Developing an AI-Driven Contextualized Short Video Learning System for EFL Speaking and Writing

Chang, Hsin-Wei
Graduate Institute of Network Learning Technology
National Central University
Taoyuan, Taiwan
astrochwwei@gmail.com

Liu, Yi-Fan
Research Center for Testing and Assessment
National Academy for Educational Research
New Taipei, Taiwan
yifan.liu.tw@gmail.com

Hwang, Wu-Yuin
Department of Computer Science and Information Engineering,
National Dong Hwa University,
Hualien, Taiwan
wyhwang1206@gmail.com

Chen, Wei-Chia
Graduate Institute of Network Learning Technology
National Central University
Taoyuan, Taiwan
hemen.cort@gmail.com

***Abstract*—Situated learning underscores the significance of authentic contexts in language acquisition, yet traditional classroom settings often lack real-world engagement, thereby constraining learning outcomes. Emerging technologies, particularly smart mobile devices and AI-driven tools, present promising solutions to these challenges. Notably, short video platforms and GPT-enabled chatbots have demonstrated their efficacy in enhancing practical language application. To address these issues, this study introduces ClipTalk, an innovative learning system designed to enhance EFL learners' speaking and writing proficiency through real-world video production tasks and AI-driven feedback. By integrating video-to-text recognition (VTR), peer video engagement, and intelligent contextual chatbots, ClipTalk cultivates an interactive and meaningful learning environment. This study recruited 45 seventh graders who participated in an eight-week experimental study assessing the system's impact on writing and speaking proficiency. The findings revealed significant improvements in EFL writing and speaking skills, with students expressing positive feedback regarding the system's usefulness, ease of use, and their behavioral intention to continue using it. Consequently, this study establishes ClipTalk as an effective pedagogical tool for fostering EFL learners' language skills. By seamlessly integrating advanced technology with real-world video tasks, the system creates an engaging and interactive learning experience, thereby bridging the gap between theoretical learning and practical application.**

Keywords—Situated learning, VTR, GPT, Chatbot, EFL

I. INTRODUCTION

The theory of situated learning provides a critical theoretical framework for language acquisition, emphasizing that learning should take place within authentic language use contexts to optimize learning outcomes [1]. However, traditional classroom settings often isolate knowledge acquisition from real-world applications, a phenomenon frequently observed in foreign language instruction [2]. Research has demonstrated that within situated learning environments, students engage more actively and reflectively in the foreign language writing process, leading to improved writing proficiency [3]. The significance of situated learning in English language acquisition has been extensively recognized for its role in enhancing learning performance [4].

In recent years, the rapid advancement of mobile technologies has enabled learners to engage with English in authentic or simulated environments, thereby further enhancing learning effectiveness [5]. With technological progress, researchers and educators have explored innovative pedagogical approaches and technology-assisted language learning strategies to address these challenges. Smart mobile devices, offering anytime-anywhere learning capabilities, have emerged as promising solutions for overcoming the difficulties faced by EFL learners. For instance, Muhammed [6] demonstrated that smart mobile devices significantly improve learners' language proficiency, grammar, and vocabulary while also boosting their motivation to learn. Similarly, mobile-assisted learning tools could effectively enhance learners' performance and willingness to participate in learning activities [7].

Beyond mobile learning applications, authentic contextual learning approaches have demonstrated potential in strengthening learners' ability to apply language skills in real-world scenarios. Integrating English learning activities into real-life contexts could significantly fosters the practical application of acquired knowledge, thereby improving learning outcomes [8]. Additionally, short video platforms have become a key source of knowledge acquisition for younger learners. According to a recent research [9] ,short videos with their vivid and intuitive presentations could enhance learners' motivation and comprehension. Teng, Heydarnejad, Hasan, Omar and Sarabani [10] also reported notable improvements in language proficiency when learners engaged in grammar-learning tasks via social media platforms such as Instagram.

Moreover, the emergence of GPT technology has introduced novel opportunities for English learning. Liu, Darvin, and Ma [11] demonstrated that GPT-enabled intelligent conversational chatbots facilitate interactive language practice, significantly improving learners' linguistic expression and confidence. The advanced natural language generation capabilities of GPT make it a powerful tool for supporting EFL learning.

