



RIELT
JOURNAL

The Effectiveness of Flowcharts in Improving Students' Analytical Exposition Writing Ability

Satria Adi Pradana

The University of Queensland

e-mail: satriaadi@pradanainstitute.id

Mira Anggraini

UIN Raden Intan Lampung

e-mail: miraanggraini@gmail.com

Galang Tirta Yudha

Universitas Negeri Yogyakarta

Email: galangtirta.2023@studetns.uny.ac.id

Abstract: This study investigated the effectiveness of using flowcharts in improving students' analytical exposition writing ability. Writing analytical exposition texts presents significant challenges for students, particularly in organizing arguments and developing coherent ideas. While various instructional strategies have been explored, the potential of flowcharts as a visual organizing tool for writing instruction remains largely unexplored. This pre-experimental study employed a one-group pre-test post-test design, involving 31 twelfth-grade students in the first semester of the 2023/2024 academic year. The intervention consisted of three treatment sessions where flowcharts were systematically implemented to guide students through the writing process. Data were collected through writing tests administered before and after the treatment. The results revealed a significant improvement in students' writing performance, with mean scores increasing from 66.93 in the pre-test to 76.41 in the post-test ($p < 0.05$). Qualitative observations indicated progressive improvement in student engagement and confidence across the treatment sessions, transitioning from initial hesitation to active participation and enhanced idea generation by the final session. The findings suggest that flowchart-based instruction can effectively improve students' analytical exposition writing ability, particularly when integrated with contextually relevant topics. This study contributes to the growing body of research on structured writing interventions and offers practical implications for writing instruction methodology.

Keywords

flowchart, analytical exposition text, writing ability, visual organizing tool, writing instruction

A. INTRODUCTION

Writing analytical exposition texts remains one of the most challenging aspects of academic writing for students across various educational contexts. Research has consistently identified several persistent issues students encounter when composing analytical texts. These challenges include difficulties in constructing effective thesis statements and topic sentences (Miller & Pessoa, 2016), inadequate use of cohesive devices (Rodliyah & Liani, 2022; Yuliana & Gandana, 2018), and struggles with developing convincing arguments (Hyytinen et al., 2017). Students often struggle to organize ideas coherently, engage with multiple perspectives effectively, and maintain proper academic discourse (Emilia et al., 2018). The complexity of these challenges is further compounded by students' difficulties in idea generation, time management, and the appropriate application of language conventions, particularly evident in diverse learning environments (Khonamari et al., 2021; Setyowati et al., 2020; Shilo & Ragonis, 2023). However, it cannot be understated that students with disabilities face other kinds of challenges (Graham et al., 2017).

Current literature has documented various interventions aimed at addressing these writing challenges. Explicit instruction and self-regulation strategies have shown promise in improving writing outcomes (Ritchey et al., 2023), while structured cognitive approaches have demonstrated effectiveness, particularly for students with learning disabilities and English language learners (Lee & Paz, 2021). Technology-based writing instruction has also emerged as a valuable tool, with studies reporting an educationally relevant effect size of 0.28 on writing outcomes (Little et al., 2018). Additionally, research has highlighted the importance of developing students' meta-language abilities to discuss organizational elements and enhance their understanding of textual features in academic writing (Hyytinen et al., 2017; Miller & Pessoa, 2016).

Despite these advances in writing instruction, there remains a critical need for innovative approaches that can systematically guide students through the complex process of analytical writing. The existing literature suggests that visual organizing tools can significantly enhance learning outcomes across different disciplines. In particular, flowcharts have shown remarkable promise in improving understanding and knowledge integration in various educational contexts (Zimmermann et al., 2024). In fields such as pharmacy education, flowcharts have demonstrated positive results in enhancing students' comprehension and integration of complex material (Zimmermann et al., 2024). Similarly, in programming education, the use of progressive flowchart development has been associated with improved computational thinking skills and academic achievement (Zhang et al., 2023).

