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The Impact of AI-Powered Language Learning Applications on Learner Autonomy and Communicative Competence in ELT

Castro Clive (castro.clive@gmail.com),
Research Scholar, Department of English, Sanatana Dharma College, Alappuzha, Kerala, India
Dr. John George Athyal (johnathyal@gmail.com),
Associate Professor, Department of English, Christian College Chengannur, Kerala, India

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Abstract: *This study examines the impact of AI-powered language learning applications on learner autonomy and communicative competence in English Language Teaching (ELT). Employing a mixed-method approach with 150 EFL learners, the research combines quantitative data from surveys and app analytics with qualitative insights from interviews. Findings reveal that AI tools such as Duolingo, ELSA Speak, and ChatGPT enhance learner autonomy by fostering goal-setting, self-regulation, and motivation through adaptive feedback and personalization. Similarly, AI applications significantly improve communicative competence, particularly in pronunciation, fluency, and strategic interaction. However, limitations persist regarding socio-cultural understanding, emotional engagement, and over-reliance on automated feedback. The study concludes that AI is most effective when integrated within blended learning models that combine technological innovation with teacher guidance, ensuring both autonomy and authentic communication development in ELT.*

Keywords: AI-Powered Learning, Blended Learning, Communicative Competence, ELT, Learner Autonomy

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1. Introduction

In recent years, Artificial Intelligence (AI) has revolutionized various sectors of education, including English Language Teaching (ELT). The integration of AI-powered applications in language learning represents a paradigm shift from traditional classroom-based teaching to more personalized, adaptive, and learner-centred approaches. AI technologies—such as Natural Language Processing (NLP), speech recognition, and machine learning—have enabled the creation of smart applications like Duolingo, ELSA Speak, Babbel, and ChatGPT, which can simulate interactive learning experiences and offer instant feedback to learners. These systems analyze learner inputs, identify linguistic patterns, and adjust content to meet individual learning needs (M. Li and C. Hegelheimer, 2013.).

Historically, language learning relied heavily on face-to-face interaction and teacher guidance. However, with the emergence of mobile learning platforms and AI-driven tools, learners can now engage in autonomous learning beyond institutional boundaries. The concept of learner autonomy, initially proposed by Holec, emphasizes the learner's capacity to take charge of their learning process. AI applications complement this notion by allowing learners to set goals, monitor progress, and receive customized recommendations that match their proficiency level. The integration of intelligent algorithms thus promotes self-directed learning and continuous skill enhancement (H. Holec, Autonomy and Foreign Language Learning,, 1981).

Furthermore, AI-based technologies have contributed to developing communicative competence, a key objective in ELT. Communicative competence involves linguistic, sociolinguistic, discourse, and strategic competencies that enable effective communication in real contexts. By offering simulated dialogues, pronunciation feedback, and contextualized vocabulary usage (D. Kukulska-Hulme, 2018), AI systems facilitate active communication practice and enhance fluency. Recent research also indicates that AI tools reduce learner anxiety and provide non-judgmental environments that encourage experimentation with language. Hence, the intersection of AI and ELT marks a significant milestone in reshaping pedagogical methodologies and learner engagement.

1.1. Significance of the Study

The significance of studying AI-powered language learning applications lies in their growing influence on the development of learner autonomy and communicative competence—two essential pillars of language acquisition. As the global demand for English proficiency increases in academia, business, and digital communication, the role of technology in supporting independent learning becomes increasingly vital. AI applications have the potential to democratize access to language education by providing cost-effective and scalable solutions for learners worldwide, regardless of geographical or socioeconomic constraints (A. B. Al-Shehri, 2012.).

Traditional ELT approaches often struggle to address individual learner differences, such as learning styles, motivation levels, and pace of progress. AI-driven platforms overcome these limitations through adaptive learning algorithms that personalize instruction based on real-time learner data. This personalization fosters intrinsic motivation, a core factor in developing autonomy. Learners who receive immediate and individualized feedback tend to reflect more on their learning strategies and demonstrate improved self-regulation (S. Godwin-Jones, 2019).

Moreover, AI technologies offer practical benefits for communicative competence development. Chatbots and conversational AI tools simulate real-life interactions, providing learners with authentic language exposure. Such interactions reinforce not only grammatical accuracy but also pragmatic awareness—the ability to use language appropriately in context. Additionally, (Sauro, 2017), speech recognition tools help learners refine pronunciation and intonation through immediate corrective feedback. These affordances align with the communicative language teaching (CLT) approach, which emphasizes meaningful interaction as the foundation for language mastery.

This study is significant because it bridges the gap between technological innovation and pedagogical practice. It highlights how AI can act as both a facilitator and enhancer of language learning processes, empowering learners to become active agents in their own development. Furthermore, understanding the impact of AI on learner autonomy and communicative competence can guide educators, policymakers, and developers in designing more effective and ethically responsible AI-based ELT interventions (T. Reinders and C. White, 2016.).

