



# The Role of Chat-GPT-Driven Materials in Shaping EFL Education: A Comparative Study across Iranian Language Institutes, Public Schools, and Private Schools

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## ABSTRACT

Artificial Intelligence (AI) is affecting various aspects of education and there is a need to consider the consequences of this technological improvement on achievement and attitudes of the most direct stakeholders. Therefore, this study has focused on the effect of AI on teaching English with three key areas of concern: the effect of Chat-GPT-driven materials on learning outcomes, the attitudes of teachers who use Chat-GPT -informed pedagogy, and the students' attitudes towards Chat-GPT-integrated materials. This study used a quasi-experimental intervention-based research design to achieve the intended objectives. Based on the type of educational institution, the participants were divided into three groups (90 students from Iranian language institutes, 100 students from public high schools, and 100 students from private high schools). Furthermore, fourteen teachers from these institutions shared their viewpoints on the use of AI, particularly Chat-GPT, in developing instructional materials. Pre- and post-tests were administered to check the effect of treatments on each group (based on the syllabus developed for those specific educational institutions). Moreover, two researcher-developed questionnaires were administered among teachers (composed of 27 Likert-Scale items) and students (composed of 23 Likert-Scale items). The obtained results indicated that Chat-GPT significantly improved EFL learners' performance in language institutions. Teachers looked upon AI with favor. This was based on its potential to change the produced educational materials and improve students' engagement in the learning process. Students, in all three environments, looked positively toward Chat-GPT-driven materials. In short, this study showed the potential for AI to upgrade EFL teaching in Iran.

**KEYWORDS:** Artificial intelligence; Language institutes; Material development; Private high schools; Public high schools

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## 1. Introduction

Nowadays, technology has significantly changed education. Technology advancements can remove the limitations imposed by geographical distance, and open up a big ocean of knowledge that people may access online (Xiao & Zhi, 2023). Amongst these Technological advances, Artificial Intelligence (AI) stands out. With its potential learning capabilities, natural language processing, and data analysis power, AI is evolving today's personalized learning systems, marking crucial innovations in this regard (Azadnia, 2024; Shaikh et al, 2023). Though the meta- frameworks defined in the algorithms of AI-driven platforms, these platforms analyze how individuals learn. By doing so, they can make various educational content (Marr & Ward, 2019; Marr, 2022; Ulla et al., 2023).

The prompts provided to AI can help customization of the learning experience. These prompts make the ground ready for AI, and through these prompts, AI can know the tastes and proficiency levels of individual learners, in detail. Educational materials can, therefore, be fine-tuned by those needs (Nguyen, 2023). These technical innovations can facilitate education, in general, and language acquisition, in particular. These facilities enable learners to have immediate and real-time feedback, resulting in the provision of an interactive teaching tool at any moment of their life (Yan, 2023). Moreover, materials used to teach any new language, such as English, provide the fundamental principles that help the learners through the interaction. They guide learners in varied aspects of language learning such as grammar, lexis, and culture. According to Ellis (2004), materials are the signposts every participant must follow. Well-made educational materials help not only create a good linguistic foundation but also improve the students' ability to think critically, understand culture and society, and communicate effectively. Good instructional materials bridge the gap between abstract knowledge and real-life application, thus enabling learners to confidently learn the language in its various complicated contexts. Therefore, the development of AI-driven EFL materials that can support the learners during various aspects of education may ensure practicability and efficiency (Azadnia, 2024).

In spite of the potential benefits of AI in education, its integration into EFL context can be challenging (Liu & Ma, 2023). The Iranian educational system has undergone significant changes during the last decades, trying to emphasize on English proficiency, and various global studies have revealed that AI-driven materials can help the language learning stakeholders, in this regard (Marr, 2022). However, the development of AI-driven content and language learning tasks, in Iran, may encounter significant restrictions due to the limited access to digital infrastructure, financial problems, international sanctions, and low levels of technological literacy among educators (Abbasi et al., 2021).

Moreover, few studies have been carried out considering the role of new technology advancements on EFL material development in the educational context of Iran. Besides, empirical data on the influence of AI-driven materials on different ELT educational contexts, such as language institutes, public schools, and private schools, are few and rare. Furthermore, both teachers' and students' perceptions about AI-driven instructional materials remain underexplored. Therefore, there is a need to investigate the effect of AI on ELT material development and the attitude of EFL learners toward the integration of AI technology into the process of educational material development.

## 2. Literature review

As mentioned previously, AI has provided new ways and techniques for teaching and learning in language education through the introduction of several new capabilities that are gradually revolutionizing the field (Mitra & Banerjee, 2022). The technology of AI is yet evolving, but its applications in oral or written proficiency, motivation of learning, and assessment have obtained substantial attention. This section serves to contextualize current research into the broader discourse of AI in language education, identifying key contributions and gaps, implications for teaching practices, with a particular focus on how AI reshapes EFL learning in Iranian educational contexts.