The application of flowcharts to analytical exposition writing represents an innovative intersection between visual organization and writing instruction that has not been extensively explored in previous research. While flowcharts have proven effective in enhancing critical thinking and knowledge organization in other disciplines, their potential for structuring analytical writing processes remains largely untapped. This study bridges this significant gap by examining how flowcharts can be specifically

adapted for writing instruction, offering a novel approach to addressing the persistent challenges in analytical exposition writing.

The novelty of this research lies in several key aspects. First, it represents one of the first systematic attempts to apply flowchart methodology specifically to the teaching of analytical exposition writing. While visual organizers have been used in writing instruction before, the structured, sequential nature of flowcharts offers unique possibilities for breaking down the complex process of analytical writing into manageable, logical steps. Second, this approach combines the benefits of visual learning with the systematic development of writing skills, potentially offering a more accessible method for students who struggle with traditional writing instruction approaches. Third, the study explores how flowcharts can be used not just as planning tools but as comprehensive scaffolds for the entire writing process, from initial idea generation to final composition.

The timing of this research is particularly relevant given the increasing emphasis on developing students' analytical writing skills across various academic disciplines. As educational systems worldwide continue to stress the importance of critical thinking and clear communication, finding effective methods to teach these skills becomes increasingly crucial. Furthermore, with the growing diversity of student populations and learning needs, developing flexible, visually oriented teaching tools that can accommodate different learning styles and abilities is more important than ever.

Therefore, this research aims to investigate the effectiveness of using flowcharts in improving student's writing ability in analytical exposition texts. Specifically, the study seeks to examine how flowchart-based instruction affects students' ability to organize their arguments, develop coherent ideas, and maintain proper text structure. By examining this innovative approach, the study aims to contribute to the growing body of knowledge on structured writing interventions while offering practical solutions for educators facing the challenge of teaching analytical writing skills.

B. RESEARCH METHOD

This study was conducted at a public high school in Ngambur during the first semester of the 2023/2024 academic year. The research aimed to explore the effectiveness of using flowcharts as a teaching tool to improve students' writing ability, specifically in crafting analytical exposition texts. The study employed a pre-experimental design with a one-group pre-test and post-test approach, as outlined by Ary et al. (2019), to evaluate the impact of the intervention. This design allowed for the direct comparison of students' writing performance before and after the treatment, providing a clear measure of the intervention's effectiveness. The methodology was carefully structured into distinct phases to ensure the systematic collection and analysis of data.

C. RESEARCH METHODOLOGY

The research design comprised three main stages:

Pre-test (T1): Conducted to establish a baseline measurement of students' writing abilities. During this phase, students were tasked with writing an analytical exposition text on a predetermined topic. The pre-test served as a diagnostic tool to identify their initial strengths and weaknesses in writing, particularly regarding organization, coherence, and argument development.

Treatment (X): This phase introduced the use of flowcharts as a pedagogical tool to enhance students' writing. The treatment was conducted over three structured sessions, during which students were taught how to effectively utilize flowcharts to brainstorm, organize, and elaborate on ideas for their analytical exposition texts. The lessons emphasized step-by-step guidance, starting with simple exercises on structuring arguments and progressing to independent application.

Post-test (T2): Administered after the treatment to evaluate the impact of the intervention on students' writing abilities. Students were required to write a new analytical exposition text similar in scope and complexity to the pre-test task, allowing for a direct comparison of performance metrics.

Sampling Methodology

The population of this study consisted of all twelfth-grade students at the school, totaling 90 individuals across three classes. From this population, one class (XII-1), comprising 30 students, was selected as the sample through cluster random sampling. This sampling method ensured that all classes had an equal chance of being chosen, minimizing selection bias and enhancing the generalizability of the findings. The selected class served as the experimental group, participating in both the pre-test and post-test as well as the treatment sessions.

Research Instruments

Two primary instruments were utilized to collect data:

Pre-test: This instrument involved a task requiring students to write an analytical exposition text on a specified topic. The purpose was to measure students' initial writing ability, focusing on elements such as idea organization, coherence, and argumentative clarity.

