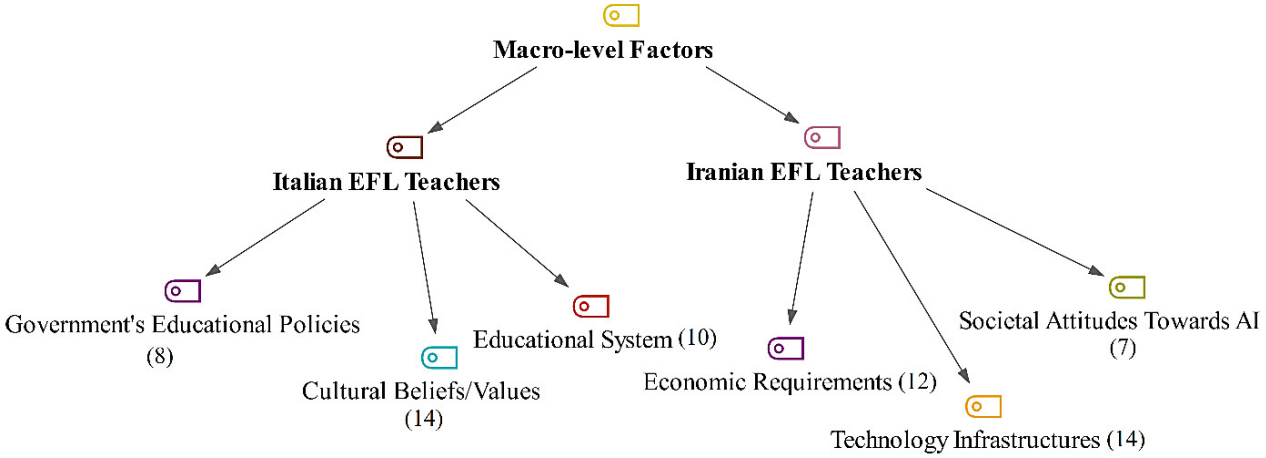

Figure 7. Macro factors influencing EFL teachers' AI-readiness

As for macro-level factors, the results ended in six themes/codes across both contexts (three each) as depicted in Figure 7. For Italian EFL teachers, "cultural beliefs/values" and "educational system" were the most influential factors in teachers' AI-readiness (n = 14, 70%; n = 10, 50%, respectively). The resistance of teachers and the Italian society to AI was claimed to "*frighten teachers and make them believe that AI tools will replace professions of any kind*" (Teacher #12). To support this claim, another participant said, "*In some cultural sectors in Italy, AI tools are subject to lingering stereotypes and accusations*" (Teacher #6). To solve these issues and encourage AI-integration, a respondent pinpointed, "*Italian educational system can welcome this type of instruction as a general practice or a policy only after unveiling its advantages via a series of trials*" (Teacher #20). Speaking of policies, another teacher consented, "*Being AI-ready or not depends on the educational policies enacted by governments and educational systems*" (Teacher #3).

Alternatively, Iranian EFL teachers mostly mentioned "economic requirements" and "technology infrastructures" as macro-level factors of AI-readiness in L2 education. Given the demands of AI, some participants claimed, "*To effectively apply AI into L2 classes, we need finance, funds, and infrastructures*" (Teacher #2, #17). Another important macro factor was "societal attitudes towards AI", which was stated seven times across interviews (35%). In this regard, Teacher #11 maintained, "*A positive societal attitude is required for AI-integration. If a country considers this technology as a danger or evil, we cannot accept AI as a teaching tool*". Teacher #10 reiterated this proposition by stating, "*The availability of financial resources, IT infrastructures, and a welcoming societal view of innovation are all pivotal for AI adoption*".

To sum up, the analysis of interviews demonstrated that both Iranian and Italian EFL teachers enumerated several factors for the ecosystem of AI-readiness at micro, meso, and macro levels. Regarding micro factors, "technology access" and "teacher AI training" were the most frequent factors

in the Iranian sample, while Italian EFL teachers highlighted "teachers' technological familiarity/literacy", "classroom technology access", and "attitudes towards technology" most recurrently. Similarly, both groups accentuated the role of technology "attitude" and "access" in their AI-readiness. Considering meso factors, it was found that Iranian and Italian EFL teachers equally pinpointed "access to AI tools", "institutional support/training", "financial support/funding", and "institutional policies/rules". However, Italian participants raised an additional factor named "misconceptions about AI". Finally, the results concerning macro factors showed that Italian EFL teachers perceived "cultural beliefs/values" and "educational system" as the most influential factors in teachers' AI-readiness, whereas Iranian participants mostly considered "economic requirements" and "technology infrastructures" as central. The role of societal attitudes and government's policies was also underscored in the interviews.