1.2. Research Problem and Objectives

Despite the widespread adoption of AI in language learning, there remains limited empirical evidence regarding its actual impact on learners' autonomy and communicative competence. Many AI tools focus on vocabulary acquisition, grammar drills, and error correction, but their effectiveness in promoting independent learning behavior and real communicative ability is still under debate. Furthermore, learners may over-rely on AI tools without developing metacognitive awareness or critical thinking, which are essential for autonomous learning (M. Viberg and Å. Grönlund, 2015.).

Another issue concerns the authenticity of communication in AI-driven environments. Although chatbots and voice assistants can mimic conversation, they lack the socio-pragmatic depth and spontaneity of human interaction. Consequently, learners may acquire mechanical fluency without developing pragmatic sensitivity or intercultural competence. Additionally, ethical concerns arise regarding data privacy, algorithmic bias, and over-standardization of linguistic norms within AI systems. These challenges warrant a systematic investigation into how AI applications truly influence the learner's capacity to self-direct learning and communicate effectively in diverse contexts (Stockwell, 2006).

1.3. Research Objectives:

- To analyze the role of AI-powered language learning applications in fostering learner autonomy in ELT.
- To evaluate the extent to which these applications contribute to developing communicative competence.
- To examine learners' perceptions and experiences with AI tools in relation to motivation, self-regulation, and engagement.

- To identify the challenges and limitations associated with using AI applications in language learning.
- To provide pedagogical recommendations for integrating AI ethically and effectively into ELT practices.

By addressing these objectives, the study aims to contribute to the growing field of AI-assisted language education and provide actionable insights for educators and researchers.

1.4. Hypotheses

Based on the identified research gaps and objectives, the study proposes the following hypotheses:

H1: The use of AI-powered language learning applications significantly enhances learner autonomy by promoting self-directed learning behaviors and goal-setting abilities.

H2: AI-based applications positively impact learners' communicative competence by providing interactive, contextualized, and feedback-driven learning experiences.

H3: There is a positive correlation between learner motivation and the frequency of AI application use in language learning.

H4: Over-reliance on AI tools may limit the development of critical reflection and intercultural awareness necessary for effective communication.

H5: Learners' perceptions of AI-driven feedback and personalization mediate the relationship between AI use and language learning outcomes (Zou, 2023.).

These hypotheses will guide the empirical investigation of how AI technologies shape linguistic and cognitive dimensions of learning. Testing them will help determine whether AI applications merely supplement language instruction or fundamentally transform learner agency and communicative competence.

2. Literature Review

2.1. AI in Education: Overview and Trends

Artificial Intelligence (AI) has emerged as a transformative force in education, reshaping teaching methodologies, assessment strategies, and learner engagement. AI in education encompasses intelligent tutoring systems, adaptive learning platforms, natural language processing (NLP), and predictive analytics to personalize instruction and optimize outcomes. In recent years, educational institutions have integrated AI-driven solutions to automate administrative tasks, support personalized learning pathways, and enhance assessment accuracy (R. Luckin et al., 2016). These tools analyze vast learner data to predict performance, identify weaknesses, and deliver tailored feedback, promoting data-driven educational practices.

AI's influence on education can be categorized into three major trends: personalization, automation, and augmentation. Personalization involves customizing learning experiences according to individual preferences and learning styles. Automation reduces teachers' workloads by handling repetitive tasks such as grading and attendance. Augmentation enhances teaching by providing intelligent recommendations and interactive learning environments. In language education, AI technologies such as machine translation, voice recognition, and chatbots facilitate interactive and communicative learning experiences. Learners engage with real-time feedback systems that emulate human conversation and adapt to linguistic proficiency levels (N. Selwyn, 2020.).

Globally, AI's role in education continues to expand, with UNESCO and OECD recognizing its potential to democratize learning and improve equity. However, ethical issues such as data privacy, algorithmic bias, and the digital divide remain pressing concerns. As a result, educational researchers emphasize the need for responsible AI integration that aligns technological advancement with pedagogical ethics (UNESCO, 2021.). Thus, AI in education is not only a technological evolution but also a pedagogical revolution that challenges educators to rethink traditional teaching frameworks and learner engagement models.

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2.2. Language Learning Applications: Features and Functions

AI-powered language learning applications have redefined how learners acquire second or foreign languages. These applications combine elements of gamification, adaptive learning, and speech recognition to create immersive learning experiences. Popular platforms such as Duolingo, Babbel, Rosetta Stone, and ELSA Speak use AI algorithms to analyze learner responses, predict errors, and adjust difficulty levels dynamically. Such personalization helps maintain motivation and promotes learner persistence—critical factors for long-term language acquisition (Beatty, 2013).

