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Exploring the Impact of AI-Generated vs. Teacher-Developed Lesson Plans on EFL Instruction: A Comparative Study in the Saudi Arabian Context

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***Abstract*—The AI-powered tools are transforming instructional methods and teaching strategies across the world. As conventional methods of instruction no longer align with the preferences of today's tech-savvy young generation, AI-powered tools are increasingly incorporated to facilitate learning and instruction. While multiple studies have examined various aspects of AI integration, there is a lack of evidence on the comparative effectiveness of AI-generated and instructor-prepared lesson plans. Therefore, this study examines the comparative efficacy of AI-generated and instructor-prepared lesson plans on students' performance and engagement. Utilizing a quasi-experimental design, the experimental group (Group A) used AI-generated lesson plans, while the control group (Group B) received instructor-prepared lesson plans. While a pre-test was administered to establish a baseline, a post-test and a delayed post-test were used to examine the impact on students' performance. The findings revealed that AI-generated lesson plans were more effective and had a more positive impact on students' performance than instructor-prepared lesson plans. The study suggests how AI could enhance language instruction in EFL classrooms.**

***Index Terms*—AI-generated lesson plans, comparative efficacy, insufficient evidence, instructor-prepared lesson plans, tech-savvy young generation**

I. Introduction

Over recent years, particularly after the COVID-19 pandemic, there has been a significant integration of technology into English as a Foreign Language (EFL) classroom, largely through AI-powered tools that have introduced innovative approaches to learning and instruction (Alharbi, 2023; Lo et al., 2024; Nazim, 2024). The advent of AI has profoundly affected language learning, revolutionizing instructional methods, skill acquisition, and educational experiences by enabling personalized learning and unique technological innovations (Xu & Wang, 2024). Today's generation, which is increasingly reliant on smartphones and technology, actively engages with the innovative features provided by AI tools. According to Evenddy (2024), AI significantly enhances language instruction and acquisition by delivering prompt feedback and customized content. Numerous studies (Mananay, 2024; Rusmiyanto et al., 2023; Jamshed et al., 2024) highlight the substantial advantages AI offers in language teaching, as it allows instructors to cater to a diverse range of learners more effectively and individually.

The development of AI-generated lesson plans, which utilize natural language processing and machine learning to provide customized instructional content, is among the most notable advancements. These AI-generated plans offer instructors an alternative to the typically time-consuming manual lesson planning, as they promise efficiency, adaptability, and alignment with curricular standards. Multiple studies have emphasized the efficacy of AI-generated lesson plans. For example, Karaman and Goksu (2024) investigated whether primary school math lesson plans incorporating ChatGPT, a chatbot, improved learners' math skills. The findings revealed a substantial enhancement in the academic performance of students instructed with ChatGPT-developed lesson plans compared to those taught using teacher-prepared lesson plans. Baytak (2024) examined the efficacy of ChatGPT and Google Gemini in developing

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lesson plans for 7th-grade students in science, literature, social studies, and mathematics. The results revealed that the lesson plans generated by both chatbots resemble those offered by human instructors, including assessments, sentence varieties, and instructional tasks. Asrori and Setyaningsih (2025) examined the assessments of secondary school EFL instructors of Gen-AI Magic School's ease of use (PEU) and usefulness (PU) for lesson planning, utilizing the Technology Acceptance Model (TAM). The findings revealed that the course instructors found AI-powered tools easy to use and invaluable for lesson planning. To assess their effects on student involvement, motivation, and learning outcomes, this comparative study investigates the effectiveness of AI-generated lesson plans compared to teacher-developed ones in Saudi Arabian EFL classrooms.

A. Research Problem Statement

In Saudi Arabia, the incorporation of technology into classrooms has been recognized as a crucial strategic goal within the framework of the national Vision 2030 strategy for educational reform. This presents an opportunity to evaluate the instructional efficacy of content generated by artificial intelligence in comparison to conventional methods. The English as a Foreign Language (EFL) classroom is a crucial context for this comparison, as instructional design has a significant impact on learners' motivation, engagement, and language acquisition. AI-generated lesson plans are not yet comparable to those of human instructors, particularly in EFL instruction, despite their increasing use in education. While AI-powered educational systems are rapid, consistent, and adaptive, their pedagogical quality and contextual relevance are uncertain, leaving room for further exploration.

B. Research Purpose Statement

This study analyses how AI-generated and teacher-created lesson plans impact Saudi Arabian EFL instruction with a particular emphasis on how each strategy influences students' motivation and engagement.

