Investigating the Effect of Flipped Classroom on the Anxiety of Iranian English Language Learners

1. Mansour. Faryadi [iD]: Department of English Language Teaching, Ali.C., Islamic Azad University, Aliabad Katoul, Iran

2. Mohammad. Aliakbari [iD]*: Professor, Department of English Language Teaching, University of Ilam, Ilam, Iran. (Email: m.aliakbari@ilam.ac.ir)

3. Seyed Hasan. Seyedrezaei [iD]: Department of English Language Teaching, Ali.C., Islamic Azad University, Aliabad Katoul, Iran

4. Omid. Mazandarani [iD]: Department of English Language Teaching, Ali.C., Islamic Azad University, Aliabad Katoul, Iran

ABSTRACT

The objective of this study was to examine the effect of flipped classroom instruction on reducing speaking anxiety among Iranian learners of English as a foreign language. This study adopted a quantitative mono-method research design using a cross-sectional online survey. The participants consisted of 105 Iranian adult EFL learners aged 18 years and above. Data were collected using a validated questionnaire measuring flipped classroom instructional components, including course content, facilities, lecturer and faculty support, concern for students, social activities, assessment practices, and instructional media, as well as learners' speaking anxiety. Content validity of the instrument was confirmed through expert evaluation using content validity ratio and content validity index procedures, and reliability was established through Cronbach's alpha coefficients exceeding acceptable thresholds. The collected data were analyzed using SPSS software. Descriptive statistics were computed to examine the distributional properties of the variables, and inferential analyses were conducted through multiple regression modeling and analysis of variance. Normality assumptions were verified using the Kolmogorov–Smirnov test, and model adequacy was assessed through R, R^2, F-statistics, Durbin–Watson, and multicollinearity diagnostics. The regression model revealed a strong and statistically significant relationship between flipped classroom instruction and speaking anxiety ($R = 0.915$, $R^2 = 0.837$, $F = 84.09$, $p < .001$). All flipped instructional components demonstrated significant predictive effects on reducing speaking anxiety, with social activities and instructional media exhibiting the strongest standardized coefficients. The results indicate that approximately 84% of the variance in learners' anxiety levels was explained by the flipped classroom model. The findings provide robust empirical evidence that flipped classroom instruction significantly reduces speaking anxiety among Iranian EFL learners by fostering interactive, supportive, and learner-centered classroom environments.

Keywords: Flipped classroom, speaking anxiety, English as a foreign language, learner-centered instruction, educational technology

Introduction

The global expansion of English as an international language has intensified the need for effective pedagogical models that address both linguistic competence and the psychological dimensions of language learning, particularly speaking anxiety among learners of English as a foreign language (EFL). Speaking anxiety remains one of the most persistent barriers to

successful oral communication, frequently undermining learners' confidence, participation, and performance in classroom environments. In many EFL contexts, including Iran, traditional teacher-centered instruction has been insufficient in creating low-anxiety, interactive learning spaces that facilitate meaningful language use. Consequently, contemporary research has increasingly emphasized learner-centered methodologies that promote engagement, autonomy, collaboration, and emotional safety. Among these, the flipped classroom has emerged as a prominent instructional model with substantial promise for transforming language learning experiences and alleviating learners' affective barriers (1-3).

The flipped classroom reverses the conventional sequence of instruction by shifting direct content delivery outside the classroom—often through video lectures or digital materials—while devoting in-class time to interactive activities, collaborative problem-solving, and personalized feedback. This pedagogical inversion allows instructors to serve as facilitators rather than lecturers and enables learners to engage actively with course content and peers. Meta-analytical evidence confirms that flipped learning significantly enhances student satisfaction, instructional effectiveness, and academic outcomes across disciplines (4, 5). In language education specifically, the model has been linked to increased learner engagement, improved communication skills, and heightened motivation (6-8). Such findings underscore the potential of flipped instruction to address persistent challenges in EFL pedagogy, particularly those related to speaking performance and anxiety.

