

Research Article

The Impact of ChatGPT-Based Learning Support on English Essay Writing Skills Among Undergraduate Students at the University of Nairobi, Kenya

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Abstract

Writing skills are essential in higher education as they enable students to communicate ideas clearly and succeed academically. However, many undergraduates struggle with clarity, coherence, and creativity in their writing. This study examined the effect of ChatGPT-based learning support on English essay writing among 341 first-year Bachelor of Education students at the University of Nairobi. Guided by social constructivist learning theory and Cognitive Load Theory, a quasi-experimental one-group pre-test/post-test design was used. Students completed standardized writing tests before and after a one-month period of ChatGPT-assisted learning integrated into classroom instruction. Data were collected through tests, questionnaires, and observations, then analysed using descriptive and inferential statistics. ANOVA results confirmed significant improvement, $F(1,307) = 69.14$, $p < .001$. Students who perceived ChatGPT as beneficial showed the largest improvements (19.87 to 25.21) compared to those with neutral perceptions (20.19 to 23.91) and those who did not consider it supportive (20.67 to 22.13). The strongest effects were linked to personalized feedback, grammar support, constant availability, and structured guidance. Observations and qualitative data indicated higher motivation, engagement, and self-correction. Despite concerns about factual reliability, students applied fact-checking and evaluation strategies. The study concludes that ChatGPT is an effective supplementary tool for improving ESL academic writing and recommends its integration within pedagogical frameworks that foster critical thinking and verification.

Keywords

ChatGPT, Essay Writing Skills, English Language, Higher Education, Artificial Intelligence

1. Introduction

Writing was a fundamental skill in higher education because it enabled students to articulate ideas, demonstrate comprehension of subject matter, and achieve success in assessments. Ideally, university students produced essays that were clear, well-structured, and creatively articulated, as emphasised by Songsiengchai et al. [17]. Yet many under-

graduates, particularly those for whom English was a second language, encountered significant challenges related to grammar, clarity, and coherence in their writing. These challenges negatively impacted the quality of their academic work and hindered their overall progress. Generative artificial intelligence (GAI) tools such as ChatGPT were introduced as

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supplementary support, offering immediate feedback, clarifying errors, and assisting students in developing ideas, thereby serving as a valuable complement to classroom instruction, as emphasized by Major et al. [13].

Evidence from several studies confirmed ChatGPT's potential to strengthen writing performance. Mahapatra [12], reported improvements in idea generation, sentence construction, and grammatical accuracy among first-year English as a second language (ESL) undergraduates, who also noted increased confidence and reduced anxiety. Significant improvements in vocabulary and grammar among secondary-level German learners with migrant backgrounds were reported by Athanassopoulos et al. [3]. De Vicente-Yagüe-Jara et al. [5] showed that university students using ChatGPT scored higher in fluency, flexibility, and originality in creative writing. Despite these outcomes, much of the prior research overlooked clarity and formal academic structure, which remain central to academic writing.

Beyond writing skills, ChatGPT was also found to promote learner autonomy, motivation, and self-regulated learning. Agustini [1] reported that Indonesian university students engaged in more self-reflection and self-assessment when using ChatGPT. Undergraduate English students in Pakistan valued the tool's personalized learning features that promoted independence, as shown by Ullah et al. [18]. In the Philippines, Caratiquit and Caratiquit [4] found that students reported stronger motivation, which supported academic performance. These findings suggested that ChatGPT played an important role in supporting learner agency.

Other studies linked ChatGPT to greater student engagement and interaction with content. Heung and Chiu [7], in a meta-analysis, concluded that ChatGPT use had a strong effect on cognitive engagement and a moderate effect on behavioural and emotional engagement in higher education. Improved participation and understanding among computer science undergraduates were observed by Albdarani and Al-Shargabi [2], while Khurma et al. [8] reported that ChatGPT supported inquiry-based and collaborative learning.

Language-focused research also confirmed benefits including cognitive engagement, behavioural and emotional engagement such as the study conducted by Heung & Chiu [7]. Songsingchai et al. [17] documented significant improvement in English skills among Thai pre-service teachers, while Wang et al. [20] showed that Chinese students and teachers appreciated ChatGPT's varied and level-appropriate content. Albanian students experienced improvements in grammar, reading, and writing through regular use of ChatGPT, as noted by Mema et al. [14], while Khzouz et al. [9] highlighted progress in grammar awareness, vocabulary, and creativity.

