



Development of a Gemini AI-Based Learning Medium with Structured Feedback for Speech-Text Writing

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ABSTRACT

This study aims to develop a Gemini AI-based learning medium with structured feedback to improve the writing achievement of speech texts among eighth-grade junior high school students. The study was conducted in the even semester of the 2025/2026 academic year at SMP Budi Murni 2 Medan, using a Research and Development approach with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The research subjects consisted of two content experts, two media experts, one eighth-grade Indonesian language teacher, and 30 eighth-grade students as questionnaire respondents and writers of the speech texts analyzed through the medium. Data were collected through expert validation sheets, teacher and student response questionnaires, observation and interview guidelines, and writing tests, then analyzed descriptively using qualitative and quantitative techniques, with Likert-scale scores converted into percentages. The results show that the resulting product is a web-based learning medium accessible at <https://mrdatoai.my.id/>, consisting of four main menus (Home, Materials, Sample Speeches, Practice) with a three-stage writing flow (Initial Text, Revision, Final Text), each accompanied by automatic feedback based on a seven-aspect assessment rubric. The medium is categorized as Highly Feasible (average 89.55%) and very high (average 89.9%), supported by writing achievement that increased gradually from 74.83 to 88.47 and classical mastery from 40.00% to 83.33%. The medium is declared valid and practical for use as a supporting alternative for teaching speech-text writing in eighth grade.

Keywords: *gemini AI, learning medium, structured feedback, speech-text writing*

INTRODUCTION

Speech-writing skills constitute a crucial competency within the writing element of the Grade VIII Indonesian Language curriculum under the Independent Curriculum. This competency requires students to compose texts incorporating specific topics, a defined structure (introduction, body, and conclusion), facts and data, persuasive sentences, and expressions of empathy. However, various studies indicate that junior high school students still struggle to master the structural and linguistic aspects of speech writing (Tyas et al., 2024). Issues include ineffective sentence construction (Maula et al., 2023) and deviations

from standard writing conventions (Assidiq et al., 2023; Razak et al., 2020). These findings underscore that student difficulties lie not only in the initial expression of ideas but also in the revision stage, which requires ongoing guidance. One contributing factor is the limitation of individualized, continuous feedback from teachers due to large class sizes; ideally, effective feedback should be specific and provided throughout the writing process, rather than solely at the final stage. Addressing these issues, this study formulates a method to develop a Gemini AI-based learning medium—featuring valid and practical structured

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feedback—to support speech-writing instruction for Grade VIII students at SMP Budi Murni 2 Medan.

The study aims to (1) describe the media development process, (2) analyze the media's validity based on assessments by subject matter and media experts, and (3) describe the media's practicality based on teacher and student responses, as well as student performance on speech-writing tests following the media's use.

In practical terms, this research is expected to offer Indonesian language teachers an alternative solution to the time constraints associated with providing individualized feedback during speech-writing lessons. Theoretically, the study aims to enrich research on integrating generative artificial intelligence into writing instruction at the junior high school level—specifically regarding the design of analytic assessment rubrics that serve as a framework for AI systems to generate structured feedback aligned with curriculum competency indicators.

The advancement of generative artificial intelligence presents opportunities to bridge this feedback gap. Kasneci et al. (2023) state that large language models have the potential to support the personalization of writing instruction. Bahroun et al. (2023) note that research in this domain has grown rapidly since 2022, with writing literacy as a primary focus, while Escalante et al. (2023) and Banihashem et al. (2024) found that AI feedback can be just as effective as teacher feedback in supporting students' writing abilities. Gemini AI, which is widely integrated through *belajar.id* accounts, has been reported to boost the motivation and critical thinking skills of Grade VIII students (Fajriati et al., 2024); however, its current application remains general and has not been specifically designed as a tool featuring structured feedback mechanisms for speech-writing competence at the junior high school level. Addressing this gap, this study develops a web-based learning tool that integrates Gemini AI as an engine for analysis and automated feedback. The tool features four main menus (Home,

Materials, Speech Examples, and Practice) and a three-stage writing workflow (Initial Draft, Revision, and Final Draft), each accompanied by rubric-based feedback covering seven aspects: (1) content, (2) facts and data, (3) audience appropriateness, (4) structure, (5) cohesion and coherence, (6) language and rhetoric, and (7) spelling. The development employs a Research and Development approach using the ADDIE model (Analysis, Design, Development, Implementation, Evaluation)—a systematic framework proven relevant in the development of various digital learning media (Latip, 2022; Muryandari & Sujatmiko, 2025).

