Analysis of Student's Scientific Writing Skills in Research: Common Mistakes and Writing Style

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Abstract. This study aims to describe the ability to write scientific papers of students from common mistakes and writing styles. Scientific writings intended in this study are in the form of a research report based on pre-research findings during student final project supervision which shows many writing problems. The research method used is in the form of content analysis by collecting data in a documentary manner and through questionnaires. Data were collected from the responses of 30 students and their research reports. Data were processed descriptively qualitatively and quantitatively to present data analysis based on content, structure, grammar, and neatness of writing. The results show that the introduction or background and discussion are the parts with the most errors and are considered difficult for students. In addition, from the writing style, it was also found that there were similarities in writing errors such as introductory topics about education, lack of coherence, and less varied word choices. Overall these findings indicate that the ability of students to write scientific papers for research reports is still low so follow-up efforts and optimization solutions are needed through ideal writing learning.

Keywords: Scientific Writing · Research Report · Self-Writing Assessment

1 Introduction

Scientific writing is an integral part of the development of science and technology in the form of research results and ideas based on certain scientific methods. Scientific writing skills are also a mandatory requirement for academics, researchers, and certain professions in the context of developing their professionalism [1]. Scientific writing is bound by scientific conventions in presenting findings and thoughts in an original, systematic, logical, objective, reliable, and cumulative manner [2]. This attachment makes writing scientific papers difficult for students in particular. At the end of their studies to determine graduation, students are required to write articles on their research results, but the scientific conventions of research reports as scientific papers are often not visible and can be presented ideally [3].

Relevant to this argument, similar facts were also found during the mentoring of a student thesis at the PGSD S1 Study Program, the State University of Malang in the Even

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Semester of 2020/2021. Students face many difficulties in writing research reports. This data was obtained from short interviews and experiences with lecturers and students during mentoring. This condition then has an impact on the non-optimal publication of student research results in accredited journals and proceedings. During the process, this difficulty also resulted in a long time to write research reports, even in some cases the writing time was longer than the research time for data collection and processing.

Related to this fact, this study will reveal a description of the ability to write articles based on student research in terms of common mistakes and writing style. The findings in this study will be a reference and development in guiding students when writing research reports. Common errors refer to patterns of inaccuracy in the writing of each part of the research article, both in terms of content and structure [4]. Writing style refers to grammar in word choice, coherence of ideas, and punctuation to neatness in writing [5]. This indicator becomes a constituent element of research reports as scientific papers that must be mastered properly by the author.

Previous research on the analysis of the ability to write research reports has also been carried out. In his findings, it was stated that the dominant common errors that appeared were plagiarism, systematic organization of content, citations, and presentation format errors [6, 7]. This finding becomes the basis for developing follow-up in optimizing the ability to write research reports from students. Follow-up is meant for example by developing a learning model for writing or mentoring, developing guidebooks, and supporting instruments to train students' writing skills [8, 9].

From this rationalization, this research is expected to be useful to provide a more detailed description of students' writing skills. This description will serve as the basis and analysis of needs for the development of more effective and efficient learning and mentoring. From this more effective and efficient writing learning and mentoring, it will indirectly have a positive impact on students' writing abilities as well as on the number of recent publications with a clear empirical basis as referring to facts in the field and the results of previous research [10, 12].

2 Methods

This study uses the content analysis method to analyze the errors and writing styles of students in writing research reports. For this reason, research data is needed in the form of articles from student research results. The data for this study were sourced from the population, namely students of the 2018 PGSD S1 Study Program who had completed their final project or thesis and were willing to be involved in this research. From the entire population, probability sampling was determined using a simple random sampling technique so that various qualifications of the student research reports could be obtained in terms of technique and writing style. The following are the demographic details of the data in this study.

Then, the research data were analyzed using an analytical assessment rubric whose results were presented quantitatively and qualitatively. Complementing this data, further information was also explored for writing errors related to student difficulties in writing research reports through questionnaires. The following grid is used in Table 2. Next, the articles analyzed were processed descriptively quantitatively by determining the

Table 1. Demographic Data

Population	Sample (30%)	Gender		Thesis Completion Period (mean)
106	32	Female	28	7 months
		Male	14	