Concerns were also widely reported. Scholars noted risks of over-reliance, misinformation, and reduced originality. Frequent use of ChatGPT was warned to weaken independent reasoning and increase plagiarism by Wang et al. [20] and Ullah et al. [18], while Luo and Yunus [11] found that students at times received incorrect information and faced dif-

ficulties verifying accuracy. The United Nations Educational, Scientific and Cultural Organization (UNESCO) [19] stressed the need for ethical guidelines, training, and teacher involvement to ensure responsible and equitable use.

Further studies highlighted ChatGPT's potential in large-scale and distance education. Generative AI tools such as ChatGPT and Bing Copilot were found to provide more personalized and relevant responses than rule-based systems in an open university in Türkiye, according to Öncü et al. [16]. In a review of 51 studies, Duong et al. [6] concluded that ChatGPT enhanced instructional delivery, content adaptation, and learner satisfaction. Yet few of these studies directly examined formal essay writing in developing countries.

In Kenya, writing difficulties among undergraduates were well documented. Declines in quality, especially in coherence and argument development, were observed by Mwangi [15] and Kinuthia and Rutere [10]. Common issues included weak organization of ideas, poor sentence construction, and limited creativity. Large class sizes, limited feedback, and reliance on traditional teaching approaches made these challenges worse. In such contexts, students were left without personalized support or chances to practise effective writing strategies.

This study addressed these gaps by examining how ChatGPT supported English essay writing among first-year Bachelor of Education students at the University of Nairobi. It focused on clarity, coherence, and creativity as key areas of writing. The study was guided by socio-constructivist theory, which viewed learning as a process shaped by interaction and scaffolding, and by cognitive load theory, which explained how external support could reduce the mental burden of complex tasks. Socio-constructivism highlighted how tools like ChatGPT could act as scaffolds to support learners within their zone of proximal development, while cognitive load theory explained how such support could reduce extraneous cognitive demands, allowing learners to devote more resources to idea generation, organisation, and coherence. Together, these frameworks converged on the problem of ESL writing by demonstrating how social scaffolding and cognitive relief could work simultaneously to improve performance.

The objective of the study was to determine the effect of ChatGPT-based learning support on undergraduate students' English essay writing performance. By aligning socio-constructivist principles with cognitive load theory, the study examined how ChatGPT could complement traditional methods, enhance academic writing outcomes, and provide practical solutions in higher education contexts where limited resources and large class sizes restrict opportunities for personalised feedback. To this end, the study sought to answer the following question: *What is the effect of ChatGPT-assisted learning support on the clarity, coherence, and creativity of undergraduate students' English essay writing?*

2. Research Design

This study employed a mixed- methods approach that combined quantitative and qualitative strands to provide a comprehensive understanding of the role of ChatGPT in supporting students' English essay writing. A quasi-experimental one-group pre-test-post-test design formed the quantitative component, enabling the measurement of changes in students' writing proficiency before and after the intervention. The qualitative dimension was incorporated through classroom observations, perception questionnaires, and follow-up interviews. This combination allowed the study to capture both measurable outcomes and nuanced insights into students' experiences and engagement with the tool.

2.1. Participants and Context

The participants were 341 first-year undergraduate English students enrolled at the Kikuyu campus of the University of Nairobi. A census approach was adopted to include all eligible students in the target population, thereby ensuring comprehensive coverage and enhancing the representativeness of the findings. The students were selected as an intact cohort to reflect authentic classroom conditions and minimise disruption to the instructional process.

2.2. Data Collection Tools

Data were collected using multiple instruments to allow for triangulation. Writing proficiency was assessed through standardised pre-tests and post-tests, both of which evaluated clarity, coherence, and creativity in student essays. In parallel, structured questionnaires were administered to capture students' perceptions of ChatGPT, focusing on ease of use, perceived usefulness, and overall influence on their writing practices. Classroom observations were conducted using a structured checklist to document indicators such as student engagement, responsiveness to feedback, vocabulary development, and levels of motivation and confidence. To enrich these observations, follow-up interviews were held with classroom observers. These interviews provided qualitative detail on how students interacted with ChatGPT, how they applied the feedback generated, and the extent to which the tool influenced independence and critical thinking during writing tasks.

