The use of AI (Artificial Intelligence) dimensions in developing English language skills and systems

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Abstract

Machine learning and other forms of artificial intelligence have been used in recent years and still they are being used extensively. Therefore, the purpose of this research is to investigate how best we use AI applications in the context of secondary school English instruction and learning. An analytical descriptive methodology was used to examine the existing literature and provide a detailed description of artificial intelligence (AI) and the methods by which it is being used in English language instruction and learning. The capacity to communicate effectively in a global context is a critical life skill, making the instruction of English a fundamental goal of education. Learning English is an important goal for one's education on a personal, intellectual, and professional level. The findings have covered a set of methods well-suited to integrating AI into English instruction and study. The findings have not only highlighted the usefulness of these methods if applied to the teaching and learning of English but also highlighted the very low rate at which they are employed. The investigation has covered, from the perspective of the sample, what kind of training is needed for teachers and students to use AI in ELT and ELL.

Keywords: Artificial Intelligence, dimensions, develop, English language, skills, systems

Introduction

Complex, fast-processing, and intelligent machines are evolving. Recently, AI and machine learning have made significant advances in deducing, inferring, and making judgments (Ageh, 2019). The research uses the analytical descriptive technique to assess the literature and discuss AI and its use for teaching/learning English. It includes AI methodologies and applications for teaching/learning English, their efficacy, practicality, and prerequisites for employing them. The research sample highlighted training needs. An AI application strategy for English teaching contains the fundamentals, goals, content, processors, and assessment techniques (Al-Farrani, 2020).

English language instruction is vital for worldwide communication skills. Personal, academic, and vocational English language acquisition is essential. It depends on educational programs and approaches that encourage language development, communication, and also learning. The value of employing AI apps to write, create, and practice writing and reading. AI applications help users become better communicators and language learners by using sophisticated dialogue boxes. Intelligent sources, windows for conversation and debate, intelligent communication tools, programs that construct reading texts, and programs that extract information from reading passages all contribute to the efficacy of language development processors. Each of these contributes to a better understanding of what is read (Bajaj, 2018).

Artificial intelligence allows computers to behave like humans and be clever. Computer and information technology analyzes, builds, and develops computer systems that replicate human

intellect (Clark, 2018). This research defines artificial intelligence (AI) as using AI systems to teach/learn English to construct scientific content organization and selection methods. It diversifies learning sources and instructional streams by learner level. Individualizing self-study and simulating using smart and expert systems helps create teaching and assessment approaches. This section discusses AI, its rationale, and its uses in education and English teaching/learning. This is done to determine its value, usefulness, and application in teaching/learning English (Haseski, 2019).

Literature Review

Jackson, (2019). The notion of creating systems with intelligent behavior like humans has been around since ancient times, but artificial intelligence was first recognized as a scientific topic in the 1950s. Thus, artificial intelligence research has increased due to attention.

Ocaña-Fernandez, (2019). Artificial intelligence-based formats hold the promise of bringing about a revolutionary leap forward in the quality of education at all levels by precisely tailoring instruction to each student's needs and interests while also incorporating a wide range of social and technological interactions.

Haseski (2019) performed research to find out how future EFL educators feel about AI. 94 aspiring educators from Manisa Celal Bayar University's School of Education participated in this qualitative research project. The data showed that future educators had varying interpretations of AI, had mostly unfavorable feelings about it, and did not want to live in a world where AI reigned. Further, it was shown that future educators saw both good and negative potential in the use of artificial intelligence in the classroom.

Gallacher (2018) performed research to learn more about students' experiences with chatbots and their impact on their English learning. Japanese college students (N=253) had conversations with both human and AI chatbot partners and provided open-ended written comments on their experiences. Quality analysis was performed on this data. It seems from the data that the students in this research saw the chatbot as more of a novelty than a serious language-learning resource, and they feel they can't have as deep of an engagement with it as they would with their human classmates. In conclusion, the argument is made that teachers should be more skeptical of using artificial intelligence (AI) tools in the L2 classroom until they have shown their efficacy.