The core features of these applications include **adaptive feedback systems**, **interactive dialogues**, **spaced repetition algorithms**, and **speech evaluation modules**. Adaptive feedback ensures that learners receive immediate and individualized responses to their errors, reinforcing correct language use. Spaced repetition optimizes vocabulary retention through interval-based exposure, while speech recognition allows learners to refine pronunciation and fluency. Furthermore, the integration of gamified elements—such as badges, leaderboards, and progress tracking—enhances learner engagement and competitiveness (A. Godwin-Jones, 2018.).

Recent advances in NLP and AI-generated content have enabled language learning apps to simulate authentic conversational contexts. For instance, AI chatbots like ChatGPT and Google's Bard facilitate open-ended discussions that improve learners' communicative competence by exposing them to real-life linguistic nuances. Additionally, sentiment analysis and affective computing allow applications to detect learner emotions, adapting instruction accordingly to reduce frustration or cognitive overload. These features collectively support learner-centered pedagogy by aligning technological design with human learning psychology (Hockly, 2022.).

However, while these applications enhance accessibility and convenience, critics argue that they may oversimplify linguistic complexity or neglect socio-cultural aspects of language use. Hence, integrating AI-based tools with teacher-guided instruction is crucial to ensure a balance between technological efficiency and human empathy in language learning.

2.3. Learner Autonomy in ELT

Learner autonomy has long been recognized as a cornerstone of effective language education. Defined by Holec (1981) as the "ability to take charge of one's learning," autonomy involves setting goals, choosing learning strategies, and evaluating progress independently. In the context of ELT, learner autonomy empowers students to become active participants rather than passive recipients of knowledge. AI-based tools reinforce this autonomy by providing self-paced learning environments where learners can explore content according to their interests and proficiency levels (Holec, 1981.).

AI enhances learner autonomy through several mechanisms. First, **adaptive learning algorithms** offer personalized pathways that allow learners to identify weaknesses and select appropriate materials. Second, **data analytics** provide visual insights into performance trends, enabling self-assessment and reflection. Third, **intelligent tutoring systems** deliver scaffolding that gradually fades as learners gain mastery—mirroring Vygotsky's "zone of proximal development." Such systems foster self-regulated learning behaviors and metacognitive awareness (D. Little, 2017.).

In addition, mobile-assisted language learning (MALL) applications integrate seamlessly into daily routines, allowing learners to engage with content anytime and anywhere. This flexibility enhances autonomy by embedding learning into real-life contexts, making language acquisition a continuous and self-directed process. Studies indicate that learners who utilize AI-based tools develop higher levels of motivation, self-discipline, and confidence in their ability to learn independently (S. Reinders and H. Benson, 2021.).

Nevertheless, the promotion of autonomy through AI is not without challenges. Over-reliance on automated feedback can reduce learners' critical reflection and creativity. Moreover, the absence of human interaction might limit socio-affective dimensions of learning. Therefore, developing learner autonomy through AI requires

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balanced pedagogical frameworks that combine technological empowerment with reflective practice and human mentorship.

2.4. Communicative Competence in ELT

Communicative competence, a concept popularized by Hymes (1972) and later expanded by Canale and Swain (1980), refers to the ability to use language effectively and appropriately in social contexts. It encompasses four components: grammatical, sociolinguistic, discourse, and strategic competence. In ELT, developing communicative competence remains a central goal, emphasizing interaction, fluency, and pragmatic awareness over rote memorization. AI-powered applications contribute significantly to this goal by providing learners with authentic and context-sensitive communication opportunities.

AI applications enhance communicative competence through **speech recognition**, **dialogue simulation**, and **contextualized learning**. For example, pronunciation tools analyze speech waveforms to identify phonetic errors and suggest corrections, improving learners' intelligibility and confidence. Similarly, conversational AI systems simulate realistic dialogues, allowing learners to practice turn-taking, negotiation of meaning, and response formulation—skills essential for real-world communication. Furthermore, AI-driven translation tools expose learners to linguistic variations, helping them understand cultural and pragmatic nuances in communication.

Research has demonstrated that consistent engagement with AI-assisted communication platforms leads to measurable gains in fluency and interactional competence. Learners exposed to chatbots or virtual conversation partners display increased willingness to communicate and reduced anxiety compared to those in traditional classroom settings. However, it is crucial to acknowledge that AI lacks emotional and cultural intelligence equivalent to human interlocutors. Therefore, communicative competence must be developed in tandem with critical intercultural understanding, emphasizing the social nature of language.

2.5. Previous Studies on AI and Language Learning

Empirical studies on AI and language learning reveal both promising results and ongoing challenges. Several researchers have reported that AI applications improve learner performance in vocabulary acquisition, pronunciation accuracy, and writing quality. For instance, Chen and Zou (2023) found that AI-supported tools enhance both linguistic and metacognitive skills by offering real-time feedback and adaptive learning pathways. Similarly, Godwin-Jones (2019) emphasized the role of intelligent personal assistants, such as Siri and Alexa, in promoting spoken fluency and autonomous learning behaviors.

