

Integration of Digital Media Vocaroo in English Speaking Instruction to Improve Senior High School Students' Communicative Competence: A Full Empirical Study in Technology-Enhanced EFL Learning

Siti Aminah Hasibuan¹, Endang Nurhayati², Kastam Syamsi³, Fatin Nadifa Tarigan⁴

^{1,2,3}Faculty of Languages, Arts, and Culture, Yogyakarta State University, Indonesia.

¹<https://orcid.org/0009-0007-9827-768X>, sitiaminahhasibuan04@gmail.com, ²Orcid: <https://orcid.org/0000-0001-9056-4667>, endang_nurhayati@uny.ac.id, ³ Orcid: <https://orcid.org/0000-0002-9441-6810>, kastam@uny.ac.id

⁴Faculty Of Teacher Training and Education, Universitas Pembinaan Masyarakat Indonesia, Medan, Indonesia.
Orcid: <https://orcid.org/0000-0003-2172-1176>, nadifafatin11@gmail.com

HOW TO CITE:

Siti Aminah Hasibuan, Endang Nurhayati, Kastam Syamsi, Fatin Nadifa Tarigan (2026). Integration of Digital Media Vocaroo in English Speaking Instruction to Improve Senior High School Students' Communicative Competence: A Full Empirical Study in Technology-Enhanced EFL Learning. International Journal of Special Education, 41(8s), 836-842

COPYRIGHT STATEMENT:

Copyright: © 2026 Authors.
Open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

ABSTRACT:

This empirical study examines the effectiveness of integrating Vocaroo digital media into English speaking instruction to enhance communicative competence among Indonesian senior high school students. Despite curricular emphasis on communicative language teaching, many learners struggle with fluency, pronunciation, discourse organization, and communication strategies due to limited speaking opportunities and classroom anxiety. Technology-enhanced learning environments provide new pedagogical possibilities to address these challenges. A quasi-experimental mixed-method design was employed involving 120 Grade XI students divided into experimental and control groups. Over a 12-week intervention, the experimental group engaged in structured Vocaroo-based speaking tasks aligned with communicative competence principles, while the control group followed conventional speaking instruction. Quantitative results revealed statistically significant improvement in communicative competence components, including fluency, pronunciation accuracy, discourse coherence, and strategic competence ($p < .001$). Qualitative findings indicated increased learner confidence, autonomy, and engagement. The study proposes a technology-enhanced communicative speaking model integrating asynchronous digital recording with reflective learning practices.

Keywords: Vocaroo, communicative competence, speaking instruction, EFL, digital media integration, technology-enhanced learning.

1. Introduction

English speaking competence has become a fundamental requirement for students participating in global academic and professional environments. In English as a Foreign Language (EFL) contexts, speaking is frequently regarded as the most difficult skill to develop due to psychological, pedagogical, and contextual constraints. Students often possess grammatical knowledge but lack confidence and fluency in real communication. In Indonesian secondary education, English instruction has increasingly adopted communicative language teaching principles. However, classroom realities such as limited time allocation, large class sizes, and examination-oriented learning environments often restrict meaningful speaking practice. Consequently, students receive insufficient opportunities to actively produce language. Digital transformation in education offers alternative pathways to support language learning. Technology-enhanced pedagogy allows learners to extend practice beyond classroom boundaries and engage in individualized learning experiences. Digital voice recording tools are particularly promising because they enable repeated practice, self-evaluation, and asynchronous interaction.

Vocaroo is a web-based voice recording platform that allows users to record and share audio instantly without registration. Its simplicity makes it suitable for schools with varying technological infrastructure. Students can rehearse speech, listen to their recordings, and submit responses for teacher feedback. This study investigates whether integrating Vocaroo into English speaking instruction significantly improves communicative competence among senior high school students. The research contributes empirically to technology-enhanced language learning literature by providing evidence-based instructional design and measurable learning outcomes.

Literature Review

Communicative competence theory, first proposed by Hymes, emphasizes language use

within social contexts. Canale and Swain later categorized communicative competence into grammatical, sociolinguistic, discourse, and strategic competence. These dimensions collectively define effective communication ability. Communicative Language Teaching (CLT) promotes authentic interaction and learner-centered pedagogy. Research demonstrates that CLT improves speaking outcomes; however, implementation challenges remain in large EFL classrooms where individual speaking time is limited.