To address these challenges, this study developed "ClipTalk," an innovative learning system, designed to overcome the scarcity of writing and speaking practice opportunities for EFL learners. ClipTalk integrates real-world video production tasks with intelligent feedback mechanisms to create an interactive learning environment, offering learners a more meaningful and contextualized writing and speaking practice experience. The instructional design adopts a step-by-step learning approach, encompassing authentic context exploration via VTR, peer video viewing and practice, and interaction with an intelligent contextual chatbot.

II. SYSTEM DESIGN FRAMEWORK

The system design of this study is illustrated in Table I. It begins with authentic context exploration aimed at helping

2025 IEEE International Conference on Advanced Learning Technologies (ICALT) | 979-8-3315-6530-5/25/$31.00 ©2025 IEEE | DOI: 10.1109/ICALT64023.2025.00048

2161-377X/25/$31.00 ©2025 IEEE
DOI 10.1109/ICALT64023.2025.00048

participants, who were 7th grader during experiment, familiarize with vocabulary, phrases, and sentences related to the real world context. Throughout this phase, learners take short video and acquire contextual vocabulary by VTR, and the system further provides phrases and sentences generated by GPT based on the VTR vocabulary. Following by that, learner wrote descriptive sentence as video narratives based on the picture taken with grammar-checking mechanism and automatic speaking scoring for speaking exercises.

Next, learners expand their learning of contextual English though viewing and practicing contextual video created by their peers . Through these contextual videos, learners are encouraged to enhance their English learning in various real life contexts.

TABLE I. SYSTEM DESIGN FRAMEWORK

Activity	Content
Authentic context exploration with VTR	Through the process of creating contextual videos, learners engage in exploring their environment by their perference while acquiring vocabulary and sentences relevant to the context assisted by VTR-generated contextual vocabulary and GPT-generated phrases and sentences based on the VTR content. With the assistance of VTR and GPT, learners further take it as reference to write narratives based on the video content, The system offers grammar-checking mechanisms, which provides learners with grammar guidence. Additionally, learners are required to practice speaking with the sentences they compose with intant feedback of real-time automatic speaking scoring.
Peer video viewing and practicing	Peer video viewing and practicing allows learners to acquire additional contextual English relevant to everyday life and expand their knowledge though videos created by their peers. At this phrase, learners select videos based on their personal preferences, and they watch the videos along with the narratives created by their peers and practice speaking skills with their peers' work.
Intelligent contextual chatbot	In the activity of intelligent contextual chatbot, learners engage in dialogue practice with an intelligent contextual chatbot.The system generates questions based on the context of the videos and VTR vocabulary with scenario-based prompts that adjust in complexity based on the learner's proficiency level in order to deepen their understanding and retention of English. It also provides grammar suggestions based on the learners' responses, offering instant feedback to improve their writing skills. Additionally, learners are required to practice speaking by responding to the chatbot, which enhances memory retention and improves their speaking proficiency.

Finally, learners engage in conversation practice with an intelligent contextual chatbot. The chatbot generates conversations based on the VTR contextual vocabulary that guides learners through dialogue by posing questions aligned with the video scenarios. Moreover, learners practice their speaking skills by responding to the chatbot's dialogue content, thereby enhancing their English conversational and speaking proficiency.

III. METHOD

This study recruited 45 seventh-grade students, aged 13–14 years, from a junior high school classes in Taiwan. To investigate the differences in learning outcomes, the two classes were randomly selected for participation in the experiment. The Experimental Group (EG, N=23) engaged in context-based learning and used the developed system "ClipTalk" with authentic context exploration with VTR with teacher as facilitator to monitor their learning progress on the system. Control Group (CG, N=22) did not use the developed system in their English learning; instead, they learned English through traditional classroom instruction. The EG interacted with the ClipTalk, which facilitated authentic context learning and offered smart feedback, while CG kept conventional classroom-based English learning methodologies. Detailed experiment procedure is presented in Fig. 1.

