

Autonomous Language Learning through Mobile Technologies: Insights from EFL Students' Perceptions

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ABSTRACT

The widespread use of mobile technology has reshaped language learning practices, particularly in promoting learner autonomy among EFL students. Mobile-Assisted Language Learning (MALL) allows learners to independently access linguistic resources, practice language skills, and manage their own learning beyond classroom constraints. This study aimed to examine EFL students' perceptions of learning autonomy facilitated through smartphone-based MALL. A quantitative survey design was employed, involving 161 EFL students from the English Department of Universitas Lancang Kuning selected through random sampling. Data were collected using a validated questionnaire adapted from Ramamurthy and Rao (2015) and analyzed using descriptive statistics via SPSS. The findings reveal that students hold positive perceptions toward autonomous learning through smartphones, with a high overall mean score ($M = 4.01$; $GM = 4.19$), indicating strong agreement. Smartphones were perceived as particularly effective in supporting autonomous speaking practice, vocabulary development, pronunciation checking, and flexible access to learning materials. The study concludes that MALL significantly supports the development of learner autonomy by enabling anytime and anywhere learning. It is recommended that educators integrate mobile technology strategically into EFL instruction, while future studies explore learners' satisfaction and longitudinal impacts of MALL on autonomy development.

Key Words: Learner Autonomy; EFL Students; Mobile-Assisted Language Learning; Smartphone; Perceptions

ABSTRAK

Penggunaan teknologi seluler yang meluas telah membentuk kembali praktik pembelajaran bahasa, terutama dalam mempromosikan otonomi pelajar di antara siswa EFL. Pembelajaran Bahasa Berbantuan Seluler (Mobile-Assisted Language Learning/MALL) memungkinkan pelajar untuk secara mandiri mengakses sumber daya linguistik, mempraktikkan keterampilan bahasa, dan mengelola pembelajaran mereka sendiri di luar batasan ruang kelas. Penelitian ini bertujuan untuk menguji persepsi siswa EFL tentang otonomi belajar yang difasilitasi melalui MALL berbasis smartphone. Penelitian ini menggunakan desain survei kuantitatif, yang melibatkan 161 mahasiswa

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EFL dari Jurusan Bahasa Inggris Universitas Lancang Kuning yang dipilih secara acak. Data dikumpulkan dengan menggunakan kuesioner yang telah divalidasi yang diadaptasi dari Ramamurthy dan Rao (2015) dan dianalisis dengan menggunakan statistik deskriptif melalui SPSS. Temuan menunjukkan bahwa siswa memiliki persepsi positif terhadap pembelajaran otonom melalui ponsel pintar, dengan skor rata-rata keseluruhan yang tinggi ($M = 4,01$; $GM = 4,19$), yang menunjukkan kesepakatan yang kuat. Ponsel pintar dianggap sangat efektif dalam mendukung praktik berbicara secara mandiri, pengembangan kosakata, pengecekan pelafalan, dan akses yang fleksibel ke materi pembelajaran. Studi ini menyimpulkan bahwa MALL secara signifikan mendukung pengembangan otonomi pelajar dengan memungkinkan pembelajaran kapan saja dan di mana saja. Disarankan agar para pendidik mengintegrasikan teknologi seluler secara strategis ke dalam pengajaran EFL, sementara penelitian di masa depan mengeksplorasi kepuasan peserta didik dan dampak jangka panjang MALL pada pengembangan otonomi.

Kata Kunci: Otonomi Pelajar; Siswa EFL; Pembelajaran Bahasa Berbantuan Seluler; Ponsel Pintar; Persepsi

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INTRODUCTION

The rapid diffusion of mobile technology has reshaped students' daily routines and, consequently, the landscape of educational practices, especially in language learning contexts. Smartphones are no longer merely communication tools; they function as personal learning devices that mediate access to information, interaction, and authentic language exposure. Empirical studies over the past five years consistently indicate that students spend substantial amounts of time engaging with mobile applications, social media, and digital content in their target language, both intentionally and incidentally. This pervasive use has encouraged educators and researchers to reconceptualize language learning as a continuous process that extends beyond formal classroom instruction. From a sociocultural perspective, mobile technology facilitates situated learning by enabling learners to interact with language in meaningful, real-world contexts, thereby supporting the development of communicative competence (Mondal & Mondal, 2025).