Table 2. Rubric for Assessment of Scientific Articles

Numb	Indicator	Description
1	Content	refers to the assessment of the research article section: (a) the background reveals the rationale, purpose, and importance of the research; (b) methods of uncovering research procedures, data collection, and analysis techniques; (c) the results reveal the research findings under the formulation of the research problem/objective; (d) the discussion reveals the theoretical/empirical support from the results of previous research related to research findings; (e) the conclusion reveals the essence of the answer to the problem formulation/achievement of research objectives, and (f) a list of references showing the references used
2	Structural	refers to the writing of each research article, for example, the background is composed of an introduction, results of preliminary studies, analysis of problem findings, follow-up, and research confirmation
3	Mechanical	refers to the use of grammar including word selection, effective sentences, punctuation, numbering, coherence between sentences and paragraphs, writing titles and subtitles
4	Neatness	refers to the accuracy of writing (no typos), paragraph volume (arranged in a consistent number of sentences), consistency of writing and layout, the accuracy of article formatting

percentage of error findings. The data is then supported by statements related to research findings from the results of document analysis and open questionnaires presented in a qualitative descriptive manner. In detail, the procedures used in this study include (a) determining the focus of research related to the ability of students to write research reports based on common mistakes and writing styles, (b) conducting a preliminary study related to the research focus, (c) determining the design and research objectives, (d) developing research instruments for assessment rubrics and questionnaires, (e) collecting and analyzing data according to research objectives, (f) presenting data, and reporting research findings (Table 1).

3 Result and Discussion

Based on the research findings, it is known that the average common errors of students in writing content and structure lie in the introduction or background and discussion

Table 3. Finding Errors in Writing Content and Structure/Section of Research Report

Numb	Section	Percentage	Description
1	Introduction	66.6%	✓ The preliminary study section is less relevant or does not support the title and formulation of the research problem ✓ Low up-to-date and up-to-date references are used because they are still dominated by old books ✓ Has not shown a research gap/state of the art research
2	Method	43.3%	✓ Weaknesses in organizing the points discussed in the literature review that are relevant to the research topic ✓ Not yet up-to-date references used (out of date, research results, and theories that are not valid)
3	Result	46.6%	✓ Weaknesses in the connection between the data to be collected, collection techniques, instruments, and analysis, although this is more related to the mastery of the research methodology, the writing must be related/synchronous
4	Discussion	70%	✓ Weaknesses in presenting data in the form of written or visual texts which tend to be less systematic ✓ Incomplete presenting evidence of data collection with collection techniques such as using observation but in the presentation of the results there is no data related to observation ✓ The results presented are not relevant to answer the problem formulation
5	Conclusion	33.3%	✓ Weaknesses in reviewing research findings with theory or previous research results (only using a few references) ✓ Discussion section but presented in the form of research data (should be the results section) ✓ Incomplete/comprehensive discussion covering all research findings/results (too short)

sections. This finding refers to the results of the analysis of student writings which are presented in the percentage in Table 3.

Referring to the writing of each part of the research article, mastery of content and structure will greatly affect the accuracy of writing. Especially in the introduction or background section that combines explanatory and argumentative presentations to build a rationalization of the importance of research carried out from the reader's point of view [13]. In line with the introduction, the discussion section will reveal a study of the research findings by comparing them to the theory and the results of previous studies to support the latest research [14]. Relevant to this condition, the results of questionnaires from students show that the introduction and discussion sections are difficult to write

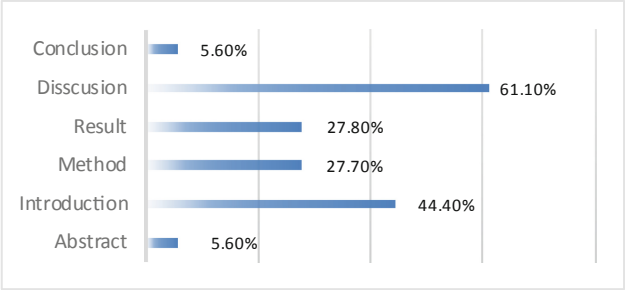

Fig. 1. Percentage of difficulty in writing/research report section.

and often get revision notes from the supervisor as shown in Fig. 1. This finding is also supported by statements from students regarding their difficulties which are described as follows.