5. Discussion

This qualitative study was a cross-cultural attempt to unmask Italian and Iranian EFL teachers' AI-readiness and its ecosystem. The results of the interview analysis revealed that Italian teachers were mostly ready for AI-powered L2 instruction thanks to their prior IT experiences and curiosity for AI injection into education and human development. They all purported to be AI-ready, but demanded further training. Conversely, most of the Iranian EFL teachers were not ready for AI integration owing to "low IT facilities", "unclear potentials of AI for L2 education", and "AI demand for change". These findings give credence to TAM and TRA, which posit that teachers' technology acceptance and adoption are the consequences of their attitudes and intentions regarding that technology (Davis, 1989; I. L. Wu et al., 2011). In view of these theories, teachers' AI-readiness could be seen as the outcome of their attitudes towards AI and intentions to use such innovations in L2 education. Empirically, the findings resonate with Adams et al. (2023) and Viktorivna et al. (2022), who contended that AI integration largely depends on one's AI literacy and accessibility. The Italian EFL teachers were more ready for AI technologies probably due to their high digital literacy and technological pedagogical content knowledge (TPACK). This is supported by previous studies, which underlined the role of AI access and literacy in high-income countries in their educators' AI integration and attitudes toward it (e.g., Viktorivna et al., 2022; Zhong et al., 2023). It is also likely that the existence of ample IT facilities and infrastructures in Italy, as a developed country, made the participants more prepared for AI compared to their peers in developing countries (Pedro et al., 2019). Another justification for Italian teachers' AI-readiness could be their positive mentality and mindset towards innovation in education. This, in turn, might have arisen from their IT affordability and access. On the other hand, Iranian teachers' lack of readiness for AI could be explained by their rudimentary knowledge of this cutting-edge technology in academia. This might be due to their

low TPACK, digital literacy, and professional training/support concerning educational technologies. In simple terms, the readiness and practicality of AI emerge from the availability of resources in a country. Therefore, it is warranted to contend that Iranian EFL teachers had less access to AI tools than their Italian counterparts did and this diverged their degree of AI-readiness.

Concerning the ecological factors shaping AI-readiness, the results indicated that for Iranian teachers "technology access" and "teacher AI training" were the most frequent micro factors, while Italian EFL teachers mostly admitted "teachers' technological familiarity/literacy", "classroom technology access", and "attitudes towards technology". Likewise, both groups emphasized technology "attitude" and "access" to become AI-ready. The findings are in line with the ecological model proposed by Bronfenbrenner (1977) in that AI-readiness is a multifaceted construct comprising factors internal and external to teachers. Despite the novelty of AI for the participants of both countries, they argued that technological access and positive attitudes towards AI play a crucial role in their readiness. This concurs with Felix's (2020) study, which highlighted the role of micro-level factors pertaining to teachers in AI implementation in education. This finding sheds more light on TAM that considers an individual's attitudes and intentions central to his/her actual use of technology. Such perceptions and intended behaviors are the result of accessibility and affordability of the given technology (Davis, 1989). The participants emphasized technological "training" and "familiarity/literacy" perhaps because of their awareness of AI usage in modern L2 education and the gap between AI theory and practice (Wang et al., 2023). It seems that their professional development level had not been satisfactory regarding AI tools, making them passionate about further training. They regarded these factors as pivotal micro-systems probably due to their pedagogical expertise and digital literacies in a changing world.

With respect to meso factors, the findings evinced that Iranian and Italian EFL teachers correspondingly identified "institutional access to AI tools", "institutional support/training", "financial support/funding", and "institutional policies/rules" influential in their AI-readiness. Furthermore, Italian teachers dubbed "misconceptions about AI" prominent, too. The findings echo the second layer of the ecological model (Bronfenbrenner, 1977) in that AI-readiness is rendered when micro-level factors are combined with the social context of learning and practice. This finding corroborates the research by Kim and Gurvitch (2020), who underscored the importance of community of inquiry in technology adoption among online instruction teachers. The findings are attributable to the participants' functional awareness and knowledge base of AI tools, which seem to originate from their practical conception and ideation that AI integration is built up from both a teacher's private world (i.e., micro-level factors) and the public community space (i.e., the meso level). Both Italian and Iranian EFL teachers accentuated

institutional roles, policies, and supports probably because of their strong belief in joint professional feedback/practice that functions as a pat on the back regarding technology acceptance and use. When an institution welcomes innovation, teachers are more willing to gain knowledge and practice characteristic tasks in a particular domain. In such settings, it can be asserted that the new knowledge and the person are accommodated and scientific equilibration is accomplished. In contrast, when there are hostilities and misconceptions about technological advances in a community, teachers prefer to avoid them and overlook their potential benefits. It appears that the participants of both contexts knew the meso space between micro and macro ecosystems, which is often dismissed as a distinct entity.

