Universal Library of Languages and Literatures Research Article

ISSN: 3064-9978 | Volume 2, Issue 1

Open Access | PP: 21-27

DOI: https://doi.org/10.70315/uloap.ullli.2025.0201005

The Role of Artificial Intelligence in Personalizing the Process of Learning the English Language

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Abstract

The article focuses on the role of artificial intelligence in personalizing English language learning for high school and university students preparing for Olympiads, within the logic of a Montessori-compatible, practice-oriented methodology (projects, debates, creative writing). Its relevance is determined by the demand for sustainable oral and written productivity growth while enhancing confidence, engagement, and autonomy. The novelty of the work lies in the analytical synthesis of recent data on project-oriented formats and their combination with AI personalization tools (adaptive tasks, voice trainers, progress analytics) as applied to Olympiad preparation and bilingual audiences. The paper explicates concrete mechanisms by which AI personalizes learning: automated diagnosis of error patterns in speech and writing, adaptive item selection and spaced micro-drills, rubric-aligned feedback on argument structure and cohesion, and voice trainers that score segmental accuracy, stress, intonation, and fluency. A practical mapping links typical deficits (e.g., Past Simple vs. Present Perfect, weak cohesion, missing warrants) to AI-generated tasks and feedback aligned with Olympiad rubrics. The goal is to formulate a reproducible model for implementing AI in conjunction with project-based and debate-based practices. Methods of comparative analysis and critical review were applied. The conclusion describes the conditions for effectiveness, limitations, and recommendations for scaling. The article will be helpful to English language practitioners, methodologists, and managers of supplementary education programs.

Keywords: *Personalization of Learning, Artificial Intelligence, English Language, Project-Based Learning, Debates, Creative Writing, Montessori, Bilingual Learners, Olympiad Preparation, Student Engagement.*

INTRODUCTION

The study's relevance stems from the need to combine individual educational trajectories with the high demands of English language Olympiads. Although the article is dedicated to personalized tutoring, the focus is shifted to Olympiad preparation because it is the Olympiads that set the highest and most measurable requirements for speaking, writing, and argumentation, allowing individual trajectories to be correlated with specific deficits and goals. Practice shows that traditional courses strengthen knowledge of grammar and vocabulary but do not always remove the barriers to public speaking, argumentation, and creative writing. The personalization capabilities of AI (adaptive tasks, automated feedback on oral and written speech, analytics, and trajectory forecasting) make it possible to purposefully support weak areas and accelerate progress, provided they are embedded in a project- and debate-based environment and supported by a culture of psychological safety.

Mechanisms of AI-driven personalization (scope and promise). In this study, personalization denotes a dynamic match between learner state and instructional moves, driven by continuous evidence from speech, writing, and task performance. The state estimate is formed from error patterns, fluency/prosody features, lexical–syntactic complexity, and argument-structure signals; instructional moves include adaptive item selection, targeted micro-drills, rubric-aligned feedback, and spaced review. The target is alignment with Olympiad rubrics and CEFR-compatible descriptors for speaking and writing, so that each learner receives more practice exactly where deficits cluster (e.g., tense control, cohesive devices, claim–evidence–warrant, prosodic stress). The remainder of the paper makes these mechanisms explicit and shows how they integrate with projects, debates, and creative writing, including after-class voice assignments supported by mobile AI tools [1,5,8–10].

This work aims to substantiate a model for integrating AI into the personalization of preparation for English Olympiads, in conjunction with projects, debates, and creative writing for bilingual groups. The tasks are:

Citation: Yazmuradova Aygozel, "The Role of Artificial Intelligence in Personalizing the Process of Learning the English Language", Universal Library of Languages and Literatures, 2025; 2(1): 21-27. DOI: https://doi.org/10.70315/uloap.ullli.2025.0201005.

to systematize the effects of the project-debate model on speaking, writing, and engagement;

to describe the role of AI tools in adjusting individual trajectories and providing feedback;

to determine the conditions for effectiveness (duration, public presentation, agency, safety) and the implementation risks.