Post-test: Conducted after the treatment, the post-test mirrored the format and requirements of the pre-test but featured a different topic to minimize practice effects. The post-test assessed improvements in students' writing performance and provided quantitative data for analysis.

Both tests were evaluated using a standardized rubric that included criteria such as content, organization, language use, vocabulary, and mechanics. To ensure consistency and reliability in scoring, two raters—the researcher and an experienced English teacher—independently evaluated the tests.

Validation and Reliability of Instruments

Before data collection, the instruments underwent rigorous validation procedures: Content Validity: Experts in English education reviewed the test tasks and scoring rubric to ensure alignment with the learning objectives of analytical exposition writing and their appropriateness for the twelfth-grade curriculum.

Construct Validity: The instruments were analyzed to confirm that they effectively measured the intended constructs, such as argument organization, coherence, and language proficiency.

Inter-Rater Reliability: The reliability of scoring was tested by comparing ratings from the two independent evaluators. A high degree of agreement was confirmed using Cohen's kappa statistic, ensuring consistent and objective evaluation.

Treatment Implementation

The treatment phase was designed to introduce students to the concept and application of flowcharts in analytical writing. Over the course of three sessions, the following steps were followed:

Session 1: Introduction to flowcharts and their role in organizing ideas. Students practiced creating simple flowcharts with guided examples provided by the teacher.

Session 2: Application of flowcharts to develop arguments and supporting details for a given topic. Students worked collaboratively in small groups to brainstorm and organize ideas using flowcharts.

Session 3: Independent use of flowcharts. Students created their own flowcharts to plan and write a complete analytical exposition text, demonstrating their ability to apply the technique autonomously.

Data Analysis

The data from the pre-test and post-test were analyzed using a paired sample t-test to determine whether the observed improvements in students' writing performance were statistically significant. The analysis was conducted in several steps:

Assumption Testing

Before performing the t-test, the following tests were conducted to ensure the suitability of the data:

Normality Test: Using the Liliefors method, the normal distribution of pre-test and post-test scores was verified.

Homogeneity Test: Levene's test was employed to confirm that the variance in scores between the pre-test and post-test groups was homogeneous.

Hypothesis Testing: The paired t-test was conducted at a significance level of $\alpha = 0.05$. The null hypothesis (H_0) stated that the use of flowcharts would have no significant effect on students' writing performance, while the alternative hypothesis (H_a) posited a significant positive impact.

Ethical Considerations

Ethical guidelines were strictly adhered to throughout the study. Informed consent was obtained from students and their guardians, ensuring voluntary participation. Anonymity and confidentiality of student data were maintained, and all instructional activities aligned with the school's curriculum and policies.

D. FINDING

Reliability Result of the Instrument

To ensure the reliability of the pre-test and post-test instruments, Cronbach's Alpha was calculated. The reliability test was conducted for the experimental class, and the results are as follows:

Table **1.**
Pre-Test Cronbach's Alpha

Cronbach's Alpha	N of Items
.940	10

The pre-test reliability yielded a Cronbach's Alpha value of 0.940, indicating a very high level of reliability. This suggests that the instrument is consistent in measuring students' writing abilities.

Table **2.**
Pre-Test Item Total Statistic

Items	Cronbach's Alpha if Item Deleted
Content_1	.932
Content_2	.933
Organization_1	.928
Organization_2	.925
Vocabulary_1	.934
Vocabulary_2	.934
Language_1	.936
Language_2	.937
Mechanic_1	.937
Mechanic_2	.938

The item-total statistics show that each item's corrected item-total correlation ranged from 0.648 to 0.911, reflecting strong internal consistency. Additionally, Cronbach's Alpha remained above 0.92 even if any item was removed, confirming that all items contribute positively to the scale's reliability.

Table 3.
Post-Test Cronbach's Alpha

Cronbach's Alpha	N of Items
.962	10

The post-test reliability yielded a Cronbach's Alpha value of **0.962**, which is also very high and suggests excellent consistency in assessing students' performance after the treatment.