One central theme in AI-based research on language learning is the role of AI in enhancing writing or speech recognition and its evaluation. Ali's (2020) research, therefore, focused on a five-year content analysis to establish that AI technology has significantly enhanced the accuracy of speech recognition systems, thereby further advancing the potential for more effective and efficient language assessment practices. Moreover, Ali's study highlighted that the integration of AI into approaches such as flipped classrooms contributed to higher levels of self-efficacy, improved listening skills, and increased motivation among learners. On the other hand, regarding writing proficiency, Azadnia (2024), in a review paper, focused on 28 research works concerned with the application of different forms of AI applications (specifically ChatGPT) in writing. Finally, the reviewer concluded that the body of research on writing is rich and advocates the positive effect of AI on writing enhancement among EFL learners.

In addition to the studies focused on a specific aspect of language learning process, there are some research works focused on the process of language learning, in general. In one of such studies, Leunard et al. (2023) investigated the impact of the employment of AI, ChatGPT, in a gamification approach to the process of language learning. The finding underpinned the ability of AI in creating an interactive learning environment, improving the general language proficiency of the students. Moreover, the study also revealed that while the integration of ChatGPT improved students' reading abilities, there was a tremendous increase in motivation and completion of assignments. This study was, however, limited to Arabic and gamified learning alone. So, the question is raised whether similar beneficial effects can be visible under less interactive and more linguistically diverse learning situations. Another critical perspective is given by Moulieswaran and Prasantha Kumar (2023), who researched how ESL learners feel and what kind of challenges they face in their learning processes on their way to language acquisition with AI support. While the participants generally expressed a preference for using AI tools, the study also identified several challenges, such as technological constraints and the performance of AI-based mobile applications. Wang et al. (2023) go even deeper into how AI can become an integral part of the process of language learning. In their research, they recorded interactions with AI in elementary students over a period of three months. Thereby, their research made possible the identification of different learner profiles based on student engagement with AI. What it ultimately proved was that some learners benefited from personalized guidance in AI, although others could not use it effectively. This variation thus underlines the fact that the use of AI in language education is nuanced, considering the differences between individual learners, and it needs to be complementary, not replacing, to foster a more inclusive community of learning.

Despite this now growing body of research on AI in language education, a number of gaps continue to exist. Recent research has focused on the direct application of AI tools in educational contexts (Leunard et al., 2023; Moulieswaran & Prasantha Kumar, 2023); however, due to the novelty of this technology, lack of familiarity with the device may reduce the optimized use and

achievement. Moreover, educational and assessment materials, as the grounding blocks of any learning process, are not vastly taken into account. Besides that, in most of the conducted research works, the most direct stakeholders of the educational system (i.e. teachers and students) were defectively analyzed (either concerned with students or teachers).

Given these gaps, therefore, the present study was conducted to explore in much depth the role of AI-driven instructional material in achievement of EFL learners within Iranian educational contexts. Chat-GPT was taken into account as the sample AI platform, due to its popularity and accessibility. The study tried to achieve a better understanding of how AI-driven materials may result in an insight into teachers' and learners' attitudes towards language education. This can thus go a long way toward addressing the literature gaps that currently exist and furthering our knowledge of the potential use of AI in language education.

Therefore, the present study attempted to answer the following research questions:

1. Does the application of Chat-GPT-driven materials improve the performances of EFL learners in Iranian language institutes, public high schools, and private high schools?
2. What are the attitudes of EFL teachers regarding the integration of Chat-GPT in material development for English language education in Iranian language institutes, public high schools, and private high schools?
3. What are the attitudes of EFL students regarding the integration of Chat-GPT in material development for English language education in Iranian language institutes, public high schools, and private high schools?

### 3. Methodology

#### 3.1. Research design

A quasi-experimental intervention-based research design was adopted in this study in order to explore the effect of AI-driven instructional materials in EFL context under diverse Iranian educational settings. The application of AI-driven instructional materials in the form of instructional intervention among the designated groups was considered as the independent variable. Besides, the ultimate achievement of EFL learners in different educational contexts, teachers' attitudes, and students' attitudes were taken into account as the dependent variables.

#### 3.2. Participants

The current study was conducted collecting the intended data from among the language institutes, public schools, and private schools in Yazd. The research was an attempt to realize how the participants (290 EFL learners) reacted to the intended treatments. The selected students were divided into three groups as determined by the type of school they attended, with 90 people being from Iranian language institutes, 100 learners selected from public high schools, and a further 100 EFL students chosen from private high schools. The rationale for selecting intact classes was that public high schools in Iran primarily follow textbooks, regulations, and methodologies mandated by the Ministry of Education. On the other hand, the ones in private high schools take advantage of complementary instructional materials (such as books, additional classes, videos, and audios) and a more liberal instructional syllabus (due to the less strict monitoring by the ministry). Finally, the language institutes are performing in a liberal context in which the instructional materials and teaching strategies are selected based on the viewpoints of the authorities in those language institutes.

Each classroom, at the language institutes, contained 12 to 17 students. Of these, three classes were selected as the experimental group and the remaining three were taken into account as a control group. It is important to note that three language institutes (owned by the same person but in different regions of the city) were selected for this study, with each of them contributing two classes, one assigned to the control group and the other chosen as an experimental one. The classes were randomly selected to be experimental and control groups to ensure unbiased distribution. The students, in these classes, were considered to be at or around intermediate level of English proficiency based on their performance in placement tests administered by the institutes to classify the learners in the intended classes.