The novelty lies in linking personalization by means of AI with inter-genre transitions from "oral → writing" and with the requirements of Olympiads, as well as in deriving practical parameters for course design.

MATERIALS AND METHODS

The materials used include English-language studies from 2021–2025 covering project-based learning, debates, engagement, the Montessori approach, and digital (including AI) tools for supporting speech and writing: Cahyono (2024)—a meta-analysis of the impact of project-based learning on writing in EFL/ESL; Cao (2024)—an increase in oral presentation confidence through the World Englishes approach; Kassem (2021)—the effects of debate training on oral and written productivity and anxiety reduction; Zanchi (2024)—data on "sensitive periods" and long-term well-being within the Montessori framework; Mingyan (2025)—an empirical study of a mobile AI application for speaking and its impact on results; Randolph (2023)—a systematic review of academic and non-academic outcomes of Montessori; Shi (2024)—an increase in public speaking scores with a project-based strategy at the university level; Tu (2021)—the role of classroom culture and psychological safety in the engagement of EFL students; Zhang (2023)—a meta-analysis of the impact of project-based learning on academic achievement; Zhong (2025)—multidimensional engagement in project-based speaking activities.

Methods: comparative analysis and critical review of the literature; content analysis of research results and designs; analytical synthesis and formulation of practical parameters; elements of conceptual modeling of personalization using AI.

RESULTS

Research demonstrates that the combination of project tasks, debates, and creative writing as the core of a practice-oriented methodology for English Olympiad preparation systematically enhances key target effects—academic (oral speech, written production), meta-subject (critical thinking, argumentation, creativity), and affective (confidence, motivation, engagement)—and is organically consistent with the principles of humanistic Montessori pedagogy for a bilingual audience. In aggregate, the data show a statistically significant advantage of project-oriented formats over traditional ones, especially with regular public presentation of results and the inclusion of discussion/debate elements (Cahyono et al., 2024; Mingyan et al., 2025; Shi et al., 2024; Zhang et al., 2023; Zhong et al., 2025). These effects are evident at different educational levels and in various cultural contexts: from universities to schools in resource-constrained regions, where project-based learning markedly increases engagement and intrinsic motivation, while having a moderate impact on standardized knowledge tests—an important caveat for correctly calibrating expectations in Olympiad preparation (Mingyan et al., 2025; Zhong et al., 2025).

Mechanism-to-skill mapping in AI-supported personalization. Integrating AI tools with project–debate cycles operationalizes personalization at the level of specific deficits and Olympiad descriptors. Table 1 summarizes typical mappings observed in practice and discussed in recent research on speaking apps, engagement, and writing gains [1,5,8–10].

Table 1. Mapping of AI personalization to skills, tasks, and feedback (for Olympiad preparation) [1–10]

Skill / Deficit	AI Diagnosis	Adaptive Task Archetype	Feedback Signals	Olympiad Rubric Focus	Micro-Task Example
Tense control (Past Simple vs. Present Perfect)	Sequence tagging of verb forms; identification of error clusters within tense pairs	Contrastive drills with mini-narratives and time-adverbial prompts	Highlighted mis-tense tokens; reformulation examples	Grammatical accuracy	"Write five two-sentence mini-stories contrasting 'yesterday' vs. 'since 2022'; system flags misuse and proposes corrections"
Collocations & academic lexis	Detection of low collocation strength; over-reliance on basic synonyms	Collocation completion and error-bank review; paraphrase chains	Underlined weak collocations; frequency and register tips	Lexical range/ precision	"Replace eight weak noun-verb pairs with high-value collocations; receive usage notes"
Cohesion & paragraphing	Sparse connectives; weak anaphora chains	Sentence combining; connective substitution; paragraph skeletons	Cohesion heatmap; suggested connectives	Organization/ coherence	"Merge four short sentences into two with appropriate logical connectors."
Argument structure in essays	Missing warrants; unfocused claims	Toulmin-guided outlines; counterargument drills	Labels for claim/ evidence/warrant; missing step prompts	Argument quality	"Draft a counterclaim and warrant in 120 words; system checks coverage."