Several relevant studies underscore the urgency of this research. Tyas et al. (2024) analyzed linguistic aspects and material presentation regarding the speech-writing element in Grade VIII Indonesian language textbooks, identifying limitations in the presentation of structured writing exercises. Fitriana Maissy Maula et al. (2023) analyzed effective sentence construction in speech texts within Grade VIII Indonesian language textbooks and found instances of sentence ineffectiveness in a number of student texts. Syam Moh. Hafidz Assidiq et al. (2023) analyzed language errors in junior high school students' speech texts from a syntactic perspective, discovering a high rate of deviation from standard writing conventions. These three studies highlight the need for supporting media capable of providing continuous, structured feedback throughout the writing process—a requirement that serves as the foundation for the media development in this study.

METHOD

This study employs a Research and Development (R&D) approach using the ADDIE model to develop and test the feasibility of a product: a web-based learning medium that integrates Gemini AI as an analysis engine and a provider of automated, structured feedback for speech-writing instruction. The development procedure follows the five stages of the ADDIE model: (a) Analysis—analyzing the curriculum,



learner characteristics, and technological needs through document review, observation, and pre-research interviews; (b) Design—drafting the information architecture, interface storyboards, and instruction patterns (prompt design) for Gemini AI, as well as the media's four-menu structure and the three-stage writing workflow; (c) Development—realizing the web-based media product by integrating the Gemini AI Application Programming Interface (API), which includes front-end and back-end programming, content preparation, and validation by subject matter and media experts to ensure quality prior to field testing (Latip, 2022; Muryandari & Sujatmiko, 2025); (d) Implementation — direct trials with Grade VIII students writing speech texts across three stages, incorporating AI feedback, activity observations, and the administration of teacher and student response questionnaires; and (e) Evaluation — formative evaluation at each preceding stage and summative evaluation at the conclusion of the study to assess the overall validity and practicality of the product (Fulcher & Davidson, 2007; Azwar, 2016; Razak, 2020). Unlike experimental research, this development study focuses on two product quality indicators: validity (via expert assessment) and practicality (via field-based usability testing by users); consequently, data from students' writing tests are treated as supporting descriptive data illustrating writing achievement, rather than as evidence of an effect to be analyzed through statistical-comparative methods. The resulting product is accessible online via the link <https://mrdataoi.my.id/>.

The research was conducted at SMP Budi Murni 2 Medan during the even semester of the 2025/2026 academic year. The research subjects consisted of two subject matter experts and two media experts (expert review), one Grade VIII Indonesian language teacher (user trial), and 30 Grade VIII students from SMP Budi Murni 2 Medan (product trial); the students served as questionnaire respondents and also wrote speech texts that were subsequently analyzed using the media.

Data were collected using seven instruments: observation guidelines, interview guidelines, subject matter expert validation sheets, media expert validation sheets, a writing test (assessed using a seven-aspect rubric, which allows for a more detailed description of writing strengths and weaknesses compared to holistic assessment; Widiastuti et al., 2022), a teacher response questionnaire, and a student response questionnaire.

Qualitative data (results from observations, interviews, and expert comments) were analyzed through the stages of data reduction, data presentation, and conclusion drawing. Validity and practicality data obtained via Likert scales were converted into percentages using the descriptive statistical formula and then interpreted using graded categories (e.g., the 81–100% range representing "highly valid/practical" down to the lowest category); the media was deemed feasible if it achieved at least the "valid" and "practical" categories. Writing test results were analyzed descriptively for each rubric aspect using the mean; as the study did not employ a pretest-posttest design or a comparison group, score increases were not interpreted as evidence of a causal-statistical effect, but rather as an indication of achievement supporting the product's practicality.

RESULTS

1. Needs Analysis Results (Analysis Phase)

Pre-research observations of speech-writing instruction for Grade VIII students at SMP Budi Murni 2 Medan yielded an overall score of 69% (Good category). However, two aspects serving as the basis for product development—student difficulties (56%) and learning media (60%)—fell into the Fair category, particularly regarding the indicator for developing speech content. Teacher interviews revealed that only about 30% of students were capable of writing speeches effectively, while student interviews consistently identified the content section as the most challenging part; all respondents were familiar with

AI applications and expressed interest in their integration into the learning process. These findings formed the basis for designing a media tool featuring four menus and a three-stage writing workflow, incorporating automated feedback based on a seven-aspect rubric.