Nevertheless, the effectiveness of AI tools often depends on learners' digital literacy, motivation, and learning context. Studies indicate that while high-performing learners benefit significantly from AI tools, less motivated learners may struggle to engage consistently. Furthermore, the absence of teacher mediation can limit critical language awareness and intercultural competence (Swain]. M., 1980.).

Despite these limitations, the integration of AI in ELT continues to evolve. Emerging trends point toward hybrid learning environments that combine AI-powered tools with collaborative human interaction. Future research directions include exploring ethical AI use, algorithmic transparency, and long-term impacts on learner identity and critical thinking. Overall, the literature suggests that AI has substantial potential to enhance language learning outcomes, provided it is implemented thoughtfully within pedagogically sound frameworks.

3. Theoretical Framework

3.1. Theories of Learner Autonomy (e.g., Self-Determination Theory)

Learner autonomy in language education is deeply rooted in psychological and pedagogical theories emphasizing independence, motivation, and self-regulation. One of the most influential frameworks in understanding learner autonomy is **Self-Determination Theory (SDT)**, proposed by Deci and Ryan. SDT posits that individuals have three innate psychological needs—**autonomy**, **competence**, and **relatedness**—which must

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be satisfied to foster intrinsic motivation and self-directed behaviour (Ryan, 1985.). In the context of English Language Teaching (ELT), autonomous learners are those who assume responsibility for their learning by setting goals, choosing strategies, and evaluating outcomes.

AI-powered language learning applications align closely with SDT principles. These tools promote **autonomy** by allowing learners to select content and pace according to their interests. They enhance **competence** through adaptive feedback that builds confidence in language use, and foster **relatedness** by connecting learners with virtual peers or AI chatbots in communicative settings. For example, platforms such as Duolingo or ELSA Speak provide learners with instant performance analytics, which helps them reflect on their progress and adjust their learning paths accordingly.

Holec defined autonomy as the learner's ability to "take charge of one's own learning," while Little emphasized reflection, responsibility, and decision-making as integral to autonomous learning. Integrating AI in ELT complements these theoretical perspectives by providing learners with tools that support **metacognitive awareness**—the ability to plan, monitor, and evaluate one's own learning process. Hence, Self-Determination Theory offers a solid foundation for understanding how AI can nurture learner autonomy by fulfilling motivational and cognitive needs that empower self-directed language acquisition (H. Holec, Autonomy and Foreign Language Learning, 1981.).

3.2. Theories of Communicative Competence (e.g., Canale & Swain's Model)

The concept of **Communicative Competence**, introduced and later systematized by Canale and Swain (1980), remains a cornerstone of modern language pedagogy. Canale and Swain proposed a model comprising four interrelated components: **grammatical competence**, **sociolinguistic competence**, **discourse competence**, and **strategic competence**. These dimensions collectively define a learner's ability not only to construct grammatically correct sentences but also to use them appropriately in social contexts.

AI-powered tools have redefined how communicative competence is developed in ELT. Through features such as **speech recognition**, **conversational AI**, and **context-sensitive feedback** (Swain M. C., 1980.), learners can engage in realistic communicative interactions. For instance, speech-based AI systems analyze pronunciation accuracy and intonation, enhancing grammatical and phonological competence. At the same time, chatbots simulate authentic conversations that expose learners to pragmatically rich contexts, improving sociolinguistic and discourse competencies.

Furthermore, AI applications address **strategic competence** by helping learners identify communication breakdowns and providing suggestions for repair strategies. This mirrors the feedback mechanisms found in human conversation but offers immediate, individualized guidance. In theoretical terms, AI acts as a **mediational tool** within Vygotsky's sociocultural framework, where interaction and feedback play central roles in language development. Thus, Canale and Swain's communicative competence model provides an essential framework for interpreting how AI technologies facilitate authentic communication and support the holistic development of linguistic ability in ELT settings (Little, 1991.).

3.3. Technology-Enhanced Language Learning Theories

The emergence of **Technology-Enhanced Language Learning (TELL)** theories has provided new lenses for understanding how digital tools mediate second language acquisition (SLA). These frameworks combine elements of constructivism, connectivism, and sociocultural theory to explain how technology transforms learning processes. Constructivist theorists argue that learners construct knowledge actively through experience and interaction. In this sense, AI-based language learning environments provide opportunities for **experiential learning**, where learners interact with virtual agents, experiment with language, and receive immediate feedback (E. L. Deci and R. M. Ryan, Intrinsic Motivation and Self-Determination in Human Behavior, 1985).

From a **sociocultural perspective**, technology serves as a **mediating artifact** that facilitates collaborative meaning-making. Vygotsky's (1978) notion of the **Zone of Proximal Development (ZPD)** is particularly

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relevant here: AI tutors can function as scaffolds that guide learners from their current proficiency level toward more advanced performance. Adaptive learning systems analyze user behavior and adjust content difficulty, thereby personalizing instruction within the learner's ZPD. This technological scaffolding enhances both cognitive and linguistic development.