Learner engagement constitutes a central mechanism through which flipped instruction exerts its pedagogical impact. Engagement in the flipped foreign language classroom encompasses behavioral, emotional, cognitive, and social dimensions, all of which are essential for meaningful language acquisition (6). By allocating classroom time to communicative practice and peer interaction, flipped instruction strengthens learners' emotional involvement and sense of belonging, factors that are critical for reducing anxiety and fostering communicative confidence. Empirical investigations demonstrate that EFL learners participating in flipped classrooms exhibit higher levels of engagement, participation, and persistence compared with those in traditional learning environments (9-11). Moreover, during the COVID-19 pandemic, flipped learning proved particularly effective in maintaining instructional continuity and learner interaction within online and hybrid learning contexts (10, 12).

Foreign language speaking anxiety is widely recognized as a multifaceted construct encompassing communication apprehension, fear of negative evaluation, and test anxiety. This anxiety disrupts cognitive processing, limits working memory, and restricts learners' willingness to communicate. Psychological research indicates that anxiety episodes often arise when learners perceive communicative tasks as threatening or beyond their perceived competence (13). In EFL classrooms, anxiety is intensified by limited exposure to authentic language use, rigid instructional formats, and fear of peer judgment. Without targeted pedagogical intervention, speaking anxiety can severely impair learners' oral proficiency development and long-term motivation.

The flipped classroom offers several structural features that directly counteract these anxiety-provoking conditions. First, pre-class exposure to learning materials allows learners to process content at their own pace, reducing cognitive overload and increasing self-efficacy prior to in-class communication (14, 15). Second, classroom activities emphasize collaborative learning, peer interaction, and formative feedback, which collectively cultivate psychological safety and social support. Third, instructors can provide individualized scaffolding and immediate feedback during in-class practice, further reinforcing learners' confidence and reducing uncertainty. Empirical studies confirm that flipped classrooms significantly reduce both general foreign language anxiety and specific speaking anxiety among EFL learners (9, 16).

Technological integration plays a pivotal role in maximizing the benefits of flipped instruction. Advances in educational technology have expanded the range of digital tools available for pre-class preparation and in-class engagement, including learning management systems, videoconferencing platforms, and artificial intelligence-driven applications. Authentic videoconferencing, for example, has been shown to substantially enhance speaking skills by exposing learners to real-time

communicative contexts and reducing performance anxiety (8). More recently, AI-supported chatbots embedded within flipped classrooms have demonstrated significant effectiveness in improving students' speaking competence and confidence by providing low-pressure practice opportunities and immediate feedback (16). Similarly, augmented reality applications in flipped environments have produced notable gains in vocabulary acquisition and retention, reinforcing learners' sense of control and reducing learning anxiety (17).

The instructional design of flipped classrooms further contributes to their anxiety-reducing potential. Structured design frameworks such as ADDIE enable instructors to systematically align learning objectives, materials, activities, and assessments in ways that support gradual skill development and emotional comfort. In medical education and language learning contexts alike, ADDIE-based flipped instruction has yielded superior learning outcomes and heightened learner satisfaction (18, 19). Moreover, problem-based and inquiry-oriented flipped models have been shown to enhance learners' autonomy, self-regulation, and resilience—psychological attributes that buffer against anxiety (14, 15).

Despite the growing body of international research on flipped instruction, important contextual gaps remain. Much of the existing literature has focused on higher education settings in Western or East Asian contexts, with comparatively limited empirical investigation in Middle Eastern and Iranian EFL environments. Readiness studies in pre-university and matriculation programs indicate that both students and teachers generally express positive attitudes toward flipped learning but require institutional support and pedagogical training for effective implementation (20). In Iranian EFL settings specifically, cultural norms, examination pressures, and limited communicative exposure intensify speaking anxiety, making this context particularly suitable for evaluating the affective impact of flipped instruction.

Furthermore, while systematic reviews and meta-analyses confirm the overall effectiveness of flipped classrooms in improving academic achievement and engagement (4, 5), fewer studies have isolated their direct impact on emotional variables such as anxiety, especially among adult EFL learners. Recent work, however, provides compelling evidence that flipped instruction not only enhances learning performance but also reshapes learners' emotional experiences by reducing stress, increasing motivation, and strengthening social connectedness (19, 21, 22). These affective benefits are crucial for sustaining long-term language learning success.

From a theoretical perspective, the flipped classroom aligns with socio-constructivist and affective learning theories, which emphasize the centrality of interaction, scaffolding, and emotional regulation in cognitive development. By decentralizing authority and redistributing cognitive load, flipped instruction creates a participatory learning ecology where learners co-construct knowledge and develop emotional resilience. The reduction of speaking anxiety emerges not merely as a by-product but as a core outcome of this pedagogical transformation. In this sense, flipped instruction serves as both a cognitive and affective intervention.

