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Leveraging AI Chatbots in ESP: The Role of Digital Readiness in Enhancing Vocational Students' Willingness to Communicate

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Abstract. This research investigates the effects of digital readiness and using AI chatbots affects vocational students' willingness to communicate in English, specifically for work or study purposes. The study used a questionnaire and open-ended questions to collect data from 182 students in Sumatera, Indonesia and then analyzed the results to see how digital readiness and chatbot use individually and together impact students' willingness to communicate in English. The findings reveal that both digital readiness and AI chatbot use significantly and positively influence students' WTC, with digital readiness emerging as the stronger predictor. The model explains a substantial proportion of variance in WTC, indicating that students' preparedness to engage with digital technologies plays a critical role in maximizing the benefits of AI-mediated learning environments. AI chatbots were found to enhance communicative confidence, reduce anxiety, and encourage active participation in English communication. A novel contribution of this study is the identification of the dual role of learners' mother language (L1). While strategic L1 use supports idea formulation and boosts confidence, excessive reliance may hinder spontaneous communication. AI chatbot interaction appears to facilitate a gradual shift from L1 dependence to more autonomous L2 use. These findings offer important theoretical and pedagogical implications for technology-enhanced ESP learning in vocational education contexts.

Keywords: AI Chatbots; Digital Readiness; ESP; Vocational Students; WTC.

1. INTRODUCTION

Digital transformation has become a fundamental pillar in the advancement of global education, particularly in higher education, where institutions are required to integrate technology into the teaching and learning process in a systematic and sustainable manner (Benavides et al., 2020). For example, when we talk about Teaching English as a Foreign Language using technology is not something we can choose to do or not do anymore. It is something we have to deal with the challenges of the world we live in today. This is especially true for English for Specific Purposes which's a type of learning that focuses on getting a job and being good at a particular profession.

Vocational students need to be good at English in general. They also need to learn how to communicate in a way that is specific to what they want to do. They need to learn the language that people use in their field so they can get a job and be good at what they do. Digital transformation is changing the way we teach and learn English, for Specific Purposes. It is helping students get the skills they need to succeed.

However, the success of technology enhanced ESP learning largely depends on students' level of digital readiness. This readiness encompasses technical, cognitive, and

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affective aspects, including the ability to use technological devices, access to digital learning resources, learning motivation, and perceptions of the effectiveness of technology-based instruction (Liza & Andriyanti, 2020). Previous studies have indicated that factors such as academic needs, technological competence, pedagogical alignment, accessibility, motivation, as well as efficiency and effectiveness significantly influence students' digital readiness in ESP learning. On the other hand, in the context of foreign language learning, willingness to communicate (WTC) is considered a crucial indicator of learning success. WTC refers to an individual's readiness to initiate and sustain communication in the target language. However, in EFL contexts across Asia, including Indonesia, students' WTC is often relatively low due to limited opportunities for communicative practice, speaking anxiety, and lack of confidence (El Shazly, 2021). This condition poses a significant challenge in English language learning, particularly in vocational settings where practical communication skills are essential. The rapid development of Artificial Intelligence (AI), particularly in the form of AI chatbots, offers new opportunities to address these challenges. AI chatbots are capable of providing interactive, adaptive, and non-judgmental learning environments, which can enhance students' confidence, motivation, and participation in English communication (Waluyo,2025). Repeated interaction with chatbots has also been shown to improve speaking fluency and reduce communication anxiety.

Nevertheless, most existing studies have focused on general EFL contexts in Asia and have not specifically examined the integration of digital readiness and AI chatbot use within vocational education contexts in Indonesia, particularly in Sumatera. Furthermore, studies that integrate digital readiness and AI-mediated learning in predicting WTC remain limited. In fact, digital readiness is assumed to be a key factor determining the effectiveness of technology use, including AI chatbots, in enhancing students' communicative competence. Without adequate digital readiness, the use of technology may not be optimal and may even hinder the learning process. Based on the above considerations, a significant research gap exists, particularly in the context of vocational students in Sumatera, who possess distinct social, cultural, and educational infrastructure characteristics. Therefore, this study aims to examine the effect of digital readiness and AI chatbot use on students' willingness to communicate in ESP learning. This research is expected to contribute theoretically to the development of technology-enhanced learning models and practically to the improvement of ESP curriculum design and instructional strategies in vocational education.