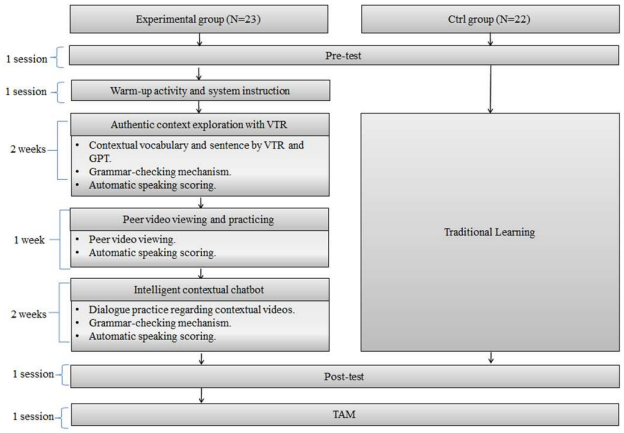

Fig. 1. Experiment procedure

The activities designed in this study were conducted in 8 weeks. One class were held each week, and each class lasted for 45 minutes. Students completed a pretest comprising writing and speaking components in the first week. The writing test contained fill-in-the-blank and multiple-choice questions to assess the students' vocabulary, grammar, and sentence writing. To be specific, there are four test items including Vocabulary, Fill-in-the-Blank Grammar Multiple Choice, Dialogue Multiple Choice and Sentence writing. As for the speaking test comprised vocabulary, short sentences, and dialogue to assess pronunciation and speaking ability. The content of test items corresponds to students' level of English proficiency.

Warm-up activities were held and system instructions were provided to the EG in two sessions that lasted for approximately 1 hours. The ClipTalk learning systems were described to the EG. Following by that, EG conducted authentic context exploration with VTR activity, and the contextual exploration was held in both inside and outside the classroom. The EG received contextualized vocabularies and sentence generated by VTR and GPT to assist learners writing their own narratives of the video taken by themselves as illustrated in Fig. 2. When practicing their sentence writing and speaking in English, the system provides instant feedback including grammar checking and error correction and real-time automatic speaking scoring which could motivate them to repeat practice and enhance their

understanding of contextual vocabulary and sentence as illustrated in Fig. 3.

In the activity of peer video viewing and practicing, learner selected videoes created by their peers according to their preference. That is, learners can practice not only their own videoes and narratives but also extend their learning by engaging in viewing videos and narritives created by others as presented in Fig. 4

Next, learners selected videoes based on their preference to have dialogue practice with the intelligent contextual chatbot. The chatbot utilizes VTR vocabulary as keywords to initiate the dialogue as presented in Fig. 5.

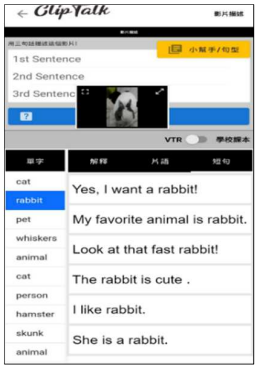

Fig. 2. VTR and GPT assistance

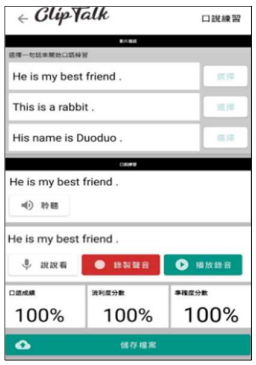

Fig. 3. Instant feedback

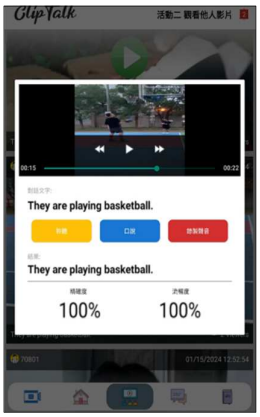

Fig. 4. Peer video viewing and practicing

Fig. 5. Inteligent contextual chatbot

Finally, both groups were asked to complete writing and speaking tests to assess the effects of the experimental activities on their English skills. The test formats and difficulty level were the same as those of the pretest. Only students EG was required to fill in the questionnaire to know their perception toward ClipTalk.