Within this evolving educational environment, Mobile Assisted Language Learning (MALL) has emerged as a theoretically grounded and pedagogically relevant approach. Rooted in constructivist and autonomous learning theories, MALL emphasizes learner control, self-regulation, and contextualized practice through mobile devices. Recent empirical evidence demonstrates that MALL enhances learners' engagement and motivation by providing flexible access to learning materials anytime and anywhere, a feature that is particularly beneficial in EFL contexts where exposure to the target language is limited (Raihan et al., 2024). The accessibility of mobile platforms allows learners to practice listening, speaking, reading, and vocabulary acquisition through interactive and multimodal resources, aligning with cognitive theory that highlights the importance of repeated, meaningful input for language acquisition.

Furthermore, the practicality of MALL lies in its ability to bridge formal and informal learning spaces. Unlike traditional classroom-based instruction, which is constrained by time and physical boundaries, mobile learning environments support microlearning, immediate feedback, and peer interaction through messaging, voice notes, and collaborative applications. Recent studies confirm that such features promote sustained learning habits and foster learner

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autonomy, which are critical predictors of long-term language proficiency (Wildeman et al., 2023). By integrating MALL into instructional design, educators can capitalize on students' existing digital practices while maintaining pedagogical alignment with curriculum objectives. Thus, the integration of mobile technology through MALL represents a systematic and empirically supported response to contemporary language learning needs, reinforcing its relevance in current and future educational settings.

Moreover, Learner autonomy has emerged as a central objective in contemporary language education, reflecting a paradigm shift from teacher-dominated instruction toward learner-centered pedagogy. In modern educational theory, autonomy is understood as learners' capacity to take responsibility for planning, monitoring, and evaluating their own learning processes. This orientation is strongly aligned with constructivist and socio-cognitive perspectives, which argue that meaningful learning occurs when students actively construct knowledge through reflection and self-regulation. In the context of language learning, autonomy is particularly crucial because language acquisition requires continuous exposure, practice, and strategic engagement beyond the classroom. Recent empirical studies have consistently demonstrated that learners who exercise higher levels of autonomy tend to show stronger motivation, deeper engagement, and more sustainable language development outcomes (Yang & Yang, 2025).

From a psychological standpoint, learner autonomy is closely connected to self-determination theory, which emphasizes the importance of autonomy, competence, and relatedness in fostering intrinsic motivation. When students are given opportunities to make decisions about learning goals, materials, and strategies, they are more likely to perceive learning as personally meaningful rather than externally imposed. This sense of ownership has been shown to enhance persistence and resilience in language learning, especially in environments where learners face limited instructional time or diverse proficiency levels. Recent classroom-based research confirms that autonomy-supportive instruction positively influences learners' self-efficacy and strategic behavior, enabling them to adapt their learning approaches to individual needs and contexts (Pangrazio et al., 2020).

In addition, the growing integration of digital technologies in language education has further strengthened the relevance of learner autonomy. Online platforms, mobile applications, and self-access learning environments provide learners with flexible opportunities to control the pace, sequence, and focus of their learning activities. Empirical evidence from the last five years indicates that technology-mediated learning environments can significantly promote autonomous behaviors, such as goal setting, self-monitoring, and reflective practice, when appropriately guided by pedagogical frameworks (Santilli et al., 2025). These findings suggest that autonomy is not an innate trait but a developable capacity that can be systematically nurtured through instructional design and institutional support.

Recent empirical studies consistently demonstrate that mobile devices play a pivotal role in strengthening learner autonomy, particularly in formal educational contexts where flexibility and personalization are increasingly required. Learner autonomy, commonly defined as learners' capacity to take responsibility for their own learning processes, has been widely discussed within the framework of self-determination theory and constructivist learning perspectives. Mobile technologies operationalize these theories by enabling learners to independently select learning resources, regulate learning pace, and monitor progress beyond classroom constraints. Research conducted over the past five years shows that mobile-assisted learning environments facilitate continuous engagement with learning content, allowing students to exercise greater control over when, where, and how learning occurs (Vadivel et al., 2021).

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Access to authentic materials is one of the most significant contributions of mobile devices to autonomous learning. Through smartphones and tablets, learners can interact with real-world texts, videos, podcasts, and interactive platforms that reflect genuine language use and disciplinary practices. Recent studies highlight that exposure to authentic materials via mobile applications enhances learners' motivation and self-efficacy, which are critical antecedents of autonomy. For instance, Argudo-Serrano et al., (2023) Panagiotidis (2018) found that mobile access to authentic digital content encourages learners to set personal learning goals and evaluate their own performance, aligning learning activities with individual needs rather than standardized classroom tasks.