2. LITERATUR REVIEW

Digital readiness refers to learners' preparedness to effectively engage with digital technologies in educational contexts, encompassing technical skills, cognitive competence, and affective dispositions toward technology use. In higher education, particularly within *English for Specific Purposes* (ESP), digital readiness plays a crucial role in determining the success of technology-enhanced learning environments. Recent studies conceptualize digital readiness as a multidimensional construct that includes academic needs, technological competence, pedagogical alignment, accessibility, motivation, and perceived efficiency and effectiveness of digital tools (Liza & Andriyanti, 2020; Martin & Grudziecki, 2006; Peng & Yu, 2022).

In vocational education, digital readiness becomes even more critical due to the applied and practice-oriented nature of learning. Students are expected not only to consume information but also to actively engage in simulations, problem-solving tasks, and communication practices relevant to their professional fields. A lack of readiness may result in ineffective technology use, reduced engagement, and suboptimal learning outcomes.

Furthermore, digital readiness is closely linked to self-directed learning and learner autonomy. Students with higher readiness levels tend to demonstrate greater initiative in accessing online materials, engaging in interactive learning, and utilizing digital tools to support their language development. Therefore, digital readiness can be considered a foundational variable that mediates the effectiveness of digital learning innovations, including AI-based tools.

Moreover, Artificial Intelligence (AI) chatbots are conversational agents designed to simulate human-like interaction through natural language processing and machine learning technologies. Their integration into language learning has gained significant attention due to their ability to provide interactive, adaptive, and learner-centered experiences.

Historically, early chatbot systems such as ELIZA and ALICE were rule-based and limited in their conversational capabilities (Weizenbaum, 1966); ALICE (Wallace, 2009). However, advancements in deep learning and transformer-based architectures have led to the development of more sophisticated conversational AI systems capable of generating context-aware and dynamic responses .

In the context of English language learning, AI chatbots function as virtual interlocutors that offer: real-time interaction, immediate corrective feedback, personalized learning experiences, and low-anxiety communication environments.

Empirical evidence suggests that chatbot-assisted learning enhances learners' motivation, communicative confidence, and engagement (Fathi et al., 2024; Kim & Su, 2024; Yuan, 2024). Additionally, these tools help reduce speaking anxiety by providing a non-judgmental environment where learners can practice freely without fear of negative evaluation.

Despite these advantages, several limitations remain. Chatbots may lack pragmatic awareness, cultural sensitivity, and the ability to sustain complex, context-rich conversations. Moreover, their effectiveness depends heavily on users' familiarity with technology and their willingness to engage consistently. These challenges highlight the importance of examining contextual and learner-related factors, such as digital readiness, in chatbot-assisted learning.

In addition, Willingness to Communicate (WTC) is a central construct in second language acquisition, defined as an individual's readiness to initiate communication in a second language at a particular time with a specific interlocutor (MacIntyre et al., 2021).

WTC is not a fixed trait but a dynamic and context-dependent variable influenced by both individual and situational factors. Key determinants of WTC include: communicative confidence, language anxiety, motivation, perceived competence, and prior communication experiences.

In EFL contexts, particularly in Asia, WTC is often hindered by high levels of anxiety, fear of making mistakes, and limited exposure to authentic communication opportunities. These factors contribute to passive classroom behavior and reduced participation in communicative activities.

Recent theoretical developments have incorporated perspectives from positive psychology, emphasizing the role of enjoyment, resilience, and emotional well-being in enhancing WTC (14)(15) (Jin & Lee, 2022; Sato, 2023). Additionally, contextual factors such as teacher support, peer interaction, and learning environment significantly shape learners' communicative behavior.

