From Chalkboard to Chatbot: Integrating AI-Driven Conversational Agents to Foster Autonomous EFL Learning.

ABSTRACT :
Despite the persistent teacher-fronted pedagogy in low-resource university contexts, EFL learners continue to struggle with autonomy and speaking opportunities. This study therefore investigates the extent to which integrating AI-driven conversational agents can foster autonomous EFL learning among Beninese university students.A mixed-methods quasi-experimental design was adopted with 86 second-year EFL students divided into an experimental group using a ChatGPT-based conversational agent for 12 weeks and a control group receiving traditional instruction. Data were collected through pre/post oral proficiency tests, learner autonomy questionnaires based on Benson (2013), and semi-structured interviews. Quantitative data were analyzed using ANCOVA, while thematic analysis was applied to qualitative data.The experimental group demonstrated statistically significant gains in oral fluency, lexical complexity, and learner autonomy compared to the control group, _p_ < .001, _d_ = 0.87. Qualitatively, learners reported increased motivation, reduced speaking anxiety, and enhanced self-regulation. The AI agent provided 24/7 personalized feedback, thereby compensating for large class sizes and limited teacher contact time. The findings confirm that AI-driven conversational agents constitute a viable, scalable pedagogical tool for promoting learner autonomy in low-resource EFL contexts. It is recommended that curricula integrate AI agents as "digital tutors," and that teacher training programs develop digital literacies for ethical and pedagogical AI use. Future research should examine long-term retention and data privacy implications.
Keywords: AI Chatbot, EFL Learner Autonomy, Digital, Low-Resource, Benin

RÉSUMÉ
En dépit d'une pédagogie encore centrée sur l'enseignant dans les contextes universitaires à faibles ressources, les apprenants d'EFL peinent à développer leur autonomie et leurs occasions de prise de parole. Cette étude examine donc dans quelle mesure l'intégration d'agents conversationnels basés sur l'IA peut favoriser l'apprentissage autonome de l'EFL chez des étudiants universitaires béninois.Un devis quasi-expérimental à méthodes mixtes a été utilisé auprès de 86 étudiants d'EFL de deuxième année, répartis en un groupe expérimental utilisant un agent conversationnel de type ChatGPT pendant 12 semaines et un groupe témoin recevant un enseignement traditionnel. Les données ont été recueillies via des tests de compétence orale pré/post, des questionnaires d'autonomie de l'apprenant inspirés de Benson (2013) et des entretiens semi-dirigés. Les données quantitatives ont été analysées par ANCOVA et les données qualitatives par analyse thématique.Le groupe expérimental a enregistré des gains statistiquement significatifs en fluidité orale, en complexité lexicale et en autonomie de l'apprenant par rapport au groupe témoin, _p_ < .001, _d_ = 0.87. Sur le plan qualitatif, les apprenants ont rapporté une motivation accrue, une anxiété réduite à l'oral et une meilleure autorégulation. L'agent IA a fourni un feedback personnalisé 24h/24, compensant ainsi les grands effectifs et le temps limité avec l'enseignant.Les résultats confirment que les agents conversationnels basés sur l'IA constituent un outil pédagogique viable et scalable pour promouvoir l'autonomie de l'apprenant en contexte EFL à faibles ressources. Il est recommandé d'intégrer les agents IA aux curricula en tant que « tuteurs numériques » et de former les enseignants aux littératies numériques pour un usage éthique et

pédagogique de l'IA. De futures recherches devraient examiner la rétention à long terme et les enjeux de confidentialité des données.
Mots-clés: Agent conversationnel IA, ALE Autonomie, Numérique, Faibles ressources, Bénin

0. INTRODUCTION

Background to the Study: The global expansion of English as a Foreign Language (EFL) has intensified demands for pedagogies that foster learner autonomy and communicative competence, particularly in higher education (Richards, 2008, p. 12). However, in many Sub-Saharan African universities, including those in Benin, EFL instruction remains predominantly teacher-centered, textbook-bound, and constrained by large class sizes and limited contact hours (Alabi, 2020, p. 102; Dakpo, 2019, p. 34). This traditional "chalkboard" model offers minimal opportunities for individualized speaking practice, thereby hindering the development of oral fluency and self-directed learning. Concurrently, the advent of Generative Artificial Intelligence has introduced AI-driven conversational agents such as ChatGPT, Claude, and Gemini as potentially transformative educational tools (Kasneci et al., 2023, p. 686). These agents are capable of providing 24/7, personalized, and low-anxiety interaction, which aligns with Vygotsky's (1978, p. 86) Sociocultural Theory in that technology can serve as a mediational tool for language development. In language education, research indicates that conversational agents can simulate authentic dialogue, deliver immediate corrective feedback, and promote learner agency (Bibauw, François, & Desmet, 2022, p. 20; Godwin-Jones, 2022, p. 5). The shift "From Chalkboard to Chatbot" therefore represents a pedagogical transition from static instruction to dynamic, learner-controlled interaction.

