OVERCOMING DIFFICULTIES IN WRITING SCIENTIFIC ARTICLES THROUGH THE IMPLEMENTATION OF THE SCAFFOLDED WRITING MODEL IN HIGHER EDUCATION

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ABSTRAK

Menulis artikel ilmiah merupakan keterampilan literasi akademik yang kompleks dan masih menjadi tantangan bagi mahasiswa di perguruan tinggi. Penelitian ini bertujuan untuk mengidentifikasi kesulitan mahasiswa dalam menulis artikel ilmiah, menganalisis penerapan model *Scaffolded Writing,* serta mengkaji persepsi mahasiswa terhadap penerapan model tersebut. Penelitian ini menggunakan pendekatan kualitatif dengan desain studi kasus yang dilaksanakan pada mahasiswa Program Studi D3 Keperawatan. Data diperoleh melalui observasi, wawancara mendalam, dan dokumentasi terhadap dua belas artikel ilmiah mahasiswa, kemudian dianalisis menggunakan model interaktif Miles dan Huberman. Hasil penelitian menunjukkan bahwa mahasiswa mengalami kesulitan dalam empat aspek utama, yaitu pengorganisasian struktur artikel ilmiah, sistem penulisan, penggunaan bahasa akademik, dan penulisan referensi. Penerapan model *Scaffolded Writing* melalui tahapan pemodelan, pendampingan intensif, revisi terstruktur, dan penulisan mandiri terbukti mampu membantu mahasiswa mengatasi kesulitan tersebut serta meningkatkan kualitas tulisan. Selain itu, mahasiswa menunjukkan persepsi positif terhadap model ini, terutama dalam meningkatkan pemahaman struktur, mempermudah proses menulis, dan meningkatkan kepercayaan diri. Simpulan penelitian ini menegaskan bahwa model *Scaffolded Writing* efektif dalam meningkatkan kemampuan menulis artikel ilmiah mahasiswa baik dari aspek kognitif maupun afektif. Oleh karena itu, model ini direkomendasikan untuk diterapkan dalam pembelajaran menulis di perguruan tinggi. Penelitian selanjutnya disarankan untuk menguji efektivitas model ini secara lebih luas dengan pendekatan yang beragam.

Kata kunci: *scaffolded writing*, menulis artikel ilmiah, literasi akademik

ABSTRACT

Writing scientific articles is a complex academic literacy skill and remains a challenge for university students. This study aims to identify students' difficulties in writing scientific articles, analyze the application of the Scaffolded Writing model, and examine students' perceptions of its application. This study used a qualitative approach with a case study design conducted on students of the Diploma 3 Nursing Study Program. Data were obtained through observation, in-

depth interviews, and documentation of twelve student scientific articles, then analyzed using the Miles and Huberman interactive model. The results showed that students experienced difficulties in four main aspects: organizing the structure of scientific articles, writing systems, using academic language, and writing references. The application of the Scaffolded Writing model through the stages of modeling, intensive mentoring, structured revision, and independent writing was proven to be able to help students overcome these difficulties and improve the quality of their writing. In addition, students showed positive perceptions of this model, especially in improving understanding of the structure, facilitating the writing process, and increasing self-confidence. The conclusion of this study confirms that the Scaffolded Writing model is effective in improving students' scientific article writing skills from both cognitive and affective aspects. Therefore, this model is recommended for implementation in writing learning in universities. Further research is recommended to test the effectiveness of this model more broadly with diverse approaches.
Keywords: *scaffolded writing, writing scientific articles, academic literacy*

INTRODUCTION

Writing scientific articles is an important form of academic literacy practice in higher education. This skill not only relates to the ability to express ideas in writing, but also reflects the ability to think critically, construct knowledge, and communicate the results of thinking systematically within the academic community. In the context of higher education, academic writing skills are an important indicator of a student's intellectual maturity and a means of participating in the development of science. Therefore, the ability to write scientific articles is an essential competency that students must possess during their studies at university (Hyland, 2019).

However, various studies show that students still experience various difficulties in writing scientific articles. These difficulties include the ability to develop research ideas, systematically structure articles, construct logical scientific arguments, and use academic language in accordance with scientific conventions. Furthermore, students often experience difficulties integrating library sources and understanding the rhetorical structure of scientific articles. Previous research indicates that many students lack an adequate understanding of

academic text organization and argument development strategies in scientific writing (Hyland, 2016; Swales & Feak, 2012). This condition shows that students' academic writing skills still face various challenges in learning practices at universities.