Pronunciation: segmentals	Identification of confusable phonemes via alignment	Minimal-pair shadowing; targeted word lists	Phoneme-level color-coding; mispronunciation examples	Pronunciation accuracy	"Shadow twelve minimal pairs /ɪ/–/iː/; immediate recast after each attempt"
Prosody & stress	Unstable word stress; flat intonation	Stress-marking read-aloud; contrastive emphasis practice	Stress contour visualization; syllable timing tips	Prosodic control/ intonation	"Read 90-second excerpt with marked nuclear stress; system scores stress placement"
Fluency & fillers	Low mean run; high pause ratio	Timed monologues; 'no-backspace' speaking sprints	Tempo meter; filler-word counter	Fluency/delivery	"Speak for 60 seconds on a prompt; receive run-length and filler counts"
Listening for gist/ detail	Missed key facts in short talks	Micro-dictations; selective note-taking	Immediate item-level feedback	Comprehension/ precision	"Listen to 45-second clip; extract numbers and named entities"
Paraphrasing & reformulation	High lexical repetition	Guided paraphrase with synonym constraints	Repetition alerts; variety suggestions	Lexical variety	"Paraphrase three sentences, avoiding the top ten frequent words."
Mechanics & punctuation	Frequent comma and spelling errors	Punctuation repair; homophone checks	Error density per 100 words	Conventions/ accuracy	"Fix punctuation in a 120-word paragraph; density compared to prior drafts"

At the level of oral speech and behavioral indicators of audience interaction, the most convincing effects are associated with public speaking training through projects and debates. In a quasi-study in Saudi Arabia, a two-month debate cycle led to a significant increase not only in speaking (fluency, vocabulary, coherence) but also in writing, as well as a reduction in speech anxiety; paradoxically, a more substantial increase was seen in writing, which confirms the transfer of argumentative structures from oral practice to written practice (Kassem, 2021). In a Chinese sample at the university level, project-oriented public speaking training provided a reliable increase in performance scores following a controlled comparison with a traditional course (Shi et al., 2024). Additional data from a mixed-design study on World Englishes show that reflecting on the variability of English as a global language itself markedly increases presentation confidence and the willingness to speak with an accent/ variation—a critically important affective effect for Olympiads (Cao et al., 2024). Finally, technological support—specifically, mobile applications for extracurricular practice—positively impacts speaking, especially in multilingual environments with few natural opportunities for oral practice; in such conditions, regular homework voice assignments lead to improved oral productivity scores (Mingyan et al., 2025).

The results of meta-analytic and empirical studies on project-based learning in language education consistently record improvements in written productivity and coherent argumentation: an aggregated analysis of 11 studies (EFL/ ESL) reveals a significant positive overall effect on writing, with moderators being the quality of the project design, learner autonomy, and the duration of the cycle (optimal durations are from 9 to 18 weeks) (Cahyono et al., 2024; Zhang et al., 2023). In a broader educational sample (66 experimental and quasi-experimental works over 20 years), project-based learning, on average, improves academic results compared to traditional methods. The magnitude of the effect varies depending on the school level, group sizes, and subject area—important parameters for constructing schedules and composing debate/project teams (Zhang et al., 2023).

From the affective side, the central cross-cutting variable is student engagement—a multidimensional construct (behavioral, emotional, cognitive, agentic, social) sensitive to classroom culture and psychological safety. In the project-debate model, an increase in behavioral and agentic engagement is observed (initiating ideas, taking responsibility, joint planning), which correlates with sustained motivation and regular speech practice; furthermore, it is a risk-safe environment (where mistakes are a resource) that proves to be a necessary condition for transitioning from reproduction to argumentation (Tu, 2021; Zhong et al., 2025). In the body of sources, this is also expressed in an apparent increase in intrinsic motivation indicators (η^2 around 0.12–0.13 by ANCOVA for intrinsic/extrinsic motivation) in project-based learning compared to a traditional control (Mingyan et al., 2025), as well as in a steady growth of engagement scores on behavioral and emotional subscales in samples that underwent project-based speaking tasks (Zhong et al., 2025).