Recent developments further reinforce the strategic importance of this model. During global educational disruptions and the rapid expansion of hybrid learning, flipped classrooms proved instrumental in maintaining instructional quality and learner engagement (10, 12). Their adaptability, scalability, and compatibility with digital innovation position them as a cornerstone of future language education. Moreover, the integration of emerging technologies such as artificial intelligence, learning analytics, and immersive media continues to enhance the capacity of flipped environments to personalize learning and support learners' emotional well-being (16, 17, 21).

In light of these considerations, the present study responds to an urgent pedagogical and psychological need within the Iranian EFL context. While previous investigations have demonstrated the instructional benefits of flipped classrooms, empirical evidence on their role in alleviating speaking anxiety among Iranian adult learners remains limited. Addressing this

gap is essential for informing curriculum design, teacher training, and educational policy aimed at fostering communicative competence and emotional health among language learners.

Accordingly, the aim of this study is to investigate the effect of flipped classroom instruction on reducing speaking anxiety among Iranian learners of English as a foreign language.

Methods and Materials

The present study employed a quantitative mono-method research design to examine the effect of flipped classroom instruction on speaking anxiety among Iranian learners of English as a foreign language. The methodological approach was selected in order to generate objective, measurable evidence regarding the relationships between instructional variables and learners' anxiety outcomes within a structured analytical framework. The research adopted a cross-sectional survey design, utilizing a single data collection strategy administered through an online platform. This design allowed for efficient access to participants, standardized data acquisition, and the collection of reliable responses within a naturalistic educational setting.

The target population consisted of adult EFL learners aged 18 years and above who were enrolled in English language programs. A total of 105 participants completed the survey and constituted the final sample for analysis. Participants were recruited through educational institutions and online academic networks and participated voluntarily. The sample included learners from different educational levels and academic backgrounds, thereby enhancing the representativeness of the dataset. Ethical considerations were observed throughout the research process, including informed consent, anonymity, and confidentiality of responses. Participation was entirely voluntary, and respondents were free to withdraw at any stage of the data collection process.

Data were collected using a structured online questionnaire developed specifically for this study. The instrument was designed to measure two principal constructs: flipped classroom instruction and speaking anxiety. The flipped instruction construct consisted of multiple dimensions including course content, facilities, lecturer and faculty support, concern for students, social activities, assessment practices, and instructional media. Speaking anxiety was measured as the dependent variable, reflecting learners' perceived emotional discomfort and apprehension associated with oral communication in the English language classroom. All questionnaire items were formatted on a Likert-type scale, allowing for quantitative analysis of participants' perceptions.

Prior to full-scale data collection, the content validity of the instrument was evaluated by a panel of ten experts in the fields of educational psychology, applied linguistics, and instructional design. The experts reviewed the relevance, clarity, and necessity of each questionnaire item. Content validity ratio (CVR) was calculated for each construct using the formula CVR = (NE – N/2) / (N/2), where NE represented the number of experts who rated an item as essential and N represented the total number of experts. Based on Lawshe's criterion for ten experts, the minimum acceptable CVR value was 0.62. The obtained CVR values were 0.666 for the flipped instruction construct and 0.680 for the speaking anxiety construct, exceeding the required threshold. In addition, content validity index (CVI) values were computed by averaging the relevance, clarity, and simplicity ratings across items. The resulting CVI values of 0.794 for flipped instruction and 0.800 for anxiety surpassed the minimum acceptable criterion of 0.79, indicating satisfactory content validity.

Construct validity was further supported through convergence indicators. Average variance extracted and composite reliability values exceeded the acceptable benchmark of 0.50, confirming adequate convergent validity. Reliability analysis using Cronbach's alpha demonstrated strong internal consistency for all measurement scales, with coefficients exceeding the standard threshold of 0.70, thereby confirming the stability and consistency of the measurement instrument.

Following data collection, responses were coded and entered into the Statistical Package for the Social Sciences (SPSS) software for analysis. Both descriptive and inferential statistical techniques were employed to analyze the data. Descriptive statistics, including means, standard deviations, skewness, and kurtosis, were computed to summarize the central tendencies and distributional properties of the study variables. These preliminary analyses ensured that the dataset met the assumptions required for subsequent inferential testing.