Table 4.
Post-Test Item Total Statistic

Items	Cronbach's Alpha if Item Deleted
Content_1	.956
Content_2	.960
Organization_1	.957
Organization_2	.958
Vocabulary_1	.957
Vocabulary_2	.960
Language_1	.959
Language_2	.955
Mechanic_1	.963
Mechanic_2	.958

The corrected item-total correlations for the post-test ranged from **0.692 to 0.919**, indicating strong contributions of each item to the overall scale. If any item were removed, Cronbach's Alpha remained above 0.95, further supporting the robustness of the instrument.

Assumptions Testing

Table 5.
Normality test of pre-and post-test results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test	.149	31	.077	.936	31	.064
Post-test	.139	31	.133	.935	31	.060

The significance (Sig.) values for both tests (Kolmogorov-Smirnov and Shapiro-Wilk) are greater than the threshold of 0.05 for both the pre-test and post-test. This indicates that the null hypothesis (Ho) of normality is accepted, meaning the data are normally distributed for both tests.

Table 6.
Homogeneity test result

Lavene Statistic	df1	df2	Sig.
.314	1	60	.577

The significance value (Sig.) is greater than the threshold of 0.05, indicating no significant difference in variances between the groups. This suggests that the variances are homogeneous, and therefore, parametric tests like the paired sample t-test are appropriate for further analysis. As all the assumptions, including normality and homogeneity, have been met, we can proceed with the t-test analysis to examine the significance of the treatment effect.

Table 7.
Table of descriptive statistics

	Mean	N	Std.Deviation	Std.Error of Mean
Pre Test	66.94	31	6.196	1.113
Post Test	76.42	31	6.158	1.106

Table 8.
Table of test of difference using t-test

Paired Difference					t	df	Sig.
Mean	Std.Dev	Std.Err	95% Confidence				
			Lower	Upper			

Pre -	-9.484	4.661	.837	-11.194	-7.774	-11.329	30	.000
Post								

The pre-test was administered on August 1st, 2023, to assess the students' initial writing abilities. The mean score of the pre-test was 66.94, with scores ranging from 56 to 80. The median score was 67.00, and the mode was 70. The standard deviation was 6.196, reflecting some student scores variation. These results suggest that students had varying ability levels in writing analytical exposition texts before the treatments. After the treatments, the post-test was conducted on August 15th, 2023. The mean score for the post-test was 76.42, which improved over the pre-test mean. The scores in the post-test ranged from 65 to 85, with a median of 78 and a mode of 80. The standard deviation of the post-test was 6.158, indicating a similar level of variability as the pre-test but with a higher concentration of students scoring in the upper range. This shows a clear improvement in the students' writing abilities after using the flowchart strategy.

A paired sample t-test was performed to compare the pre-test and post-test scores. The test revealed a significant difference between the two scores ($t = -7.774$, $p = 0.000$), indicating that the flowchart strategy significantly improved the student's writing abilities. The mean difference between the pre-test and post-test scores was 9.48, with the post-test scores being consistently higher than the pre-test scores.

E. DISCUSSION

The integration of flowcharts into teaching analytical exposition writing revealed both confirmatory and novel findings, enriching the understanding of their efficacy as highlighted in existing literature. Initially, students exhibited hesitation and confusion in generating and organizing ideas during the first treatment. This observation is consistent with Miller and Pessoa's (2016) findings, which emphasize the persistent challenges students face in constructing cohesive arguments and maintaining logical flow in analytical writing. Similarly, this early struggle reflects Emilia et al.'s (2018) research, which identified difficulties in cohesion and argument development as key barriers for students, underscoring the critical need for instructional strategies that offer clarity and support.