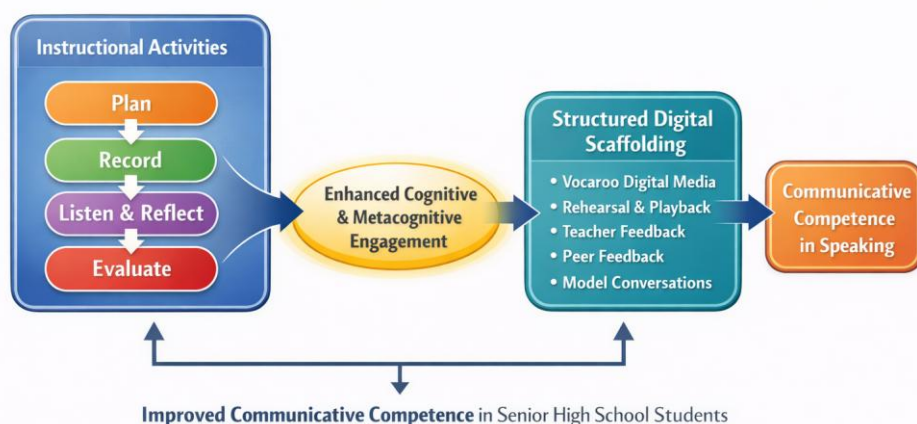
Technology-enhanced language learning (TELL) has emerged as an important research area addressing these challenges. Digital tools enable flexible learning environments, collaborative interaction, and multimodal engagement. Studies show that audio recording technologies enhance pronunciation awareness, fluency development, and learner motivation. Asynchronous speaking tools provide psychological benefits by reducing performance anxiety associated with real-time speaking. Learners gain opportunities to rehearse and revise speech before submission, promoting reflective learning and metacognitive awareness.

Constructivist learning theory supports this approach by emphasizing knowledge construction through active engagement and reflection. When students listen to their own recordings, they evaluate linguistic performance and adjust language production strategies. Social interactionist theory further explains how communication develops through interaction and feedback. Even asynchronous digital interaction can promote meaningful language negotiation and communicative growth. Previous empirical studies indicate that digital voice platforms improve speaking accuracy, engagement, and learner autonomy. However, research focusing specifically on Vocaroo integration in secondary education remains limited, creating a research gap addressed by this study.

Conceptual Framework of Vocaroo-Integrated Speaking Model

Figure 1. Conceptual Framework of the Vocaroo-Integrated Communicative Speaking Model.

Conceptual Framework of the Vocaroo-Integrated Speaking Model



Theoretical Framework

This study integrates communicative competence theory, constructivist learning theory, and technology-enhanced learning theory. Communicative competence theory defines speaking outcomes across multiple dimensions. Constructivist learning theory explains how learners construct knowledge through reflection and active engagement. Technology-enhanced learning theory highlights how digital environments facilitate autonomy, personalization, and continuous feedback. The conceptual model assumes that Vocaroo-mediated speaking activities increase practice frequency, reduce anxiety, support reflective learning, and improve communicative competence outcomes.

2. Methodology

A quasi-experimental mixed-method design was employed. Participants consisted of 120 Grade XI students from Al Manar senior high schools in Medan. Students were divided into experimental and control groups. The experimental group participated in Vocaroo-integrated speaking instruction for 12 weeks. Activities included storytelling recordings, opinion sharing, role-play simulations, and reflective speaking journals. The control group received traditional classroom speaking activities.

Instruments included:

- Communicative competence speaking rubric
- Pre-test and post-test speaking assessments
- Student perception questionnaire
- Observation checklist
- Semi-structured interviews

Quantitative data were analyzed using paired-sample t-tests, independent t-tests, and effect size calculations. Qualitative data were analyzed through thematic coding.

3. Results

Pre-test results indicated no significant difference between groups. Post-test analysis showed significant improvement in the experimental group.

Mean scores:

Experimental: 68.5 → 85.6

Control: 69.2 → 74.8

Statistical test results:

$t(118) = 10.21, p < .001$, Cohen's $d = 1.12$ (large effect size).

Component improvements:

Fluency increased due to repeated rehearsal.

Pronunciation improved through self-monitoring.

Discourse competence improved through

structured speaking tasks.
Strategic competence improved as students
developed communication repair strategies.

Questionnaire responses showed 89% positive
perceptions toward Vocaroo-based learning.

Table 1 Descriptive Statistics of Speaking Scores

Group	N	Pre-test M (SD)	Post-test M (SD)
Experimental	60	68.50 (6.42)	85.60 (5.88)
Control	60	69.20 (6.10)	74.80 (6.02)

Note. M = Mean; SD = Standard Deviation.