Furthermore, mobile devices support self-directed learning by integrating tools that promote planning, monitoring, and reflection—key components of autonomous learning behavior. Learning management applications, mobile note-taking tools, and adaptive learning platforms enable learners to design personalized learning trajectories and make informed decisions about their learning strategies. Recent empirical evidence suggests that students who regularly engage in mobile-supported self-directed learning demonstrate higher levels of metacognitive awareness and sustained learning engagement (Jake Follmer & Sperling, 2018; Özbek & Ergül, 2021). These findings indicate that mobile technologies do not merely provide convenience but function as cognitive and metacognitive scaffolds that empower learners to become more independent and self-regulated. In sum, contemporary research within the last five years affirms that mobile devices significantly enhance learner autonomy by expanding access to authentic materials and fostering self-directed learning practices. As digital literacy and mobile accessibility continue to grow, the integration of mobile devices is increasingly recognized as a sustainable and theoretically sound pathway for promoting learner autonomy in diverse learning contexts.

Although Mobile-Assisted Language Learning (MALL) has attracted substantial scholarly attention in recent years, empirical investigations into how Indonesian EFL students perceive learning autonomy mediated by smartphones remain relatively scarce. This gap is noteworthy given the rapid penetration of smartphones among secondary and tertiary students in Indonesia, where mobile devices are no longer supplementary tools but integral components of daily learning practices. From the perspective of learner autonomy theory, which emphasizes learners' capacity to take responsibility for planning, monitoring, and evaluating their own learning, smartphones offer unique affordances such as ubiquitous access, personalization, and self-paced interaction. However, the mere availability of mobile technology does not automatically translate into autonomous learning experiences, making students' subjective perceptions a critical yet underexplored dimension in MALL research.

Consequently, the paucity of empirical research on Indonesian students' perceptions of learning autonomy through smartphones represents both a theoretical and practical gap. Addressing this gap is essential for refining MALL implementation strategies that align with learners' needs and sociocultural realities. By systematically examining students' perceived autonomy, future research can contribute to a more nuanced understanding of how mobile technologies function not merely as instructional tools, but as catalysts for autonomous language learning in EFL contexts similar to Indonesia.

METHODS

Research design

This study adopted a quantitative survey research design to systematically investigate

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EFL students' perceptions of autonomous learning within the context of Mobile-Assisted Language Learning (MALL). A quantitative approach was considered appropriate because it allows for objective measurement of learners' attitudes and self-regulated behaviors through numerical data that can be statistically analyzed. Survey research is widely used in learner autonomy studies as it enables researchers to capture patterns of perception across relatively large populations in an efficient and replicable manner (Neuman, 2014). Recent empirical studies on MALL and learner autonomy have also relied on survey-based designs to explain how mobile technologies support self-directed learning processes, metacognitive awareness, and independent practice across language skills (Özer & Şükrü Özbay, 2022). By grounding the design in established autonomy theory and contemporary MALL research, this study ensures methodological relevance and alignment with current developments in applied linguistics.

Research site and participants

The research was conducted at the English Department of Universitas Lancang Kuning, a higher education institution where mobile technology is commonly integrated into language learning activities. The participants consisted of 161 EFL students who were selected using a random sampling technique to ensure representativeness and reduce sampling bias. This number is considered statistically adequate for descriptive survey research and allows for stable estimation of central tendencies in perception data. University-level EFL learners were chosen because they are generally expected to demonstrate higher levels of learning independence, making them a relevant population for examining autonomous learning in a MALL environment. Previous studies conducted in similar tertiary EFL contexts indicate that students' exposure to mobile learning platforms significantly shapes their autonomy, motivation, and strategic learning behavior (Almufarreh & Arshad, 2023; Özer & Şükrü Özbay, 2022). Therefore, the selected site and participants provide a meaningful empirical setting for exploring learner autonomy mediated by mobile technology..

Data collection and analysis

Data were collected using a validated questionnaire adapted from Ramamurthy and Khampusaen (2025), which was refined to suit the MALL context while retaining its core focus on learner autonomy characteristics across listening, speaking, reading, and writing skills. The instrument employed a Likert-scale format to capture students' perceptions in a structured and quantifiable manner. An online questionnaire was used to facilitate efficient data distribution and response collection, aligning with current research practices that emphasize accessibility and time efficiency in educational surveys (Bozkurt et al., 2024). Prior to analysis, the instrument's validity and reliability were ensured to maintain the accuracy of the measurement.