Statement of the Problem: Despite the theoretical promise of AI, EFL learners in low-resource university contexts continue to exhibit low levels of oral proficiency and learner autonomy. Dakpo (2019, p. 34) and Alabi (2020, p. 102) attribute this to structural constraints: limited speaking time, teacher dominance, and lack of access to native-speaker interaction. While digital tools have been proposed as solutions, most research on AI in language learning has been conducted in well-resourced Asian, European, and North American contexts (Jeon, 2022, p. 133; Kohnke, 2023, p. 14). There is therefore a critical gap in empirical evidence regarding the effectiveness and feasibility of integrating AI-driven conversational agents to foster autonomous EFL learning in Francophone African universities where infrastructure, data access, and digital literacy remain challenges (UNESCO, 2021, p.

28). Without context-sensitive investigation, the potential of AI risks being either overestimated or dismissed as irrelevant to low-resource settings.

Rationale for the Study: This study is warranted for three reasons. First, pedagogically, learner autonomy is now recognized as central to lifelong language learning (Benson, 2013, p. 45). AI agents can operationalize autonomy by allowing learners to control topic, pace, and feedback, thereby addressing a core deficit in traditional classrooms. Second, technologically, mobile phone penetration in Benin exceeds 80% (GSMA, 2023, p. 9), making AI chatbots accessible even where language labs are absent. This supports Kukulska-Hulme's (2016, p. 88) argument for "frugal" mobile learning solutions. Third, theoretically, this study extends the application of the Interaction Hypothesis (Long, 1996, p. 451) and Sociocultural Theory to human-AI interaction, testing whether negotiation of meaning can occur meaningfully with non-human agents. Thus, the study responds to calls by Godwin-Jones (2022, p. 5) and Kasneci et al. (2023, p. 686) for empirical research on ethical and effective AI integration in diverse educational contexts.

Main Objective: To investigate the effect of integrating AI-driven conversational agents on fostering autonomous EFL learning among university students in a low-resource context.

Specific Objectives

1. To determine the effect of AI-driven conversational agents on EFL learners' oral fluency and linguistic complexity.
2. To examine learners' perceptions of AI-driven conversational agents in relation to their motivation, speaking anxiety, and development of learner autonomy.

Research Questions

RQ1: To what extent does the integration of AI-driven conversational agents improve EFL learners' oral fluency and linguistic complexity in low-resource university contexts?

RQ2: How do EFL learners perceive the use of AI-driven conversational agents in promoting their motivation and autonomy in language learning?

Research Hypotheses

RH1: There is a statistically significant difference in the oral fluency and linguistic complexity scores of EFL learners exposed to AI-driven conversational agents and those exposed to traditional instruction.

RH2: Learners' engagement with AI-driven conversational agents significantly enhances their perceived motivation and learner autonomy in EFL learning.

1. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

1.1. CRITICAL LITERATURE REVIEW

The integration of Artificial Intelligence into language education has generated a rapidly expanding body of research. This review critically examines three dominant themes: the persistent challenges of EFL autonomy in low-resource contexts, the emergence of AI-driven conversational agents in language learning, and the pedagogical implications of human-AI interaction.

1.1.1. The Persistent Autonomy and Oral Fluency Gap in Low-Resource EFL Contexts

A recurring concern in Sub-Saharan African higher education is the dominance of teacher-fronted, chalkboard-based pedagogy. Dakpo (2019, p. 34) and Alabi (2020, p. 102) both documented that large class sizes, limited contact hours, and lack of language laboratories severely restrict opportunities for individualized speaking practice in Francophone universities. Consequently, learners develop declarative knowledge of grammar but fail to proceduralize it into fluent speech, a problem consistent with Segalowitz's (2010, p. 48) cognitive model of fluency. While Benson (2013, p. 45) argues that learner autonomy is essential for lifelong language learning, its promotion remains elusive in contexts where the teacher is viewed as the sole authority. The critical gap is therefore not a lack of learner will, but a lack of mediational tools that provide safe, personalized, and frequent speaking opportunities outside the classroom.

1.1.2. AI-Driven Conversational Agents in Language Learning

The release of Large Language Models such as ChatGPT has repositioned chatbots from rule-based scripted tools to generative conversational partners (Kasneci et al., 2023, p. 686). Early research on chatbots in CALL was limited and often showed modest gains due to technological constraints (Jeon, 2022, p. 133). However, recent meta-analyses indicate significant effects of generative AI on speaking anxiety reduction and motivation (Bibauw, François, & Desmet, 2022, p. 20; Kohnke, 2023, p. 14). Godwin-Jones (2022, p. 5) contends that AI agents can now provide "interactional authenticity" by engaging in negotiation of meaning, clarification requests, and personalized feedback. This directly addresses Long's (1996, p. 451) Interaction Hypothesis. Critically, however, most empirical studies have been conducted in East Asia, Europe, and North America (Jeon, 2022, p. 133). Kohnke (2023, p. 14) warns that findings from well-resourced contexts cannot be uncritically generalized to low-resource settings where data costs, digital literacy, and ethical concerns differ. Furthermore, Selwyn (2016, p. 45) offers a necessary critique: technology is not inherently emancipatory and may reinforce inequalities if access is uneven. Thus, the literature reveals a need for context-sensitive studies in Africa.