The collected data were subjected to statistical analyses, which involved independent t-test and the calculation of Pearson correlation coefficients.

IV. Result and Discussion

This section examines the impact of ClipTalk on writing and speaking proficiency by analyzing the study's findings. The analysis explores how key features of ClipTalk influence EFL learners' performance, alongside their perceptions of the system. Improvements in writing and speaking proficiency are assessed through analysis of independent t-test of posttest scores between EG and CG, supported by statistical evidence to evaluate the system's effectiveness in enhancing English writing and speaking skills. Moreover, the findings are analyzed in relation to existing research, highlighting the contribution of the developed system to language learning, with a particular focus on the features to enhance learning effectiveness.

TABLE II. Analysis of Student's t-test of Posttest

	Group	N	Mean	Std. Dev.	F	Sig. (2-tailed)
Writing	EG	23	73.34	19.863	1.248	.027
	CG	22	58.86	23.761		
Speaking	EG	23	76.78	20.385	5.850	.021
	CG	22	57.45	32.748		

To investigate the differences in learning outcomes among the two research groups, an intendant t-test was conducted. The pre-test scores of the EG and CG showed no significant differences, indicating that the two groups had comparable proficiency levels before the experiment. Specifically, the total pre-test written scores between the two groups is $p=.601$($F=.437$, $p > .05$), and the total pre-test speaking scores yielded $p=.998$ ($F=.244$, $p>.05$), neither of which reached statistical significance. As shown in the analysis results in Table II, there was a significant difference between two groups in the post-test written scores($F = 1.248$, $p < .05$). This finding is likely attributable to the diverse AI-enhanced learning features provided by the ClipTalk system, including VTR contextual vocabulary and GPT-generated sentences, and interactions with the intelligent contextual chatbot, which contributed to the learners' English learning. VTR contextual vocabulary, generated based on real-world contexts in the video, help learners better understand and learn about the elements depicted in the video and enable them to apply these words in sentence construction related to the video, thereby enhancing overall English learning effectiveness. In the speaking assessment, significant differences were observed in the post-test speaking scores among the groups ($F = 5.850$, $p < .05$). This improvement is likely due to the diverse speaking practice opportunities provided by the ClipTalk system, including narrative speaking exercises of videos and conversational practice with the intelligent contextual chatbot, which enhanced learners' English speaking proficiency. Learners in the experimental group utilized the ClipTalk system to engage in video description-based speaking practice, which required them to practice speaking sentences constructed from video narratives. This not only enabled learners to learn the pronunciation of these sentences but also reinforced their pronunciation through repeated practice with the assistance of automatic speech scoring. Cohen's d revealed moderate-to-large effects for writing ($d = 0.66$) and speaking ($d = 0.71$), indicating that the instructional intervention produced both statistically significant and practically meaningful improvements in learner performance.

Pearson correlation analysis was conducted to examine the correlation between the learning behaviors and learning performance. According to the data presented in Table III, the frequency of viewing AI-enhanced contextual vocabulary and sentence (V1) was significantly positively correlated with the writing posttest score ($r = .605$, $p < .01$) with moderate to large effect sizes. By consulting VTR contextual vocabulary and further generated sample sentence by GPT, learners were able to strengthen the connection between vocabulary and expression in real-life contexts, thereby enhancing their overall learning achievement. This aligns with research findings showing that contextual vocabulary and sentence, through exposure to diverse contexts, significantly improves recall and application in both native and foreign languages [12]. Similarly, studies suggest that embedding vocabulary in meaningful contexts enhances comprehension and retention, supporting its value as an effective instructional approach [13]. Additionally, learners benefited from using GPT-generated example sentences as references to construct narratives for videos, contributing to improved overall performance. This aligns with findings that GPT tools improve productivity and quality in professional writing tasks, particularly for those with weaker skills [14]. Moreover, the frequency of practicing peers' narrative speaking exercises (V2) also showed a positive correlation ($r = .496$, $p < .05$). Through watching peers' videos, learners were exposed to a variety of contexts and expressions, enabling them to learn how to describe different scenarios. This process further enhanced their descriptive abilities and pragmatic competence. These findings align with research indicating that peer video activities significantly improve speaking and writing skills by fostering interaction, providing constructive feedback, and exposing learners to diverse language use [15]. Finally, the frequency of interactions with the intelligent contextual chatbot (V3) was positively correlated with the total writing score ($r =.540$, $p< .01$) with moderate to large effect sizes. Through interactions with the chatbot, learners enhanced their understanding of the video contexts and improved their language application. Additionally, chatbot provides grammar correction suggestions during the conversation process, learners were able to refine their language skills, thereby improving their overall learning performance. These findings align with research demonstrating that chatbot-based systems improve writing performance and motivation by providing personal feedback and fostering self-directed learning environments [16].