The collected data were analyzed using descriptive statistical techniques with the support of SPSS version 16. Mean scores and standard deviations were calculated to identify general trends and the degree of variation in students' perceptions of autonomous learning. In addition, categorical interpretations were applied to classify levels of learner autonomy, enabling clearer interpretation of the findings. Descriptive statistics remain a central analytical method in recent autonomy and MALL studies, as they effectively reveal learners' overall tendencies and readiness for self-directed learning supported by mobile technologies (Yang & Yang, 2025). Through this systematic analytical procedure, the study provides an empirically grounded portrayal of EFL students' autonomous learning perceptions in a contemporary MALL environment.

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FINDINGS AND DISCUSSION

Findings

The overall findings of this study reveal that students demonstrate consistently positive perceptions toward autonomous learning mediated by smartphone use, reinforcing the growing relevance of Mobile-Assisted Language Learning (MALL) in contemporary EFL contexts. Empirically, the high grand mean score of 4.19 reflects strong agreement among learners that smartphones function not merely as supplementary tools but as central resources supporting self-directed learning. This result aligns with recent research emphasizing that mobile technologies enhance learner autonomy by enabling flexible access to learning materials, self-paced practice, and immediate feedback beyond classroom constraints. From a theoretical standpoint, this trend supports learner autonomy theory, which posits that control over learning processes strengthens motivation and engagement, particularly when technology reduces dependency on formal instruction.

A more detailed analysis indicates that autonomous learning in speaking skills achieved the highest mean score among all language skills examined. This finding suggests that students most frequently utilize smartphones for vocabulary expansion, pronunciation modeling, and oral rehearsal through applications such as digital dictionaries, speech recognition tools, and audio-visual platforms. Recent studies confirm that mobile applications provide authentic pronunciation input and opportunities for repeated practice, which are crucial for developing oral proficiency (Sun & Teng, 2022; Alshammari et al., 2023). The prominence of speaking autonomy reflects the practicality of smartphones in addressing common EFL challenges, such as limited exposure to native-like pronunciation and insufficient classroom speaking time, thereby reinforcing the functional value of MALL in oral skill development.

In contrast, autonomous learning in reading, listening, and writing skills was categorized at a moderate level, indicating steady yet varied engagement across learners. This pattern implies that while smartphones are regularly used for accessing texts, multimedia content, and writing support tools, students may not exploit these features as intensively as those related to speaking. Recent empirical evidence suggests that learners often perceive mobile devices as more effective for receptive and micro-skill practice rather than extended writing tasks, which may still require more structured guidance (Zhang & Pérez-Paredes, 2021; Hazaea & Alzubi, 2023). Nevertheless, the moderate scores demonstrate that smartphones remain integral to fostering partial autonomy across multiple language domains, supporting a balanced development of language skills.

Furthermore, the low standard deviation values across all indicators signify a high degree of homogeneity in students' perceptions toward MALL-based autonomous learning. This statistical consistency suggests that positive attitudes toward smartphone-assisted autonomy are shared broadly among learners, regardless of individual differences. Such uniformity strengthens the reliability of the findings and indicates that mobile learning acceptance has become a normalized phenomenon in the current digital learning environment. Recent studies corroborate that widespread smartphone ownership and habitual use contribute to stable and favorable learner perceptions of mobile-based autonomy in language learning (Pham et al., 2022; Huang et al., 2024). Collectively, these results underscore the strategic role of smartphones in promoting autonomous learning practices and

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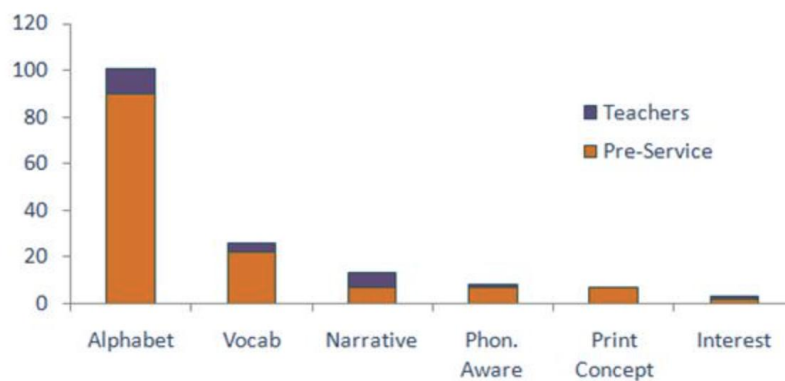
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provide empirical support for integrating MALL more systematically into EFL pedagogy.