Table 1
Pre-research Observation Results (Maximum Score: 25)

Aspect	Score	Percentage	Category
Student activity	17	68%	Good
Teacher method	20	80%	Good
Student difficulty	14	56%	Fair
Learning media	15	60%	Fair
Total	69	69%	Good

2. Media Validity Results (Development Phase)

Media expert validation (two validators, four aspects) yielded an average of 87.5% (Highly Suitable), with the AI-based feedback aspect scoring the highest (98%) and media interactivity the lowest (72%, "Suitable" category). Subject matter expert validation (two validators, five aspects) yielded an average of 91.6% (Highly Suitable), with curriculum alignment scoring the highest (97.5%). Both validators suggested adding a specific identity/name to the media and a teacher comment feature; these suggestions were addressed through product revisions prior to implementation.

Table 2
Media Validity Recapitulation

Validation Type	Percentage	Category
Media Expert		
Validation 1 & 2	87.5%	highly feasible
Subject Matter Expert		
Validation 1 & 2	91.6%	highly feasible
Average Validity	89.55%	highly feasible

3. Media Implementation and Practicality Results

Implementation observations showed a significant improvement compared to pre-research conditions (rising from 69% to 94%, "very high" category). The teacher response questionnaire yielded an average of 87.2% (very high), with the highest score in the ease-of-use aspect (96%); the student response questionnaire (n = 30) yielded an average of 92.60% (very high), with the highest score in the AI understanding and feedback aspect (98.27%). Evaluation interviews confirmed that automated feedback is a key strength of the media, as it helps overcome teachers' time constraints; the only issues encountered were technical (internet network stability), and all students expressed interest in using the media again.

Table 3
Summary of Media Practicality

Data Source	Percentage	Category
Implementation		
Observation	94%	very high
Teacher Response		
Questionnaire	87.2%	very high
Student Response		
Questionnaire	92.60%	very high
Average		
Practicality	89.9%	very high

4. Students' Speech Writing Achievement Results

The average score increased progressively from 74.83 (Initial Draft) to 82.80 (Revised Draft) and 88.47 (Final Draft), accompanied by a rise in the classical mastery rate (Minimum Mastery Criterion/KKM of 80) from 40.00% to 66.67% and 83.33%. These data are descriptive in nature; as the study did not employ a pretest-posttest design or a control group, the score increases are not interpreted as evidence of a causal effect of the media, but rather as an indication of achievement



supporting the product's practicality. Five students (16.67%) did not meet the KKM by the final stage—likely due to differences in initial writing proficiency and the ability to utilize AI feedback (Sari & Han, 2024)—underscoring that the media should be positioned as a supplement to, rather than a replacement for, the teacher's role.

Table 4
Score Achievement and Mastery in Writing
Speech Texts

Stage	Score	Mastered	Mastery Rate
Initial Text	74.83	12	40.00%
Revised Text	82.80	20	66.67%
Final Text	88.47	25	83.33%

Table 5
General Summary of Research Results

Indicator	Percentage	Category
Pre-research Observation	69%	Good
Media Expert Validation	87.5%	High
Suitable Content Expert Validation	91.6%	High
Suitable Implementation Observation	94%	Excellent
Teacher Response Questionnaire	87.2%	High
Practical Student Response Questionnaire	92.60%	High
Research Documentation	100%	Excellent
Classical Learning Mastery (Final Score)	83.33%	-

DISCUSSION

Validity of the Learning Media

The high validity scores across both validation instruments (87.5% and 91.6%) confirm that the media met the quality gate requirements of the

ADDIE model prior to field testing (Latip, 2022; Muryandari & Sujatmiko, 2025). Interestingly, the highest scores were achieved in the media's core components—specifically AI-based feedback (98%) and rubric suitability (92.2%)—indicating that the product's primary strength lies in its structured feedback mechanism rather than merely in supplementary aspects such as visual design. The relatively lower interactivity score (72%, "Adequate" category) aligns with literature highlighting the importance of robust interaction design to ensure generative technology truly supports—rather than replaces—active learner engagement (Kasneci et al., 2023); this insight has been addressed through product revisions. Compared to the study by Muryandari and Sujatmiko (2025), which also applied the ADDIE model to web-based learning media, the media validity in this study was relatively higher, indicating the added value provided by the generative AI-based automated feedback mechanism.