However, the structured and progressive application of flowcharts across three treatments yielded marked and transformative improvements. This was evidenced by a statistically significant rise in mean scores from 66.93 to 76.41 ($p < 0.05$), showcasing not only enhanced student performance but also a shift in their ability to approach writing tasks with greater confidence and clarity. This quantitative improvement underscores the dual efficacy of flowcharts: they serve not only as organizational aids that help students logically structure their ideas but also as confidence-building tools that empower students to engage more actively with analytical writing. These findings highlight the broader educational value of visual aids, bridging gaps in analytical writing skills and affirming their utility as an indispensable component of writing instruction.

Insights Into Student Development and Engagement

The observed progression in students' engagement and performance underscores the developmental nature of learning facilitated by visual tools. While Zimmerman et al. (2023) previously demonstrated the general utility of flowcharts in enhancing understanding and knowledge integration, this study provides more targeted insights into their adaptability for writing instruction. Notably, students transitioned from being "confused with giving their ideas" during the first treatment to becoming "more enthusiastic, active, and comfortable" by the third. This progression strongly supports Zhang et al.'s (2023) findings on the cumulative benefits of visual aids, specifically in fostering a more interactive and self-assured learning environment.

Contextual and Innovative Applications

A particularly distinctive aspect of this research was the contextualization of writing tasks using locally relevant topics, such as the school library, public health issues, and Mount Krakatau. By grounding tasks in familiar and meaningful contexts, the study addressed Setyowati et al.'s (2020) concerns about the dual challenges of idea generation and time management in writing tasks. This innovative application of flowchart-based instruction not only enhanced students' ability to develop structured analytical arguments but also provided a scaffolded framework that made abstract writing concepts tangible and relatable.

Moreover, this contextual adaptation extends the theoretical scope of previous research. While Hyytinen et al. (2017) highlighted the barriers students face in academic writing, particularly in constructing analytical arguments, this study demonstrates how a tailored approach can mitigate such challenges. The combination of visual organization and locally relevant content created a dynamic learning environment that improved not only students' performance but also their intrinsic motivation to engage with writing tasks.

Broader Implications and Contributions

Quantitative data from this study adds a critical dimension to the largely qualitative discourse surrounding flowcharts in education. The significant improvement in mean scores provides empirical validation of their effectiveness, aligning with Little et al.'s (2018) meta-analysis on technology-based writing tools while offering a more focused examination of visual aids. Furthermore, the findings extend Ritchey et al. (2023) and Lee and Paz's (2021) conclusions on the utility of structured writing activities by demonstrating their adaptability to group-based learning contexts in Indonesia—a cultural and educational setting previously underexplored in such studies.

Engagement, Motivation, and Confidence

Beyond organizational support, flowcharts were found to enhance students' motivation and confidence. The progressive shift from hesitation to active participation

underscores their potential as confidence-building instruments, complementing broader research on self-efficacy in writing, such as Sun and Wang's (2020) study. This dimension, often overlooked in earlier research, suggests that the benefits of flowcharts extend beyond improving writing mechanics, fostering a more holistic approach to writing instruction.

Structured Implementation as a Model

The systematic three-treatment approach demonstrated how the gradual introduction of visual tools can effectively address multifaceted challenges in analytical writing. Rodliyah and Liani's (2022) identification of difficulties in maintaining coherence and organizing ideas finds practical solutions in this study's structured methodology. The clear progression from basic conceptual understanding to independent application offers a replicable model for educators seeking to incorporate visual aids into their teaching practices, transcending theoretical discussions and providing actionable strategies.

F. CONCLUSION

This study has demonstrated the significant effectiveness of flowcharts in improving students' analytical exposition writing abilities through a carefully designed three-treatment intervention. The results not only confirm but also extend existing research on the role of visual tools in education. With an observed increase in mean scores from 66.93 to 76.41 ($p < 0.05$), the findings provide robust evidence for the practical utility of flowcharts as tools that enhance not only organizational skills but also student confidence, engagement, and performance in writing tasks. The implementation of flowchart-based instruction allowed students to navigate and overcome common challenges in analytical writing, including generating ideas, structuring arguments, and maintaining coherence, challenges that have been widely documented in prior research (e.g., Miller & Pessoa, 2016; Emilia et al., 2018).