Gardner, (2018). Artificial intelligence (AI) is a method that employs cutting-edge technology to overcome the difficulties associated with disinterested students and a dearth of qualified educators. Better learning environments could be made possible with the help of AI. For instance, AI may help students keep track of their course history and use that knowledge to better organize their future studies.

Bajaj, (2018) presents a new way of looking at the gap between artificial intelligence and human intelligence, arguing that the ability of computers to understand meaning is constrained by what he terms "signifiers," a logical programming language with more storage space than the human brain. As a result, a computer's operational or computational intelligence is restricted to information processing and cannot interpret the data it processes.

Russell, S., & Norvig, P. (2010), "chatbots are fantastic ways to interact with clients." By

asking basic questions and compiling responses, businesses may better tailor their offerings to their consumer's needs and preferences while also keeping tabs on user habits. Possible students may get assistance from AI while completing the application process. Present-day students may use AI because of its ability to give out timely reminders of upcoming deadlines.

Research Methodology

In the current research, we adopted an analytic descriptive strategy to investigate and understand the phenomena of interest. Previously published research was reviewed to define artificial intelligence, its components, and its potential educational uses. The research looked at AI applications for teaching and learning English to build a study tool and provide study material. The purpose of this article was to investigate how far artificial intelligence (AI) has come in its application to English language acquisition, how successful it has been, and what strategies may be employed to effectively apply it.

Study Tools

To gauge the sentiments of a cross-section of college freshmen, a survey was developed. To identify what questions to ask, we created Table 1.

Table 1: Explaining the questionnaire that was used for the research

Sr. No.	Field of the Questionnaire	Description	No. of Items
1.	Familiarity with AI-based methods and ESL software.	The level of understanding the sample has of AI and its many parts, functions, and applications. In addition, they need to be familiar with its approaches to the teaching and learning of English, including its pedagogical principles, methods of assessment, and overall program structure.	8
2.	The usefulness of AI programs for English instruction and study	Sample's thoughts on the significance and impact of using AI programs to advance methods of studying English and improve language abilities (listening, speaking, reading, and writing)	10

3.	English language instruction and study using actual AI applications	Perspectives on the effectiveness of employing artificial intelligence (AI) apps for teaching or learning English are evaluated.	12
4.	Importance and strategies for using AI-powered tools in language classrooms	Examining the sample's perspectives on the benefits, drawbacks, best practices, and guidelines for employing AI-powered tools for ESL	10
Total			10

The tool was shown in its unaltered condition. It was divided into two sections: the first dealt with the sample's foundational data, while the second focused on the questions themselves. The tool's original form has been preserved, and it used a 5-point Likert scale ("very strongly agree = 5, strongly agree = 4, agree = 3, somewhat agree = 2, and a little agree = 1").

Measuring Tool Validity

Eight members of the university's teaching faculty with expertise in areas such as teaching methods, curriculum, and psychological testing have reviewed the questionnaire's validity. Each item's relationship to the domain it measures, as well as the whole item's relationship to the instrument, has been investigated. The suggestions from the reviewers were considered, and the document was changed before being restored to its original form. A sample size of 32 college English majors was employed for the study. Evidence of internal consistency was determined by calculating the "Pearson correlation coefficient" between the item's score and the total score on the axis it was supposed to measure. Below, Table 2 displays the findings.

Table 2: Results from Pearson's correlation analyses of questionnaire internal consistency reliability

Item No.	Correlation coefficient	Item No.	Correlation coefficient	Item No.	Correlation coefficient	Item No.	Correlation coefficient
1	0.67**	11	0.72**	21	0.84**	31	0.74**
2	0.73**	12	0.58**	22	0.89**	32	0.76**
3	0.77**	13	0.69**	23	0.72**	33	0.65**

4	0.69**	14	0.71**	24	0.64**	34	0.74**
5	0.75**	15	0.69**	25	0.76**	35	0.66**
6	0.81**	16	0.64**	26	0.65**	36	0.70**
7	0.59**	17	0.62**	27	0.73**	37	0.89**
8	0.64**	18	0.79**	28	0.80**	38	0.84**
9	0.78**	19	0.84**	29	0.67**	39	0.58**
10	0.62**	20	0.67**	30	0.80**	40	0.68**

The range of significance for Pearson's r values from high to moderate is shown in Table 2. Assuming the questionnaire is reliable since all of the item values are positively correlated.