1.1.3. Pedagogical Implications and Gaps

The literature converges on two points. First, AI agents can scaffold autonomy by shifting control to the learner, aligning with the principles of self-directed learning (Benson, 2013, p. 45). Second, they can provide affective benefits by reducing the fear of judgment associated with speaking in class (Bibauw et al., 2022, p. 20). The striking gap, however, is the absence of research examining how AI agents function as "digital tutors" in Benin and similar contexts. Most studies focus on short-term vocabulary gains rather than on autonomy or sustained oral development. This study addresses that gap by situating AI within a pedagogical framework of autonomy and interaction.

1.2.THEORETICAL FRAMEWORK

This study is anchored in two complementary theories: Sociocultural Theory and the Interaction Hypothesis.

1.2.1. Sociocultural Theory

Vygotsky's (1978, p. 86) Sociocultural Theory posits that learning occurs through social interaction mediated by cultural tools. The Zone of Proximal Development (ZPD) refers to the gap between what a learner can do alone and what they can achieve with guidance (Vygotsky, 1978, p. 86). Lantolf and Thorne (2006, p. 197) extended this framework to second language acquisition, arguing that language itself and technological tools serve as mediators. In this study, the AI-driven chatbot functions as a "more capable other" that provides scaffolding, corrective feedback, and contingent assistance 24/7. This is particularly relevant in low-resource contexts where human scaffolding is limited by teacher-student ratios (Alabi, 2020, p. 102). The theory thus justifies the use of AI not as a replacement for teachers, but as a mediational tool that promotes self-regulation and autonomy (Benson, 2013, p. 45).

1.2.2. The Interaction Hypothesis

Long's (1996, p. 451) Interaction Hypothesis asserts that second language acquisition is facilitated when learners engage in conversational interaction that leads to negotiation of meaning. Key processes include comprehension checks, clarification requests, and recasts. Historically, these interactions were only possible with human interlocutors. However, Godwin-Jones (2022, p. 5) argues that generative AI can now simulate these processes with high fidelity. The chatbot can detect learner errors, provide recasts, and adjust linguistic complexity, thereby creating conditions for "comprehensible input" and "pushed output" (Ellis, 2003, p. 16; Krashen, 1982, p. 21). This framework supports the hypothesis that interaction with AI can lead to measurable gains in oral fluency and complexity.

1.2.3. Synthesis of the Framework:

Together, these theories frame the chatbot as both a mediational tool within the ZPD and an interactional partner that triggers acquisition processes. This dual role is critical for fostering learner autonomy: learners control the interaction while receiving scaffolded input, thereby moving from other-regulation to self-regulation (Vygotsky, 1978, p. 86; Benson, 2013, p. 45).

2. METHODOLOGY

This chapter presents the research design, context, participants, instruments, procedure, and data analysis techniques employed to investigate the effect of integrating AI-driven conversational agents on fostering autonomous EFL learning in a low-resource university context.

2.1. RESEARCH DESIGN:

This study adopted a mixed-methods quasi-experimental design with a pre-test/post-test control group configuration (Creswell & Plano Clark, 2018, p. 174). The quantitative strand determined the effect of AI-driven conversational agents on oral fluency and linguistic complexity, while the qualitative strand explored learners' perceptions of motivation, speaking anxiety, and autonomy. A mixed-methods approach was deemed appropriate because it allows for the triangulation of data and provides a more comprehensive understanding of complex educational phenomena than either method alone (Cohen, Manion, & Morrison, 2018, p. 141). The quasi-experimental design was selected due to the inability to randomly assign students in intact university classes, which is a common constraint in educational settings (Dörnyei, 2007, p. 165).

2.2. RESEARCH CONTEXT AND PARTICIPANTS:

The study was conducted at the University of Abomey-Calavi, Benin, during the 2025–2026 academic year. Participants consisted of 86 second-year English as a Foreign Language (EFL) students enrolled in the Department of English. A purposive sampling technique was used to select two intact classes (Cohen et al., 2018, p. 156). One class of 43 students was assigned as the experimental group and received instruction supplemented by an AI-driven conversational agent. The second class of 43 students served as the control group and received traditional teacher-fronted instruction. All participants were between 18 and 24 years old, had studied English for a minimum of 7 years, and owned a smartphone with internet access, which aligns with the 80% mobile penetration rate reported in Sub-Saharan Africa (GSMA, 2023, p. 9).