Figure 1 illustrates the structure of engagement adopted in modern educational psychology, linking the behavioral component with participation and task completion, the emotional component with interest/anxiety and enjoyment of learning, the cognitive component with deep strategies, and the agentic component with the student's contribution to improving learning; this framework explains why the combination of debates, project work, and creative writing yields a cumulative effect specifically in Olympiad preparation, where autonomy, initiative, and the public defense of solutions are required (Tu, 2021).

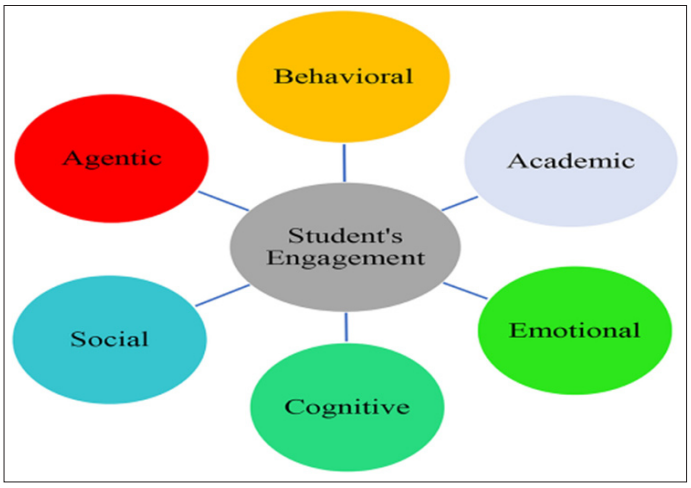

Figure 1. The dimensions of students' engagement (Tu, 2021)

The voice pipeline samples a short prompt (60–120 s), captures audio, and runs ASR with forced alignment to obtain phoneme-level timing. Segmental accuracy is computed from confusable sets; prosody trackers estimate word-stress stability and intonation movement; fluency is summarized by mean length of run, pause ratio, and filled-pause frequency. Feedback is immediate and dual-channel: (a) recasts or prompts during practice, (b) a post-task panel with phoneme highlights, stress contours, and tempo suggestions. Weekly after-class assignments create enough volume to shift fluency bands, which aligns with gains reported for mobile AI speaking practice in multilingual settings [5,10].

Automated writing feedback: from local errors to argument structure. The writing pipeline flags local form issues (grammar and mechanics) and then evaluates organization and argument moves. Learners receive targeted micro-drills (sentence combining, connective substitution) and a rubric-aligned checklist (thesis specificity, topic-sentence clarity, cohesion devices, claim–evidence–warrant). Revision depth and error density trends surface on dashboards to support reflective practice in project and debate cycles [1,9].

Data relevant to the Montessori context and bilingual audiences are important for extrapolating the results to the author's practice. An extensive systematic review by Campbell (32 studies; 132,249 observations) shows that Montessori provides meaningful advantages in both academic ($g \approx 0.24$ on average; for language $g \approx 0.17$) and non-academic outcomes (executive functions, creativity), with effects being higher in preschool and elementary levels and with stricter implementation of the approach (Randolph et al., 2023). New data from 2025 indicate "sensitive periods" when Montessori education is more strongly associated with well-being in adulthood and confirm the importance of agency and self-determination. These variables are fundamentally developed in a debate and project-based environment (Zanchi et al., 2024). This provides a rationale for integrating the methodology (debates, public project defenses, creative writing) into a Montessori-compatible developmental environment for bilingual university and high school students (Zanchi et al., 2024; Randolph et al., 2023).

The results confirm:

The core of the methodology—a regular cycle of "mini-projects → debates/public defense → creative writing"—is statistically associated with growth in speaking, writing, and confidence;

The effects are enhanced when quality parameters are met—a straightforward "big question," transparent criteria, inter-role interactions, a duration of 9–18 weeks, and groups of 4–7 people (Cahyono et al., 2024; Shi et al., 2024; Zhang et al., 2023; Zhong et al., 2025).