Normality of data distribution was examined using the Kolmogorov–Smirnov test. The results indicated that all variables satisfied normality assumptions, allowing for the application of parametric statistical procedures. Multiple regression analysis was conducted to evaluate the predictive relationship between flipped instructional components and speaking anxiety. The regression model assessed the combined and individual effects of course content, facilities, lecturer and faculty support, concern for students, social activities, assessment practices, and instructional media on learners' anxiety levels.

Model fitness was evaluated using R, R^2, adjusted R^2, the F-test from ANOVA, and the Durbin–Watson statistic. Multicollinearity diagnostics were examined using tolerance and variance inflation factor values to ensure that the independent variables were not excessively correlated. All statistical decisions were made using a significance level of 0.05. Through this rigorous analytical framework, the study was able to generate robust evidence regarding the effectiveness of flipped classroom instruction in reducing speaking anxiety among Iranian EFL learners.

Findings and Results

Demographically, the highest number of frequencies with a value of 73 people belongs to women. This shows that most of the respondents were women. Based on the results, it can be seen that most of the respondents were between 30 and 40 years of age, and the least number of respondents were above 40. Furthermore, the highest frequency was obtained by doctoral students, numbering 46 among the respondents, and the lowest frequency belonged to high school.

Table 1. Descriptive Statistics of Study Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
Anxiety	105	2.41	4.00	3.47	0.43	-0.53	-0.76
Course Content	105	2.00	4.00	3.35	0.60	-0.50	-0.95
Facilities	105	2.16	3.83	3.27	0.42	-0.31	-0.71
Lecturer & Faculty	105	2.00	4.00	3.31	0.57	-0.52	-0.71
Social Activities	105	2.00	4.00	3.48	0.79	-1.07	-0.59
Concern for Student	105	1.50	4.00	3.30	0.81	-0.76	-0.96
Assessment	105	1.00	3.33	2.34	0.75	-0.10	-1.40
Instruction Medium	105	2.00	4.00	3.47	0.79	-1.05	-0.61

Table 1 presents the descriptive statistics for all study variables. All variables exhibit mean values above the scale midpoint, with anxiety (M = 3.47), social activities (M = 3.48), and instruction medium (M = 3.47) obtaining the highest averages, indicating generally favorable perceptions among participants. Standard deviation values indicate moderate dispersion, with the highest variability observed in concern for student (SD = 0.81) and social activities (SD = 0.79). Skewness and kurtosis values for all variables fall within acceptable normality thresholds (±3), confirming that the data distribution for each construct is approximately normal and appropriate for parametric analysis.

Table 2. Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin–Watson
1	0.915	0.837	0.827	0.332	2.57

Table 2 summarizes the overall regression model assessing the effect of flipped classroom instruction on speaking anxiety. The correlation coefficient (R = 0.915) indicates a very strong relationship between the predictor variables and anxiety. The coefficient of determination (R^2 = 0.837) shows that approximately 83.7% of the variance in learners' anxiety is explained by the flipped instructional components included in the model. The adjusted R^2 (0.827) confirms the stability of this explanatory power. The Durbin–Watson statistic (2.57) falls within the acceptable range (1.5–2.5), indicating no serious autocorrelation among residuals and confirming the adequacy of the model.

Table 3. Analysis of Variance (ANOVA) for Regression Model

Model	Source	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	55.652	6	9.275	84.09	.000
	Residual	10.810	98	0.110		
	Total	66.462	104			

The ANOVA results presented in Table 3 confirm the statistical significance of the regression model. The obtained F-value (F = 84.09, p < .001) indicates that the set of independent variables collectively explains a significant portion of the variance in speaking anxiety. The extremely low significance level demonstrates that the model provides a strong fit to the data and that flipped instructional components exert a meaningful effect on learners' anxiety outcomes.
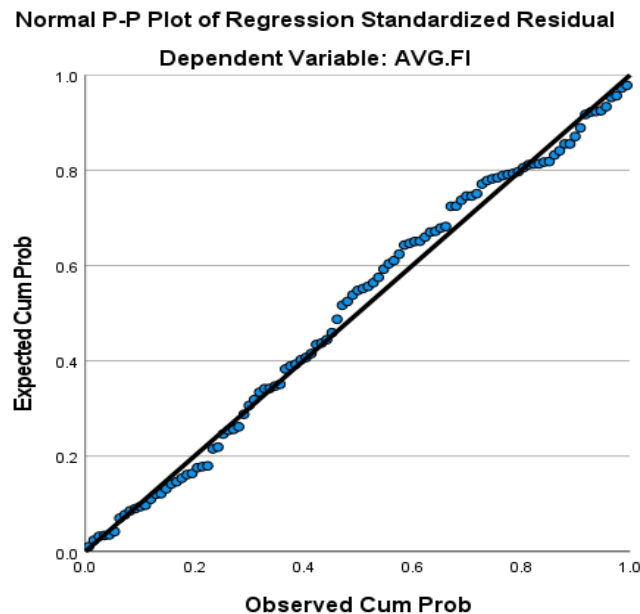