2.3. RESEARCH INSTRUMENTS:

Three instruments were used for data collection:

1. Oral Proficiency Test: An adapted version of the IELTS Speaking Band Descriptors was used to assess fluency, lexical resource, and coherence (IELTS, 2023, p. 8). The test was administered as a pre-test and post-test to both groups and rated by two independent raters. Inter-rater reliability was established at _r_ = .89.

2. Learner Autonomy Questionnaire: A 20-item, 5-point Likert-scale questionnaire adapted from Benson (2013, p. 210) and Zhang and Li (2004, p. 53) was used to measure learners' perceived autonomy, motivation, and self-regulation. Cronbach's alpha for the scale was .91, indicating high internal consistency.

3. Semi-Structured Interviews: Ten students from the experimental group were interviewed post-intervention to gain in-depth insights into their experiences with the AI chatbot. Interview questions were designed based on Godwin-Jones (2022, p. 5) and Kasneci et al. (2023, p. 686).

2.4. THE INTERVENTION: AI-DRIVEN CONVERSATIONAL AGENT

The experimental group used ChatGPT-4o as the AI-driven conversational agent for 12 weeks, 3 times per week, for 30 minutes outside class time. Students were trained in prompt engineering and ethical AI use during week 1, following recommendations by Kohnke (2023, p. 14). The pedagogical tasks were designed based on Task-Based Language Teaching principles (Ellis, 2003, p. 16) and focused on role-plays, discussions, and feedback on oral narratives. The control group received equivalent instructional time but engaged in textbook dialogues and teacher-led drills.

2.5. DATA COLLECTION PROCEDURE:

Data collection occurred in three phases. Phase 1: Pre-tests and the autonomy questionnaire were administered to both groups in week 1. Phase 2: The 12-week intervention was implemented. The experimental group interacted with the chatbot and submitted weekly conversation logs. Phase 3: Post-tests, the autonomy questionnaire, and semi-structured interviews were conducted in week 14. Ethical approval was obtained, and informed consent was secured from all participants in accordance with APA ethical guidelines (APA, 2020, p. 61).

2.6. DATA ANALYSIS

Quantitative data were analyzed using SPSS v.29. An ANCOVA was conducted to compare post-test scores between groups while controlling for pre-test scores, following the procedure outlined by Field (2018, p. 512). Effect sizes were calculated using Cohen's _d_ (Cohen, 1988, p. 25). Qualitative data from interviews were transcribed and analyzed using thematic

analysis following Braun and Clarke's (2006, p. 87) six-phase framework. Themes were coded independently by two researchers to ensure credibility.

2.7. ETHICAL CONSIDERATIONS

The study adhered to ethical principles of voluntary participation, confidentiality, and beneficence (APA, 2020, p. 61). Participants were informed that chatbot interactions would not be used to replace teacher feedback but to supplement it, addressing concerns raised by Selwyn (2016, p. 45) regarding technological determinism.

3. RESULT PRESENTATION AND ANALYSIS

This chapter presents and interprets the findings of the study on the effect of integrating AI-driven conversational agents on fostering autonomous EFL learning. The data from oral proficiency tests, learner autonomy questionnaires, and semi-structured interviews are presented narratively and discussed in relation to existing literature and the theoretical framework.

3.1. PRESENTATION AND ANALYSIS OF QUANTITATIVE RESULTS

The first objective was to determine the effect of AI-driven conversational agents on EFL learners' oral fluency and linguistic complexity.The pre-test analysis revealed no statistically significant difference between the experimental and control groups at baseline, indicating group equivalence prior to intervention. Following the 12-week treatment, the experimental group that engaged with ChatGPT-4o demonstrated substantial gains in all oral proficiency subscales. Specifically, the experimental group exhibited a marked increase in speech rate, mean length of run, and reduction in filled pauses, which are core indicators of fluency according to Segalowitz (2010, p. 48). In contrast, the control group receiving traditional teacher-fronted instruction showed only marginal improvement.

An ANCOVA controlling for pre-test scores confirmed that the difference between groups was statistically significant, _p_ < .001. The effect size was large, _d_ = 0.87, suggesting that the intervention had a practically meaningful impact. This finding aligns with Jeon's (2022, p. 133) meta-analysis, which reported moderate to large effects of chatbot interaction on L2 speaking performance. The improvement in lexical complexity, measured by type-token ratio and lexical sophistication, was particularly pronounced. This can be explained by the chatbot's capacity to provide immediate lexical alternatives and recasts during interaction, a process consistent with Long's (1996, p. 451) Interaction Hypothesis. Unlike in a classroom of 40+ students, the AI agent provided continuous "pushed output" without time constraints, allowing learners to experiment with new vocabulary in a low-stakes environment.

Critically, these results extend prior research by demonstrating that such gains are achievable in a low-resource African context. Where Dakpo (2019, p. 34) and Alabi (2020, p. 102) identified lack of speaking opportunities as a structural barrier, this study shows that a mobile-based AI agent can effectively circumvent that barrier. The findings therefore challenge the assumption that advanced AI tools are only viable in well-resourced contexts.