Similarly, 10th-grade classes (each consisting of 20 to 25 students) of both public and private high schools were selected to participate in the study, due to their age proximity to the ones in the language institutes. In each of the schools, two classes were randomly selected as experimental groups and the other two were assigned as the control ones. The use of random selection techniques was based on the idea to minimize potential selection bias and increase the internal validity of the study. To ensure the homogeneity of the participants of both kinds of schools with the ones in language institutes (to be at or around intermediate proficiency level), their English proficiency was determined based on their most recent English exam scores and teacher evaluations. Of course, there were some outliers in each class, who were tested (since it was not possible to omit them from the intact classes), but their scores were not taken into account in this study.

Moreover, the participants were surveyed regarding their linguistic background such as their L1, prior studies in English, and residence in English speaking countries. Through the investigation, the homogeneity of the participants was proved. The learners' English learning period had ranged from three months to one year by the time of testing. Almost none of them had been living in an English-speaking community, and English could be considered as a foreign language for them.



In addition, this research covered the viewpoints of educators, which included language teachers at Iranian Language Institutes as well as the ones in public and private schools. The teacher cohort consisted of 6 instructors from language institutes, 4 teachers from public schools, and 4 teachers from private schools, all of whom contributed their insights and perceptions regarding the utilization of AI in material development. It is worth mentioning that the selected teachers were the ones involved in the instructional process during the interventions of the study.

### 3.3. Instruments and materials

#### 3.3.1. AI-based applications

This study was mainly based on the instructional materials developed by Chat-GPT platform. It is worth mentioning that the major instructional materials i.e. course textbooks were the ordinary ones proposed by the ministry of education or the institute; however, the complementary materials that helped the students and teachers through the process of instruction were designed to be Chat-GPT-driven. Therefore, in order to enable the participants to develop the intended materials, there was a need to have some pre-treatment instructional period for both students and teachers. The instructional period lasted for one and half an hour (students and teachers were taught in separate sessions to avoid any discomfort in the case of problem or question).

The researcher introduced and explained about different varieties of AI applications or platforms that could help the students or teachers in addition to the major focus on the potentials of Chat-GPT platform. Teachers were provided with some information on how to craft AI-generated reading materials, exercises, and test questions. The students were taught about using AI for self-practice, self-correction, and personalized learning. In spite of the training, some challenges were observed. A few of the teachers, at the beginning, were doubtful with AI and its accuracy, reliability, validity of content, and if it could meet the curriculum's purposes. Then there were other challenges, where a number of the students found difficulty in formulating clear prompts. Therefore, sample prompts provided and more structured guidelines were added in another training session. In fact, the students and teachers were provided with the prompts that could help receive the most optimized version of the materials. For instance, the teachers were provided with the following prompt for developing a text based on the vocabulary of each chapter in the textbook.

“write a reading text, composed of 250 to 300 words, for EFL learners at ----- proficiency level, focused on ----- topic, including this list of vocabulary-----.”

On the other hand, the students were provided with the prompts related to self-practice or self-correction. The following prompt was developed as an example of the prompts for checking students' writing.

“Please identify and pinpoint any grammatical, structural, or discoursal problem in the following text: -----”

In addition to the prompts, various examples were provided to both groups on the potentials and capabilities of the mentioned AI platforms. It is worth mentioning that the prompts were carefully developed and validated following several steps. First, the pedagogical needs and instructional requirements of public schools, private schools, and language institutes were analyzed, in order to be able to say that the prompts addressed the curriculum goals. Then, the prompts were reviewed for effectiveness, and pedagogical suitability by language teaching experts and a specialist in computer science and AI. Finally, the prompts were tested on a small group of students and teachers. Feedback was collected to revise and optimize them.

In these three settings, the AI-generated materials were systematically integrated into classroom instruction. In public and private schools Chat-GPT-generated reading passages and exercises were developed by teachers twice a week, to supplement textbook activities. Students used the Chat-GPT for their writing assignments or self-practice outside class. In the language institutes, Chat-GPT was used for text creation in every session for vocabulary, reading, and writing improvement. Moreover, in all groups, students and teachers used AI-generated content for exam preparation, vocabulary building, interactive exercises, etc. at any time they felt the need.

#### 3.3.2. Pre and post-test assessments

Selection of pre-test and post-test instruments was a laborious process because the tests had to be in line with the particular educational context in which each participating institution was functioning in. For the public and private high school groups, the assessments were based on official final test sanctions proposed by the Ministry of Education. The tests included reading comprehension, vocabulary use, grammar, and writing tasks, as aligned with the ministry's English curriculum. These tests were selected by the researchers, since they normally undergo very strict validation procedures in order to ensure that the tests fit the curriculum contents and learning objectives. This was well explained by a series of tests and analyses conducted by educational experts and officials. Thus, the validity and reliability of the tests were taken for granted by the wide range of procedures that validation experts and education authorities have carried out on them.

Regarding the language institute group, the tests were institutional, specially prepared to match the syllabuses and learning goals of EFL programs at that particular institute. However, while their origins lay in the institute, they proved to have considerable validity and reliability. These assessments indeed matched not only the needs of the institute but the standards themselves. These were confirmed in expert review for their ability to measure, quite effectively, the language proficiency abilities required by these tasks or conditions. Finally, these assessments also reflected good properties of reliability, as evidenced

by a Cronbach's  $\alpha$  of 0.84, a coefficient which shows the intrinsic confidence and certainty with which their results on academic performance are accepted as true.