Furthermore, this study illustrated that Italian EFL teachers regarded "cultural beliefs/values" and "educational system" as the most fundamental macro factors in AI-readiness, but Iranian teachers perceived "economic requirements" and "technology infrastructures" as determinants. This finding is consistent with the socio-cultural perspective of L2 education that regards teachers' behaviors and practices as offshoots of numerous social, cultural, and contextual idiosyncrasies (van Lier, 2011). The study also undergirds the macro-system layer of the ecological model. Italian teachers' previous experiences and pedagogical knowledge about AI could explain their emphasis on cultural beliefs and educational systems. This extrapolation complies with De Angelis (2011), who found teachers' beliefs, values, and prior experiences the core of their teaching practices across Italy, Austria, and the UK. Another reason could be the existence of cultural avoidance and stereotyping in the Italian educational system regarding AI technologies, making the participants more concerned about these macro factors. Such interpretation mirrors the role of societal attitudes and the government's educational policies in welcoming or guarding against innovation. On the other hand, Iranian EFL teachers' concerns about "economic requirements" and "technology infrastructures" could be ascribed to their limited logistics and resources for AI integration. As Iran is a developing country, its teachers may show less AI-readiness but more worries about funds and infrastructures. This is substantiated by Pedro et al.'s (2019) contention that teachers in developing countries are less AI-ready. Another explanation could be the idea that Iranian EFL teachers' knowledge and understanding of AI is still not fully-fledged and remains at the basic stage. That is why their macro understanding of AI has mostly revolved around economy and IT access. In sum, although this study presented insightful findings regarding AI-readiness in L2 education across two countries, the researchers are uncertain if cultural-contextual variation has caused all the outcomes or other factors (e.g., experience, education, literacy) are at play.

6. Conclusion and implications

In view of the results, it can be concluded that EFL teachers' AI-readiness is a multi-faceted construct comprising micro, meso, and macro ecosystems. It is also asserted that cultural disparities, educational policies, societal attitudes, and IT affordability/accessibility play a major role in the presence or absence of AI-readiness among EFL teachers. Depending on the fulfillment of such requirements, EFL teachers from different educational contexts may perceive AI integration differently. For instance, teachers who work in educational contexts that are open to diversity and change, are provided with ample support, and enjoy high IT access are more likely to be AI-ready compared to those working in poor countries. With these insights, this study may be momentous for both theory and practice of AI in L2 education. Theoretically, the findings of this study extend TPACK and TAM models to the world of L2 education in light of AI. Moreover, the study unravels the ecosystem and ecological factors of AI-readiness, which in turn certifies the applicability of this perspective in AI-powered L2 education across cultures.

Practically, the findings may help EFL teachers, trainers, and language policy-makers. They might be useful for EFL teachers to make informed decisions about what AI technologies to use and how to use them appropriately. Teachers can also draw from this study to figure out practical ways to get ready for the AI age. Teacher trainers may also benefit from the findings by running professional development for teachers and offering viable ways to prepare them for AI-enhanced learning. The factors that mediate the acceptance and utilization of AI in applied linguistics can also be explained to early-career L2 teachers in teacher education courses. Likewise, language policy-makers can draw on the findings of this study and revisit their regulations and plans for educational technology injection into the curricula. They can consider and assign enough budget for an effective implementation of AI technologies into L2 education.

Despite these merits, this study suffers from some limitations, too. Firstly, the data were collected only from two contexts, and making universal conclusions is not warranted. Secondly, the researchers only used semi-structured interviews to glean the data, while other complementary instruments could make the picture clearer. Thirdly, the effect of intervening factors such as experience and academic degree for AI-readiness was not controlled in this study. Focusing on these constraints, future researchers can examine the dynamism of AI-readiness using longitudinal and time-series designs. Additionally, future research is suggested to triangulate the data via questionnaires, observations, and narratives. The influence of digital literacy and AI literacy on teachers' adoption of AI can be investigated, too. Moreover, theoretical models and frameworks for the implementation of AI in L2 education and teacher education can be sought in future studies. Avid L2 researchers are also advised to scrutinize the impact of AI teaching and

learning from the perspective of different stakeholders. Finally, the interaction of AI-readiness with language teacher identity and emotions can be a fresh line of inquiry in the future.

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Appendix

Interview Questions

Part A) Consent Form

I hereby declare that I voluntarily take part in this research project. I allow the researchers to use my answers as long as my privacy is respected and my identity remains anonymous. The researchers assured that the data will be used only in this study and remain confidential.

1. **Agree** to participate in this study ☐
2. **Disagree** to participate in this study ☐

Part B) Background Information

1. Age:……..
2. Gender……
3. Major……
4. Teaching experience……..
5. Degree of familiarity with the use of artificial intelligence in L2 education

   Low ☐

   Mid ☐

   High ☐

6. Have you ever used AI-powered tools and bots in your L2 classes?

   Yes ☐

   No ☐

Part C) Teachers' Perceptions of AI-Mediated Education

1. What is your view of using AI in L2 education? What are its benefits and misfits?
2. To what extent, do you think you are ready for an AI-powered L2 education? Can you explain your perspective?
3. What micro-level factors (i.e., individual and classroom-level) influence your readiness for AI-mediated L2 instruction? Can you list them?
4. What meso-level factors (i.e., institutional) shape your readiness for an AI-mediated L2 instruction?
5. What macro-level factors (i.e., educational system, policy, culture) affect your degree of readiness for an AI-mediated L2 instruction? Can you elaborate on your response?