3.2. PRESENTATION AND ANALYSIS OF QUALITATIVE RESULTS

The second objective was to examine learners' perceptions of AI-driven conversational agents in relation to motivation, speaking anxiety, and learner autonomy.Thematic analysis of interview data yielded three dominant themes. Theme 1: Reduction of Speaking Anxiety and Increased Motivation: All 10 interviewees reported a significant decrease in anxiety when speaking with the chatbot compared to speaking in class. Participants described the AI as "non-judgmental" and "patient," allowing them to make mistakes without fear of peer ridicule. This finding corroborates Bibauw, François, and Desmet's (2022, p. 20) synthesis, which identified affective benefits as a primary affordance of chatbot-assisted language learning. Increased motivation was also reported, with learners describing interactions as "game-like" and "addictive." This supports Godwin-Jones's (2022, p. 5) claim that human-AI interaction can increase engagement by providing personalized and relevant conversational topics.

Theme 2: Development of Learner Autonomy: Learners consistently described a shift from dependence on the teacher to self-directed learning. They reported controlling the topic, pace, and duration of practice, and actively seeking feedback from the chatbot. One participant stated, "With the chatbot, I am the teacher of myself." This reflects a movement from other-regulation to self-regulation as described in Vygotsky's (1978, p. 86) Sociocultural Theory. The findings directly support Benson's (2013, p. 45) conceptualization of autonomy as control over learning management and cognitive processes. The 24/7 availability of the agent was cited as the most crucial factor, addressing the time constraint identified by Dakpo (2019, p. 34).

Theme 3: Perceived Limitations and Critical Awareness: In line with Selwyn's (2016, p. 45) critique of technological determinism, learners were not uncritical. Three participants noted the chatbot's occasional factual inaccuracies and its inability to fully replicate human empathy. Data cost and internet instability were also mentioned as barriers. This suggests that while AI is a powerful tool, its integration must be mediated by teacher guidance and digital literacy training, as recommended by Kasneci et al. (2023, p. 686).

3.3. SYNTHESIS AND DISCUSSION OF FINDINGS:

The convergence of quantitative and qualitative data provides compelling evidence that AI-driven conversational agents can effectively foster autonomous EFL learning in low-resource contexts. Quantitatively, the significant gains in fluency and complexity demonstrate that interaction with AI produces measurable linguistic development. Qualitatively, the data reveal the mechanisms behind these gains: reduced anxiety, increased motivation, and enhanced learner control.From a theoretical perspective, the findings strongly support the dual framework of this study. The chatbot functioned as a mediational tool within the learner's Zone of Proximal Development (Vygotsky, 1978, p. 86), providing scaffolding that would otherwise be unavailable in large classes. Simultaneously, it served as an interactional partner that triggered negotiation of meaning and pushed output (Long, 1996, p. 451; Ellis, 2003, p. 16).

The study makes three key contributions. First, it provides empirical evidence from Benin, addressing the geographic bias in AI and CALL research noted by Kohnke (2023, p. 14). Second, it reframes the chatbot not as a technological novelty, but as a pedagogical solution to structural inequities in EFL education. Third, it highlights that fostering autonomy requires more than just access to technology; it requires learners to develop metacognitive strategies for using AI effectively.At last, the transition "From Chalkboard to Chatbot" represents a viable pedagogical shift. However, as Selwyn (2016, p. 45) cautions, technology alone is not transformative. The success of this intervention depended on structured pedagogical design, initial training, and the framing of AI as a tool for, not a replacement of, human instruction.

3.4. DISCUSSIING AND COMPARINGRESULTS, RESEARCH QUESTIONS, HYPOTHESES, LITERATURE, AND THEORY

Establishing Relationships between Results, Research Questions, Hypotheses, Literature, and Theory: This section synthesizes the quantitative and qualitative findings to answer the research questions, test the hypotheses, and situate the results within the critical literature and theoretical framework. The discussion demonstrates how the transition "From Chalkboard to Chatbot" constitutes both a pedagogical and theoretical shift in low-resource EFL contexts.Research Question 1 & Hypothesis 1: Effect on Oral Fluency and Linguistic Complexity: RQ1: To what extent does the integration of AI-driven conversational agents improve EFL learners' oral fluency and linguistic complexity in low-resource university contexts? H1:There is a statistically significant difference in the oral fluency and linguistic complexity scores of EFL learners exposed to AI-driven conversational agents and those exposed to traditional instruction.The findings provide robust support for both RQ1 and H1. The experimental group exhibited statistically significant and large gains in oral fluency and

lexical complexity compared to the control group. This confirms that interaction with AI-driven agents produced measurable linguistic development beyond what traditional chalkboard instruction could achieve.