### 3.3.3. Teacher survey

Designed by researchers, the teacher survey was an AI-assisted tool with 27 items which aimed at gathering pedagogical and practical insights from EFL teachers (See Appendix A). They had about twenty to twenty-five minutes to fill it up in order to give well thought and comprehensive answers to a combination of Likert-type scale items. The focus of this questionnaire was on various aspects such as teachers' pedagogical perspectives on AI integration in materials development, their experiences with AI-enhanced content, their perceptions on the advantages and disadvantages associated with AI integration, as well as their confidence levels when it comes to utilizing AI-driven materials for teaching purposes. To ensure its reliability, the teacher survey underwent rigorous internal consistency assessments using Cronbach's alpha ( $\alpha = 0.87$ ). Moreover, the questionnaire was developed based on prior research and expert recommendations. Then, a pilot study was conducted with 4 teachers to revise the potential challenges of the items. Finally, content validity was thoroughly established through experts' involvement in questionnaire review process, after the revisions.

### 3.3.4. Learner survey

Since learners are mostly observed as passive participants whose performance is mostly studies (Azadnia, 2024), while their ideas are often neglected, the present study sought to fill this gap in the literature to some extent. With only 23 Likert-type scale items, the learner survey acted as a method created by researchers for collecting information regarding EFL learners' views, preferences, and perceived impacts of AI on material development (See Appendix B). The survey aimed at enabling the learner to see through a window of his/her mind in terms of attitudes and preferences. Students had approximately fifteen to twenty minutes to fill in this questionnaire, with the aim of obtaining meaningful answers while still capturing their attention.

The scope of this study involved different aspects including learners' views on AI-enhanced materials, their tendencies when selecting between traditional and AI-based materials and their evaluations of how AI affects their general learning experiences. This survey was found to have high reliability levels after conducting Cronbach's alpha which indicated good internal consistency ( $\alpha = 0.91$ ). Furthermore, content validity was ensured through a long process of designing very comprehensive questionnaires and subjecting them to pilot testing and critical expert reviews.

## 3.4. Procedure

The research enterprise started by taking a careful selection-by consulting with the supervisors in the education office of Yazd Province about the quality of instruction and the quantity of the participants in the mentioned educational centers-of the participating institutions which accounted for three Iranian language institutes besides a wide range of public and private high schools in Yazd, Iran. The targeted EFL Learners were primarily identified and included from these educational institutions. Of all the identified population sample, 90 learners comprised those studying in Iranian language institutes-with the same instructional policies-, another 100 were public high school learners, and the remaining 100 attended high schools of private facilitation. The participants in each of these educational settings, selected through cluster sampling, that is, intact classes in each institution, were further divided into experimental and control groups.

One of the most important areas was to design and develop Chat-GPT -derived material based on the curriculum and objectives of the participating institutions. Therefore, the AI-based instructional period was administered among the teachers and students, through which the participants could have developed their own materials. The materials developed by the students themselves to facilitate the practice process were not checked by the researchers since each student may have self-practice according to his taste and preference. However, the instructional materials developed by the teachers themselves were checked in collaboration with other colleagues in order to match the needs and proficiency level of the students in addition to the educational norms and regulations. In fact, the students could themselves use or ask for AI-mediated materials whenever they felt they need it. However, in the private and public high schools, in the classes, the researchers could not take such a liberal view into account. They had to obey the rules and regulations of the schools and the ministry of education. They, therefore, allowed only the teachers to use AI-mediated materials in the classes, and students were only aware that they were instructed through new ways of teaching.

The integration of Chat-GPT in material development would allow for dynamic and adaptive learning development for the Iranian language institutes. The students would have much more personalized and responsive approaches to language learning through virtual AI tutors (which would explain each of the questions proposed by them) integrated into the institutes' learning management systems. These virtual tutors applied natural language processing algorithms and assessed the response of students to exercises and quizzes. For example, if a student struggled with verb conjugation, the Chat-GPT system would instantly provide targeted exercises and detailed explanations about verb tenses. This level of accuracy enabled learners to effectively deal with their own weaknesses. Moreover, AI algorithms carefully examined each learner's unique patterns and preferences. If a student had a preference for visual learning, the Chat-GPT system would easily provide more video-based content or interactive visual exercises. On the other hand, for those who performed well with auditory cues, the system adjusted the materials to include more audio-based activities. This flexibility ensured that students interacted with the materials in ways that matched their individual learning styles.

Besides this, AI-based materials supported the principle of learner autonomy. In this respect, students could find supplementary resources and practice tasks themselves by means of Chat-GPT-driven instruments. Such aids were always made on the fly to suit every individual learner's needs. For example, if a student had some kind of problem with phrasal verbs and he would ask some questions in this regard or check his erroneous homework in the mentioned platforms, then immediately AI generated exercises and tests that focused on helping him improve that particular skill.