Measuring Questionnaire Reliability

Cronbach's alpha was used to determine the reliability of the questionnaire's fields and the instrument as a whole. The outcomes are shown in Table 3.

Table 3: Cronbach's alpha as a trust indicator

No.	Questionnaires	No of items	Cronbach's alpha
1	Acquiring an awareness of how artificial intelligence may be used in language classrooms	8	0.768
2	The usefulness of AI programs for English instruction and study	10	0.833
3	English language instruction and study using actual AI applications	12	0.857
4	Importance and strategies for employing AI-powered tools in language classrooms	10	0.814
	The questionnaire as a whole	40	0.931

Sample Size

Students of English at universities make up the original community, and the study sample includes 44 individuals drawn at random from this larger group.

Procedures of Field Application

First-semester 2021-2022 students used the study aid. Participants were made aware of the goals of the study and how to respond. They were contacted through various social media platforms with clarifications on the survey's terminology and topics. The kids' curiosity showed

in using AI technologies to teach and learn English in the classroom was palpable. They were also prepared to understand the strategies behind using the applications. Within a week, we received responses to our surveys and had encoded and processed the data for statistical analysis using SPSS.

Statistical tools

The questionnaire's validity and reliability were examined using Cronbach's alpha and Pearson's correlation coefficient.

To characterize the research sample's answers, we computed field and item means and standard deviations. We may infer the levels of items available to the sample by changing the discrete Likert scale into a continuous one and applying the following indicators to the means.

Results

Answer to the first question: From the standpoint of college freshmen and sophomores, what are effective approaches of use AI in English instruction and learning?

Table 4: Averages, dispersion, and student ratings of artificial intelligence strategies and approaches for English instruction and study

No	Items	Mean	Std.	Rating level	order
1	The Impact of artificial intelligence on the Rise of digital cognition and language study	3.87	1.13	high	8
2	Intellect, memory, inference, and the modeling of human intelligence are all used in artificial intelligence.	4.07	0.98	high	5
3	Expert system AI educational apps build curriculum and organize English teaching sessions.	4.37	0.86	Very high	3
4	Incorporating NLP (natural language processing) into English instruction and study, with a focus on applications related to neurobiology and cognitive linguistics	4.18	1.04	high	4
5	Applying translation systems to improve reading, writing, and English text translation	3.92	1.08	high	7
6	Developing skills in simultaneous interpreting and editing English texts with the use of sophisticated software.	3.96	1.23	high	6

7	Using smart voice communication and interactive communicative language for planning and implementing participative educational scenarios may be useful in English language classes.	4.56	1.34	Very high	1
8	Smart English teaching systems use AI in English teaching and learning.	4.43	1.28	Very high	2
	Total	4.17	1.01	high	

The mean values for the first field, "Appropriate ways of using AI to teaching/learning English," range from 3.87 to 4.56, indicating a high to a very high level of relevance. There was an extensive agreement on the merits of smart system applications, expert systems, and communicative and interactive language strategies used in voice communication programs. From the perspective of the sample, they are of paramount relevance as methods of using AI in the service of English instruction and acquisition. Most of the other items in the first field also show a high degree of agreement, which highlights their significance as methods of implementing AI in English instruction and learning.

Answer to the second question: From the perspective of college freshmen and sophomores, how efficient is the use of AI programs in enhancing English instruction and student learning?