This issue is important to examine because the ability to write scientific articles serves not only as a means of academic evaluation but also as a fundamental skill for students in developing scientific thinking and contributing to the academic community. Therefore, higher education institutions need to develop learning strategies that can help students overcome various difficulties in writing scientific articles in a systematic and sustainable manner. From an academic literacy perspective, writing is understood not only as the activity of producing text but also as a cognitive and social process involving planning, organizing ideas, constructing arguments, and the process of revising and reflecting on one's writing (Hyland, 2019).

One learning approach that can be used to help students overcome difficulties in academic writing is the Scaffolded Writing model. The concept of scaffolding is rooted in sociocultural theory, which emphasizes the importance of pedagogical support in the learning process. According to Vygotsky (1978), According to Vygotsky (1978), the learning process occurs most effectively when students receive assistance or support from someone more competent within their zone of proximal development. In the context of writing instruction, scaffolding is implemented through various forms of support, such as text modeling, explicit guidance, providing feedback, and gradually reducing assistance until students are able to write independently (Hammond, 2001).

Various previous studies have shown that the use of scaffolding in writing instruction can improve students' academic writing skills. Research conducted by Derewianka & Jones, (2016), indicates that the scaffolding approach helps students understand the structure of academic texts more systematically. Additionally, other studies have found that scaffolding strategies can improve students' ability to develop ideas, construct scientific arguments, and boost their confidence in academic writing (Li & Stackhouse, 2025).

The results of this study indicate that scaffolding is an effective pedagogical strategy for improving the quality of academic writing instruction in higher education. However, most previous studies have focused primarily on the effectiveness of scaffolding in writing instruction in general or in the context of second-language learning. Studies that specifically analyze how the Scaffolded Writing model is applied to help students overcome difficulties in writing scientific articles in higher education are still relatively limited. Furthermore, research integrating analyses of students' difficulties, the process of implementing the learning model, and students' perceptions of the model's application in academic writing instruction has also been scarce.

Based on this research gap, this study aims to conduct a more in-depth examination of the application of the Scaffolded Writing model in the teaching of scientific article writing at the university level. The novelty of this study lies in its analytical approach, which integrates three main aspects: identifying students' difficulties in writing scientific articles, analyzing the process of implementing the Scaffolded Writing model in instruction, and examining students' perceptions regarding the model's effectiveness in improving academic writing skills. Thus, this study is expected to provide a more comprehensive overview of the practice of teaching scientific writing at the university level.

In addition to contributing to the development of academic literacy studies, this research is also expected to provide practical insights for the development of writing instruction strategies in higher education. The findings of this study can serve as a reference for instructors in designing more systematic, step by step, and student-centered approaches to teaching scientific writing. Based on this background, this study aims to: (1) identify the difficulties students face in writing academic papers, (2) analyze the application of the Scaffolded Writing model in academic writing instruction, and (3) examine students' perceptions of the application of the Scaffolded Writing model in academic writing instruction at the university level.

METHOD

This study employs a qualitative research approach with a descriptive design. The qualitative approach is used to gain an in-depth understanding of the phenomenon of applying the Scaffolded Writing model in the teaching of scientific article writing, as well as to examine students' difficulties and perceptions in the academic writing process. Qualitative research allows researchers to gain a comprehensive understanding of the experiences, views, and learning practices that occur in a specific context (Creswell & Creswell, 2018). The approach used in this study is a case study, which allows the researcher to explore learning phenomena contextually in real-world situations and to understand the dynamics of the learning process in depth (Yin, 2018). The study was conducted during the odd semester of the 2025/2026 academic year in the Associate Degree in Nursing program at Bhamada Slawi University, which offers an Indonesian Language course that includes academic writing practice. The research subjects were the students enrolled in the course and the course instructor. The research data sources included primary and secondary data. Primary data were obtained through observation of the learning process and in-depth interviews with students and lecturers. Meanwhile, secondary data consisted of learning documents and student writing products, namely twelve student scientific articles composed using the Scaffolded Writing model.