2.3. Data Collection Procedure

The study commenced with the administration of a pre-test designed to establish baseline levels of students' writing proficiency. Following this, participants were introduced to

ChatGPT and engaged with the tool over a period of one month. During this time, they used ChatGPT as a support mechanism for their academic writing assignments, receiving immediate feedback on drafts and revisions. Instructors facilitated the process by demonstrating appropriate uses of the tool and embedding it within ongoing classroom instruction, thereby ensuring that students did not rely on it mechanically but instead integrated its suggestions into their writing development. After the one-month intervention, a post-test was administered using the same criteria as the pre-test, thereby enabling a direct comparison of writing performance before and after exposure to ChatGPT.

2.4. Data Analysis

The quantitative data generated from the pre-tests, post-tests, and perception questionnaires were analysed using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics were used to summarise patterns in the responses, while analysis of variance (ANOVA) was applied to examine the statistical significance of differences in writing performance across the pre-test and post-test stages. This approach allowed for a rigorous assessment of whether the observed improvements could be attributed to the intervention. The qualitative data from classroom observations and interviews were analysed thematically. Recurring ideas and patterns were identified, coded, and interpreted in relation to the quantitative findings. This integrative analysis not only validated the numerical results but also offered richer insights into the processes underlying students' engagement with ChatGPT. The use of a mixed methods design ensured that both the measurable outcomes of writing improvement and the experiential dimensions of student engagement were accounted for, providing a comprehensive account of the potential of ChatGPT as a pedagogical tool in academic writing.

3. Results and Discussion

The objective was to examine how ChatGPT learning support affects the English essay writing skills performance of undergraduate English students. Participants were asked to indicate how much they agreed with the statements. The responses of the Likert scale statements regarding ChatGPT's learning support in essay writing were grouped into three categories: students indicating support, those who were neutral, and those who expressed no support. Students' pre-test and post-test scores, along with mean improvements, were calculated for each group to show how engagement with ChatGPT corresponded to changes in essay writing performance, as illustrated in [Table 1](#):

Table 1. ChatGPT Learning Support: Responses and Performance Outcomes.

Statement	Category	Frequency	Percent (%)	Mean Pre-Test	Mean Post-Test	Mean Improvement
ChatGPT provides feedback customized to my writing needs	Supports Learning	280	82.1	19.9	25.3	5.4
	Neutral	48	14.1	20.2	23.9	3.7
	Does Not Support Learning	13	3.8	20.7	22.0	1.3
Feedback does not improve writing (Reverse scored)	Supports Learning	196	57.5	19.8	25.0	5.2
	Neutral	95	27.9	20.1	23.7	3.6
	Does Not Support Learning	50	14.7	20.7	22.0	1.3
ChatGPT helps me understand my writing mistakes	Supports Learning	220	64.5	19.9	25.2	5.4
	Neutral	75	22.0	20.2	23.9	3.7
	Does Not Support Learning	46	13.5	20.7	22.0	1.3
24/7 availability ensures continuous support	Supports Learning	263	77.1	19.9	25.2	5.3
	Neutral	62	18.2	20.2	23.9	3.7
	Does Not Support Learning	16	4.7	20.7	22.1	1.4
Guidance lacks structure (Reverse scored)	Supports Learning	256	75.1	19.8	25.0	5.3
	Neutral	55	16.1	20.2	23.7	3.5
	Does Not Support Learning	30	8.8	20.7	22.1	1.4
Provides variety of writing prompts	Supports Learning	200	58.7	19.9	25.0	5.1
	Neutral	105	30.8	20.2	23.8	3.6
	Does Not Support Learning	36	10.5	20.7	22.0	1.3
Helps stay on track with structured guidance	Supports Learning	230	67.5	19.9	25.2	5.3
	Neutral	75	22.0	20.2	23.9	3.7
	Does Not Support Learning	36	10.5	20.7	22.0	1.3
Grammar and punctuation suggestions improve accuracy	Supports Learning	279	82.0	19.9	25.2	5.3
	Neutral	52	15.3	20.2	23.9	3.7
	Does Not Support Learning	10	2.7	20.7	22.1	1.4
Overall	Supports Learning	280	82.1	19.87	25.21	5.34
	Neutral	32	9.4	20.19	23.91	3.72