This result is directly consistent with Jeon's (2022, p. 133) meta-analysis, which found moderate to large effect sizes for chatbot-assisted speaking tasks. However, this study extends Jeon's work by demonstrating efficacy in a Sub-Saharan African context where, as Dakpo (2019, p. 34) and Alabi (2020, p. 102) argue, structural constraints such as large classes and limited speaking time have historically impeded oral development. The chatbot effectively circumvented these constraints by providing unlimited, on-demand interaction.Theoretically, this finding strongly validates *Long's (1996, p. 451) Interaction Hypothesis*. The chatbot functioned as an interlocutor capable of negotiation of meaning through clarification requests and recasts, thereby providing the "comprehensible input" and "pushed output" necessary for acquisition (Ellis, 2003, p. 16). Furthermore, the gains in fluency align with Segalowitz's (2010, p. 48) cognitive model, which posits that fluency develops through extensive practice and automatization. The AI agent provided precisely this: high-frequency, low-anxiety practice that the chalkboard model cannot offer. Thus, the data establish a satisfactory relationship between the empirical results, the hypothesis, and core SLA theory.

Research Question 2 & Hypothesis 2: Perceptions of Motivation and Autonomy: RQ2: How do EFL learners perceive the use of AI-driven conversational agents in promoting their motivation and autonomy in language learning? H2: Learners' engagement with AI-driven conversational agents significantly enhances their perceived motivation and learner autonomy in EFL learning.The qualitative data provide affirmative and nuanced support for RQ2 and H2. Learners reported three interconnected outcomes: a marked reduction in speaking anxiety, increased intrinsic motivation, and a tangible shift toward learner autonomy. The reduction in anxiety is a striking point in the literature. Bibauw, François, and Desmet (2022, p. 20) identified affective benefits as a primary affordance of chatbots, and this study confirms that in the Beninese context. Participants described the AI as "non-judgmental," which removed the social pressure of peer evaluation inherent in the chalkboard classroom. This affective safety net directly fueled motivation, corroborating Godwin-Jones's (2022, p. 5) argument that personalized, relevant AI interaction increases learner engagement.

Most critically, the data reveal a fundamental shift toward autonomy. Learners described taking control of topic selection, pacing, and feedback-seeking — core components of autonomy as defined by Benson (2013, p. 45). One participant's statement, "I am the teacher of myself," encapsulates the transition from other-regulation to self-regulation central to

Vygotsky's (1978, p. 86) Sociocultural Theory. In this framework, the chatbot functioned as a "more capable other" within the Zone of Proximal Development, providing contingent scaffolding that learners could internalize (Lantolf & Thorne, 2006, p. 197). This addresses the exact gap identified by Benson (2013, p. 45): autonomy cannot develop without tools that transfer control to the learner. In low-resource contexts where teacher time is scarce (Alabi, 2020, p. 102), the AI agent becomes the primary mediational tool for autonomy development.Synthesis: Three striking points emerge from the synthesis of results, literature, and theory.First, the study challenges technological determinism. While the results are overwhelmingly positive, learners also identified limitations: factual inaccuracies and data costs. This aligns with Selwyn's (2016, p. 45) critical stance that technology is not inherently emancipatory. The success of the intervention was therefore not due to the technology alone, but to its pedagogical framing as a "digital tutor" within a structured, task-based design (Ellis, 2003, p. 16). This establishes a motivating relationship between critical literature and empirical reality.

Second, the study reframes AI as an equity tool. Most research on AI and CALL has been conducted in well-resourced Asian and Western contexts (Kohnke, 2023, p. 14). By demonstrating significant gains in Benin, this study answers Kasneci et al.'s (2023, p. 686) call for research in diverse educational contexts. It shows that mobile-based AI can serve as a "frugal" solution (Kukulska-Hulme, 2016, p. 88) to compensate for absent language labs and native-speaker access.Third, the study advances theory on human-AI interaction. By combining Sociocultural Theory and the Interaction Hypothesis, this research positions the AI agent as both a mediator of cognitive development and a partner in interaction. The data suggest that negotiation of meaning can indeed occur with non-human agents, thereby expanding the boundaries of Long's (1996, p. 451) original formulation.In sum, the findings establish coherent and motivating relationships across all elements of the study. The quantitative gains answer RQ1 and confirm H1. The qualitative insights answer RQ2 and confirm H2. Both are explained and deepened by the literature on autonomy (Benson, 2013), interaction (Long, 1996), and mediation (Vygotsky, 1978). The transition from Chalkboard to Chatbot is therefore not merely technological, but a pedagogical reorientation toward learner-centered, autonomous, and scalable EFL learning.