What sets this study apart is its innovative approach to contextualizing writing tasks with locally relevant topics, such as school libraries, public health concerns, and Mount Krakatau. This contextualization bridged the gap between abstract writing concepts and students' real-world experiences, creating a scaffolded learning environment that made analytical writing more accessible and engaging. By doing so, the study addressed critical gaps identified in the literature, such as Setyowati et al.'s (2020) concerns about idea generation and time management in writing tasks. Furthermore, it extended the findings of Hyytinen et al. (2017) by demonstrating how such tools can be adapted to educational settings where English is taught as a foreign language, providing new insights into the cultural adaptability of writing instruction methodologies.

Another noteworthy contribution of this study is its emphasis on the progressive nature of learning with flowcharts. The three-treatment design facilitated a gradual transition from initial confusion and hesitation to active engagement and confidence, underscoring the developmental potential of structured visual tools. The observed changes in students' attitudes—evidenced by their increasing enthusiasm and comfort with writing tasks—illustrate the dual role of flowcharts as both organizational aids and

confidence-building instruments. This aspect enriches the broader discourse on writing instruction by aligning with research on self-efficacy and motivation, such as Sun and Wang's (2020) findings on the psychological dimensions of writing improvement.

The quantitative data collected in this study offers an empirical foundation for claims regarding the efficacy of flowcharts, complementing the predominantly qualitative focus of earlier research. By providing measurable evidence of improvement, the study reinforces Little et al.'s (2018) conclusions about the benefits of technology-supported instructional tools, while narrowing the focus to highlight flowcharts' specific contributions to writing pedagogy. Additionally, the group-based implementation of this approach in an Indonesian high school context represents a significant expansion of the scope of existing research, such as Ritchey et al.'s (2023) and Lee and Paz's (2021) work, which primarily examined individual-based interventions in Western contexts.

The implications of this study are far-reaching. For educators, the findings offer a replicable model for integrating visual aids into writing instruction, with the potential to address a range of challenges, including those related to coherence, idea generation, and argument development. For curriculum designers, the research underscores the importance of contextualizing writing tasks in ways that resonate with students' lived experiences, fostering both engagement and relevance. For researchers, the study opens new avenues for exploration, such as the long-term retention of skills developed through flowchart-based instruction, the application of this approach to other writing genres, and its scalability across different educational levels and cultural contexts.

It is also important to acknowledge the study's limitations. While the results highlight the short-term benefits of flowchart use, further research is needed to assess their long-term impact on students' writing abilities. Similarly, the focus on analytical exposition writing, while significant, leaves open questions about how flowcharts might be adapted for narrative, descriptive, or argumentative writing genres. Additionally, while this study focused on a high school context in Indonesia, future research could investigate the applicability of this approach across different age groups and educational systems to better understand its universal potential.

In conclusion, the findings of this study make a compelling case for the integration of flowcharts into writing pedagogy. By addressing foundational challenges in analytical writing, creating engaging and contextually relevant learning environments, and fostering student confidence and motivation, flowcharts emerge as a powerful tool in modern education. The success of this approach suggests that visual aids can serve as a bridge between theoretical frameworks and practical application, providing educators with an effective strategy for enhancing students' writing skills in diverse and complex educational contexts. By building on these insights, future studies can further refine and expand the use of flowcharts in education, ensuring that their full potential is realized in shaping the next generation of confident and skilled writers.