II. Literature Review

A. AI in Education and EFL Classrooms

In recent years, the application of AI in education has expanded significantly. Sophisticated teaching systems, personalized educational platforms, and AI-powered content-generating tools have transformed the design of instruction and implementation (Luckin & Holmes, 2016). Multiple studies have highlighted the efficacy of AI in education and EFL classrooms. For example, Rahman (2024) investigated Indonesian EFL instructors' utilization of AI technology, their opinions on its efficacy, and the challenges they faced. Semi-structured interviews were utilized to collect qualitative data from five Indonesian EFL instructors. The data analysis revealed that instructors utilized various AI-powered tools, including Google Translate, Grammarly, ChatGPT, and Claude AI, for content creation, providing feedback, and comprehension. Dai and Liu (2024) examined Chinese EFL students' opinions of AI in educational settings using a phenomenological method. Forty-five Chinese EFL students were picked from a variety of educational institutions using a criterion sampling. The findings revealed that AI in EFL classes could offer customized instruction, real-time feedback, an extensive range of educational materials, and a stimulating environment. Tafazoli (2024) examined how Generative Artificial Intelligence (GenAI), specifically ChatGPT, can assist Iranian English language teachers (N = 23) in overcoming their academic challenges. Semi-structured interviews, focus groups, and reflective essays were utilized to collect the data. The results revealed GenAI's potential to overcome ideological presumptions, enhance cross-cultural communication, and provide relevant, diverse learning resources tailored to individual learners. Espartinez (2024) examined and categorized the perspectives of Philippine higher education instructors and learners on the utilization of ChatGPT to identify commonalities. Twenty-seven respondents—15 students and 12 professors—were asked to rank 36 statements about ChatGPT use using questionnaires and Q-methodology interviews. The findings revealed that instructors and college students held contrasting opinions on the incorporation of ChatGPT, with different aspects representing moral, artistic, and practical perspectives. Zheng (2024) investigated the efficacy of a GenAI-based chatbot, "Reading Bot," in alleviating foreign language reading anxiety (FLRA) and enhancing foreign language reading performance (FLRP) among Chinese secondary school EFL students. Qualitative interviews were employed in a mixed-methods, quasi-experimental pre-test/post-test design. The findings revealed that the chatbot intervention significantly minimized the participants' FLRA in the experimental group when comparing pre- and post-test scores.

B. Lesson Planning in EFL Instruction

Lesson planning enables instructors of English as a Foreign Language (EFL) to meet the diverse language needs of their students while effectively conveying knowledge and skills. Lesson planning, which is grounded in pedagogical philosophy, offers learner-centered, scaffolded, and purposeful instruction. To promote meaningful language acquisition, Vygotsky's social development theory emphasizes creating activities that fall within the learner's zone of proximal development (ZPD) and planning tasks that are appropriately supported. Multiple studies have stressed the importance of lesson planning in practical education and EFL instruction. For example, Putri (2016) examined the challenges faced by EFL teachers in developing effective lesson plans. Interviews and lesson plans from four language instructors were utilized to collect data. Interview findings revealed that each respondent understood the course plan, its evolution, and its components, but instructors were unable to comprehend the learning assessment method. Emiliasari (2019)

examined the preparation and implementation of English teachers' lesson plans. Data was gathered through interviews, observations, and written records. The findings showed that instructors developed the lesson plan by examining the syllabus's core competencies and basic competencies, searching for learning resources, identifying learning media and content, and setting indicators and goals. Hejji Alanazi (2019) examined the lesson design attitudes, concepts, and problems of pre-service trainee instructors. Informal interviews and daily and weekly lesson plans were utilized to collect data from 50 pre-service trainee teachers. Triangulation was employed to gather both quantitative and qualitative data. The findings revealed that pre-service trainee instructors understood the importance of lesson planning, but they experienced difficulty during the planning process.

C. AI-Generated Lesson Plans

Several educational theories support the use of AI-generated lesson plans to teach EFL. AI's capacity to structure and customize instruction aligns with cognitive learning theory, which emphasizes perception, recall, and problem-solving. AI systems enhance cognitive engagement by tailoring instruction to the needs of learners (Anderson, 2015). Moreover, Technological Pedagogical Content Knowledge (TPACK) explains how AI-generated lesson plans interact with content and pedagogy. AI could automate administrative and design tasks, allowing instructors to focus on student engagement and content. These theories support the use of modern, AI-generated lesson plans in the classroom. Multiple studies have highlighted the empowering efficacy of AI-generated lessons for enhancing EFL instruction and learning. Kehoe (2023) examined how generative AI could transform course formats for future teachers. It utilized generative AI to identify flaws in lesson plans. It was found that AI-generated lesson plans enhanced instructional methods and transformed education by offering learners greater agency. The study suggests that teachers should bring their perspectives and experiences to generative AI content to inform their pedagogical decisions. Chen et al. (2025) evaluated instructional prejudices in AI-driven learning resources, with a special focus on lesson plan generators. The analysis of 90 lesson plans from for-profit generators revealed that AI-generated material promoted teacher-centered classrooms with limited student choice, goal-setting, or substantive discussion. This research contributes to the critical discussion on how AI tools can enhance student agency and engagement in the educational context. An exploratory design was employed to achieve these objectives. A case study was conducted on middle school science, with ChatGPT assigned to develop lesson plans by outlining the objectives and duration of each course. The results indicated that AI-generated lesson plans achieved course objectives, incorporated actual-life scenarios, and promoted inquiry-based learning. This study revealed that structured feedback and curiosity necessitate enhancement, despite those characteristics.