Chat-GPT-embedded materials in public high schools were developed to enhance traditional classroom instruction through technology applications that effectively engaged students. Language learning tasks enriched with Chat-GPT platform became useful classroom tools. Among other things, these programs included interactive exercises that enabled students to learn languages interestingly and deeply. The key point about them was their provision of immediate responses. For example, if during oral practice one mispronounced a term, the artificial intelligence system without delay detected this error giving ways of such mistakes being addressed and thus enabling learners to better their pronunciation as they go along. Besides, the complexity of exercises and quizzes adjusted automatically as students improved in their language proficiency levels, ensuring that there was always a consistent level of challenge which would keep them from being bored or overwhelmed.

In private schools, mostly like public high schools, Chat-GPT-based contents facilitated the generation of personalized teaching materials. These instructional resources were produced faster than ever before using these tools (Chat-GPT 3.5 (free version), Gemini.google.com, poe.com, and claude.ai). For example, if a chapter in the textbook was about business, the Chat-GPT content creation tool could generate a bunch of business vocabulary flashcards and some related questions like quizzes autonomously. This saved teachers time and effort that would have been used to develop everything from scratch. Besides, Chat-GPT-generated materials in private schools were intended for active learning. For instance, interactive exercises and scenarios were created to simulate authentic language use in real life situations thus making students prepared for practical English communication scenarios.

On the other hand, students in the control groups used traditional learning materials such as course books and audio resources. After a two-month period, post-tests, teacher's surveys and learner's surveys were used to collect the desired data; this was done at the end of two months of treatment. The collected data was then analyzed by the designated statistician.

#### 4. Results

The first research question, in this study, was concerned with the effect of application of Chat-GPT-driven materials on the performances of EFL learners in Iranian language institutes, public high schools, and private high schools. The t-test results revealed differences between the mean scores of experimental and control groups, from pretest to posttest.

The participants, in public experimental group, had a significant improvement from pretest ( $M = 43.80$ ) to posttest ( $M = 54.82$ ). This resulted in a notable mean difference ( $MD = -11.024$ ,  $SD = 19.376$ ). The associated t-value was ( $t = -3.817$ ,  $df = 44$ ,  $p < .001$ ). On the other hand, the ones in the public control group did not manifest any significant improvement from pretest ( $M = 43.69$ ) to posttest ( $M = 46.95$ ), yielding a smaller mean difference ( $MD = -3.265$ ,  $SD = 18.468$ ). The t-value for this group was ( $t = -1.186$ ,  $df = 44$ ,  $p = .242$ ), indicating no statistically significant improvement. According to the numerical findings, obtained through independent samples t-test, there was a significant difference between the posttest scores of experimental and control groups in public high schools;  $t(78) = 4.28$ ,  $p = 0.000$ . The magnitude of the difference in the means was large (Eta squared= 0.79).

Moving to the next experimental group concerned with instructional materials in language institutes, the participants demonstrated a significant enhancement from pretest ( $M = 42.84$ ), to posttest ( $M = 68.11$ ). This remarkable improvement resulted in a mean difference ( $MD = -25.266$ ,  $SD = 16.794$ ). The corresponding t-value was ( $t = -10.638$ ,  $df = 49$ ,  $p < .001$ ). On the other hand, in the institute control group, an increase was observed from pretest ( $M = 44.08$ ) to posttest ( $M = 51.41$ ); however, the mean difference ( $MD = -7.326$ ,  $SD = 18.709$ ) and t-value ( $t = -2.769$ ,  $df = 49$ ,  $p = .008$ ), indicated a smaller improvement rate (although significant). According to the numerical findings represented on the performance of the institute control group, although the participants had a significant improvement from pretest to posttest, the participants in the experimental group outperformed the ones control group ( $MD = -16.70$ ;  $t(78) = 2.68$ ,  $p = 0.000$ ). The magnitude of the difference in the means was very large (Eta squared= 0.86).

Finally, the participants in private experimental group had an improvement from pretest ( $M = 41.32$ ) to posttest ( $M = 65.90$ ), leading to a significant mean difference ( $MD = -24.580$ ,  $SD = 21.559$ ) and high t-value ( $t = -8.062$ ,  $df = 49$ ,  $p < .001$ ). On the other hand, the private control group had an improvement from pretest ( $M = 43.96$ ) to posttest ( $M = 51.12$ ), leading to a smaller mean difference ( $MD = -7.155$ ,  $SD = 21.333$ ) and t-value ( $t = -2.372$ ,  $df = 49$ ,  $p = .022$ ), indicating a statistically significant but smaller improvement. However, it is worth noting that the participants in the experimental group outperformed the ones control group ( $MD = -14.78$ ;  $t(78) = 2.61$ ,  $p = 0.000$ ). Moreover, the magnitude of the difference in the means was large (Eta squared= 0.81).

Furthermore, an ANCOVA was conducted to determine the effect of different groups: public experimental (Mean = 54.82,  $SD = 15.190$ ), institute experimental (Mean = 68.11,  $SD = 14.391$ ), and private experimental (Mean = 65.90,  $SD = 17.142$ ) on posttest scores with pretest scores as the covariate. The results are shown in Table 1.