Practicality of the Learning Media

Practicality ratings in the "Highly Practical" category from both teachers (87.2%) and students (92.60%) reinforce the fact that integrating Gemini AI offers tangible value to both parties. For teachers, the high ease-of-use score (96%) aligns with the potential of automated feedback to help overcome time constraints associated with providing individual feedback, without compromising quality or consistency (Escalante et al., 2023; Banihashem et al., 2024). For learners, the highest scores regarding AI understanding and feedback (98.27%) correspond with observations of AI interactions (96%) and high learning motivation (95.07%). These results are consistent with findings that automated writing evaluation can contribute to learners' writing self-efficacy and self-regulation (Sari & Han, 2024) and encourage the application of more active cognitive strategies when revising writing based on automated feedback compared to peer feedback (Tian et al.,

2022). Internet connectivity issues were technical in nature and did not diminish the conclusion regarding the media's practicality, aligning with research trends identifying language learning and writing literacy as some of the most promising domains for generative AI application today (Bahroun et al., 2023; Fajriati et al., 2024).

Writing Achievements and Research Limitations

The pattern of incremental score increases aligns with the writing-feedback-revision cycle designed into the media; descriptively, this links the process of guided revision—facilitated by structured feedback—to improvements in the quality of students' writing (Sari & Han, 2024). However, given the single-group trial design—which lacked a comparison group or inferential statistical testing—this score increase cannot be strictly interpreted as evidence of a causal effect attributable to the media. Weaknesses of the study include the limited scope of the trial (one class, 30 students, a single school), preventing broad generalization of the results, as well as the media's reliance on stable internet connectivity. Conversely, the study's strengths include the use of a seven-aspect assessment rubric—offering greater detail than holistic assessment methods (Widiastuti et al., 2022)—the integration of generative AI-based automated feedback (an approach rarely applied specifically to speech-writing at the junior high level), and a three-stage writing design that allows for the monitoring of progress at each step. The finding that five students (16.67%) failed to meet the Minimum Mastery Criteria (KKM) by the final stage underscores that AI-based learning media should serve as a complement to, rather than a replacement for, the teacher's role in guiding students who require more intensive intervention.

In practical terms, these findings offer Indonesian language teachers an alternative solution to the time constraints associated with providing individual feedback during speech-writing instruction. Theoretically, the study

enriches the literature on integrating generative AI into writing instruction at the junior high level, particularly regarding the design of analytic assessment rubrics that serve as the reference framework for AI systems to generate structured feedback aligned with curriculum competency indicators.

CONCLUSION

A Gemini AI-based learning medium featuring structured feedback—accessible via <https://mrdataoi.my.id>—was developed using the five-stage ADDIE model. The resulting product comprises four menus (Home, Materials, Sample Speeches, and Exercises) and a three-stage writing workflow (Initial Draft, Revision, and Final Draft) accompanied by automated feedback based on a seven-aspect rubric. The medium was validated as "Highly Suitable" (average score of 89.55%) based on assessments by media experts (87.5%) and subject matter experts (91.6%). It was also deemed "Highly Practical" (average score of 89.9%) based on implementation observations (94%), teacher response questionnaires (87.2%), and student response questionnaires (92.60%). These findings are supported by improvements in writing performance—with scores rising from 74.83 to 88.47—and an increase in the classical mastery rate from 40.00% to 83.33%. Thus, the medium is proven to be valid and practical for use as an alternative tool to support the teaching of speech-writing in Grade VIII of junior high school (SMP).

REFERENCES

- Azwar, S. (2016). *Sikap Manusia: Teori dan Pengukurannya*. Yogyakarta: Pustaka Pelajar.
- Bahroun, Z., Anane, C., Ahmed, V., & Zacca, A. (2023). Transforming Education: A Comprehensive Review of Generative Artificial intelligence in Educational Settings through Bibliometric and Content Analysis. *Sustainability* (Switzerland), 15(17). <https://doi.org/10.3390/su151712983>