As for the speaking performance, the results indicate that the experimental group learners' frequency of viewing AI-enhanced contextual vocabulary and sentence(V1) was positively correlated with their speaking posttest score ($r = .452$, $p < .05$). VTR provided vocabulary related to video contexts, enabling learners to describe scenarios more accurately. By practicing speaking with these contextual vocabularies, learners enhanced their speaking skills and retention, thereby improving their overall English speaking proficiency. This is supported by research showing that contextualized vocabulary learning significantly enhances learners' language application and retention [12]. Additionally, the sentences generated by GPT based on video contexts served as references for learners to practice using the vocabulary accurately to construct appropriate contextual descriptions during speaking exercises. Assisted by GPT-generated sentence, learners were able to express their ideas more accurately, strengthen their speaking skills through practice, and enhance their overall English speaking proficiency. These findings align with studies that highlight the effectiveness of AI-generated examples in improving accuracy and engagement in language learning[14].

TABLE III. PEARSON CORRELATION ANALYSIS

Varaiables	Writing Posttest Score	Speaking Posttest Score
V1	.605**	.452*
V2	496*	.569**
V3	540*	465*

Note: Frequency of viewing AI-enhanced contextual vocabulary and sentence(V1), Frequency of practicing peers' narratives speaking exercises(V2), Frequency of interactions with intelligent contextual chatbot(V3)

In terms of interactive learning, the frequency of practicing peers' narratives speaking exercises (V2) ($r = .569$, $p < .01$) were positively correlated with the speaking posttest score with moderate to large effect sizes.. ClipTalk provided real-time feedback on pronunciation, accuracy, and fluency during speaking practice, motivating learners to engage more deeply in speaking exercises and achieve higher scores, ultimately enhancing their overall English speaking performance. The importance of real-time feedback for improving speaking proficiency has been highlighted in research on AI-assisted language tools [17]. Finally, the Frequency of interactions with the intelligent contextual chatbot (V3) was positively correlated with the speaking posttest score ($r = .465$, $p < .05$). Through interactions with the chatbot, learners were able to gain a deeper understanding and application of video contextual content while practicing various descriptive approaches, thereby improving their overall English speaking ability. This aligns with findings that interactive AI systems enhance learning outcomes by fostering deeper engagement and contextual understanding [16].

TABLE IV. DESCRIPTIVE STATISCTICS OF STUDENTS PERCEPTION TOWARD THE SYSTEM

#	Item	1	2	3	4	5	Means	SD
1	PEU1- I find it simple to to operate ClipTalk.	0%	4%	39%	43%	14%	3.65	0.14
2	PEU2- Interacting with ClipTalk does not require a lot of effort.	0%	4%	43%	43%	9%	3.57	0.31
3	PEU3-The feedback provided by ClipTalk is easy to understand.	0%	9%	43%	39%	9%	3.43	0.38
4	PU1- ClipTalk is useful for improving my EFL writing skills.	0%	0%	56%	39%	9%	3.52	0.44
5	PU2- ClipTalk enhances my English proficiency in authentic learning contexts.	0%	13 %	30%	39%	9%	3.43	0.46
6	PU3- Using ClipTalk motivates me to be more engaging in learning.	0%	13 %	39%	35%	13%	3.52	0.33
7	BI1- I intend to use ClipTalk regularly in my EFL learning.	0%	5%	47%	43%	5%	3.47	0.44
8	BI2-I feel satisfied learning English with ClipTalk.	0%	5%	52%	43%	0%	3.39	0.36
9	BI3-I am willing to use ClipTalk in my EFL learning process.	0%	0%	52%	39%	9%	3.56	0.39