**Table 1.** ANCOVA results for the posttest scores in all three groups

Source	df	F	Sig.	Partial Eta Squared
group	2	1.973	.043	.128
pretest	1	.430	.513	.003
group * pretest	2	.758	.471	.011

The ANCOVA results, represented in Table 1, showed that there was a statistically significant difference ( $F = 4.238$ ,  $p < 0.001$ ) between the posttest scores of the three groups. Moreover, the intercept was highly significant ( $F = 155.609$ ,  $p < 0.001$ ), showing the difference in posttests while controlling for the pretest scores. However, no statistical numbers, in the mentioned table, could show the magnitude of the difference between the groups. Table 2 provides a two-by-two comparison of posttest scores between the groups.

**Table 2.** Post-hoc results for the posttest scores in all three groups

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig. <sup>b</sup>	95% Confidence Interval for Difference <sup>b</sup>	
					Lower Bound	Upper Bound
publicexp	instituteexp	-13.408*	3.230	.000	-21.235	-5.581
	privateexp	-11.091*	3.239	.002	-18.940	-3.242
instituteexp	publicexp	13.408*	3.230	.000	5.581	21.235
	privateexp	2.317	3.148	1.000	-5.311	9.945
privateexp	publicexp	11.091*	3.239	.002	3.242	18.940
	instituteexp	-2.317	3.148	1.000	-9.945	5.311

The post-hoc pairwise comparisons as shown in Table 2, indicated that there are significant differences between the public experimental group and both institute experimental group ( $p < 0.001$ ) and the private experimental group ( $p = 0.002$ ). Nevertheless, there was no significant difference between institute experimental and private experimental groups ( $p = 1.000$ ).

The second research question, addressed in this study, was about the attitudes of EFL teachers towards AI integration in materials development for English language education in Iranian language institutes, public high schools and private high schools. ANOVA analysis was performed to establish whether different groups such as public (Mean = 109.25, SD = 15.67), institute (Mean = 133.67, SD = 8.07), and private (Mean = 111.75, SD = 14.68), have any effect on teachers' attitude by assuming that variances are equal among these groups.

**Table 3.** ANOVA results for teachers' attitude in all three groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1852.595	2	926.298	5.963	.018
Within Groups	1708.833	11	155.348		
Total	3561.429	13			

The ANOVA results recorded a statistically significant ( $F = 5.963$ ,  $p = 0.018$ ) difference, demonstrating that at least one group had a significant effect on teacher attitudes. Therefore, Table 4 is provided to show the two-by-two comparisons.

**Table 4.** Post-hoc results for teachers' attitude in all three groups

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
public	institute	-24.41667*	8.04540	.028	-46.1462	-2.6872
	private	-2.50000	8.81330	.957	-26.3035	21.3035
institute	public	24.41667*	8.04540	.028	2.6872	46.1462
	private	21.91667*	8.04540	.048	.1872	43.6462
private	public	2.50000	8.81330	.957	-21.3035	26.3035
	institute	-21.91667*	8.04540	.048	-43.6462	-.1872

Post-hoc pairwise comparisons, represented in Table 4, using Tukey's test, revealed a significant difference ( $p = 0.028$ ) between teacher attitudes in the institute group and the ones in the public group. However, no significant difference ( $p = 0.957$ ) was found between the public and private groups. On the other hand, significant difference ( $p = 0.048$ ) was observed in teachers'



attitudes from the institute group to the private group.

The last research question, in this study, dealt with was about the attitudes of EFL learners towards AI integration in materials development for English language education in Iranian language institutes, public high schools and private high schools. An ANOVA analysis was conducted to examine the effect of different groups (public (Mean = 96.44, SD = 16.64), institute (Mean = 90.26, SD = 19.25), and private (Mean = 93.76, SD = 20.44)) on learners' attitudes.

**Table 5.** ANOVA results for learners' attitudes in all three groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	916.521	2	458.261	1.281	.281
Within Groups	50813.851	142	357.844		
Total	51730.372	144			

The ANOVA results represented in Table 5 revealed that there was no statistically significant difference in learners' attitudes among the three groups ( $F = 1.281$ ,  $p = 0.281$ ). In other words, group membership did not significantly affect learners' attitudes.

## 5. Discussion

The present study contributed to the existing knowledge on the role of Chat-GPT-driven instructional material in achievement of EFL learners within Iranian educational contexts. Moreover, the study tried to achieve a better understanding of how Chat-GPT-driven materials may result in an insight into teachers' and learners' attitudes towards language education.

The first research question was proposed to see whether Chat-GPT-developed materials improved participants' performance in three different educational settings. There were significant differences in mean scores between experimental and control groups across a range of educational institutions when investigating the effects of AI integration into instructional material development on EFL learners' achievement. In particular, there were significant improvements in learners' posttest scores compared to their pretest scores among experimental groups using Chat-GPT-enhanced materials. This implied that AI integration had a positive effect on performance of EFL students in Iranian language institutes, public schools, and private schools.

In comparison to peers from public and private schools, language institute teachers tended to have more positive attitudes toward the integration of AI. The results show that EFL institution teachers were more in favor of using Chat-GPT-enhanced materials and they saw potential advantages in such technology for classroom use.