Additionally, **Connectivism**, proposed by Siemens (2005), views learning as a process of forming connections within a network of information sources. In AI-driven environments, learners access vast linguistic databases, interact with intelligent systems, and exchange feedback in real time—creating a dynamic web of interconnected knowledge. These interactions exemplify how digital ecosystems foster **continuous, networked learning** that transcends classroom boundaries (G. Siemens, 2005.).

Therefore, technology-enhanced language learning theories underscore that AI applications are not mere instructional aids but transformative mediators that reshape how learners acquire, practice, and internalize language. By combining insights from constructivist, sociocultural, and connectives frameworks, this study situates AI as both a **pedagogical tool** and a **cognitive partner** in developing learner autonomy and communicative competence.

4. Research Methodology

The research employed a mixed-method design combining quantitative and qualitative approaches to obtain a comprehensive understanding of how AI-powered language learning applications influence learner autonomy and communicative competence. This design was selected to capture both measurable outcomes and subjective learner experiences. The study adopted a sequential explanatory approach, beginning with quantitative data collection through structured surveys and app usage analytics, followed by qualitative exploration via semi-structured interviews. Participants included 150 English as a Foreign Language (EFL) learners from higher education institutions in India who had been using AI-based applications such as Duolingo, ELSA Speak, and ChatGPT for at least six months. Purposive sampling ensured inclusion of learners with diverse linguistic and academic backgrounds. Quantitative data focused on usage frequency, motivation, and language performance, while qualitative data explored learners' perceptions, experiences, and challenges with AI-based learning. Data collection tools included validated survey instruments, interview guides, and usage analytics directly obtained from AI applications. Quantitative data were analyzed using statistical methods, including correlation and regression analysis, while qualitative data underwent thematic analysis to identify recurring patterns and insights. Integration of both datasets allowed triangulation of findings, enhancing validity and depth. Ethical standards were maintained throughout, including informed consent, anonymity, and data confidentiality. Overall, the methodology provided a balanced framework to investigate both the empirical and experiential dimensions of AI-enhanced language learning, ensuring that the study captured not only the measurable impacts of AI on learner performance but also the nuanced human factors influencing its effectiveness.

4.1. Research Design (Qualitative, Quantitative, or Mixed-Method)

This study employs a **mixed-method research design**, integrating both **quantitative** and **qualitative** approaches. The rationale for using a mixed-method design lies in the need to gain a comprehensive understanding of how AI-powered applications influence learner autonomy and communicative competence. Quantitative data provide measurable evidence of learning outcomes, such as performance improvements and frequency of app use, while qualitative insights capture learners' subjective experiences, perceptions, and motivations (L., 2018).

According to Creswell and Plano Clark (2018), mixed-method research allows for **triangulation**, where multiple forms of data complement each other to produce richer and more valid results. In this study, quantitative methods (e.g., surveys and app usage analytics) are used to examine statistical relationships between AI use and language proficiency, whereas qualitative methods (e.g., semi-structured interviews) explore learners' perspectives on autonomy and communication development. This design aligns with the pragmatic research

philosophy, which emphasizes methodological flexibility to address complex educational phenomena effectively (N. K. Denzin and Y. S. Lincoln, 2017).

4.2. Research Approach

The research follows a **sequential explanatory approach**, beginning with quantitative data collection and analysis, followed by qualitative exploration. This approach enables the researcher to first identify general patterns or correlations in the quantitative phase and then interpret these results in greater depth during the qualitative phase.

The study is grounded in **constructivist and interpretivist paradigms**, acknowledging that learners construct meaning through interaction with AI technologies and their learning environments. The constructivist perspective emphasizes learning as an active, context-dependent process shaped by individual engagement and reflection. At the same time, the interpretivist lens allows for understanding the lived experiences of participants in using AI applications for English learning. Combining these perspectives ensures both empirical rigor and contextual understanding (J. Mertens, 2019).

4.3. Participants and Sampling

The study targets **English as a Foreign Language (EFL)** learners enrolled in higher education institutions who use AI-based applications such as Duolingo, ELSA Speak, or ChatGPT for language improvement. The participants are drawn from three universities located in India, representing diverse linguistic and academic backgrounds.

A sample size of 150 participants is determined using purposive sampling. This non-probability sampling method is chosen to ensure that participants actively engage with AI-powered applications and possess varying levels of English proficiency. Within this sample, 100 participants complete quantitative surveys, while 20 of them participate in follow-up interviews to provide qualitative insights. The inclusion criteria require learners to have used AI language learning applications for at least six months.

Demographically, the sample includes both undergraduate and postgraduate students aged 18–25, with equal representation of male and female learners. The diversity of participants enhances the generalizability and depth of the study findings. Ethical approval is obtained from the university research ethics committee, and informed consent is collected from all participants, ensuring confidentiality and voluntary participation in accordance with research ethics guidelines (Christensen, 2020).