Importantly, WTC is closely associated with actual language use and proficiency development. Learners with higher WTC are more likely to engage in meaningful interaction, which in turn facilitates language acquisition. Therefore, fostering WTC is a key objective in communicative language teaching.

The integration of digital readiness and AI chatbot use provides a comprehensive framework for understanding learners' communicative behavior in technology-enhanced ESP environments.

First, digital readiness is hypothesized to influence learners' ability to effectively use AI chatbots. Students with higher levels of readiness are more likely to engage with digital tools, navigate learning platforms, and utilize chatbot features for language practice.

Second, AI chatbot interaction has been shown to positively affect WTC by: reducing communication anxiety, increasing confidence, and providing opportunities for repeated practice (Sato, 2023) (16).

Third, the interaction between digital readiness and chatbot use is expected to produce a synergistic effect. Without sufficient readiness, the potential benefits of AI chatbots may not be fully realized. Conversely, when both factors are present, learners are more likely to experience meaningful engagement and improved communicative outcomes.

However, existing research has largely examined these variables in isolation. There is a lack of integrative studies that explore how digital readiness and AI-mediated interaction jointly influence WTC, particularly in vocational education contexts.

3. RESEARCH METHODOLOGY

This study employed a mixed-methods study with a survey-based component to examine the relationships between digital readiness, AI chatbot use, and students' willingness to communicate (WTC) in English for Specific Purposes (ESP) contexts and open-ended questions to digging the deep informations. The participants were vocational higher education students in Sumatera, Indonesia, who had experienced ESP instruction and were familiar with digital learning environments. A purposive sampling technique was used to ensure that respondents met specific criteria, including prior exposure to digital tools and AI chatbot applications in language learning contexts. This study adopted a convergent mixed-methods design (Creswell & Creswell, 2018). While the primary data were quantitative, derived from a 45-item Likert scale, the inclusion of five open-ended questions allowed for a qualitative exploration of students' lived experiences (Bazeley, 2013).

Data were collected through a structured questionnaire consisting of 45 items measured on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The instrument was developed based on established theoretical constructs and prior empirical studies on digital readiness , AI chatbot-assisted language learning, and WTC . The digital readiness scale included dimensions such as technological competence, accessibility, motivation, and perceived effectiveness, while the AI chatbot construct captured aspects of usability, interactivity, and feedback. WTC was measured through indicators of communicative confidence, willingness to initiate interaction, participation, and anxiety

reduction. Prior to data collection, the instrument was validated through expert judgment and pilot testing, and reliability was confirmed using Cronbach's alpha coefficient, with a threshold of 0.70 indicating acceptable internal consistency (Hair et al., 2019).

Data analysis was conducted using descriptive and inferential statistical techniques. Descriptive statistics were used to summarize the distribution of responses, while multiple linear regression analysis was applied to examine the individual and combined effects of digital readiness and AI chatbot use on WTC. Assumption testing, including normality, multicollinearity, and heteroscedasticity, was performed to ensure the robustness of the regression model. The coefficient of determination (R^2) was used to assess the explanatory power of the model, and significance levels were set at $p < .05$. This analytical approach is widely recommended for examining causal relationships among variables in educational research (Field, 2018; Hair et al., 2019).