Besides, this study sought to assess EFL students' attitudes on how they felt about AI usage during material production. Iranian language institutes, public schools and private schools had relatively similar views on integrating it. Consequently, these three sets of learners did not differ significantly in their opinions. This showed that EFL students in various types of Iranian educational institutions had similar opinions on using Chat-GPT-driven materials, with no significant difference in their attitudes.

In summary, these research findings suggest that integrating AI into materials considerably improves performance of EFL learners. However, teachers' attitudes varied across different types of educational institutions, whereas learners' attitudes remained constant irrespective of whether the institutions were public or private based.

The findings of this study supported the results of previous studies and also underlined the potential of AI in improving language education. For example, Ali (2020) stated that AI influences several factors that are related to language education positively, including speech recognition, flipped learning, language instruction, and assessment. Equally, Leonard et al. (2023) examined the benefits of AI, specifically GPT Chat Application, regarding enhancement in Arabic Language Learning. These were in line with findings from our study, where performance of EFL learners was enhanced a great deal with AI-enhanced learning materials. Similarly, Moulieswaran and Prasantha Kumar (2023) showed that ESL students had a preference for AI-based tools, while our conclusions have also identified their inclination for the use of artificial intelligence in teaching foreign languages. However, that does not mean Moulieswaran and Prasantha Kumar disagreed with the very notion that AI programs need revision when it comes to instructing languages; it means our study focused on the optimization of AI integration, something more important than anything that may be discussed by them. More recently, Wang et al. (2023) have explored students' interactions with these agents and found a fair amount of variety among learner profiles in the AI-supported learning environment.

This study gave new perspectives in solving various problems identified in existing literature. The Chat-GPT influence on language acquisition viewed holistically embraced all aspects such as reading, writing, speaking, and listening. In this regard, the study was different from other studies, partial to show more general perspective on how it contributed to language education. This was elaborated to encompass within its coverage its application in such an area as public schools, private schools, and language institutes, among many others, in that way making the findings more relevant for different linguistic backgrounds and educational institutions. Thus, these results became more relevant and informative regarding the applicability of Chat-GPT in different educational contexts. Furthermore, the study analyzed how teachers applied Chat-GPT in their teaching methodologies.



This was a critical aspect since it outlined the idea of the teachers themselves in applying Chat-GPT to language learning, an important aspect necessary for effective implementation. The study also acknowledged that each student uses Chat-GPT while learning the language in their own way, hence they should be taught accordingly.

## 6. Conclusion

This study has thus added to the increasing research into AI in language education by providing a holistic view on the role of AI-driven instructional material in achievement of EFL learners within Iranian educational contexts. The findings highlighted the positive contribution of AI in EFL learners' performance, teacher perspectives, and learner attitudes. The study also highlighted how personalized AI tutoring is crucial and how AI platforms can facilitate the language learning process.

Importantly, it was indicated that even in the most constrained environments, such as public schools, AI has a positive effect on language education. However, it had a much stronger effect in less constrained contexts, such as language institutes. The basic point arising from this is that AI is appropriate for all these relatively flexible educational contexts and allowing more flexibility in the teaching and learning environment may lead to far greater improvements. The positive contribution of AI to language education, therefore, can be exploited for a whole spectrum of educational settings, though the degree of influence may vary depending on specific constraints and adaptability of each context.

Ultimately, the present study enriched our understanding of the use of AI in language education and provided further insight into ways in which educators, researchers, and policy-makers who seek to exploit AI for language learning and teaching might most effectively avail themselves of this opportunity.

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## 8. Appendices

### 8.1. Appendix A

#### Teacher Survey on EFL Educators' Perspectives on AI in Materials Development

<b>Demographic Information</b>					
<b>Gender:</b>					
1. Male					
2. Female					
<b>Age:</b>					
1. 18-24					
2. 25-34					
3. 35-44					
4. 45-54					
5. 55 and above					
<b>English Proficiency Level:</b>					
1. Intermediate					
2. Advanced					
3. Native-like					
<b>Years of English Teaching Experience:</b>					
1. Less than 1 year					
2. 1-3 years					
3. 4-6 years					
4. 7 or more years					
Instructions: Please indicate your level of agreement with each statement by selecting the appropriate number on the scale:					
	<b>Strongly Disagree</b>	<b>Disagree</b>	<b>No Comment</b>	<b>Agree</b>	<b>Strongly Agree</b>
Pedagogical Perspectives on the Use of AI in Materials Development:					