"In the introduction, the frequent revision is on the background because it is less detailed and less thorough"

"It is difficult to write a background because the background, in addition to containing the reasons for conducting the research, must also be careful in adjusting to the content of the research"

"The obstacle I experienced in the background I wrote was that I was too deep into the title (too deep) so that it seemed like I had carried out research even though it was only part of the background"

"It is difficult to write a discussion because the discussion must be adjusted to the content"

"Discussion of research because I am still confused about linking the same theory with research results according to the data I obtained"

"The discussion is difficult to write because I am confused to develop an explanation of the results obtained"

From the statements obtained, it can be concluded that the difficulty in writing content and structure lies in its organization. Organizing ideas is the key to writing quality to avoid repetition or discussion of topics in circles. This is why in the writing process itself, the pre-writing stage is a crucial stage for writers to prepare for what they are writing [15]. The use of a stimulus or the preparation of a writing framework, for example, is an example of a treatment that has been widely studied for its usefulness in learning to write [16]. For this reason, this finding is evidence that learning to write itself needs to be better organized based on the difficulties experienced by students as novice writers.

Furthermore, in the writing style, it was also found that there was a tendency of similarity in the writing style of students in their research reports. The details are described in the following points. First, the majority (65%) start the background with the phrase "education is…" with an introduction of 4–5 paragraphs on average, exceeding other sections, for example, a preliminary study which averages only 1 paragraph. Second,

Table 4. Student Responses Regarding Writing Difficulties in terms of Writing Style

Numb	Indicator	Percentage
1	Using disorganized language, for example, repetition, not writing specifically, ideas are not clear, ideas are not related	33.3%
2	Using inappropriate punctuation, such as a colon or other punctuation	11.1%
3	Using incorrect chapter or sub-chapter numbering	5.6%
4	Writing a list of references that do not match the quotes in the text	0%
5	Lack of accuracy in writing so that many parts are wrong writing	55.6%
6	Has a limited vocabulary so there is less variety in writing	55.6%

the low coherence between paragraphs, for example in the introduction paragraphs 1–2 discuss education, paragraph 3 discusses the media, and paragraph 4 discusses the results of interviews, without connecting/hooking between paragraphs. Third, editorial errors, numbering, word spacing, punctuation, and others related to writing mechanics. Fourth, the length of the paragraph is very inconsistent, so there are paragraphs written in 8–10 sentences long but there are also paragraphs written in 2–3 sentences in one research article. Fifth, the writing of the reference list still tends to be inconsistent because it is done manually and does not use a references manager.

From the findings and examples, it can be concluded that the writing style of students tends to be monotonous from the introduction to the choice of words used. This finding was strengthened by further information during interviews where students used research results from previous students documented in the library, 2–3 writings, then used them as models without analyzing their accuracy first. This condition shows that students' creativity in writing still needs to be improved as the problems in learning to write were revealed in previous studies [17, 18].

In addition, students' writing habits can also be predicted through mechanical errors that are often found. The allegation is based on the lack of thoroughness of the students or even in the writing process where the editing and revising stages were not carried out. In addition, the assumption that writing will be completed in one writing has become a habit that causes many revision notes to be obtained. Whereas in writing, the editing and revising process plays an important role in improving the quality of the written work [19]. It is very possible for the author to change his writing in content or mechanically so that the author feels that the information he wants to convey is presented [20]. Furthermore, the difficulties faced by students related to writing style, both elements of grammar and neatness, were explored from the research reports presented in Table 4.

From the students' responses, it is shown that the dominant difficulty in writing style lies in the lack of accuracy in writing, limited vocabulary, and weak organization of ideas. The lack of accuracy in writing is one of the human errors that will inevitably occur in writing, for example, typos, wrong numbering, and others that are not intentionally done by the author. As previously stated, in this condition the editing stage plays a very important role in the writing process, especially in this digitalization era, there are more

applications or digital supporting tools that can be used to help improve the accuracy of the writer [21]. Next, the limitations of vocabulary and organizing ideas are included in the general constraints where not all students like writing or have previous writing experience [22]. However, the research shows that experience in the writing process will have a major role in stimulating students' skills considering writing skills as a productive language skill.

4 Conclusion

This study shows that students' scientific writing skills in research reports are still not optimal in terms of content, structure, grammar, and neatness. From the common errors related to content and structure, it was found that background writing and discussion were the parts with the most errors, especially in terms of organizing ideas. In the background section, it is known that students find it difficult to assemble theoretical and empirical ideas as the basis for carrying out research. In the discussion section, the error lies in the repetition of the data presented that has been presented in the results section. From the writing style related to grammar and neatness, it was found that there were many inaccuracies in the selection of ideas, coherence, and editorial, to the low accuracy of students in writing. This finding also shows that efforts are needed to improve students' writing skills in academics, especially in writing research reports.

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