Data collection techniques include observation, interviews, and documentation. Observation was used to directly observe the process of implementing the Scaffolded Writing model in the teaching of scientific article writing. In-depth interviews were conducted to explore students' experiences, difficulties, and perceptions regarding the teaching of scientific article writing. Documentation was used to analyze students' written work, including drafts of scientific articles and learning materials such as learning aids and teaching resources used in the learning process. The use of these various data collection techniques aimed to obtain more comprehensive data regarding the phenomenon under study (Merriam & Tisdell, 2016).

The research instrument in this qualitative study is the researcher as the primary instrument (human instrument). The researcher plays a role in directly

collecting, interpreting, and analyzing the research data. To support the data collection process, the researcher uses several auxiliary instruments, namely observation guidelines, semi-structured interview guidelines, and documentation sheets used to analyze students' written work (Creswell & Creswell, 2018). The validity of the data in this study was tested using source triangulation and methodological triangulation to enhance the credibility of the research findings. Source triangulation was conducted by comparing data obtained from various informants, while methodological triangulation was conducted by comparing data obtained through observation, interviews, and documentation (Miles, et.al, 2014). In addition, the researcher also conducted member checking with informants to ensure that the data and interpretations obtained were consistent with the informants' experiences and perspectives (Lincoln & Guba, 1985).

Data analysis using the interactive analysis model proposed by Miles, et.al, (2014), comprises three main stages: data reduction, data presentation, and drawing conclusions. Data reduction involves selecting, focusing, and simplifying data relevant to the research objectives. Next, the data is presented in the form of a descriptive narrative to facilitate the interpretation process. The final stage is drawing conclusions, which is carried out repeatedly and continuously until valid and comprehensive findings are obtained regarding the application of the Scaffolded Writing model in teaching students to write scientific articles.

DISCUSSION

Results

Students' Difficulties in Writing Scientific Articles

Based on a document analysis of twelve student scientific articles, observations of the learning process, and in-depth interviews with students, it was found that students still face various difficulties in writing scientific articles. These difficulties encompass four main aspects, namely (1) organizing the structure of scientific articles, (2) the scientific writing system, (3) the proper use of academic language, and (4) writing references. These four aspects are interrelated and influence the quality of students' scientific writing.

a. Difficulties in Organizing the Structure of Scientific Articles

Organizing a scientific article involves the ability to arrange the article's sections systematically according to the commonly used scientific structure, namely Introduction, Methods, Results, and Discussion (IMRAD). Document analysis revealed that some students are not yet able to organize the structure of a scientific article systematically. Some student articles indicate that the introduction section does not clearly present the background of the problem, the research objectives have not been explicitly formulated, and the results and discussion sections remain intermixed.

This finding is further supported by interview results with students who stated that they still face difficulties in understanding the structure of scientific articles.

> "I'm still having trouble distinguishing between the results and discussion sections. Sometimes I just explain the research findings without knowing whether they belong in the results or the discussion." (Student 1)

Other students also mentioned that they had difficulty writing the research background. "Writing the background is difficult because you have to explain the research problem and connect it to theory." (Student 3)

These findings indicate that students still struggle to systematically understand the rhetorical structure of scientific articles.

b. Challenges in the Scientific Writing System

In addition to difficulties in organizing the structure of their articles, students also face challenges in the scientific writing system. The scientific writing system pertains to the application of scientific writing conventions, such as the use of citations, consistency in formatting, and adherence to a writing structure that meets academic standards. Analysis of the documents revealed that some student articles still exhibit inconsistencies in writing format, such as the formatting of subheadings, the use of tables, and inconsistent paragraph formatting. Additionally, errors in citation usage were identified.

This is further supported by the following student statements from interviews:

"I still often get confused about how to properly cite sources within the text." (Student 4)

Other students also stated that they are not yet accustomed to writing scientific articles and therefore still have difficulty following the correct writing format.

"The writing format sometimes changes because I'm not yet used to writing scientific articles." (Student 2)

c. Difficulties in Using Academic Language

The proper and correct use of academic language is a crucial element in writing scientific articles. Scientific language is characterized by the use of effective, objective sentences that adhere to standard linguistic conventions. Analysis of the documents revealed that some student articles still contain errors in language usage. These errors include overly long sentences, the use of non-standard vocabulary, and ineffective sentence structures.