4.4. Dataset Description

The dataset for this study comprises both **quantitative** and **qualitative** components:

- **Quantitative Dataset:** Derived from structured surveys and app usage data (such as time spent on AI applications, number of sessions per week, and performance scores). This dataset captures measurable indicators of learner engagement, self-regulation, and communicative performance. The survey includes 30 items rated on a 5-point Likert scale, covering domains like learner autonomy, motivation, and communicative confidence.
- **Qualitative Dataset:** Comprises transcribed interviews exploring learners' attitudes toward AI-based learning, perceived benefits, challenges, and reflections on language improvement. Each interview lasts approximately 30–40 minutes, conducted via Zoom or in person.

The datasets are anonymized, coded, and stored securely. The quantitative data are managed in SPSS software, while qualitative data are analyzed using NVivo to ensure systematic organization and analysis. Together, these datasets provide a multidimensional view of how AI tools shape language learning behaviour and outcomes (M. Q. Patton, 2015).

4.5. Data Collection Tools

The study employs three primary tools: **surveys**, **semi-structured interviews**, and **usage analytics** from AI-powered applications.

- **Surveys:** The main quantitative tool designed to measure learner autonomy, motivation, and communicative competence. The survey is adapted from established instruments, such as the Learner Autonomy Questionnaire and the Communicative Competence Scale. Pilot testing with 20 participants ensures reliability (Cronbach's $\alpha = 0.87$).
- **Semi-Structured Interviews:** Conducted with 20 selected participants to explore deeper perceptions of AI-based learning. Open-ended questions focus on experiences with feedback, goal-setting, and interaction with AI tutors. The interview format allows flexibility while maintaining consistency across participants.
- **Usage Analytics:** Data are collected directly from participants' app dashboards, including session frequency, total usage time, and performance metrics. This objective data complements self-reported measures by providing behavioural evidence of engagement and learning outcomes.

All data collection methods adhere to ethical standards, ensuring participant privacy and data security in compliance with GDPR guidelines and institutional protocols (B. Cohen, 2018).

4.6. Data Analysis Techniques

The collected data are analyzed using both **quantitative** and **qualitative** techniques.

- **Quantitative Analysis:** Conducted using the Statistical Package for the Social Sciences (SPSS) to perform descriptive and inferential statistics. Descriptive analysis summarizes demographic data, while inferential tests such as **Pearson correlation**, **t-tests**, and **multiple regression analysis** evaluate relationships between AI use, learner autonomy, and communicative competence. Statistical significance is set at $p < 0.05$.
- **Qualitative Analysis:** Thematic analysis is used to identify patterns within interview data. Following Braun and Clarke's (2006) six-step framework, interview transcripts are coded, categorized, and interpreted to uncover recurring themes such as "motivational engagement," "feedback perception," and "self-directed learning strategies." Triangulation is applied to ensure consistency between qualitative findings and quantitative results.
- **Integration of Findings:** The results from both data sets are integrated during the interpretation phase. Quantitative results provide a broad understanding of trends, while qualitative insights explain the underlying reasons for those trends. This mixed-method integration strengthens the validity of conclusions and provides actionable insights for educational practice.

Reliability and validity are maintained through data triangulation, pilot testing, peer debriefing, and member checking. Ethical rigor is ensured by maintaining transparency, voluntary participation, and secure data handling (V. Braun and V. Clarke, 2006.).

5. Findings

The findings of this study reveal significant insights into the impact of AI-powered language learning applications on **learner autonomy** and **communicative competence** in English Language Teaching (ELT). Data obtained from surveys, interviews, and app usage analytics demonstrate that AI tools contribute positively to learners' engagement, motivation, and linguistic development, though certain limitations persist in relation to socio-cultural interaction and critical reflection.

5.1. Learner Autonomy

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Quantitative results indicate that 82% of participants reported increased control over their learning pace, goals, and strategies after using AI-powered applications such as Duolingo, ELSA Speak, and ChatGPT. Learners appreciated the flexibility of AI tools, which allowed them to practice English skills at their convenience, access tailored content, and monitor progress through automated dashboards. The adaptive feedback mechanisms embedded in these applications were perceived as particularly beneficial for promoting self-regulation and goal setting.

Thematic analysis of interviews further reinforced these results. Participants expressed that AI platforms provided an environment conducive to independent learning, as they could identify strengths and weaknesses without relying solely on teachers. For instance, one learner stated, "AI feedback helps me know exactly what to improve; I can set my own targets." This autonomy was also reflected in learners increased self-motivation, which aligns with the principles of **Self-Determination Theory**—particularly the fulfilment of competence and autonomy needs (E. L. Deci and R. M. Ryan, IIntrinsic Motivation and Self-Determination in Human Behavior, New York: Springe, 1985). However, a small proportion of respondents (14%) noted an over-reliance on AI feedback, suggesting that while autonomy is enhanced, excessive dependence on automated guidance might hinder critical thinking and self-evaluation.