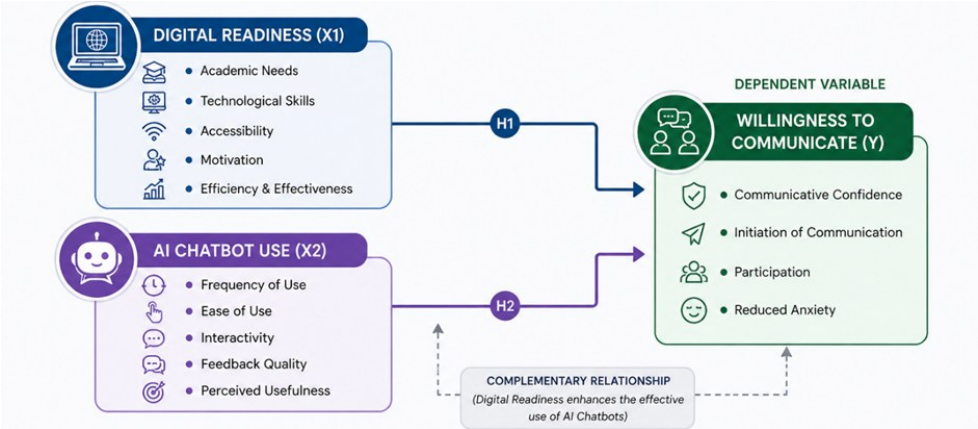

Figure 1. Conceptual Framework.

4. RESULT AND DISCUSSION

A total of 182 valid responses were analyzed in this study. The participants consisted of vocational students from various study programs in Sumatera who had prior experience with ESP learning and digital tools. Table 1 presents the descriptive statistics for the main variables.

Table 1. Descriptive Statistics of Variables.

Variable	Mean	SD	Interpretation
Digital Readiness	3.87	0.56	High
AI Chatbot Use	3.74	0.61	Moderately High
WTC	3.68	0.59	Moderately High

The results indicate that students demonstrated a relatively high level of digital readiness, suggesting that they are generally capable of engaging with digital learning environments. The use of AI chatbots was also reported at a moderately high level, indicating

increasing familiarity with AI-assisted learning tools. Meanwhile, students' willingness to communicate (WTC) was found to be moderately high, reflecting a generally positive disposition toward using English for communication.

a. Reliability and Validity

All measurement scales demonstrated satisfactory internal consistency. Cronbach's alpha values were 0.91 for digital readiness, 0.89 for AI chatbot use, and 0.88 for WTC, exceeding the recommended threshold of 0.70 (Hair et al., 2019). Item-total correlations ranged from 0.52 to 0.81, indicating good construct validity. These results confirm that the instrument is both reliable and valid for further analysis.

b. Regression Analysis

A multiple linear regression analysis was conducted to examine the effects of digital readiness and AI chatbot use on WTC. Prior to analysis, all assumptions, including normality, multicollinearity, and homoscedasticity, were satisfied. The model explained 52% of the variance in WTC ($R^2 = 0.52$), indicating a strong explanatory power. Both digital readiness ($\beta = 0.41$, $p < .001$) and AI chatbot use ($\beta = 0.36$, $p < .001$) were found to be significant predictors of WTC, as shown in the table below:

Table 2. Multiple Linear Regression

Model	Unstandardized B	Std. Error	Standardized β	t	Sig. (p)
(Constant)	1.12	0.24	-	4.67	.000
Digital Readiness	0.43	0.08	0.41	5.38	.000
AI Chatbot Use	0.35	0.07	0.36	5.01	.000

Discussion

The findings of this study provide empirical support for the significant role of digital readiness and AI chatbot use in enhancing students' willingness to communicate in ESP contexts.

First, digital readiness emerged as the strongest predictor of WTC. This finding suggests that students who possess higher levels of technological competence, accessibility, and motivation are more likely to engage in communication activities. This aligns with previous research indicating that digital readiness facilitates learner autonomy and engagement in technology-enhanced learning environments. In vocational education, where learning is practice-oriented, digital readiness enables students to actively participate in interactive tasks and simulations that foster communication skills.

Second, AI chatbot use was found to significantly contribute to WTC. The results confirm that chatbot-assisted learning creates a supportive and low-anxiety environment that encourages students to practice speaking more frequently. This supports earlier findings that AI chatbots enhance communicative confidence, reduce language anxiety, and promote spontaneous interaction. The interactive nature of chatbots allows learners to engage in repeated practice, which is essential for developing fluency and confidence.