These findings are further supported by the results of interviews with students.

"I often struggle to construct formal sentences because I usually write in everyday language." (Student 5)

This statement indicates that students still require guidance in using academic language that aligns with the conventions of scientific writing.

d. Difficulties in Writing References

Writing references is an important part of scientific articles because it indicates the sources used in the writing of the scientific work. The results of the document analysis show that some students still have difficulty writing references correctly and consistently.

These difficulties are evident in the discrepancies between in-text citations and the reference list, as well as inconsistencies in the formatting of references.

This was also expressed by students in the following interviews:

"I often forget to include the source in the reference list after writing a citation in the text." (Student 6)

These findings indicate that students still require a better understanding of citation techniques in scientific articles.

The Application of the Scaffolded Writing Model in Teaching Scientific Writing

Based on classroom observations and interviews with students, the Scaffolded Writing model was implemented in stages to help students overcome difficulties in writing scientific articles. This model was implemented through four main stages: modeling, guided writing, structured revision, and independent writing.

a. Modelling Stage

In this stage, the instructor provides examples of well written scientific articles and explains the structure of scientific writing to the students. The instructor breaks down the sections of a scientific article, which include the introduction, methods, results, and discussion.

This stage helps students understand the structure of a scientific article more clearly. One student stated:

> "After the instructor explained the structure of the article, I began to understand how to organize the text from the introduction through the discussion." (Student 2)

b. Intensive Guidance Stage (Guided Writing)

In this stage, students begin to draft their scientific articles step by step under the instructor's guidance. Students create an outline, then write the introduction and research methods sections.

During this process, the instructor provides direct feedback on the students' writing so they can correct any errors that arise.

> "When writing the first draft, the instructor provided feedback so I knew which parts needed improvement." (Student 4)

c. Structured Revision Stage

In this stage, students are asked to revise their papers based on feedback provided by the instructor. The revision process is carried out several times to improve the paper's structure, language use, and citation formatting.

> "After several revisions, my paper became clearer and its structure more organized." (Student 3)

d. Independent Writing Stage (Independent Writing)

The final stage is independent writing. In this stage, students are asked to complete a scientific article independently after going through the previous learning and guidance process.

The results of the document analysis show that the quality of the students' writing has improved, particularly in terms of article structure, use of academic language, and citation formatting.

Students' Perceptions of the Implementation of the Scaffolded Writing Model

Based on the results of in-depth interviews, classroom observations, and analysis of student reflections, it was found that students' perceptions of the implementation of the Scaffolded Writing model in scientific article writing instruction tend to be positive. These perceptions are not only related to an improved understanding of the structure of scientific articles but also encompass aspects of the learning process, self-confidence, and overall academic writing ability. More specifically, students' perceptions can be categorized into four main aspects, namely (1) understanding of scientific writing structure, (2) ease in the writing process, (3) increased self-confidence, and (4) the effectiveness of guided learning.

a. Improved Understanding of the Structure of Scientific Articles

Students believe that the application of the Scaffolded Writing model helps them understand the structure of scientific articles more systematically. Through the modeling and mentoring stages, students gain a clear understanding of how scientific articles are organized according to the IMRAD structure (Introduction, Methods, Results, and Discussion). Before participating in this learning model, some students admitted they did not fully understand the structure of scientific articles. However, after completing the learning process, students began to be able to identify and organize the sections of an article in a more focused manner.

This is reflected in the following student statements:

> "Previously, I didn't really understand the structure of scientific articles, but after it was explained and examples were provided, I now better understand how to organize each section of an article." (Student 2)

Another student also stated:

"With the step-by-step explanations, I now know the function of each section in a scientific article." (Student 3)

These findings indicate that the Scaffolded Writing model plays a role in enhancing students' conceptual understanding of the structure of scientific writing.

b. Ease in the Process of Writing Scientific Articles

In addition to improving their understanding of structure, students also found that the process of writing scientific articles became easier through the application of the Scaffolded Writing model. The step by step learning process helped students manage the writing process, which they had previously considered complex.