Figure 1- Regression Standardized Residual

Discussion and Conclusion

The present study examined the impact of flipped classroom instruction on speaking anxiety among Iranian learners of English as a foreign language. The statistical results provide compelling evidence in support of the research hypothesis, demonstrating that flipped instruction exerts a strong and significant effect on reducing learners' anxiety. The regression analysis revealed a substantial relationship between flipped instructional components and learners' speaking anxiety (R = 0.915, R^2 = 0.837), indicating that approximately 84% of the variance in anxiety reduction can be explained by features of the flipped classroom model. The ANOVA results further confirmed the model's significance (F = 84.09, p < .001), while the coefficient analysis showed that all instructional components—course content, facilities, lecturer and faculty support, concern for students, social activities, assessment practices, and instructional media—made statistically significant contributions to lowering

speaking anxiety. These findings provide strong empirical support for the pedagogical and affective value of flipped learning in the Iranian EFL context.

Among the instructional components, social activities and instructional media demonstrated particularly strong standardized effects. This pattern suggests that opportunities for interaction, collaboration, and multimodal engagement play a decisive role in alleviating speaking anxiety. These results are highly consistent with the theoretical assumptions of flipped learning, which emphasize learner engagement, interaction, and autonomy as central mechanisms of effective instruction (1, 6). By shifting the delivery of core content to pre-class environments and dedicating classroom time to communicative practice, the flipped model transforms the classroom into a psychologically supportive learning space. Such an environment allows learners to rehearse language use in low-threat contexts, receive immediate feedback, and develop communicative confidence, thereby directly addressing the emotional barriers that typically inhibit oral performance.

The observed reduction in speaking anxiety corroborates prior findings that flipped instruction can significantly lower foreign language classroom anxiety. Gok and colleagues found that learners exposed to online flipped instruction exhibited lower levels of both general language anxiety and reading anxiety, attributing these outcomes to increased learner control, interaction, and preparation (9). Similarly, the present study's results demonstrate that learners who engage with instructional materials before class and participate in structured in-class activities experience reduced apprehension and greater emotional stability. This convergence of evidence reinforces the notion that anxiety reduction is not incidental but rather a core outcome of flipped pedagogy.

The strong contribution of course content to anxiety reduction highlights the importance of well-designed instructional materials in the flipped environment. When learners can access content at their own pace prior to class, they experience greater cognitive clarity and preparedness, which diminishes fear of failure and performance pressure. This finding aligns with research showing that carefully structured flipped content promotes learner autonomy and self-regulation, both of which are essential for emotional resilience in language learning (14, 15). Learners who feel cognitively prepared are more willing to take communicative risks, thereby weakening the anxiety-performance cycle that often constrains speaking development.

Instructor support and concern for students also emerged as significant predictors of anxiety reduction. These results underscore the affective dimension of teacher presence in flipped classrooms. When instructors function as facilitators rather than lecturers, they are better positioned to offer individualized guidance, reassurance, and emotional support during in-class activities. Prior studies have emphasized that the instructor's role in scaffolding learner participation and fostering psychological safety is critical for sustaining engagement and reducing anxiety (2, 4). The present findings affirm that emotional climate is not peripheral but fundamental to the effectiveness of flipped learning in EFL contexts.