Learners were also asked to complete a questionnaire based on Davis's Technology Acceptance Model (TAM) [18] to assess their perception of the developed system. The questionnaire examined learners' views on using the system for EFL learning, focusing on perceived ease of use (PEU),

perceived usefulness (PU), and behavioral intention to use (BI). As shown in Table IV, participants reported positive attitudes toward the system's ease of use (M = 3.55), usefulness (M = 3.49), and behavioral intention (M = 3.47).

To sum up, the findings show that ClipTalk significantly improves EFL learners' writing and speaking proficiency. Independent t-tests confirmed no pre-test differences between groups, while post-tests revealed significant gains for the experimental group. These improvement can be attributed to ClipTalk's integrated features, AI-enhanced contextual vocabulary and sentences, peer video viewing and practicing and interactive contextual chatbot functionalities, which provided comprehensive language practice and contextual understanding. Also, correlation analyses further supported these findings. The frequency of viewing AI-enhanced contextual vocabulary and sentence showed strong positive correlations with both writing and speaking post-test scores. This suggests that contextual learning aids significantly enhance vocabulary retention and application. Additionally, Peer narrative speaking and chatbot interaction also positively correlated with speaking and writing outcomes, highlighting the role of contextual and interactive learning. Finally, learners showed positive attitude toward the developed system through TAM questionnaire.

V. Conclusion

This study developed ClipTalk, a system integrating VTR and GPT technologies, which significantly enhanced learners' English writing and speaking abilities. By incorporating VTR contextual vocabulary alongside GPT-generated phrases and sentences, learners acquired content that was contextually relevant. Moreover, the provision of instant feedback, including a grammar-checking mechanism and an automatic speaking scoring, effectively improved their language proficiency. Additionally, engagement with the intelligent contextual chatbot not only facilitated the development of learners' writing skills but also reinforced their speaking abilities. The study results indicated that learners responded positively to the ClipTalk system, expressing that it contributed to improving their ability to communicate in real-world contexts. Based on these findings, systems integrating VTR technology can effectively support EFL learners in extending classroom learning to after-class activities, enabling them to apply acquired knowledge in authentic contexts. Furthermore, the intelligent contextual chatbot, which initiates questions using VTR vocabulary as keywords, played a crucial role in reinforcing and consolidating learned material. This approach not only enhanced learners' language skills but also fostered their interest in learning, potentially deepening their overall comprehension and engagement with the language.

References

[1] John Seely Brown, A. Collins, P. Duguid, and University Of Illinois At Urbana-Champaign. Center For The Study Of Reading, Situated cognition and the culture of learning. Champaign, Ill.: University Of Illinois At Urbana-Champaign, 1989.

[2] S.-M. Lee and M. Park, "Reconceptualization of the context in language learning with a location-based AR app," Computer Assisted Language Learning, vol. 33, no. 8, pp. 1–24, May 2019, doi: https://doi.org/10.1080/09588221.2019.1602545

[3] A. Mohammed and A. F. Hamad, "EFL Writing Tasks and the Application of the Concept of Situatedness: Evaluating the Theoretical and Practical Aspects of the Saudi EFL Context.," TESOL International Journal, vol. 15, no. 4, pp. 167–190, 2020, Accessed: Feb. 12, 2025. [Online]. Available: https://eric.ed.gov/?id=EJ1329889

[4] V. Lin, G.-Z. Liu, and N.-S. Chen, "The effects of an augmented-reality ubiquitous writing application: a comparative pilot project for enhancing EFL writing instruction," Computer Assisted Language Learning, pp. 1–42, May 2020, doi: https://doi.org/10.1080/09588221.2020.1770291.