Students no longer feel they must write the entire article at once but can start by creating an outline, then proceed to write each section systematically. This was expressed by a student as follows:

"With the provided steps, I no longer find it difficult because I don't have to write the whole thing at once, but rather in stages." (Student 5)

Another student also stated:

"The writing process became easier because there was guidance from the instructor at every stage." (Student 4)

These findings indicate that the step by step approach in Scaffolded Writing is effective in helping students manage the cognitive processes involved in writing scientific articles.

c. Increased Confidence in Writing

Students' positive perceptions are also evident in their increased confidence in writing scientific articles. Before participating in the course, some students lacked confidence because they did not yet have sufficient experience or understanding of scientific writing.

However, through a learning process involving continuous guidance and feedback, students began to feel more confident in their writing abilities.

This is reflected in the following statement:

"At first, I wasn't confident writing scientific articles, but after receiving guidance, I became more confident in my writing." (Student 6)

Another student also stated:

"With the revisions and feedback from the instructor, I became aware of my mistakes and was able to correct them." (Student 1)

These findings indicate that pedagogical support within the Scaffolded Writing model not only enhances writing skills but also improves students' affective aspects, particularly their self-confidence.

d. Perceptions of the Effectiveness of Scaffolding Based Learning

Students generally believe that the Scaffolded Writing model is an effective learning approach for helping them understand and master the skills required for writing scientific articles. Learning that is conducted in a gradual, structured manner and accompanied by feedback is considered more helpful than learning that immediately demands a final product.

Students also believe that the instructor's role in providing guidance is crucial to the learning process.

This is evident in the following statement:

"This learning model is very helpful because there is guidance from start to finish." (Student 2)

Another student stated:

"In my opinion, this method is more effective because we are guided step-by-step until we can write on our own." (Student 5)

Additionally, some students noted that this model helped them overcome difficulties they had previously experienced in writing scientific articles.

"The difficulties I previously faced have decreased because of the step by step explanations and exercises." (Student 3)

These findings indicate that students view Scaffolded Writing as an effective learning model for improving the quality of scientific article writing.

Discussion

Students' Difficulties in Writing Scientific Articles

Research findings indicate that students still face difficulties in organizing the structure of scientific articles, adhering to scientific writing conventions, using academic language, and citing references. These findings suggest that writing a scientific article is not merely the act of putting ideas into writing, but a complex process that requires simultaneous mastery of linguistic, rhetorical, social, and epistemological aspects. According to Hyland (2019), academic writing is a social practice that requires writers to understand how to construct arguments, manage evidence, and adapt to the discursive conventions of the academic community. Thus, students' difficulties in writing scientific articles can be understood as a consequence of the complexity of academic demands that they have not yet fully mastered.

Difficulties in organizing the structure of scientific articles, particularly in understanding the IMRAD format (Introduction, Methods, Results, and Discussion), indicate that students have not yet fully grasped the rhetorical structure of academic texts. According to Swales & Feak, (2012), each section of a scientific article serves a distinct communicative function and is interconnected in constructing a coherent scientific argument. Students' inability to distinguish the functions of the introduction, methods, results, and discussion indicates a still-weak understanding of the academic genre. This finding aligns with research by Paltridge (2017), which shows that novice academic writers generally face challenges in organizing ideas, structuring arguments, and logically building cohesion between sections.

In addition, difficulties with the scientific writing system indicate that students are not yet accustomed to academic conventions, such as the use of citations, consistency in writing format, and the application of a scientific structure that meets established standards. According to Hyland (2016), novice writers often face obstacles in integrating sources into their writing, using citation practices correctly, and understanding the rhetorical expectations inherent in academic writing. In line with this Pecorari (2018), emphasizes that students often struggle with paraphrasing, citing sources proportionally, and providing ethical

scholarly attribution. This indicates that scientific writing skills are closely linked to mastery of academic literacy and an understanding of the ethics of source usage.

Difficulties in using academic language also reinforce the finding that students still face challenges in using formal, objective, concise, and argumentative language. According to Paltridge & Starfield, (2020), academic writing requires mastery of academic register, precise word choice, cohesion between sentences, and the ability to develop evidence based arguments. Limited exposure to academic texts, a limited academic vocabulary, and a lack of formal writing practice lead students to tend to use everyday language patterns in scientific contexts. This results in unclear arguments, weak text cohesion, and ineffective academic sentence structures constructed by students.