Table 5: Means, standard deviations, and ratings of AI apps for teaching/learning English

No	Items	Mean	Std.	Rating level	order
9	Intelligent tools tackle language education issues including classroom density, availability, and adequate teaching material.	4.66	1.38	Very high	2
10	Artificial intelligence applications may help people learn independently by using things like cognitive traces and preference models.	4.37	1.27	Very high	6
11	Intelligent robots are enhancing knowledge representation, linking cognitive disciplines, and simulating laboratory research in virtual reality.	4.13	1.22	high	9

12	By acting out real-world scenarios and providing context, texts become easier to understand.	4.72	1.09	Very high	1
13	Using AI, lengthy instructional procedures may be sped up.	3.93	0.96	high	10
14	The use of AI approaches has been shown to increase students' focus and enthusiasm for language study.	4.18	0.85	high	8
15	AI programs improve English listening skills.	4.34	1.04	Very high	7
16	AI helps kids learn English.	4.38	1.39	Very high	5
17	AI apps help pupils read English.	4.41	1.24	Very high	3
18	AI apps help kids write English.	4.39	1.17	Very high	4
	Total	4.35	1.26	Very high	

According to replies, the entire second field is important. AI apps' effectiveness in teaching/learning English is quite strong, with typical values of 3.93–4.72. All four facets of language proficiency (listening, speaking, reading), as well as the use of AI in simulation, managing education issues, and especially setting up work with high-density classrooms, were unanimously agreed upon. High levels of agreement are also found for the remaining elements in this group, which points to the success of AI-based applications in boosting students' focus and motivation, helping them better express their understanding of English reading passages, and facilitating the implementation of more sophisticated educational activities. Not only can these goals not be achieved by conventional tutoring or classroom instruction, but neither can they be achieved through the use of standard teaching or tutoring methods.

Answer to the third question: How realistic do you think it is to use AI to help college students learn and speak English?

Table 6: Analyzing the averages, standard deviations, and star ratings of real-world artificial intelligence applications for English instruction and study

No	Items	Mean	Std.	Rating level	order
19	Learning how to use AI for text comprehension and information extraction	2.97	1.19	medium	7

20	Robotic voice recognition software	2,74	1.08	medium	9
21	Analyzing English texts using optical character recognition	2.53	1.32	low	11
22	Free, online dictionaries in several languages to help students learn new words	3.47	0.97	high	1
23	Evaluating writing skills to teach pupils gradually	3.29	1.26	medium	2
24	Technology that uses artificial intelligence to help English majors sound more articulate.	3.22	1.03	medium	3
25	Evaluating paragraph and essay writing skills	3.09	0.89	medium	5
26	Writing-text grading using set norms	2.78	0.88	medium	8
27	Application of artificial intelligence to the process of teaching a language	2.99	0.79	medium	6
28	Helpful English-language learning software for students with specific requirements	2.43	0.91	low	12
29	High-achieving children's artificial intelligence programs	3.19	1.18	medium	4
30	Methods based on artificial intelligence and other intelligent technology for studying English	2.56	0.93	low	10
	Total of the third field: AI-based English instruction	2.94	0.86	medium	

According to the responses, all of the third fields are very important. Mean values of 2.43-3.47, representing strong, medium, and poor agreement, are found when artificial intelligence systems are used in English teaching and learning. People generally believe that students might benefit from free online dictionaries to expand their vocabulary and develop their linguistic competence. Given that certain young individuals may get a linguistic edge via the use of smartphone apps, this is to be expected. The majority of responses show moderate agreement,

indicating that additional research and development are required before AI applications may be used successfully in the English language classroom. Concerning little agreement exists around whether or if technology like optical character recognition (OCR), written-text analysis (WTA), and smart apps help students with learning difficulties and special needs (LLS) learn more effectively in the classroom.

Answer to the fourth question: How do university students use AI applications to teach/learn English?