III. METHODOLOGY

A. Research Design

A quasi-experimental comparison investigated the impact of AI-generated and teacher-prepared lesson plans on EFL instruction. The design involved a control group with teacher-created lesson plans and an experimental group with AI-generated ones. The study investigated the impact of AI-generated lesson plans and instructor-developed lesson plans on EFL learners' motivation and engagement over time, using pre-tests, post-tests, and delayed post-tests. The respondents from both groups were asked to complete a questionnaire after the intervention to report their experiences.

B. Participants

The participants were chosen from two existing intermediate diploma classes for tourism. Class A (n = 30) was assigned to the experimental group, while Class B (n = 30) was the control group. The former received teacher-prepared lesson plans, while the latter received AI-generated lesson plans (ChatGPT). All the participants are native speakers of Arabic and study English as a foreign language. They are in the 18—to 24-year-old age group.

C. Data Collection Instruments

The data collection instruments included modified motivation and engagement items based on the Student Engagement Instrument and the Motivated Strategies for Learning Questionnaire, as well as teacher-developed achievement exams that assessed vocabulary, grammar, reading, and writing skills. Prior to implementation, each lesson plan was evaluated to ensure it aligned with the educational goals.

D. Procedure

A pre-test comprising items on motivation and engagement was administered to establish a baseline. To ensure consistency in the instructional process, both groups received instruction directly from the instructor throughout the intervention. The experimental group was taught using ChatGPT and other AI-generated lesson plans, while the control group was taught using traditional teacher-developed lesson plans. Post-intervention and delayed assessments evaluated motivation and engagement.

E. Data Interpretation

The quantitative data were analysed using SPSS. While descriptive statistics were employed to evaluate means and standard deviations of scores, paired sample t-tests were used to compare within-group differences (pre-test to post-test, post-tests to delayed post-test). ANCOVA was used to compare post-test scores between groups while controlling for pre-test scores.

IV. Results and Findings

The following section compares lesson plans made by teachers for the control group to artificial intelligence-generated lesson plans for the experimental group. Three assessment points were compared: the pre-test, the post-test, and the delayed post-test period. Both descriptive statistics and inferential methods were used to assess variations in performance and learning retention levels over time.

A. Descriptive Statistics

Table 1 displays the mean scores and standard deviations for the three tests of both groups. The experimental group (M = 45.20, SD = 6.80) and the control group (M = 44.75, SD = 6.95) reported comparable pre-test scores, suggesting comparable baseline proficiency. The experimental group achieved higher mean scores on the post-test and delayed post-test than the control group (M = 65.30, M = 63.90). The post-test mean score for the experimental group was 78.40; the delayed post-test mean score was 76.10.

Table 1

Tests	Group	N	Mean	SD
Pre-test	A (Experimental Group)	30	45.20	6.80
	B (Control Group)	30	44.75	6.95
Post-test	A (Experimental Group)	30	78.40	7.10
	B (Control Group)	30	65.30	8.25
Delayed Post-test	A (Experimental Group)	30	76.10	7.45
	B (Control Group)	30	63.90	7.90

Note. The experimental group received AI-generated lesson plans; the control group received teacher-developed plans.

B. Inferential Statistics

Independent sample t-tests were used to compare the scores of the experimental and control groups at each assessment point. Table 2 reveals that there was no statistically significant difference between the two groups in the pre-test ($t(58) = 0.27$, $p = .790$). The experimental group showed substantial improvements in both the post-test ($t(58) = 6.91$, $p < .001$, $d = 1.78$) and the delayed post-test ($t(58) = 6.25$, $p < .001$, $d = 1.61$). The large effect sizes revealed that AI-generated lesson plans had a significant impact on student performance.

Table 2

Assessment	Mean Difference (A–B)	t	df	p	Cohen's d
Pre-test	0.45	0.27	58	.790	0.06
Post-test	13.10	6.91	58	< .001	1.78
Delayed Post-test	12.20	6.25	58	< .001	1.61

Within-Group Analysis (Experimental Group)

To examine the performance trend over time within the experimental group, a repeated-measure analysis of variance (ANOVA) was used. The results, presented in Table 3, revealed that time had a statistically significant impact, as indicated by $F(2, 58) = 94.25$, $p < .001$, and $\eta^2 = 0.77$. This implies that there was a significant improvement from the pre-test to the post-test, and that this improvement was maintained mainly in the delayed post-test.