Meanwhile, difficulties in writing references indicate that students still have limitations in academic information literacy and the ethical use of sources. Students often encounter discrepancies between in text citations and the reference list, inconsistencies in reference formatting, and a lack of understanding of the principles of scholarly attribution. According to Eaton, (2021), academic integrity is not only related to the prevention of plagiarism but also encompasses the ability to manage information sources, apply citation practices accurately, and understand ethical responsibilities in scientific writing. Thus, the findings of this study reinforce the view that students' difficulties in writing scientific articles are a multidimensional phenomenon involving cognitive, linguistic, rhetorical, and academic literacy aspects simultaneously.

The Application of the Scaffolded Writing Model in Teaching Scientific Article Writing

The application of the Scaffolded Writing model in this study proved effective in helping students overcome difficulties in writing scientific articles through the stages of modeling, guided writing, structured revision, and independent writing. These findings indicate that pedagogical support provided in a step by step manner can help students build both conceptual understanding and practical skills in academic writing. The theoretical foundation of this model is rooted in Vygotsky, (1978), concept of the zone of proximal development, which

asserts that learners can achieve higher levels of competence through targeted assistance from more competent individuals. In the context of academic writing instruction, this assistance is realized through explicit guidance, the provision of examples, feedback, and gradual support until students are able to write independently.

The results of the study indicate that the modeling stage helps students understand the structure of scientific articles more systematically. This finding aligns with the research by Derewianka & Jones, (2016), which explains that text modeling in genre pedagogy helps learners explicitly understand text organization, the rhetorical functions of each section, and patterns of idea development. With the availability of text examples analyzed together, students find it easier to understand how a scientific article is constructed logically and coherently. This is reinforced by oleh Paltridge & Starfield, (2020), who assert that explicit academic text modeling significantly contributes to students' ability to construct scientific argumentative structures, develop logical flow, and adapt language choices to academic demands. During the intensive guidance phase (guided writing), students receive guidance and feedback that help them gradually improve the weaknesses in their writing.

These findings align with the view Hyland, (2019), which states that feedback is a central element in academic writing instruction because it serves as a dialogic mechanism that helps students understand academic expectations, clarify errors, and develop strategies for improving their writing. Furthermore, according to Ferris (2018), consistent written corrective feedback has been shown to improve students' language accuracy, text organization, and revision skills. Recent empirical findings by Li, et.al, (2024), indicate that a scaffolding based writing approach through structured, step by step teacher student interactions can enhance students' ability to grasp main ideas, compose academic summaries, and produce grammatically more complex sentences.

The structured revision phase in this study demonstrated that students were able to improve the quality of their writing through a process of reflection, self-evaluation, and iterative revision. These findings align with Ferris (2018), who asserts that revision is not merely about correcting mechanical errors, but rather a

reflective process that encourages students to reassess the quality of their arguments, the coherence of their ideas, and the effectiveness of their use of academic language. A similar point was raised by Graham, et.al (2018), who found that writing instruction strategies emphasizing revision, self-evaluation, and systematic feedback significantly influence improvements in writing quality regarding the organization of ideas, elaboration of arguments, and textual cohesion. Thus, structured revision in Scaffolded Writing not only produces better writing but also fosters students' metacognitive awareness of the writing process itself.

Furthermore, the effectiveness of the Scaffolded Writing model in this study demonstrates that writing instruction based on gradual support can improve the quality of writing while fostering students' academic independence. Recent research indicates that systematic scaffolding provided during the planning and idea-development stages can help students produce writing that is more structured, more argumentative, and more reflective of their thought processes. Research on scaffolding recommendations for students' essay planning indicates that step-by-step support during the essay planning stage significantly helps students construct a framework of ideas, organize arguments, and improve the quality of the final composition. These findings reinforce the research results that the Scaffolded Writing model is an effective pedagogical approach for bridging the gap between students' initial abilities and the demands of writing complex academic papers in higher education. Thus, the findings of this study are not only consistent with existing theory and previous research but also strengthen the empirical evidence that Scaffolded Writing is an effective instructional model for improving the quality of students' scientific writing, including in terms of text structure, argument development, use of academic language, and the ability to revise their own writing.