The importance of facilities and instructional media further illustrates the technological dimension of anxiety reduction. Modern learning environments equipped with appropriate technological resources enable diverse modes of participation, reduce performance pressure, and create alternative pathways for expression. Ibrahim and Hashim demonstrated that authentic videoconferencing significantly enhances speaking skills while simultaneously reducing learner anxiety by providing meaningful communicative experiences in supportive settings (8). More recently, AI-supported instructional tools integrated into flipped classrooms have been shown to substantially improve learners' speaking competence and confidence (16). The present study's findings are fully consistent with this growing body of evidence, confirming that technology-mediated engagement plays a central role in shaping learners' emotional experiences.

Assessment practices also contributed significantly to anxiety reduction. This finding reflects the influence of formative, process-oriented assessment within flipped classrooms, where learners receive continuous feedback and opportunities for improvement rather than being judged solely on high-stakes performance. Such assessment practices reduce fear of negative

evaluation, one of the primary components of speaking anxiety. Research indicates that learner-centered assessment structures in flipped environments enhance motivation and psychological well-being (19, 22). The present results confirm that assessment reform is a key pathway through which flipped instruction supports emotional stability.

From a broader perspective, these findings reinforce the conceptualization of flipped learning as both a pedagogical and psychological intervention. Flipped classrooms not only restructure the flow of instruction but also reshape learners' emotional relationship with language learning. By cultivating autonomy, social connection, and emotional safety, flipped instruction disrupts the anxiety–avoidance cycle that frequently undermines speaking development. This interpretation is further supported by recent studies demonstrating that flipped learning enhances motivation, engagement, and overall learning performance while simultaneously improving emotional outcomes (10, 12, 21).

Importantly, the present study extends the international literature by providing robust empirical evidence from the Iranian EFL context, where speaking anxiety remains a persistent challenge. While previous studies have documented the instructional benefits of flipped learning across diverse educational systems (3, 5, 11), fewer investigations have examined its affective impact within Middle Eastern settings. The current findings therefore contribute valuable context-specific insights and underscore the universal relevance of flipped pedagogy for addressing emotional barriers in language education.

Despite its contributions, the present study is subject to several limitations. The sample size, although adequate for statistical analysis, was limited to adult learners from a single regional context, which may restrict the generalizability of the findings. Additionally, the reliance on self-report measures of anxiety may introduce response bias, as learners' perceptions of anxiety can be influenced by social desirability or temporary emotional states. The cross-sectional design also precludes conclusions regarding long-term effects of flipped instruction on anxiety reduction.

Future studies should employ longitudinal designs to examine the sustained impact of flipped classrooms on speaking anxiety and communicative competence over time. Comparative investigations across educational levels, proficiency groups, and cultural contexts would further clarify the generalizability of the model. Incorporating qualitative methods such as interviews and classroom observations could provide deeper insight into learners' emotional experiences and the specific classroom dynamics that facilitate anxiety reduction.

Language educators are encouraged to adopt flipped classroom models as a systematic strategy for reducing speaking anxiety and enhancing communicative engagement. Teacher training programs should emphasize the affective dimensions of instruction and equip instructors with the skills needed to design supportive flipped environments. Educational institutions should invest in technological infrastructure and flexible assessment practices that align with learner-centered, anxiety-reducing pedagogies.

Acknowledgments

We would like to express our appreciation and gratitude to all those who helped us carrying out this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adhered in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

References

1.   Santos AI, Serpa S. Flipped classroom for an active learning. Journal of Education and E-Learning Research. 2020;7(2):167-73. doi: 10.20448/journal.509.2020.72.167.173.

2.   Zain FM, Sailin SN. Students' experience with flipped learning approach in higher education. Universal Journal of Educational Research. 2020. doi: 10.13189/ujer.2020.081067.

3.   Tsai HL, Wu JF. Bibliometric analysis of flipped classroom publications from the Web of Science Core Collection published from 2000 to 2019. Science Editing. 2020;7(2):163-8. doi: 10.6087/kcse.212.

4.   Strelan P, Osborn A, Palmer E. Student satisfaction with courses and instructors in a flipped classroom: A meta-analysis. Journal of Computer Assisted Learning. 2020;36(3):295-314. doi: 10.1111/jcal.12421.

5.   Turan Z. Evaluating Whether Flipped Classrooms Improve Student Learning in Science Education: A Systematic Review and Meta-Analysis. Scandinavian Journal of Educational Research. 2023;67(1):1-19. doi: 10.1080/00313831.2021.1983868.