Table 3

Source	SS	df	MS	F	p / η^2
Time (Pre–Post–Delay)	11235.25	2	5617.63	94.25	< .001 / 0.77
Error (within)	3490.20	58	60.18		

V. Discussion and Analysis

The results provided strong evidence that AI-generated lesson plans significantly enhanced the academic performance of EFL learners compared to traditional teacher-developed plans. While both groups started at a similar proficiency level, the experimental group showed significantly higher gains in both immediate learning (as measured by the post-test) and retention (as measured by the delayed post-test). The large effect sizes and high η^2 value indicate a robust impact of AI-based instructional design. This supports the theoretical claims grounded in cognitive theory, social constructivism, and the TPACK framework, which suggest that well-designed AI tools can effectively support and extend language learning outcomes. Bandura (1997) argued that ChatGPT and other AI-enhanced educational technologies could impact learning. His Social Cognitive Theory emphasizes observational learning, self-efficacy, and outcomes to explain behavioral changes, as shown by Class A's success with AI-generated lesson plans and Class B's

success with human-created plans. Interactive and responsive AI-driven content likely enhanced observational learning in Class A by engaging students with information that dynamically corresponded to proper language usage, modifying instructional techniques, and improving grammar. Interactive involvement provided pupils with individualized education and concentrated experiences that enhanced confidence, tenacity, and performance (Bandura, 1997). Zhang and Nouri (2019) found that AI improved self-efficacy, engagement, and learning. AI lesson plans, such as those utilizing ChatGPT, employ SCT principles to enhance learning, showcasing AI's educational potential. Multiple studies have highlighted the advantages of AI-generated lesson plans over those prepared by teachers. For example, Karaman and Goksu (2024) found a substantial enhancement in the academic performance of students instructed with ChatGPT-developed lesson plans compared to those taught using teacher-prepared lesson plans. While emphasizing the efficacy and swiftness of ChatGPT in preparing lesson plans, Kiryakova (2025) noted that ChatGPT required a shorter period than an instructor would need to prepare a quiz, including creating test questions, answers, and practical exercises and solutions. ChatGPT could generate an extensive number of questions about practical tasks and learning resources. However, Lammert et al. (2024) found that AI-generated lesson plans lacked universal design for learning/universal design for transition (UDL/UDT) alignment and needed teacher-initiated modifications to assist students with different requirements. The study suggested that while AI lesson plan generators could be advantageous to novice instructors or occasionally to seasoned instructors, their output was not sufficiently comprehensive to offer new ideas to experienced teachers. Additionally, multiple studies have acknowledged the efficacy of AI-powered tools while also emphasizing their alignment with human instructors. Yanar and Ergene (2025) found that ChatGPT generated creative and practical ideas but required well-structured prompts to provide beneficial outcomes. Similarly, Setyaningsih et al. (2024) found that AI serves as a collaborative ally rather than a replacement for instructors, emphasizing the need to strike a balance between human skill and technical efficiency. In addition, Kehoe (2023) argued that AI-powered tools were transforming classroom instruction, but they were unable to substitute human teachers. Teachers would always need to incorporate their viewpoints and experiences into generative AI content to make informed pedagogical decisions.

VI. Conclusion

The study examined the comparative efficacy of AI-generated and teacher-prepared lesson plans in Saudi EFL classrooms. The results revealed that artificial intelligence-generated lesson plans enhanced EFL students' academic performance compared to teacher-created ones. Both groups started at a similar level of proficiency; however, the experimental group achieved significantly greater gains in post-test learning and delayed post-test retention. The experimental design revealed that Class A, which used AI-generated lesson plans, constantly outperformed Class B, which utilized human-made plans. This significant achievement difference indicates that AI could enhance instructional learning processes and outcomes. Both immediate and delayed assessments revealed that the adaptive and interactive features of AI-driven content enhanced grammar recall and knowledge. Additional analysis indicated that AI-driven lesson preparation promoted student achievement, demonstrating that cutting-edge technology could alter classroom instruction.

A. Implications

The study and its findings offer multiple implications and pedagogical advantages for both EFL learners and instructors, as ChatGPT-generated lesson plans not only facilitate language teaching but also conform to the changed tastes of the tech-savvy generation in general and Saudi EFL learners in particular, as the universities and institutions of learning are equipped with advanced digital and AI-powered technology. The instructors and policymakers may use such findings to update and upgrade their digital infrastructures in keeping with the technology-revolutionized times.

B. Limitations and Suggestions

Future studies should explore hybrid models that incorporate AI efficiency with instructor knowledge. Instructors should be ready to offer AI-supported education through professional development. The goal should be to create a well-rounded strategy that enhances language learning without compromising instruction.

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