Importantly, the combined effect of digital readiness and AI chatbot use indicates a complementary relationship. While AI chatbots provide the technological platform for interaction, digital readiness determines the extent to which students can effectively utilize these tools. This finding highlights that technology alone is insufficient; learners must also be prepared to engage with it meaningfully. This supports the argument that digital readiness acts as an enabling factor in technology-enhanced language learning.

From a theoretical perspective, this study extends the WTC framework (MacIntyre et al., 1998) by integrating technological variables into the model. It demonstrates that WTC is not only influenced by psychological and linguistic factors but also by digital and technological readiness. This integration is particularly relevant in contemporary EFL contexts, where digital tools increasingly mediate communication.

From a pedagogical perspective, the findings suggest that ESP instructors in vocational education should: Enhance students' digital readiness through training and scaffolding, Integrate AI chatbot-based activities into classroom practice, and Design communicative tasks that leverage technology to reduce anxiety and increase participation.

Despite these contributions, this study has several limitations. First, the use of self-reported data may introduce response bias. Second, the cross-sectional design limits the ability to establish causal relationships over time. Future research is recommended to employ longitudinal or experimental designs to examine the long-term impact of AI chatbot use on communicative competence and real-world communication performancel.

5. CONCLUSION

This study set out to examine the effects of digital readiness and AI chatbot use on vocational students' willingness to communicate (WTC) in English within ESP contexts. The findings demonstrate that both digital readiness and AI chatbot use significantly and positively predict WTC, with digital readiness emerging as the stronger predictor. The model explains a substantial proportion of variance in WTC, indicating that learners' preparedness to engage

with digital environments, combined with opportunities for AI-mediated interaction, plays a decisive role in fostering communicative engagement in EFL settings.

From a pedagogical standpoint, the results underscore that technology integration alone is insufficient; its effectiveness is contingent upon learners' capacity and readiness to use it meaningfully. AI chatbots contribute by providing low-anxiety, interactive practice that enhances confidence and participation, while digital readiness enables students to fully capitalize on these affordances. Together, these factors create a supportive ecosystem for communication development in vocational ESP learning.

A notable and original insight emerging from this study concerns the role of learners' mother language (L1) in shaping WTC. The findings suggest that L1 functions as both a facilitator and a constraint. On the one hand, students who strategically relied on their mother language as a cognitive scaffold such as for planning utterances, translating key vocabulary, or organizing ideas demonstrated higher confidence and a greater willingness to initiate communication. This indicates that L1-mediated cognitive processing can reduce cognitive load and support message formulation, thereby indirectly enhancing WTC.

On the other hand, excessive dependence on the mother language was associated with hesitation and reduced spontaneity in English communication. Students who frequently reverted to L1 during interaction tended to exhibit lower fluency and increased self-monitoring, which in turn limited their willingness to engage in real-time communication. This dual role highlights that the influence of L1 is not inherently detrimental; rather, its impact depends on how it is utilized within the learning process.

Importantly, the integration of AI chatbots appears to mediate this relationship. The chatbot environment encourages gradual transition from L1-supported processing to more direct L2 production by offering repeated, low-stakes interaction. Students reported feeling more comfortable experimenting with English without immediate social pressure, which reduced reliance on L1 over time. This suggests that AI-mediated learning environments can serve as a bridge between L1-dependent cognition and autonomous L2 communication.

Theoretically, this study extends the WTC framework by incorporating digital readiness and AI-mediated interaction as key determinants, while also introducing the nuanced role of mother language as a dynamic influencing factor. Practically, the findings recommend that ESP instructors adopt a balanced approach: allowing strategic use of L1 as scaffolding while progressively encouraging direct L2 engagement, supported by AI-based tools.

Despite its contributions, this study is limited by its reliance on self-reported data and cross-sectional design. Future research is recommended to employ longitudinal or

experimental approaches to further explore the evolving role of L1 in AI-supported language learning and its long-term impact on communicative competence.

In conclusion, enhancing WTC in vocational ESP learning requires not only technological innovation but also a deeper understanding of learners' cognitive and linguistic realities, including the strategic role of the mother language in second language communication.

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