G. REFERENCES

- Ary, D., Jacobs, L. C., Sorensen, C. K., & Walker, D. A. (2019). *Introduction to research in education* (Tenth edition. Student edition). Cengage.
- Emilia, E., Habibi, N., & Bangga, L. A. (2018). AN ANALYSIS OF COHESION OF EXPOSITION TEXTS: AN INDONESIAN CONTEXT. *Indonesian Journal of Applied Linguistics*, 7(3), 515. <https://doi.org/10.17509/ijal.v7i3.9791>
- Graham, S., Collins, A. A., & Rigby-Wills, H. (2017). Writing Characteristics of Students With Learning Disabilities and Typically Achieving Peers: A Meta-Analysis. *Exceptional Children*, 83(2), 199–218. <https://doi.org/10.1177/0014402916664070>
- Hyttinen, H., Löfström, E., & Lindblom-Ylänne, S. (2017). Challenges in Argumentation and Paraphrasing Among Beginning Students in Educational Sciences. *Scandinavian Journal of Educational Research*, 61(4), 411–429. <https://doi.org/10.1080/00313831.2016.1147072>
- Khonamari, F., Hashemi, E., Pavlikova, M., & Petrasova, B. (2021). Coherence Problems of EFL Students' Writing in Light of the Gricean Maxims. *Journal of Education Culture and Society*, 12(2), 294–313. <https://doi.org/10.15503/jecs2021.2.294.313>
- Lee, Y., & Paz, S. D. L. (2021). Science Writing Intervention Research for Students With and At Risk for Learning Disabilities, and English Learners: A Systematic Review. *Learning Disability Quarterly*, 44(4), 261–274. <https://doi.org/10.1177/07319487211018213>
- Little, C. W., Clark, J. C., Tani, N. E., & Connor, C. M. (2018). Improving writing skills through technology-based instruction: A meta-analysis. *Review of Education*, 6(2), 183–201. <https://doi.org/10.1002/rev3.3114>
- Miller, R. T., & Pessoa, S. (2016). Where's Your Thesis Statement and What Happened to Your Topic Sentences? Identifying Organizational Challenges in Undergraduate Student Argumentative Writing. *TESOL Journal*, 7(4), 847–873. <https://doi.org/10.1002/tesj.248>
- Ritchey, K. D., Coker, D. L., Myers, M. C., & Zhang, F. (2023). Teaching Students to Write Sentences: A Review of the Literature. *Topics in Language Disorders*, 43(4), 317–332. <https://doi.org/10.1097/TLD.0000000000000323>
- Rodliyah, R. S., & Liani, A. E. (2022). SFL analysis: An investigation of students' use of cohesive devices in exposition text. *Indonesian Journal of Applied Linguistics*, 12(1), 235–246. <https://doi.org/10.17509/ijal.v12i1.46596>
- Setyowati, L., Mujaddidah, A., Sukmawan, S., & El-Sulukiyyah, A. A. (2020). COMPARING THE HIGH AND LOW ACHIEVER STUDENTS' DIFFICULTIES IN LEARNING WRITING DURING REMOTE LEARNING. *Academic Journal Perspective : Education, Language, and Literature*, 8(2), 107–121. <https://doi.org/10.33603/perspective.v8i2.4074>
- Shilo, G., & Ragonis, N. (2023). Students' abilities to formulate exhaustive titles as a key to comprehending arguments. *International Journal of Applied Linguistics*, 33(2), 132–149. <https://doi.org/10.1111/ijal.12454>

- Yuliana, D., & Gandana, I. S. S. (2018). WRITERS' VOICE AND ENGAGEMENT STRATEGIES IN STUDENTS' ANALYTICAL EXPOSITION TEXTS. *Indonesian Journal of Applied Linguistics*, 7(3), 613. <https://doi.org/10.17509/ijal.v7i3.9812>
- Zhang, J.-H., Meng, B., Zou, L.-C., Zhu, Y., & Hwang, G.-J. (2023). Progressive flowchart development scaffolding to improve university students' computational thinking and programming self-efficacy. *Interactive Learning Environments*, 31(6), 3792–3809. <https://doi.org/10.1080/10494820.2021.1943687>
- Zimmermann, A. E., King, E. E., & Bose, D. D. (2024). Effectiveness and Utility of Flowcharts on Learning in a Classroom Setting: A Mixed-Methods Study. *American Journal of Pharmaceutical Education*, 88(1), 100591. <https://doi.org/10.1016/j.ajpe.2023.100591>