For a bilingual audience in a Montessori environment, this model is particularly productive due to its high academic autonomy and psychological safety. This increases the proportion of learners transitioning from reproduction to argumentation—a key competence for English Olympiads.

DISCUSSION

Mechanisms are the bridge between pedagogy and outcomes. The evidence reviewed for projects, debates, and creative writing gains meets a mechanism layer that operationalizes personalization: diagnosis converts raw speech and text into skill signals; adaptation schedules high-leverage micro-tasks; feedback makes growth paths visible; analytics stabilize pacing and goals. In practice, debates seed the argumentative inventory; AI then targets weak links (tense control, cohesion, warranting), while mobile voice tasks maintain frequency between sessions. This sequencing explains consistent improvements in writing and speaking alongside sustained engagement in bilingual groups working toward Olympiad rubrics [1,2,5,8–10].

The discussion is built around how convincingly the aggregated data from recent years confirm the effectiveness of combining project tasks, debates, and creative writing for English Olympiad preparation in a Montessori-compatible environment and in bilingual groups. The central conclusion is the transfer of argumentative structures between oral and written speech and the steady growth of affective variables (confidence, psychological safety, engagement), which are critical for competitive formats. At the same time, different types of studies provide unevenly substantial grounds for generalization: meta-analytic reviews set the integrative framework of effects, while quasi-experiments and design-based studies locally specify the conditions of application (Cahyono et al., 2024; Kassem, 2021; Shi et al., 2024; Tu, 2021; Zhang et al., 2023; Zhong et al., 2025).

Before moving on to the implications, it is important to emphasize: although project-based learning consistently improves writing and speaking results, the magnitude of the effect is modified by the quality of the tasks (the presence of a "big question"), the degree of student autonomy, the duration of the cycle, the mandatory public defense, as well as the classroom culture and level of psychological safety (Cahyono et al., 2024; Shi et al., 2024; Tu, 2021; Zhang et al., 2023; Zhong et al., 2025). For the Montessori context, an additional enhancer is agency and self-regulation, which the

methodology addresses directly through role-playing and debate practices (Zanchi et al., 2024; Randolph et al., 2023). Next, the key effects and their limits of applicability are correlated (see Table 2).

Table 2. Comparison of the effects of methodologies (debates, projects, creative writing) on key outcomes

Outcome	What the literature reports	Limitations/Applicability boundaries
Oral speech (fluency, coherence, vocabulary)	Increase in scores after debate cycles and project-based speaking tasks; additional benefits from regular public defense and varied use of English	Mostly quasi-experiments; dependence on formative assessment practices and frequency of presentations
Argumentative writing	Significant overall positive effect of project-based learning on writing; transfer of structures from oral practice to essays	Variation in designs, quality of project tasks, and reflective protocols is critical
Self-confidence and reduction of speech anxiety	Improved self-confidence noted through reflection on English variability (World Englishes) and through debates; psychological safety increases engagement	Effects are more potent in groups with a supportive classroom culture; some data are self-reported
Student engagement (behavioral, emotional, cognitive, agentic)	Multidimensional engagement increases with project-debate organization, especially with explicit roles and student voice	Requires consistency and duration; without agency, the effect is short-lived
Technological support (extracurricular speaking tasks)	Speaking applications enhance gains in oral productivity when natural practice is scarce	Requires clear scenarios and feedback; heterogeneity of tools

Source: Cahyono et al., 2024; Kassem 2021; Mingyan et al., 2025; Shi et al., 2024; Tu, 2021; Zhang et al., 2023; Zhong et al., 2025

In light of this convergence of data, the practical value of the methodology for Olympiad preparation is twofold. First, debates provide a safe platform for repeated argumentation logic, facilitating the transition to essays and the oral defense of problem solutions; second, project tasks create a dense context for developing lexico-grammatical accuracy and content coherence. However, transferring this to new cohorts requires considering cultural and organizational factors: if psychological safety is low, learners avoid risk, and argumentation remains superficial (Tu, 2021). Meta-analytic reviews emphasize the need for sufficient cycle duration and student autonomy; if the duration is insufficient, the gains in writing and speaking are diluted and not captured in post-tests (Cahyono et al., 2024; Zhang et al., 2023).