6.   Li Z, Li J. Learner engagement in the flipped foreign language classroom: Definitions, debates, and directions of future research. Frontiers in Psychology. 2022;13:810701. doi: 10.3389/fpsyg.2022.810701.

7.   Cheng X, Zhang LJ. Teacher written feedback on English as a foreign language learners' writing: Examining native and nonnative English-speaking teachers' practices in feedback provision. Frontiers in Psychology. 2021;12:629921. doi: 10.3389/fpsyg.2021.629921.

8.   Ibrahim SKS, Hashim H. Enhancing English as a second language learners' speaking skills through authentic videoconferencing. Creative Education. 2021;12(3):545. doi: 10.4236/ce.2021.123037.

9.   Gok D, Bozoglan H, Bozoglan B. Effects of online flipped classroom on foreign language classroom anxiety and reading anxiety. Computer Assisted Language Learning. 2023;36(4):840-60. doi: 10.1080/09588221.2021.1950191.

10.   Tang T, Abuhmaid AM, Olaimat M, Oudat DM, Aldhaeebi M, Bamanger E. Efficiency of flipped classroom with online-based teaching under COVID-19. Interactive Learning Environments. 2023;31(2):1077-88. doi: 10.1080/10494820.2020.1817761.

11.   Hilal TA, Hoshang S, Hilal HA. The Flipped Classroom Opportunities within The Hybrid Learning Approach in the UAE. Journal of Ubiquitous Systems and Pervasive Networks. 2022;16(1):29-35. doi: 10.5383/JUSPN.16.01.004.

12.   Divjak B, Rienties B, Iniesto F, Vondra P, Žižak M. Flipped classrooms in higher education during the COVID-19 pandemic: findings and future research recommendations. International Journal of Educational Technology in Higher Education. 2022;19(1):9. doi: 10.1186/s41239-021-00316-4.

13.   Orson CN, Larson RW. Helping teens overcome anxiety episodes in project work: The power of reframing. Journal of Adolescent Research. 2021;36(2):127-53. doi: 10.1177/0743558420913480.

14.   Soleymani S, Aliabadi K, Zavaraki EZ, Delavar A. Designing and Validating a Flipped Learning Pattern to Enhance Problem-Based Teaching in Higher Education Instructors for Teaching the English Language. Journal of Modern Research in English Language Studies. 2022;9(3):73-100.

15.   Mashhadi J. Investigating the Efficacy of Flipped Learning on Autonomy and Skill-Learning of Iranian EFL Learners. Journal of English Language Teaching and Learning. 2022;14(30):137-48.

16.   Setyoningrum TY, Susanto DA, Setiaji A. Impacting Artificial Intelligent Chatbot in Flipped Classroom to Enhance Students' Speaking Competence. Aree. 2025;3(1):8. doi: 10.26714/aree.3.1.2025.8-25.

17.   Khodabandeh F. Enhancing Vocabulary Learning and Retention in EFL Students: A Comparative Study of ARLOOPA Augmented Reality App in Flipped Online and Flipped Face-to-Face Classes. Educational Technology Research and Development. 2025:1-19. doi: 10.1007/s11423-025-10489-8.

18.   Zhang J, Chen H, Wang X, Xie D. Application of Flipped Classroom Teaching Method Based on ADDIE Concept in Clinical Teaching for Neurology Residents. BMC Medical Education. 2024;24(1). doi: 10.1186/s12909-024-05343-z.

19.   Krishnian MB, Por FP, Prasath MR, Goyal SB, Verma C, Singh PK. Exploring the Impact of a 5E-Flipped Learning Environment on Students' Learning Motivation: A Case Study of Medical Assistant Education. Data Science and Artificial Intelligence for Digital Healthcare: Communications Technologies for Epidemic Models. Cham: Springer International Publishing; 2024. p. 213-36.

20.   Shaari F, Kamsin IF. Quantitative Analysis of Students and Teachers Readiness for Flipped Classroom in Matriculation. International Journal of Academic Research in Business and Social Sciences. 2024;14(5). doi: 10.6007/ijarbss/v14-i5/21724.

21.   Gao J, Keong TC, Madjapuni MN, Hu P. Factors Predicting Learning Performance in Flipped Classroom:A Survey Study Based on RCoI Framework. Interciencia. 2025. doi: 10.59671/kcucp.

22.   Travis R. Student perceptions toward flipped learning: new methods to increase interaction and active learning in economics. 2024.