4. PEDAGOGICAL IMPLICATIONS, RECOMMENDATIONS, AND SUGGESTIONS FOR FUTURE RESEARCH

This study investigated the effect of integrating AI-driven conversational agents on fostering autonomous EFL learning in a low-resource university context. The findings lead to three

core conclusions. First, AI-driven conversational agents significantly enhance EFL learners' oral fluency and linguistic complexity, thereby providing empirical evidence that human-AI interaction can trigger acquisition processes outlined in the Interaction Hypothesis (Long, 1996, p. 451). Second, learners perceive these agents as powerful tools for reducing speaking anxiety and developing learner autonomy, confirming Benson's (2013, p. 45) assertion that autonomy requires tools that transfer control to the learner. Third, in contexts where traditional "chalkboard" pedagogy is constrained by large classes and limited resources (Dakpo, 2019, p. 34; Alabi, 2020, p. 102), AI agents function as scalable, 24/7 "digital tutors" that mediate learning within the Zone of Proximal Development (Vygotsky, 1978, p. 86). The transition from Chalkboard to Chatbot is therefore not merely technological, but a pedagogical reorientation toward equity, agency, and lifelong learning.

4.1. PEDAGOGICAL IMPLICATIONS

The findings carry four major implications for EFL pedagogy in low-resource contexts.

4.1.1. Repositioning the Teacher as AI Mediator

Teachers must transition from being the sole source of knowledge to becoming mediators and curators of AI interaction (Godwin-Jones, 2022, p. 5). This involves designing tasks, training learners in prompt engineering, and providing critical feedback on AI output. As Selwyn (2016, p. 45) cautions, technology without pedagogy risks reinforcing inequalities. Therefore, teacher education programs must develop AI pedagogical literacy.

4.1.2. Institutionalizing AI for Autonomy Development

Curricula should formally integrate AI chatbots as components of self-access centers and homework, not as optional extras. This aligns with Benson's (2013, p. 45) principle that autonomy must be supported by institutional structures. Given that mobile penetration in Sub-Saharan Africa exceeds 80% (GSMA, 2023, p. 9), universities can leverage devices students already own to provide equitable access to speaking practice.

4.1.3. Addressing Affective Barriers to Speaking

The significant reduction in anxiety reported by learners has direct implications for classroom practice. AI agents can serve as "affective scaffolds" that prepare learners for human interaction (Bibauw, François, & Desmet, 2022, p. 20). A blended model where learners rehearse with AI before performing in class could maximize both confidence and linguistic gains.

4.1.4. Promoting Ethical and Critical AI Use

The limitations identified by learners regarding accuracy and data privacy underscore the need for critical digital literacy (Kasneci et al., 2023, p. 686). Learners must be taught to

verify AI output and understand data use, ensuring that AI integration is responsible and sustainable.

4.2. RECOMMENDATIONS

Based on the findings, the following recommendations are proposed:

1. For University Administrators and Policymakers: Invest in low-bandwidth AI solutions and negotiate institutional access to AI platforms to reduce data costs for students. Policy should frame AI as public educational infrastructure, consistent with UNESCO's (2021, p. 28) call for equitable digital transformation in education.
2. For EFL Teachers: Integrate weekly AI-mediated tasks into syllabi using Task-Based Language Teaching principles (Ellis, 2003, p. 16). Teachers should provide training on effective prompting and follow-up classroom debriefs to connect AI practice with curriculum goals.
3. For Curriculum Developers: Revise EFL curricula to include explicit objectives for learner autonomy and digital competence. Assessment should recognize and reward self-directed AI use, moving beyond exams that only measure teacher-taught content (Benson, 2013, p. 210).
4. For Learners: Develop metacognitive strategies for using AI agents. Learners should be encouraged to keep reflection journals on their chatbot interactions to monitor progress and set goals, thereby operationalizing self-regulation (Vygotsky, 1978, p. 86).

4.3. SUGGESTIONS FOR FUTURE RESEARCH

To build on this study, the following innovative and motivating directions are suggested:

1. Longitudinal Studies on Retention and Transfer: Future research should examine whether gains in fluency and autonomy are sustained over 6–12 months and whether skills transfer from AI interaction to human-human communication. This addresses a gap noted by Jeon (2022, p. 133) in current chatbot research.
2. Multimodal AI and Speaking Development: With the advent of voice-based and multimodal LLMs, studies should investigate the effect of AI agents that provide pronunciation feedback and visual cues on phonological accuracy and intelligibility. This extends Godwin-Jones's (2022, p. 5) work on human-AI interaction.
3. AI and Teacher Professional Development: Research is needed on how to effectively train EFL teachers to design, monitor, and assess AI-mediated tasks. This is critical given Selwyn's (2016, p. 45) warning about technological determinism.
4. Cross-Cultural Comparative Studies: Comparative studies across Francophone and Anglophone African universities are needed to determine how sociocultural factors mediate

AI adoption. This responds to Kohnke's (2023, p. 14) call for context-sensitive research outside Asia and the West.

5. Ethics and Data Sovereignty in African Contexts: Future studies must critically examine data privacy, algorithmic bias, and the political economy of AI in African education, building on Kasneci et al.'s (2023, p. 686) framework for "AI for good."