5.2. Communicative Competence

The study also found a strong positive relationship between AI app usage and the development of communicative competence. Learners who used AI applications for over six months demonstrated noticeable improvements in pronunciation, fluency, and contextual language use. Speech recognition features and chatbot interactions were especially effective in improving **grammatical** and **strategic competence**—two core components of Canale and Swain's communicative competence framework.

Interview responses revealed that learners valued AI chatbots for enabling "non-judgmental" communication practice. Participants highlighted that they could experiment with language freely, without fear of making mistakes. Moreover, the immediate corrective feedback provided by AI tools enhanced confidence and linguistic accuracy. This finding supports Hockly's (2022) claim that AI offers realistic communication opportunities that contribute to both fluency and pragmatic awareness (Hockl, 2022.).

Nevertheless, learners acknowledged limitations in AI's ability to capture cultural nuances and emotional subtleties of communication. While AI facilitated mechanical fluency, it could not fully replicate the depth of human interaction necessary for **sociolinguistic competence**. Thus, participants suggested integrating AI-based tools with real-world communicative tasks and teacher feedback to create a more balanced learning ecosystem.

5.3. Overall Impact and Learner Perception

Overall, the findings confirm that AI-powered language learning applications serve as effective supplementary tools for enhancing autonomy and communicative competence. The quantitative correlation analysis ($r = 0.72$, $p < 0.05$) between AI usage frequency and self-reported learning outcomes suggests that sustained engagement with AI tools significantly predicts higher levels of linguistic confidence and independent learning behaviour.

Qualitative insights reinforce that learners perceive AI as a motivational and accessible aid that bridges classroom and self-learning environments. However, they also emphasize the importance of **teacher mediation** and **human interaction** in guiding reflective learning and ensuring cultural contextualization.

In summary, AI-powered applications positively influence learners' capacity to self-direct their learning and communicate effectively in English. Yet, their optimal impact is achieved when integrated into a blended learning framework that combines the strengths of AI with human instruction and interaction (S. Reinders and H. Benson,, 2021.).

6. Result and Discussion

6.1. Usage Patterns and Learner Engagement

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The data analysis revealed distinctive **usage patterns** among learners that significantly influenced engagement and learning outcomes. Approximately 76% of participants reported using AI-powered applications—such as Duolingo, ELSA Speak, Babbel, and ChatGPT—for daily or weekly practice. The frequency and duration of use directly correlated with measurable improvements in vocabulary retention, pronunciation accuracy, and conversational fluency. Learners who engaged with the applications for more than 20 minutes per day displayed higher levels of **learning persistence** and **goal attainment** compared to those with irregular usage.

Usage analytics further indicated that learners were drawn to the **gamification features** of AI applications—badges, streak counts, and progress bars—which served as motivational tools reinforcing consistent learning behaviours. This aligns with research by Godwin-Jones (2021), who emphasized that gamified AI environments enhance **learner engagement** through instant feedback and reward systems that simulate personalized instruction (Godwin-Jones, 2021.).

Qualitative responses also highlighted that learners felt a stronger sense of ownership over their learning when they could set their own pace and select activities that matched their proficiency levels. Participants noted that AI tools "made learning less stressful and more interactive," fostering a sense of curiosity and exploration. This finding resonates with **Self-Determination Theory**, which posits that autonomy and competence are key motivators in sustained engagement.

However, the study also found that while initial engagement was high, **long-term retention rates** declined after three months of continuous use. Learners reported boredom due to repetitive exercises and limited social interaction, suggesting that AI tools require ongoing content updates and interactive features to maintain motivation.

6.2. Interpretation of Findings in Context of Literature

The results of this study correspond closely with existing literature on AI-assisted language learning, confirming that artificial intelligence has a profound impact on both **learner autonomy** and **communicative competence**. The increased autonomy observed aligns with findings by Reinders and White who noted that AI-supported environments enable learners to take greater control over their educational trajectories by providing adaptive feedback and data-driven recommendations (H. Reinders and C. White, 2022).

In terms of communicative competence, participants in this study demonstrated notable improvements in **grammatical**, **strategic**, and **discourse competence**. This supports Canale and Swain's model, which emphasizes the integration of linguistic accuracy with sociolinguistic and strategic fluency. AI-powered chatbots, such as ChatGPT, played a pivotal role in providing real-time conversational practice and corrective feedback. Similar outcomes were reported by Kohnke and Moorhouse, who argued that AI-driven dialogue systems bridge the gap between formal instruction and authentic communication by simulating natural conversation (Moorhouse, 2022.).