[5] S. Shapsough and I. A. Zualkernan, "A Generic IoT Architecture for Ubiquitous Context-Aware Learning," IEEE Transactions on Learning Technologies, pp. 1–1, 2020, doi: https://doi.org/10.1109/tlt.2020.3007708.

[6] A. A. Muhammed, "The Impact of Mobiles on Language Learning on the Part of English Foreign Language (EFL) University Students," Procedia - Social and Behavioral Sciences, vol. 136, pp. 104–108, Jul. 2014, doi: https://doi.org/10.1016/j.sbspro.2014.05.297.

[7] N. Refat, H. Kassim, M. A. Rahman, and R. bin Razali, "Measuring student motivation on the use of a mobile assisted grammar learning tool," PLOS ONE, vol. 15, no. 8, p. e0236862, Aug. 2020, doi: https://doi.org/10.1371/journal.pone.0236862.

[8] H. Zhang, W.-Y. Hwang, S.-Y. Tseng, and H. S. L. Chen, "Collaborative Drama-Based EFL Learning in Familiar Contexts," Journal of Educational Computing Research, vol. 57, no. 3, pp. 697–722, Apr. 2018, doi: https://doi.org/10.1177/0735633118757731.

[9] S. Sasi et al., "Technology Enhanced Instruction: An Example of English Language Learning in the Context of Peace," EURASIA Journal of Mathematics, Science and Technology Education, vol. 13, no. 6, Apr. 2017, doi: https://doi.org/10.12973/eurasia.2017.00687a.

[10] C. Teng, T. Heydarnejad, Md. K. Hasan, A. Omar, and L. Sarabani, "Mobile assisted language learning in learning English through social networking tools: An account of Instagram feed-based tasks on learning grammar and attitude among English as a foreign language learners," Frontiers in Psychology, vol. 13, Sep. 2022, doi: https://doi.org/10.3389/fpsyg.2022.1012004.

[11] Guangxiang Leon Liu, R. Darvin, and C. Ma, "Exploring AI-mediated informal digital learning of English (AI-IDLE): a mixed-method investigation of Chinese EFL learners' AI adoption and experiences," Computer Assisted Language Learning, pp. 1–29, Feb. 2024, doi: https://doi.org/10.1080/09588221.2024.2310288.

[12] O. Rezaei and S. Dezhara, "An investigation of the possible effects of favored contexts in second language vocabulary acquisition," English Language Teaching, vol. 4, no. 4, Nov. 2011, doi: 10.5539/elt.v4n4p97.

[13] I. Elgort, S. Candry, T. J. Boutorwick, J. Eyckmans, and M. Brysbaert, "Contextual Word Learning with Form-Focused and Meaning-Focused Elaboration," Applied Linguistics, p. amw029, Sep. 2016, doi: https://doi.org/10.1093/applin/amw029.

[14] S. Noy and W. Zhang, "Experimental evidence on the productivity effects of generative artificial intelligence," Science, vol. 381, no. 6654, pp. 187–192, Jul. 2023, doi: https://doi.org/10.1126/science.adh2586.

[15] R. A. Baten, F. Clark, and M. Hoque, "Upskilling Together: How Peer-interaction Influences Speaking-skills Development Online," IEEE Xplore, Sep. 01, 2019. https://ieeexplore.ieee.org/abstract/document/8925448 (accessed Mar. 09, 2023).

[16] F. Wang, Alan, A. J. Neitzel, and Ching Sing Chai, "Does Chatting with Chatbots Improve Language Learning Performance? A Meta-Analysis of Chatbot-Assisted Language Learning," Review of educational research, Jun. 2024, doi: https://doi.org/10.3102/00346543241255621.

[17] C. Song and Y. Song, "Enhancing academic writing skills and motivation: assessing the efficacy of ChatGPT in AI-assisted language learning for EFL students," Frontiers in Psychology, vol. 14, no. 14, p. 1260843, Dec. 2023, doi: https://doi.org/10.3389/fpsyg.2023.1260843.

[18] F. D. Davis, The Technology Acceptance Model. Springer Nature, 1989