Table 1 Title

Themes	Sub-themes
Theme one: The comprehensive overview of the bilingual education program	Status Accreditation Admission policy Student body Curriculum Teachers Language policy Teaching materials Student assessment

Figure 1 Numbers of Teachers and Pre-Service



Discussion

The empirical findings of this study corroborate the growing body of recent research indicating that Mobile-Assisted Language Learning (MALL) plays a significant role in fostering learner autonomy in EFL contexts. By leveraging mobile technologies, students are no longer constrained by classroom time or teacher-centered instruction; instead, they are able to independently access authentic learning resources, such as digital dictionaries, pronunciation models, grammar explanations, and interactive language platforms. This autonomy aligns with contemporary theories of learner-centered pedagogy, which emphasize learners' capacity to take responsibility for their own learning processes. Recent studies have demonstrated that autonomous access to mobile-based resources enhances learners' motivation and engagement, particularly when students can select materials that match their proficiency level and immediate learning needs (Greenhow et al., 2021). In this sense, MALL functions not merely as a supplementary tool but as an enabling environment that reshapes how learners plan, monitor, and evaluate their language development.

Furthermore, smartphones in MALL environments operate as cognitive tools that support self-regulated learning across the four core language skills: speaking, reading, listening, and writing. From a cognitive and constructivist perspective, digital tools extend learners' mental capacities by providing immediate feedback, multimodal input, and

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opportunities for repetitive practice. For instance, speaking skills are enhanced through voice recording and automated feedback features, while listening and reading comprehension benefit from adjustable playback speeds, subtitles, and integrated glossaries. Writing development is similarly supported through mobile-based drafting, editing, and language-check applications that promote iterative learning. Recent empirical evidence confirms that such smartphone-mediated activities strengthen learners' metacognitive awareness, enabling them to set goals, manage learning strategies, and reflect on outcomes more effectively (Graves et al., 2021).

Besides, the findings reinforce the theoretical view that smartphones, when pedagogically integrated through MALL, serve as powerful mediational artifacts in language learning. Rather than distracting learners, mobile devices facilitate continuous and self-directed engagement with language input and output, thereby supporting holistic skill development. This conclusion is consistent with recent longitudinal studies suggesting that sustained use of MALL contributes to improved self-regulation and long-term language proficiency gains (Makransky & Petersen, 2021). Consequently, MALL should be conceptualized as a strategic instructional approach that empowers learners to become autonomous and self-regulated language users in digitally mediated learning environments.

Over the past five years, mobile-assisted learning has increasingly been framed as a pedagogical response to the changing learning habits of digital-native students, particularly in language and vocational education. The present results indicate that the integration of mobile technology not only supports instructional delivery but also creates a learning environment that is perceived as more engaging and personally meaningful by learners. This outcome is consistent with self-determination theory, which posits that motivation is strengthened when learners experience autonomy, competence, and relevance in their learning activities. Mobile learning platforms, by allowing learners to access content anytime and anywhere, appear to fulfill these psychological needs more effectively than conventional classroom-based instruction.

In terms of learning flexibility, the results reinforce recent studies demonstrating that mobile technology reduces temporal and spatial constraints in the learning process. Research conducted between 2021 and 2024 has consistently shown that mobile-based learning environments enable students to manage their own learning pace and pathways, which is particularly beneficial in heterogeneous classrooms. The current findings extend this perspective by showing that flexibility does not merely function as a logistical advantage but also contributes to sustained learner engagement. When students are able to choose when and how they interact with learning materials, they tend to demonstrate higher persistence and willingness to explore additional resources. This aligns with constructivist learning theory by Vygotsky (1978), which emphasizes the importance of active learner involvement and contextualized knowledge construction supported by adaptable learning tools.