Students' Perceptions of the Implementation of the Scaffolded Writing Model

Students' generally positive perceptions of the implementation of the Scaffolded Writing model indicate that this model has a significant impact not only on cognitive aspects but also on the affective dimension of scientific article writing instruction. These findings suggest that scaffolding-based writing

instruction not only helps students understand the structure and process of academic writing but also fosters motivation, self-confidence, and active engagement in the learning process. From a social constructivist perspective, learning occurs optimally through social interaction, pedagogical dialogue, and targeted support from more competent individuals. This view aligns with Vygotsky, (1978), concept of the zone of proximal development, which asserts that the development of learning abilities occurs optimally when learners receive assistance tailored to their needs. The relevance of this perspective in language learning is reinforced by Lantolf, et.al (2018), who explain that scaffolding plays a crucial role in fostering cognitive development, metacognitive reflection, and learning autonomy through systematic pedagogical interactions.

The improvement in students' understanding of the structure of scientific articles indicates that the scaffolding approach is effective in helping students build knowledge gradually and purposefully. Through the stages of modeling, explicit instruction, and continuous feedback, students gained a clearer understanding of the rhetorical structure of scientific articles, the communicative functions of each section, and the patterns of academic argumentation. These findings align with the research by Derewianka & Jones, (2016), which shows that genre-based pedagogy supported by scaffolding effectively enhances students' ability to understand text organization, discourse cohesion, and the construction of academic meaning. This is reinforced by Paltridge & Starfield, (2020), who assert that students who receive explicit guidance on academic text structure tend to be better able to construct scientific arguments logically, systematically, and coherently.

Furthermore, students' perceptions regarding the ease of the writing process indicate that the step-by-step approach in Scaffolded Writing is able to reduce the cognitive load previously perceived as the main obstacle in writing scientific articles. Students are no longer faced with the demand to produce a complete piece of writing all at once, but rather through more structured stages, ranging from planning, outlining, paragraph development, to revision. These findings align with Ferris, (2018), who states that systematic pedagogical support in the writing process helps students understand writing strategies, improve writing

weaknesses, and develop better control over the academic composition process. Additionally, research by Li, et.al (2024), indicates that a scaffolding-based "Reading to Learn" approach significantly enhances students' ability to grasp main ideas, organize information, and produce more complex and structured academic writing.

From an affective perspective, the increase in students' confidence in writing scientific articles indicates that success in completing writing assignments through step by step guidance has a direct impact on enhancing self-efficacy. According to Hyland, (2019), success in academic writing practice contributes to increased motivation, engagement in learning, and students' belief in their writing abilities. In line with Pecorari, (2018), findings adequate pedagogical support, repeated writing practice, and constructive feedback play a crucial role in building academic self confidence while enhancing students' awareness of the ethics and quality of scientific writing.

Students' perceptions of the effectiveness of this model also indicate that process-based learning is more highly valued than product-based approaches. Students responded positively to learning that provided step-by-step guidance, continuous feedback, and reflective opportunities to revise their writing. This suggests that students view academic writing not merely as the production of a final product, but as an academic thinking process that develops through practice, reflection, and pedagogical interaction. Thus, the results of this study reinforce the empirical finding that the Scaffolded Writing model is an effective approach for improving the quality of scientific article writing instruction in higher education, whether in terms of understanding structure, ease of the writing process, increased self-confidence, or student engagement in learning.

Furthermore, this study offers a novel contribution because it not only confirms the effectiveness of scaffolding in writing instruction but also demonstrates that the systematic and contextual implementation of Scaffolded Writing can address students' real world challenges in writing academic papers. By simultaneously integrating an analysis of students' difficulties and their perceptions, this study proposes a model of academic literacy instruction that is more adaptive, practical, and relevant to the context of higher education.

CONCLUSION

The results of the study indicate that students still face difficulties in writing academic papers, particularly regarding text structure, writing organization, the use of academic language, and citation formatting. These findings indicate that students' academic literacy skills still need to be developed systematically. The application of the Scaffolded Writing model has proven effective in guiding students through structured learning stages namely modeling, coaching, revision, and independent writing thereby enhancing their understanding of the writing process and the quality of their academic articles. From a pedagogical perspective, instructors are advised to implement step by step academic writing instruction using a scaffolding approach. Instructors should provide modeling of scientific article writing, guide the idea development process, offer feedback during the revision stage, and encourage students to write independently. This approach can help students understand the scientific writing process more systematically and improve their academic literacy skills.

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