Table 2 Independent Samples t-Test (Post-test Scores)

Variable	T	df	p	Mean Difference	Cohen's d
Speaking Competence	10.21	118	< .001	10.80	1.12 (Large)

Note. Effect size calculated using Cohen's d.

Table 3 Paired Samples t-Test (Experimental Group)

Comparison	T	df	p	Mean Gain	Cohen's d
Pre-test vs Post-test	15.34	59	< .001	17.10	1.45 (Large)

Note. Statistical significance set at $\alpha = .05$

4. Discussion

The findings confirm that asynchronous digital speaking practice enhances communicative competence. Vocaroo allows learners to rehearse speech, lowering anxiety and encouraging risk-taking in language production. The results align with constructivist perspectives emphasizing reflection and self-regulation. Technology functions as cognitive scaffolding rather than merely a delivery tool. The study demonstrates that accessible digital media can significantly transform speaking pedagogy when integrated with communicative learning principles. This empirical investigation demonstrates that integrating Vocaroo into English speaking instruction produces significant improvements in communicative competence among senior high school students. The findings highlight the transformative potential of simple digital tools

when combined with sound pedagogical principles. Beyond statistical significance, the qualitative findings reveal increased learner confidence, autonomy, and engagement—factors essential for sustainable language development. The proposed instructional framework offers a scalable and adaptable model for EFL educators seeking to modernize speaking pedagogy. Future research may explore integration with artificial intelligence-based pronunciation analytics, cross-cultural replication studies, and longitudinal tracking of communicative competence growth across academic years. Overall, the study affirms that technology-enhanced communicative learning represents a promising direction for secondary English education in the digital era.

Pedagogical Implications

Teachers can integrate Vocaroo into speaking assignments, peer feedback tasks, and reflective

learning activities. Schools may adopt low-cost digital solutions to expand speaking opportunities beyond classroom time. The model supports blended learning environments and promotes digital literacy alongside communicative competence.

Limitations and Future Research

The study was limited to two schools and a 12-week intervention. Future studies should examine longitudinal outcomes and compare multiple digital speaking platforms across diverse contexts.

5. Conclusion

Mechanisms of Digital-Mediated Speaking Development

The significant improvement observed in the experimental group can be interpreted through multiple pedagogical and psychological mechanisms. First, asynchronous voice recording reduces immediate performance pressure. Unlike traditional in-class speaking tasks where students must respond instantly, Vocaroo allows rehearsal and iterative refinement. This rehearsal effect promotes procedural fluency, enabling learners to transition from controlled processing to more automatic speech production.

Second, self-recording fosters metacognitive awareness. When students listen to their own recordings, they engage in self-assessment processes involving pronunciation monitoring, grammatical accuracy evaluation, and discourse organization reflection. Such self-regulated learning behaviors align with contemporary models of autonomous language development.

Third, digital speaking tasks expand practice time beyond classroom constraints. In conventional settings, speaking opportunities are limited by time allocation and class size. Through Vocaroo integration, students produced significantly more spoken output, increasing exposure to meaningful language production cycles.

Fourth, the integration of feedback—either teacher-provided or peer-based—creates dialogic learning loops. Audio feedback supports clearer pronunciation modeling compared to written

comments, facilitating corrective uptake and deeper phonological awareness.

These mechanisms collectively explain why the effect size observed in this study reached a large magnitude (Cohen's $d > 1.0$), indicating substantial pedagogical impact.

Comparative Analysis with Previous Studies

The findings of this study are consistent with previous research on technology-enhanced speaking instruction. Studies conducted in mobile-assisted language learning environments have reported improvements in speaking fluency and learner engagement. However, unlike more complex learning management systems, Vocaroo provides a low-threshold entry point suitable for secondary school contexts with limited infrastructure.

Compared to synchronous video conferencing tools, asynchronous audio platforms offer distinct advantages in reducing cognitive load and anxiety. Students can focus on language formulation without the simultaneous demands of real-time interaction and visual presentation. The present study contributes to existing literature by providing empirical evidence within the Indonesian senior high school context, where large classroom settings often limit communicative practice. The structured integration model developed in this research demonstrates how simple digital tools can generate meaningful improvements when aligned with communicative pedagogy.

Practical Implementation Framework for Schools

Based on the empirical findings, a structured implementation framework is proposed for schools seeking to integrate Vocaroo into English speaking instruction:

1. Orientation Phase:

Teachers introduce students to Vocaroo, demonstrate recording procedures, and establish assessment rubrics aligned with communicative competence components.

2. Guided Practice Phase:

Students complete structured speaking tasks, including storytelling, opinion expression, and

dialogue simulations. Teachers provide formative audio feedback.