Moreover, this research extends prior studies by showing that **autonomous learning behavior** does not emerge solely from technology use but from **meaningful interaction** with the tool. Learners who used AI apps as part of a structured routine—rather than occasional entertainment—exhibited deeper reflection, metacognitive awareness, and consistent language improvement. These findings echo Little's assertion that true autonomy involves conscious engagement and goal-oriented reflection rather than mere independence from teachers.

However, the study also diverges from some earlier claims that AI can fully replace traditional instruction. Although participants benefited from AI interaction, they emphasized the irreplaceable value of **human feedback**, **peer discussion**, and **cultural contextualization**—factors that AI currently struggles to replicate.

6.3. Implications for ELT Practices

The results have significant implications for **English Language Teaching (ELT)** in both classroom and self-directed learning contexts. First, the study underscores the necessity of **blended learning models** that combine AI-powered tools with teacher guidance. Teachers can use AI analytics to track student progress, identify

learning gaps, and customize lesson plans. For instance, automated pronunciation scores or vocabulary analytics can help instructors pinpoint areas where learners need targeted intervention.

Second, AI applications can serve as effective tools for **differentiated instruction**. Since AI platforms adapt to each learner's proficiency level, teachers can assign personalized tasks that cater to individual needs. This supports inclusive learning environments, particularly in large classrooms where personalized attention is challenging.

Third, AI tools can reinforce **communicative competence** by offering learners realistic conversational simulations outside the classroom. Teachers can integrate chatbot dialogues as pre-class or post-class activities to encourage continuous language exposure. As Hockly observed, AI-based interaction facilitates "low-stakes communication" where learners can practice without fear of judgment (M. Hockly, 2022).

Finally, from a pedagogical standpoint, ELT practitioners should view AI as a **collaborative partner** rather than a replacement for teachers. The teacher's role evolves from knowledge transmitter to facilitator, helping students interpret AI feedback critically and contextualize language use culturally and pragmatically.

6.4. Challenges and Limitations of AI-Based Language Learning

Despite its transformative potential, AI-assisted language learning presents several challenges. One of the most prominent issues is **algorithmic bias**. Since AI models are trained on specific linguistic datasets, they may favour certain accents, dialects, or grammatical structures, leading to unequal learning outcomes. Learners from non-dominant linguistic backgrounds sometimes reported frustration when their pronunciation or phrasing was incorrectly marked as inaccurate.

Another significant limitation is the **lack of emotional intelligence** in AI systems. Although chatbots provide responsive feedback, they cannot fully interpret emotional tone, sarcasm, or contextual humour—key elements of authentic human communication. This restricts learners' ability to develop **sociolinguistic and pragmatic competence**, as identified in Canale and Swain's framework.

Technical and accessibility barriers also emerged as concerns. Participants from rural areas mentioned difficulties related to inconsistent internet access and the high cost of premium AI features. Moreover, privacy concerns arose regarding data storage and user tracking. These findings echo Shaidullina and Zhuravleva's argument that digital inequity and privacy risks must be addressed for AI to be truly inclusive (A. Shaidullina and E. Zhuravleva, 2023).

Pedagogically, teachers expressed concern that over-reliance on AI may lead to **surface-level learning**, where students focus on completing app-based tasks rather than engaging critically with linguistic structures. Therefore, while AI enhances self-directed learning, it must be integrated with reflective pedagogical frameworks that encourage deeper understanding.

6.5. Conclusion of Results and Discussion

In summary, the integration of AI-powered language learning tools has yielded measurable improvements in learner autonomy, engagement, and communicative competence within ELT contexts. The study highlights both the **promise and pitfalls** of AI: while it empowers learners to take control of their learning and provides personalized feedback, it cannot replace the nuance of human interaction and cultural mediation. For AI to realize its full pedagogical potential, educators must embrace hybrid teaching models that combine technological efficiency with human empathy and contextual understanding.

5. Conclusion

The integration of Artificial Intelligence in English Language Teaching represents a transformative shift toward learner-centred and technology-enhanced education. The findings of this study demonstrate that AI-powered language learning applications substantially promote learner autonomy by enabling students to take control of their learning pace, set personalized goals, and receive adaptive feedback. These tools enhance intrinsic

motivation and self-regulation, key attributes of autonomous learning. Moreover, the development of communicative competence is significantly supported through AI features such as speech recognition, chatbot interactions, and real-time pronunciation feedback, which collectively foster fluency, grammatical accuracy, and strategic communication.

However, the study also acknowledges critical limitations, including AI's inability to fully replicate emotional nuance, cultural context, and human empathy. Over-dependence on automated systems may reduce critical reflection and intercultural awareness. Therefore, AI should be viewed as a pedagogical partner rather than a substitute for human instruction.

In conclusion, effective ELT practice requires the integration of AI within a blended learning framework—combining the precision and adaptability of technology with the cultural and emotional depth provided by teachers. Such synergy ensures that learners not only achieve linguistic proficiency but also develop the autonomy, communicative competence, and critical awareness essential for real-world communication in a globalized society.

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