Table 7: Means, standard deviations, and grading levels of AI programs for teaching/learning English needs

No	Items	Mean	Std.	Rating Level	order
31	Defining AI, its components, and its uses	4.01	1.13	high	9
32	Teaching/learning AI applications procedurally	4.15	1.06	High	7
33	AI techniques in educational planning and management	4.37	1.27	Very high	5
34	Providing templates and case studies on how to incorporate AI tools into English instruction and study	4.51	1.33	Very high	3
35	Learning how to use artificial intelligence (AI) tools to teach English and hone your program design and teaching abilities	4.57	1.08	Very high	2
36	Using AI-powered apps to hone one's program implementation and pedagogical techniques in the service of instructing English	4.36	0.99	Very high	6
37	Learning management system expertise and familiarity with open educational resources for English language teachers Smart educational technologies for classroom use	4.39	1.34	Very high	4

38	Learning how to effectively use artificial intelligence (AI) language learning programs requires mastery of both actual evaluation skills and performance-based evaluation.	4.68	1.61	Very high	1
39	using artificial intelligence methods and tools for education and ongoing research	4.09	0.87	High	8
40	Learning how to control the variables that affect career progression in the age of AI	3.86	0.92	High	10
	Total	4.30	1.25	Very high	

From these replies, we may infer the relative significance of the entire fourth field. The mean values for the ratings on the items are (3.86-4.68), reflecting a widespread consensus on the need of incorporating AI methods into English instruction and learning. A large majority of respondents agreed that it is important to understand how to effectively evaluate students' progress and create and execute effective instructional techniques for teaching and learning English using artificial intelligence apps and smart technologies. Most people seem to believe that it's important to learn as much as possible about the principles, programs, and procedures of artificial intelligence and apply them to one's own education and professional growth.

The findings of this research can be used to develop a framework for using AI-powered tools in the English language classroom. Smart and expert systems are crucial to the success of these methods. This research has shown the usefulness of these tools in improving the results of English language instruction and study. Implications for the use of AI applications in this process were highlighted by the study's findings. The study also established a list of skillset development needs for putting these methods and programs into action. The findings are consistent and make sense, but the actual use of AI applications is minimal, which is related to the training required to develop these applications.

Study findings corroborate those of Al-(2014) Gayyar, who found similar positive effects from using AI in the classroom. Knowledge of AI program techniques and mechanics is also required. Smart apps that may be effective in the classroom are supported by these findings. In line with these findings, the need for training in the use of AI apps owing to the possible advantages they may have on the development of cognitive skills. They agree with the conclusion that it's crucial to teach university staff on using AI applications for customized higher education. These results are consistent with those who also found that AI applications help identify students' multifaceted talents, and such identifications are critical for determining students' educational and cognitive preferences and, by extension, the possible majors they may pursue in higher education.

Discussion and Findings

The proposed conception aims to improve English pedagogical procedures and linguistic practices. This encompasses both the know-how and the emotional and mental facets of the education process, from planning to assessing and delivering instruction.

- The ability to recognize artificial intelligence (AI) and smart devices.
- Identifying AI-based instructional approaches and uses.
- Identifying the best AI-based methods for instructing the English language.
- Proficient in developing lesson plans using AI-based methods.
- Acquiring expert-level proficiency in AI-based pedagogical techniques.
- Gaining expertise in assessing classroom performance using AI methods.
- Using AI-powered study tools for independent student learning.
- Using AI programs for ongoing professional education and training.

Conceptual framework: This is associated with research into the foundations of artificial intelligence as well as the systems and arguments for how they are used in education.

AI applications and strategies: Understanding what AI methods work best for English instruction and learning.

The procedural framework: This includes instruction on how to utilize AI in the classroom and how to assess the efficacy of various AI-based teaching methods.

- The recommended framework may be implemented through the use of AI apps and individual self-training. Conceptual presentations based on debate and participatory brainstorming eventually reveal processing activity.
- This is supported by instruction in the methods via traditional and interactive training sessions, during smaller teaching presentations, and by participatory and careful observation of the assessment.
- How well the AI-applied program does in enhancing pupils' linguistic abilities in higher education.
- Considering AI's potential uses in education, analyze the training needs of high school English instructors.
- Assessing the training requirements of university faculty in light of AI-based tools and methods.