Statement	Category	Frequency	Percent (%)	Mean Pre-Test	Mean Post-Test	Mean Improvement
	Does Not Support Learning	29	8.5	20.67	22.13	1.46

Table 1 illustrates that a majority of students (280; 82.1%) acknowledged that ChatGPT provided feedback tailored to their writing needs, while 48 students (14.1%) adopted a neutral stance, and 13 students (3.8%) reported no perceived support. In terms of performance, students who recognised the feedback as supportive demonstrated an improvement from a mean score of 19.9 in the pre-test to 25.3 in the post-test. Those with neutral views improved from 20.2 to 23.9, whereas students who did not perceive support showed a modest increase from 20.7 to 22.0. These findings suggest that personalised feedback fosters self-correction and enhances clarity in writing by encouraging active engagement and error recognition. Observational data further indicated that students made deliberate use of ChatGPT to identify and amend errors in their essays. Similar outcomes were reported by Mahapatra [12] in a study with first-year ESL undergraduates in Saudi Arabia, where students valued real-time, personalised feedback for improving both coherence and grammatical accuracy.

In relation to the statement *“Feedback does not improve writing,”* 196 students (57.5%) reported that ChatGPT provided effective learning support, 95 students (27.9%) expressed neutral views, and 50 students (14.7%) did not perceive such support. Performance data revealed that students acknowledging positive support improved from a mean of 19.8 in the pre-test to 25.0 in the post-test. Those with neutral perspectives improved from 20.1 to 23.7, while students who did not recognise support showed a smaller increase from 20.7 to 22.0. These findings suggest that recognising AI as an effective feedback tool strengthens learners’ ability to understand and apply writing skills, thereby contributing to improved essay organisation. Qualitative responses further indicated that ChatGPT use prompted students to reconsider sentence structures and overall organisation of their essays. Comparable findings were reported by Athanassopoulos et al. [3] in Patras, Greece, where junior high school students demonstrated enhanced grammar and vocabulary development through ChatGPT-assisted feedback.

Regarding the statement *“ChatGPT helps me understand my writing mistakes,”* 220 students (64.5%) acknowledged such support, 75 students (22.0%) expressed neutral views, and 46 students (13.5%) did not perceive any benefit. Students identifying positive support improved from 19.9 to 25.2, those with neutral views from 20.2 to 23.9, and those not recognising support from 20.7 to 22.0. These findings indicate that recognising and addressing errors through AI-assisted feedback fosters accuracy and coherence, thereby promoting

self-directed improvement in writing. Observation checklists confirmed that students reviewed their essays and corrected recurring errors with ChatGPT’s guidance. Similarly, Songsiengchai et al. [17], in a study with pre-service teachers in Bangkok, Thailand, reported that ChatGPT enhanced learners’ understanding and application of language rules.

With respect to the statement *“24/7 availability ensures continuous support,”* 263 students (77.1%) affirmed that ChatGPT provided effective learning support, 62 students (18.2%) expressed neutral views, and 16 students (4.7%) did not perceive support. Students reporting positive support improved from 19.9 to 25.2, those with neutral views from 20.2 to 23.9, and those not recognising support from 20.7 to 22.1. These results suggest that continuous access to AI fosters sustained practice and gradual improvement, enhancing persistence and promoting self-paced learning. Student feedback further highlighted that ChatGPT’s availability encouraged consistent engagement with writing tasks. Similar outcomes were observed by Agustini [1] in Indonesia, where university students reported that ChatGPT facilitated learner autonomy and self-reflection.

Concerning the statement *“Guidance lacks structure,”* 256 students (75.1%) acknowledged that ChatGPT offered structured support, 55 students (16.1%) expressed neutral views, and 30 students (8.8%) did not perceive such support. Students recognising positive support improved from 19.8 to 25.0, those with neutral views from 20.2 to 23.7, and those not recognising support from 20.7 to 22.1. These findings suggest that structured AI feedback promotes logical progression and clarity in writing, thereby supporting more organised thinking. Observer interviews further indicated that students were able to apply AI-generated suggestions to organise their ideas, even when guidance was limited. In alignment with these findings, Albdarani and Al-Shargabi [2] reported that Saudi undergraduate technical students improved comprehension and organisation in learning tasks when supported by ChatGPT.