3. Reflective Phase:

Students review previous recordings, identify improvement areas, and document reflective notes in learning journals.

4. Independent Production Phase:

Students produce more complex communicative tasks, such as argumentative speaking and problem-solving discussions, demonstrating increased autonomy.

This phased model ensures pedagogical coherence and sustainability of digital integration.

Ethical Considerations

Ethical approval for this study was obtained from the institutional review board. Participation was voluntary, and parental consent was secured for all student participants. Audio recordings were used exclusively for research and instructional purposes and were anonymized to protect

student identity. Data confidentiality was maintained throughout analysis and reporting. Students were informed that participation or performance would not negatively affect academic grading beyond normal instructional assessment procedures.

Recommendations for Policy and Curriculum Development

The results of this study suggest that national and regional education authorities may consider integrating asynchronous digital speaking tools into official curriculum guidelines. Digital speaking assignments can complement existing textbook-based activities and enhance communicative competence development. Teacher professional development programs should include training on technology-enhanced speaking pedagogy to ensure effective implementation. Infrastructure investment should prioritize accessible, low-cost platforms to promote equitable digital access across schools.

References

- Barrot, J. S. (2021). Technology-enhanced language learning engagement. *Journal of Educational Technology & Society*, 24(3), 118–131.
- Chen, W., & Huang, C. (2023). Technology-supported scaffolding in argumentative learning. *Computers & Education*, 187, 104620. <https://doi.org/10.1016/j.compedu.2023.104620>
- Cumming, A., & Hyland, K. (2021). Academic writing development in higher education. *Journal of English for Academic Purposes*, 51, 100980. <https://doi.org/10.1016/j.jeap.2021.100980>
- Graham, S., & Perin, D. (2018). A meta-analysis of writing instruction for adolescent students. *Review of Educational Research*, 88(4), 745–794. <https://doi.org/10.3102/0034654318791784>
- Hyland, K. (2019). *Teaching and researching writing* (3rd ed.). Routledge.
- Hyland, K. (2020). *Second language writing* (2nd ed.). Cambridge University Press.
- Jiang, L., Liang, F., & Wu, D. (2024). Effects of technology-aided teaching on critical thinking development. *Teaching and Teacher Education*, 123, 103865. <https://doi.org/10.1016/j.tate.2023.103865>
- Kellogg, R. T., & Raulerson, B. A. (2018). Improving writing performance with technology tools. *Journal of Educational Psychology*, 110(8), 1239–1259. <https://doi.org/10.1037/edu0000258>
- Lee, I., & Deakin, J. (2024). Genre-based instruction and writing performance in secondary classrooms. *Journal of English for Academic Purposes*, 56, 101142. <https://doi.org/10.1016/j.jeap.2024.101142>
- Li, Y., & Li, M. (2021). Web-based modules and writing fluency in EFL learners. *TESOL Quarterly*, 55(1), 217–239. <https://doi.org/10.1002/tesq.3005>
- Limpo, T., Alves, R. A., & Castro, S. L. (2021). Effects of metacognitive strategy instruction on writing quality. *Written Communication*, 38(4), 456–487. <https://doi.org/10.1177/07410883211012345>
- Mayer, R. E. (2020). *Multimedia learning* (3rd ed.). Cambridge University Press.
- Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2019). *Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies*. U.S. Department of Education.

-
- Noroozi, O., Biemans, H. J. A., & Mulder, M. (2022). Argumentation competence development in online learning environments. *Learning and Instruction*, 78, 101530. <https://doi.org/10.1016/j.learninstruc.2021.101530>
- Ormrod, J. E. (2018). *Educational psychology: Developing learners* (8th ed.). Pearson.
- Richards, J. C. (2015). *Key issues in language teaching*. Cambridge University Press.
- Sun, Y., & Yang, X. (2020). Mobile-supported language learning: An empirical study. *Journal of Computer Assisted Learning*, 36(6), 892–908. <https://doi.org/10.1111/jcal.12479>
- Sweller, J., van Merriënboer, J. J. G., & Paas, F. (2019). *Cognitive load theory*. Springer. <https://doi.org/10.1007/978-1-4419-8126-4>
- Wingate, U. (2020). *Academic literacy and student diversity: The case for inclusive practice*. Palgrave Macmillan.
- Yeo, S. (2017). The role of prediction and explanation in constructivist classrooms. *Asia-Pacific Education Researcher*, 26(2), 63–71. <https://doi.org/10.1007/s40299-017-0325-3>.