Conclusion

AI's role in secondary and pre-secondary student evaluation. Teachers can simply measure pupils' development with AI. It helps instructors assess educational programs and identify gaps in student teachings, research, and readings. AI's clever systems recognize students' typical mistakes, provide instructors with ideas as to what the difficulties are, and provide rapid feedback in a file developed uniquely for each student, helping teachers satisfy each student's requirements by assigning homework and monitoring results. AI can also handle packed lecture halls. The data reveals that AI research focuses on two themes. Modern dictionaries accurately define vocabulary items based on context, and AI systems that translate English may increase

learning. Phonetics can distinguish letters and words in phrases and paragraphs. They identify word maps and connect media.

References

Ageh, K. (2019). When Artificial Intelligence Met Public Procurement: Improving the World Bank's Suspension and Debarment System with Machine Learning. Public Contract Law Journal, 48(3), 565-595.

Al-Farrani, L. A. K., & El-Hejaili, S. A. S. (2020). An educational scenario for using AI to discover the instructors' multiple facets of intelligence. The Arab Institution of Education, Sciences, and Literature, 11, 73-91

Al-Omari, Z. H. Z. (2019). The Effect of using AI chat robots to develop the science subject cognitive aspects of primary stage female pupils. The Saudi Association for Educational and Psychological Sciences, 64, 23-48.

Al-Yajizi, F. H. (2019). Using AI applications to enhance university education in KSA. Arab Educationalist League, 113, 257-282.

Bajaj, R., & Sharma, V. (2018). Smart Education with Artificial Intelligence-Based Determination of Learning Styles. Procedia Computer Science, 132, 834-842.

Cassell, J. (2019). Artificial Intelligence for a Social World. Issues in Science & Technology, 35(4), 29-36.

Cautela, C., Mortati, M., Dell'Era, C., & Gastaldi, L. (2019). The impact of Artificial Intelligence on Design Thinking practice: Insights from the Ecosystem of Startups. Strategic Design Research Journal, 12(1), 114-134.

Clark, M. (2018). Artificial intelligence for the general interest. The world summit report on AI for the general interest, The World Union for Communication, Genève, Switzerland.

Gallacher, A., Thompson A., & Howarth, M. (2018, August). "My Robot is an Idiot!"-Students' Perceptions of AI in the L2 Classroom. Research presentation at EUROCALL International.

Gardner, L. (2018). How A. I. is infiltrating every corner of the campus? Chronicle of Higher Education, 64(31), 1-1.

Ge, X., Yin, Y., & Feng, S. (2018). Application Research of Computer Artificial Intelligence in College Student Sports Autonomous Learning. Educational Sciences: Theory & Practice, 18(5), 2143-2154.

Haseski, H. (2019). What Do Turkish Pre-Service Teachers Think about Artificial Intelligence? Faculty of Education, Manisa Celal Bayar University, International Journal of Computer Science Education in Schools, 3 (2), ISSN 2513-8359
Jackson, R. (2019). Introduction to Artificial Intelligence. Courier Dover Publications.

Kamuka, E. E. D. I. (2015). Artificial Intelligence in programmed Education. The Arab Institution for Scientific Counsel and Development of Human Resources, 49(1), 84-96.

Ocana-Fernandez, Y., Valenzuela-Fernandez, L., & GarroAburto, L. (2019). Artificial

Intelligence and its Implications in Higher Education. Propósitosy Representaciones, 7(2), 536-568.

Qammourah, S. S., Muhammad, B., & Krosh, H. (2018). Artificial Intelligence between reality and the expected: A technical field study (pp. 1-19). The International Meeting entitled "Artificial Intelligence: A New Challenge for the Law". Algeria: November 26-27.

Raphael, N., Madoda, C., Baba, T., & Sindiso, Z. (2017). Exploring the Second Language Teaching Strategies of Ndebele English Teachers in Selected Secondary Schools in Zimbabwe. Gender & Behaviour, 15(2), 8626-8637.

Russell, S., & Norvig, P. (2010). Artificial Intelligence: A modern approach (3rd ed.). NJ: Pearson.

Ziegler, N. (2014). English language learners' epistemic beliefs about vocabulary knowledge. The University of Toledo. Available from ProQuest Dissertations & Theses Global (1773492386).