A strong point of the Montessori-compatible implementation is the built-in support for agency, self-regulation, and meaningful choice. This lowers barriers to public speaking and strengthens long-term motivation, which is found in large datasets and recent works on "sensitive periods" (Zanchi et al., 2024; Randolph et al., 2023). For bilingual groups, there is an added effect of "legitimizing" variable English, where accent and non-standard variations of the norm cease to be perceived as deficits, thus reducing anxiety and opening a window for precise work with the argument (Cao et al, 2024). This combination also aligns well with practical results, but to maintain reproducibility, it is important to define the implementation architecture (see Table 3).

Table 3. Implementation parameters associated with improved results, and implementation risks

Parameter	Why it works	Risk if violated	Practical recommendation
Cycle duration (at least one quarter)	Time is required to form arguments and solidify writing genre frameworks; effects accumulate	Short modules give a superficial effect and weak transfer	Plan continuous sprints with intermediate defenses
Public presentation (debates/presentations)	Social validation of the argument and rhetoric training improves the quality of writing and speaking	Motivation decreases without a "stage"; the argument is not refined	Mandatory defense of each project with a debrief
Agency and learner choice	Increases engagement and responsibility for the result	Formal implementation "for show" reduces the effect	Choice of topic/role/format while maintaining clear criteria
Psychological safety	Reduces fear of mistakes, provides space for experimentation	Anxiety blocks participation and development	Introduce interaction norms and reflection after debates
Variability of English (World Englishes)	Normalizes accent/variations, increases willingness to speak	Rigid norms intensify self-criticism	Integrate analysis of global English examples
Technological support for speaking	Increases the frequency of practice outside of class	Without feedback, the effect is unstable	Set up short audio tasks with quick feedback
Inter-genre transitions (oral → writing)	Transfer of argument structures to essays and reverse processing	Isolated teaching of genres slows progress	Express-essay and peer review after debates
Progress monitoring	Makes growth visible, supports motivation	Harder to maintain pace without metrics	Rubrics with criteria and mini-portfolios

Source: Cahyono et al., 2024; Cao et al., 2024; Zanchi et al., 2024; Randolph et al., 2023; Shi et al., 2024; Tu, 2021; Zhang et al., 2023; Zhong et al., 2025

After comparing the implementation parameters, it becomes obvious why the methodology demonstrates a dual-circuit effect: cognitive-communicative (argument structure, accuracy, coherence) and affective (confidence, anxiety reduction, participation stability). The first circuit is supported by meta-analytic results on the impact of projects on writing and general academic achievement (Cahyono et al., 2024; Zhang et al., 2023); the second is supported by research on engagement, safety, and the variability of English (Cao et al., 2024; Tu, 2021; Zhong et al., 2025). As a result, bilingual students develop a mindset for productive risk-taking and the public defense of solutions—competencies directly required by the Olympiad format.

Most of the studies were conducted using quasi-experimental designs with limited randomization and reliance on local contexts; this introduces heterogeneity in the effects and requires careful transfer to new audiences (Kassem, 2021; Shi et al., 2024; Zhong et al., 2025). The contribution of technology to speaking varies depending on the feedback scenarios and the discipline of independent work; therefore, without a methodological framework, the digital component may not provide the expected enhancement (Mingyan et al, 2025). The Montessori approach shows consistent associations with academic and non-academic outcomes; for older cohorts and university groups, the effect depends more on the strictness of implementation of key principles (freedom within structure, prepared environment, observation, and reflection) (Zanchi et al., 2024; Randolph et al., 2023).

In practical terms, this means that when scaling the methodology, it is advisable to: a) maintain sufficient duration of the modules, b) guarantee the public defense of each project, c) institutionalize norms of psychological safety, d) include components of English variability and inter-genre transitions, and e) ensure rapid feedback cycles on oral homework assignments. This configuration is consistent with modern data and increases the likelihood of reproducible results in new groups—from high school seniors to university students preparing for English Olympiads.