Moreover, the results substantiate recent scholarly arguments that mobile technology plays a critical role in fostering learner independence. Studies published in the last five years highlight that mobile learning encourages students to take greater responsibility for goal setting, progress monitoring, and self-evaluation. The present study confirms this trend by showing that learners increasingly rely on mobile platforms to seek information, practice skills, and reflect on their performance without constant teacher intervention. This pattern reflects the principles of self-regulated learning theory, where technology acts as a scaffold that gradually shifts control from instructors to learners. Consequently, mobile technology

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emerges not only as a supplementary instructional medium but also as a catalyst for developing long-term independent learning skills that are essential in lifelong learning frameworks.

The frequent use of smartphones by students in problem-solving activities indicates a growing awareness of individual learning needs and a shift toward self-regulated learning practices. From a constructivist perspective, learners actively construct knowledge by selecting tools that support their cognitive processes, and smartphones have increasingly become an accessible medium for this purpose. Recent empirical studies demonstrate that mobile devices enable students to identify knowledge gaps, seek contextualized information, and apply digital resources in real time when encountering academic challenges. This behavior aligns with the theory of self-regulated learning, which emphasizes learners' capacity to plan, monitor, and evaluate their own learning strategies. Research conducted in higher education and secondary school contexts between 2021 and 2024 confirms that students who intentionally use smartphones for academic problem solving tend to show higher metacognitive awareness and stronger learning autonomy, particularly in tasks requiring analysis and decision-making (Pangrazio et al., 2020).

Moreover, the integration of smartphones into problem-solving tasks reflects the principles of mobile-assisted learning, which highlight flexibility, immediacy, and learner control. Contemporary studies suggest that smartphones support just-in-time learning by allowing students to access multimodal explanations, simulations, and collaborative platforms whenever difficulties arise. This immediacy fosters adaptive learning behaviors, as students are no longer passive recipients of instruction but active agents who independently select digital tools to resolve academic problems. Empirical evidence from recent classroom-based studies shows that such practices enhance cognitive engagement and promote deeper understanding, particularly in complex or ill-structured tasks (Crogman et al., 2025).

Despite these benefits, unequal access to smartphones remains a critical limitation that may undermine the consistency of autonomous learning experiences. Digital divide theory emphasizes that disparities in device ownership, internet connectivity, and digital literacy can create unequal learning opportunities among students. Recent research in developing and transitional education systems indicates that students without reliable access to smartphones are less able to engage in independent problem solving and mobile-based learning activities, resulting in uneven learning outcomes (Rasyidah et al., 2025). This inequity can lead to dependency on traditional instructional methods, limiting students' capacity to develop self-directed learning skills in technology-enhanced environments.

In addition, unequal smartphone access may affect the effectiveness of instructional designs that assume universal device availability. Studies published within the last five years highlight that when mobile learning strategies are implemented without addressing access disparities, they may inadvertently widen achievement gaps rather than reduce them (OECD, 2018). Therefore, while students' frequent use of smartphones for problem solving reflects positive awareness of their learning needs, institutional policies and pedagogical planning must account for access inequality. Ensuring equitable access through school-provided devices, offline learning resources, or blended instructional approaches is essential to maximize the potential of autonomous learning and maintain consistency across diverse student populations.

CONCLUSIONS AND SUGGESTION

In conclusion, this study demonstrates that EFL students generally perceive Mobile-

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Assisted Language Learning (MALL) as an effective means of supporting autonomous learning. The findings confirm that mobile technologies facilitate learner independence by enabling students to control learning pace, select resources, and engage in self-regulated language practice. This result is consistent with recent research emphasizing the role of MALL in strengthening learner autonomy within contemporary EFL contexts. The study further reveals that smartphone-assisted learning enhances students' ability to manage their learning processes flexibly across time and place. Such accessibility allows learners to extend learning beyond classroom constraints, fostering continuous engagement and responsibility for learning outcomes. This supports recent empirical evidence indicating that ubiquitous mobile access promotes sustained learning behaviors and metacognitive development in EFL settings.

Importantly, autonomous learning through MALL is found to particularly strengthen speaking skills by encouraging frequent, self-directed oral practice. Interactive mobile features provide opportunities for authentic communication and reduce learners' anxiety, contributing to improved fluency and confidence. These findings corroborate recent studies highlighting the effectiveness of mobile-supported speaking practice in enhancing oral proficiency. Overall, this study contributes empirical evidence to the growing body of literature on learner autonomy in mobile-assisted EFL learning. Nevertheless, future research is recommended to investigate learners' satisfaction and examine the long-term impacts of MALL on the development of autonomous learning, ensuring a more comprehensive understanding of its sustained educational value.

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