- Banihashem, S. K., Kerman, N. T., Noroozi, O., Moon, J., & Drachsler, H. (2024). Feedback sources in Essay Writing: Peer-Generated or AI-Generated Feedback? *International Journal of Educational Technology in Higher Education*, 21(1).
- Escalante, J., Pack, A., & Barrett, A. (2023). AI-Generated Feedback on Writing: Insights into Efficacy and ENL Student Preference. *International Journal of Educational Technology in Higher Education*, 20(1). <https://doi.org/10.1186/s41239-023-00425-2>
- Fajriati, A., Wisroni, W., & Handrianto, C. (2024). Pemanfaatan Teknologi Artificial Intelligence (AI) dalam Pembelajaran Berbasis Peserta didik di Era Digital. *Wahana Pedagogika: Jurnal Ilmiah Pendidikan dan Pembelajaran*, 6(2). <https://doi.org/10.52166/wp.v6i2.7890>
- Fitriana, M. M., Desi, F., Hastutik, M. A., Asmaning, T. E. S. S., Yudi, U. A. P. & Irfai, F. (2023). Analisis Kalimat Efektif dalam Teks Pidato pada Buku Bahasa Indonesia Kelas VIII Kurikulum Merdeka. *Jurnal Kajian Penelitian Pendidikan dan Kebudayaan*, 1(3), 97-110. <https://doi.org/10.59031/jkppk.v1i3.149>
- Fulcher, G. & Davidson, F. (2007). *Language Testing and Assessment: An Advanced Resource Book*. New York: Routledge Applied Linguistics.
- Kasneci, E., Sessler, K., Küchemann, S., Bannert, M., Dementieva, D., Fischer, F., Gasser, U., Groh, G., Günemann, S., Hüllermeier, E., Krusche, S., Kutyniok, G., Michaeli, T., Nerdel, C., Pfeffer, J., Poquet, O., Sailer, M., Schmidt, A., Seidel, T., & Kasneci, G. (2023). ChatGPT for Good? On opportunities and Challenges of Large Language Models for Education. *Learning and Individual Differences*, 103, 1-13. <https://doi.org/10.1016/j.lindif.2023.102274>
- Latip, A. (2022). Implementasi Model ADDIE dalam Pengembangan Media Pembelajaran. *Jurnal Pendidikan Guru*, 3(1), 1-10.
- Muryandari, P. R., & Sujatmiko, B. (2025). Implementasi Model ADDIE dalam Pengembangan Media Pembelajaran Berbasis web untuk Meningkatkan Keahlian Pemrograman Dasar di SMKN 1 Wonoasri. *IT-Edu: Jurnal Information Technology and Education*, 10(02), 90-97. <https://doi.org/10.26740/it-edu.v10i02.68124>
- Razak, A. (2020). *Pendekatan Konstruktivisme dalam Pembelajaran Membaca Pemahaman*. Pekanbaru: UR Press.
- Razak, A., Syihabuddin, S., Damaianti, V. S., & Mulyati, Y. (2020). The Effectiveness of Islamic Characters by Approaching Constructivism in Reading Understanding Ability. *JOMSIGN: Journal of Multicultural Studies in Guidance and Counseling*, 4(2), 1-12. DOI: <https://doi.org/10.17509/jomsign.v4i2.26214>
- Sari, E., & Han, T. (2024). The Impact of Automated Writing Evaluation on English as a Foreign Language Learners' Writing Self-Efficacy, Self-Regulation, Anxiety, and Performance. *Journal of Computer Assisted Learning*, 40(5), 2065-2080. <https://doi.org/10.1111/jcal.13004>
- Syam, M. H. A, Amellia, M., Hoerunisa, N. I., & Rachman, I. F. (2023). Analisis Kesalahan Berbahasa Teks Pidato pada Siswa SMP di Tasikmalaya (Dari Sudut Pandang Sintaksis). *Jurnal Indopedia (Inovasi Pembelajaran dan Pendidikan)*, 1(2), 2985-7309. <https://indopediajurnal.my.id/index.php/jurnal/article/view/182>

- Tian, L., Liu, Q., & Zhang, X. (2022). Self-Regulated Writing Strategy use When Revising upon Automated, Peer, and Teacher Feedback in an Online English as a Foreign Language Writing Course. *Frontiers in Psychology*, 13(April), 1-12. <https://doi.org/10.3389/fpsyg.2022.873170>
- Tyas, I. C., Mutiah, A., & Rahman, A. A. (2024). Analisis Aspek Kebahasaan dan Penyajian Materi pada Elemen Menulis Teks Pidato dalam Buku teks Bahasa Indonesia Kelas VIII Kurikulum Merdeka. 17(2), 217-236. <https://doi.org/10.30651/st.v17i2.22884>
- Widiastuti, N. P. K., Putrayasa, I. B., & Adnyana, K. S. (2022). Instrumen Penilaian Keterampilan Menulis Siswa Sekolah Dasar. *Jurnal Pedagogi dan Pembelajaran*, 5(1), 50-56. <https://doi.org/10.23887/jp2.v5i1.42473>