CONCLUSION

The effects of the project-debate model were systematized: a steady growth in oral and written speech indicators, the transfer of argumentative structures, and enhanced engagement, provided there is public defense and sufficient cycle duration. The role of AI in personalization was shown: adaptive tasks and automated feedback allow for the targeted elimination of gaps, support the regularity of practice (including extracurricular voice assignments), and increase confidence without overburdening the teacher. The conditions for effectiveness and risks were identified: a prepared environment of psychological safety, learner agency, variability of English, inter-genre transitions ("oral → writing"), as well as transparent assessment criteria and progress monitoring are necessary; the effect weakens if the duration is shortened and the public presentation is formalized. Thus, integrating AI as a personalization layer on top of projects, debates, and creative writing in a Montessori-compatible environment represents a reproducible model for preparing bilingual groups and motivated students for English language Olympiads. The mechanism-level account specifies how AI personalizes English learning: targeted diagnosis, adaptive tasking, rubric-aligned feedback, and progress analytics, with concrete mappings to Olympiad descriptors for grammar, cohesion, argumentation, pronunciation, prosody, and fluency.

REFERENCES

1. Cahyono, B. Y., Irawati, R., Amalia, S. N., & Hidayat, L. E. (2024). Project-based learning in EFL educational settings: A meta-analysis study in EFL/ESL writing. Journal of Writing Research, 16(1), 105–127. https://doi.org/10.17239/jowr-2024.16.01.04
2. Cao, H., Xiao, X., & Yao, C. (2024). Improving EFL learners' self-confidence in English-speaking performance with World Englishes teaching. English Today, 40(4), 283–293. https://doi.org/10.1017/S0266078424000269
3. Kassem, H. M. (2021). Training EFL learners on debating: Effects on their oral and written performance, ideal L2 self, and communication apprehension. Modern Journal, 45(4). https://doi.org/10.61871/mj.v45n4-13
4. Zanchi, P., Mullier, E., Fornari, E., Guerrier de Dumast, P., Alemán-Gómez, Y., Ledoux, J. B., Beaty, R., Hagmann, P., & Denervaud, S. (2024). Differences in spatiotemporal brain network dynamics of Montessori and traditionally schooled students. NPJ Science of Learning, 9(1), 45. https://doi.org/10.1038/s41539-024-00254-6
5. Mingyan, M., Noordin, N., & Razali, A. B. (2025). Improving EFL speaking performance among undergraduate students with an AI-powered mobile app in after-class assignments: An empirical investigation. Humanities and Social Sciences Communications, 12, 370. https://doi.org/10.1057/s41599-025-04688-0
6. Randolph, J. J., Bryson, A., Menon, L., Henderson, D. K., Kureethara Manuel, A., Michaels, S., Rosenstein, D. L. W., McPherson, W., O'Grady, R., & Lillard, A. S. (2023). Montessori education's impact on academic and nonacademic outcomes: A systematic review. Campbell Systematic Reviews, 19(3), e1330. https://doi.org/10.1002/cl2.1330
7. Shi, C., Kassim, A., & Mohd Radzuan, N. R. (2024). [Article title not provided]. Language Teaching Research Quarterly, 42, 126–144. https://doi.org/10.32038/ltrq.2024.42.08
8. Tu, X. (2021). The role of classroom culture and psychological safety in EFL students' engagement. Frontiers in Psychology, 12, 760903. https://doi.org/10.3389/fpsyg.2021.760903
9. Zhang, L., & Ma, Y. (2023). A study of the impact of project-

based learning on student learning effects: A meta-analysis study. Frontiers in Psychology, 14, 1202728. https://doi.org/10.3389/fpsyg.2023.1202728

10. Zhong, J., Ismail, L., & Lin, Y. (2025). Investigating EFL students' engagement in project-based speaking activities: From a multi-dimensional perspective. Frontiers in Psychology, 16, 1598513. https://doi.org/10.3389/fpsyg.2025.1598513