1. AI can enhance the effectiveness of language teaching materials.					
2. The integration of AI in materials development aligns with my pedagogical philosophy.					
3. AI-enhanced materials cater to diverse learning styles in my classroom.					
4. I feel confident in incorporating AI-based materials into my teaching practices.					
5. AI in material development positively influences student engagement in my classes.					
6. AI can provide personalized learning experiences for my students.					
7. AI-enhanced materials facilitate more efficient learning outcomes.					
Actual Encounters with Radically Rehashed Educational Content:					
8. I have encountered radically rehashed educational content that bears little resemblance to traditional materials.					
9. The rehashed educational content has positively impacted my teaching approach.					
10. Integrating radically rehashed content has improved student understanding in my classes.					
11. The use of rehashed content challenges traditional teaching norms in a positive way.					
12. Radically rehashed content enhances my students' critical thinking skills.					
Attitudes Toward Benefits and Problems of Integrating New Ideas:					
13. I see potential benefits in integrating radically rehashed educational content.					
14. Integrating new ideas challenges me to adapt my teaching methods.					
15. Radically rehashed content contributes to a more dynamic learning environment.					
16. There are potential problems associated with integrating radically rehashed content.					
17. Addressing potential problems in integrating new ideas is essential for effective teaching.					
Self-Confidence in Applying AI-Enhanced Material in Practices:					
18. I feel confident in my ability to effectively use AI-enhanced materials in my classroom.					
19. Professional development opportunities have enhanced my confidence in utilizing AI in teaching.					
20. AI-enhanced materials can positively impact student learning outcomes.					
21. Integrating AI in teaching practices aligns with my professional goals.					
22. I actively seek out ways to enhance my skills in using AI in language education.					
Reliability and Content Validity Assessments:					
23. The survey items comprehensively assess various aspects of my pedagogical perspectives.					
24. The survey adequately covers the challenges and benefits of AI in materials development.					
25. The survey items are clear and easy to understand.					
26. The survey effectively captures the experiences of EFL educators in using AI-enhanced materials.					
27. I feel confident that the survey results will contribute valuable insights to the field of language education.					

## 8.2. Appendix B

### Learner Survey on EFL Their Perspectives on AI in Materials Development

#### Demographic Information

##### Gender:

1. Male
2. Female

##### Age:

1. 18-24
2. 25-34
3. 35-44
4. 45-54
5. 55 and above

##### English Proficiency Level:

1. Intermediate
2. Advanced
3. Native-like

##### Years of English Learning Experience:

1. Less than 1 year
2. 1-3 years
3. 4-6 years
4. 7 or more years

##### Learners' Views on AI-Enhanced Materials

1. AI-enhanced materials positively impact my language learning experience.
  - 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
2. I find AI-enhanced materials more engaging and interactive compared to traditional materials.
  - 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
3. AI-based materials help me understand and grasp language concepts more easily.
  - 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral



- 4 - Agree
  - 5 - Strongly Agree
4. The use of AI in material development enhances my motivation to learn English.
- 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
5. AI-enhanced materials cater better to my individual learning needs.
- 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
6. AI-based materials contribute to a more personalized learning experience.
- 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
7. The incorporation of AI in materials positively influences my language proficiency.
- 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
8. AI in material development has improved my overall language learning experience.
- 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree
9. AI-based materials make language learning more efficient for me.
- 1 - Strongly Disagree
  - 2 - Disagree
  - 3 - Neutral
  - 4 - Agree
  - 5 - Strongly Agree

10. AI-based materials allow for a more interactive and dynamic learning environment.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

Tendencies when Selecting Between Traditional and AI-Based Materials:

11. Traditional materials are more effective for my language learning than AI-based materials.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

12. I prefer using traditional materials over AI-based materials for language learning.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

13. Traditional materials provide a more reliable foundation for language learning.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

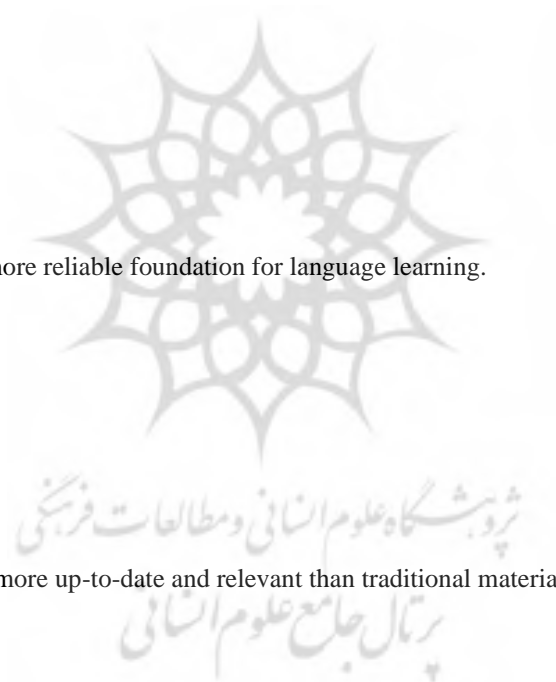
14. I believe AI-based materials are more up-to-date and relevant than traditional materials.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

15. Traditional materials are more enjoyable for me compared to AI-enhanced materials.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

16. I prefer a combination of traditional and AI-based materials in my language learning.



- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

17. AI-based materials cater to diverse learning styles better than traditional materials.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

Evaluations of How AI Affects General Learning Experiences:

18. The time spent using AI-based materials is more productive for my learning.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

19. AI in material development helps me practice language skills in a real-world context.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

20. I feel more confident in my language abilities when using AI-enhanced materials.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

21. AI in material development positively influences my attitude towards learning English.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

22. I am open to exploring new AI-based materials for language learning.

- 1 - Strongly Disagree

- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

23. Overall, I believe AI has a significant impact on the future of language education.

- 1 - Strongly Disagree
- 2 - Disagree
- 3 - Neutral
- 4 - Agree
- 5 - Strongly Agree

Thank you for participating in this survey!