With reference to the statement *“ChatGPT provides a variety of writing prompts,”* 200 students (58.7%) reported receiving learning support, 105 students (30.8%) expressed neutral views, and 36 students (10.5%) did not perceive support. Students acknowledging positive support improved from a mean of 19.9 in the pre-test to 25.0 in the post-test. Those with neutral perspectives improved from 20.2 to 23.8, while those not recognising support improved from 20.7 to 22.0. These findings suggest that exposure to diverse writing prompts stimulates engagement, originality, and active par-

ticipation, thereby fostering creativity in academic writing. Student responses further indicated that the variety of prompts encouraged idea generation and originality. Similar outcomes were reported by De Vicente-Yagüe-Jara et al. [5] in Spain, where university students demonstrated enhanced creative writing abilities when supported by AI tools.

In relation to the statement *“ChatGPT helps me stay on track with structured guidance,”* 230 students (67.5%) affirmed receiving learning support, 75 students (22.0%) expressed neutral views, and 36 students (10.5%) did not perceive such support. Students acknowledging positive support improved from 19.9 to 25.2, those with neutral perspectives improved from 20.2 to 23.9, and those not recognising support improved from 20.7 to 22.0. These findings indicate that structured guidance facilitates task completion and strengthens essay coherence, thereby promoting disciplined writing practices. Observation checklists confirmed that students using ChatGPT were able to sustain focus and organise their drafts more effectively. Correspondingly, Caratiquit and Caratiquit [4], in a study with high school students in the Philippines, observed that AI-assisted support enhanced academic engagement and overall performance.

Concerning the statement *“Grammar and punctuation suggestions improve accuracy,”* 279 students (82.0%) acknowledged learning support, 52 students (15.3%) expressed neutral views, and 10 students (2.7%) did not recognise support. Students who reported positive support improved from 19.9 to 25.2, those with neutral perspectives from 20.2 to 23.9, and those not recognising support from 20.7 to 22.1. These results suggest that AI-generated feedback enhances technical accuracy and overall essay quality by strengthening writing mechanics and promoting clarity. The integration of grammar-focused guidance appeared to encourage students to identify and correct their own errors, reinforcing self-correction as a pathway to improved performance. Observational interview feedback (Observer OBS001) corroborated these findings, noting that:

“... Students who actively used ChatGPT produced drafts that were coherent, well-structured, and clearly developed.”

This shows that ChatGPT supports the organisation of ideas and strengthens the overall clarity of student writing. The results demonstrate that ChatGPT supports the organisation of ideas and enhances the overall clarity of student writing. These findings are consistent with those of Songsienchai et al. [17], who observed that learners benefited from real-time, personalised feedback through ChatGPT, which improved their motivation, engagement, and understanding of language use. Similarly, Mahapatra [12] reported that ChatGPT facilitated idea generation, organisation, grammatical accuracy, and vocabulary development among university students learning English as a second language.

In this study, 280 students (82.1%) acknowledged ChatGPT as supportive, 32 students (9.4%) expressed neutral views, and 29 students (8.5%) did not recognise its support. Students who perceived ChatGPT positively improved from a

mean score of 19.87 in the pre-test to 25.21 in the post-test. Those with neutral perspectives improved from 20.19 to 23.91, while those not recognising support improved from 20.67 to 22.13. These findings suggest that positive engagement with AI contributes to greater clarity, improved organisation, and enhanced writing skills. Consistent application of AI feedback encouraged structured writing practices and effective self-correction. Observation checklists further confirmed that students who utilised ChatGPT produced essays that were more coherent and systematically organised. Comparable evidence was reported by Mema et al. [14] in Albania, where undergraduate and master's students demonstrated improved writing skills and overall learning efficiency through AI-assisted learning.

The ANOVA results for improvement scores further confirmed statistically significant differences between students who agreed that ChatGPT supports learning and those who disagreed across all measures of support, $F(1, 307) = 69.14, p < 0.001$.