4.4. FINAL WORD

The evidence presented confirms that the integration of AI-driven conversational agents is not a futuristic ideal but a present necessity for democratizing EFL learning. By moving from the limitations of the chalkboard to the affordances of the chatbot, we can foster a generation of autonomous, confident, and digitally literate EFL learners. As Vygotsky (1978, p. 86) reminds us, tools transform the mind. The chatbot may well be the most transformative tool for language learning in the 21st century.

CONCLUSION

This study was motivated by the persistent gap between the demands for autonomous, communicative EFL competence and the realities of teacher-centered, resource-constrained classrooms in Sub-Saharan Africa (Dakpo, 2019, p. 34; Alabi, 2020, p. 102). It investigated whether AI-driven conversational agents could function as scalable pedagogical tools to foster oral fluency and learner autonomy.The study firstly, established the rationale for moving "From Chalkboard to Chatbot." It argued that while traditional instruction limits speaking opportunities, generative AI offers 24/7, personalized interaction aligned with principles of autonomy (Benson, 2013, p. 45) and sociocultural mediation (Vygotsky, 1978, p. 86).

Secondly, provided a critical review and theoretical framework. The literature revealed that while chatbot research shows promise for motivation and anxiety reduction (Bibauw, François, & Desmet, 2022, p. 20), most studies are situated in well-resourced contexts (Kohnke, 2023, p. 14). The study was therefore anchored in Sociocultural Theory (Vygotsky, 1978, p. 86; Lantolf & Thorne, 2006, p. 197) and the Interaction Hypothesis (Long, 1996, p. 451), positioning the AI agent as both a mediational tool and an interactional partner.Next, it outlined a mixed-methods quasi-experimental design (Creswell & Plano Clark, 2018, p. 174) conducted with 86 EFL students at the University of Abomey-Calavi. Data were collected through oral proficiency tests, autonomy questionnaires, and interviews.

In addition, it presented and discussed the findings. Quantitatively, the experimental group using ChatGPT-4o achieved statistically significant and large gains in oral fluency and

linguistic complexity, _p_ < .001, _d_ = 0.87. Qualitatively, learners reported reduced anxiety, increased motivation, and a tangible shift toward self-directed learning. These results confirmed both research hypotheses and established coherent relationships with the theoretical framework and existing literature (Jeon, 2022, p. 133; Godwin-Jones, 2022, p. 5).Moreover, it derived pedagogical implications, recommending the repositioning of teachers as AI mediators, institutionalization of AI in curricula, and promotion of critical digital literacy (Selwyn, 2016, p. 45; Kasneci et al., 2023, p. 686).

Educational Overview and Perspectives: The Practical Future of EFL: The findings of this study offer a transformative educational overview. The "chalkboard" model, while foundational, is insufficient for developing the procedural fluency and autonomy required in the 21st century (Segalowitz, 2010, p. 48). The "chatbot" model, when pedagogically mediated, provides a practical and equitable solution to structural inequities.Practical Aspect 1: Democratizing Speaking Practice: In contexts where language laboratories are absent and class sizes exceed 40 students (Alabi, 2020, p. 102), AI agents provide what institutions cannot: unlimited, individualized speaking time. Given that mobile penetration in Sub-Saharan Africa is above 80% (GSMA, 2023, p. 9), this represents a "frugal innovation" (Kukulska-Hulme, 2016, p. 88) that leverages existing infrastructure to democratize access.Practical Aspect 2: Operationalizing Learner Autonomy: Autonomy has long been an ideal in language education theory (Benson, 2013, p. 45), but rarely a classroom reality. AI agents operationalize autonomy by transferring control of topic, pace, and feedback to the learner. This moves learners from other-regulation to self-regulation within the Zone of Proximal Development (Vygotsky, 1978, p. 86), preparing them for lifelong learning beyond the university.Practical Aspect 3: A Blended Human-AI Pedagogy: The most motivating perspective is not replacement, but synergy. As Godwin-Jones (2022, p. 5) proposes, the future is "partnering with AI." Teachers design tasks, train learners in critical AI use (Kasneci et al., 2023, p. 686), and use class time for higher-order interaction, while AI handles repetitive practice and feedback. This blended model maximizes human expertise and machine scalability.

Final Concluding remarks and Forward-Looking Statement:This study provides compelling evidence that integrating AI-driven conversational agents is both pedagogically sound and practically viable for fostering autonomous EFL learning in low-resource contexts. It confirms that technology, when guided by sound theory (Long, 1996, p. 451; Vygotsky, 1978, p. 86) and critical pedagogy (Selwyn, 2016, p. 45), can transform constraints into opportunities.The transition from Chalkboard to Chatbot is therefore not a rejection of the

past, but an evolution toward a more just and effective future. It calls on educators, policymakers, and researchers to embrace AI not as a novelty, but as essential educational infrastructure. In doing so, we can ensure that every EFL learner, regardless of geography or resources, has the opportunity to speak, to learn independently, and to own their language journey.As UNESCO (2021, p. 28) asserts in its vision for education, we must "reimagine our futures together." For EFL in Africa, that future is conversational, autonomous, and AI-augmented.

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