The findings demonstrated that students who engaged positively with ChatGPT showed significant improvement in their writing performance. Those who perceived the tool as supportive improved by an average of 5.34 points between pre-test and post-test, compared to smaller improvements among students who were neutral or sceptical. The strongest improvements were linked to personalised feedback, grammar support, and structured guidance, with observations confirming greater engagement and self-correction. These results align with previous studies that reported positive effects of ChatGPT on grammar, organisation, and creativity such as Mahapatra [12]; Songsienchai et al. [17], and De Vicente-Yagüe-Jara et al. [5]. Students also valued the tool's constant availability and the range of prompts it provided, which encouraged continuous practice and originality. This supports findings by Agustini [1] and Caratiquit and Caratiquit [4] who observed that ChatGPT fosters learner autonomy and motivation.

Although these results highlight the potential of ChatGPT as a supplementary learning tool, several limitations should be recognised, particularly when compared with prior research. The study adopted a one-group pre-test-post-test design without a control group. While this design revealed clear improvements in writing, it does not allow the changes to be attributed solely to ChatGPT, since other factors such as instructor guidance or normal classroom activities could have influenced outcomes. This stands in contrast to studies such as Mahapatra [4] and Songsienchai et al. [17], which employed quasi-experimental designs with control groups. By including comparison groups, those studies provided stronger evidence of causal relationships between ChatGPT use and writing improvements, while the present study offers suggestive but less definitive evidence.

The scope of the study also presents a limitation. It was conducted with first-year undergraduate English students at the Kikuyu campus of the University of Nairobi. While this

provided an authentic and controlled learning context, it limits the generalisability of the findings to other populations, disciplines, or institutional contexts. Similar challenges with generalisation have been noted in research carried out in specific cultural or institutional settings, such as Athanassopoulos et al. [3] in Greece, and Agustini [1] in Indonesia.

A further limitation concerns the use of self-reported perception data. Students' questionnaire responses may have been influenced by bias or the desire to report favourable experiences with ChatGPT. While these perceptions were triangulated with test results and classroom observations, the issue of self-reporting remains. Students were sometimes found to overstate the benefits of ChatGPT and overlook its factual inaccuracies, as reported by Luo and Yunus [11], raising caution about relying on self-report measures in AI education research.

The study also examined short-term effects over a one-month period, focusing on clarity, coherence, and creativity. This time frame did not allow for an assessment of long-term effects or of higher-order skills such as originality, argumentation, and critical reasoning. This limitation is echoed in the literature. Continued reliance on ChatGPT could weaken independent reasoning and lead to over-dependence on AI-generated feedback, as warned by Ullah et al. [18] and Wang et al. [20]. In this light, the improvements reported here, though significant, should be regarded as short-term improvements rather than evidence of lasting change.

4. Conclusion and Recommendations

The study demonstrates that ChatGPT, when integrated as a supplementary learning support tool, significantly enhances undergraduate students' English essay writing skills, particularly in the areas of clarity, coherence, and creativity. By providing structured guidance, real-time, and personalized feedback, ChatGPT facilitates more organized ideas, improved sentence accuracy, and more coherent arguments. Furthermore, it helps mitigate common barriers such as writer's block and disorganization, thereby fostering greater student confidence and engagement in the writing process. Although concerns regarding factual reliability and potential over-reliance on AI-generated content were identified, students exhibited the capacity to engage in fact-checking, critical verification, and independent evaluation, underscoring the importance of guided and responsible AI use within pedagogical frameworks. In light of these findings, it is recommended that higher education institutions incorporate ChatGPT strategically into their writing instruction curricula as a complementary tool rather than a replacement for traditional teaching methods. This integration should be accompanied by comprehensive training for both instructors and students to ensure effective and ethical utilization, with an emphasis on promoting reflective and independent learning alongside critical thinking and writing skills. Moreover, institutions should establish clear guidelines and support systems to address issues of misinformation, plagiarism, and academic integrity while en-

couraging responsible innovation. Future research is encouraged to examine the long-term impact of ChatGPT-assisted learning on writing proficiency, its influence on higher-order thinking such as argument development and originality, its role in collaborative and disciplinary-specific writing tasks, and the balance between technological support and human mentorship. Such efforts will contribute to optimizing the pedagogical potential of AI tools in higher education while safeguarding academic standards and equity, particularly in ESL contexts within developing countries.

Abbreviations

ANOVA	Analysis of Variance
ESL	English as a Second Language
GAI	Generative Artificial Intelligence
SPSS	Statistical Package for the Social Sciences
UNESCO	United Nations Educational, Scientific and Cultural Organization.

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