

# Description of the Ability to Write Scientific Articles in Student Teachers of Elementary Education on Mathematics Lessons: A Preliminary Study

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**Abstract**—This study aims to describe the article writing ability of students in mathematics study in elementary school. This research is a descriptive study with a quantitative approach involving 20 graduate students of primary education as a sample of research. The research instrument used is a simple article writing task sheet consisting of 4 aspects namely the ability to identify (1) research objectives; (2) research methods (data analysis techniques); (3) research results; (4) construct new idea of the reviewed article. The data obtained is subsequently analyzed using descriptive analysis. The results showed that the average value of students' ability to identify research objectives is 56.67, for aspects of identification of the research methods acquired on average of 51.67, while on the aspect of proficiency on identifying research result is 55 and the aspect of constructing research idea is 50. The average value of these four aspects is 53.33 and is in low category. This indicates that the student article writing skills are still low.

**Keywords**—Write scientific articles, mathematics lessons

## I. INTRODUCTION

In the 21st-century learning framework, mathematics is one of the core subjects that allow students to possess various competencies. This indicates that mathematics learning should be well prepared to achieve that goal so that students can possess life skills to face complex problems in the 21st Century (Agustan, Juniati & Siswono 2017; Syamsuddin, 2017; Syamsuddin, 2017). A variety of skills that students can obtain using the 21st-century learning framework is entrusted in Permendikbud No. 21 year 2016 namely creative, critical, communication and collaboration (Permendikbud, 2016). Thus, communication skills are one of the 21st-century skills that students need to have (Partnership for 21st Century Skills, 2009).

Communication skills are intended to effectively articulate ideas through an oral form, written in the various forms of media and contexts. The development of written communication is expressly stated in the Law of the Republic of Indonesia No. 12, year 2012 of Higher Education, chapter II of article 6 of paragraph C stated that higher education is conducted with the principles of development of academic culture and the cultivation of writing for the academicians (Dikti, 2012). This indicates that the culture of writing in colleges is an important skill that needs to be developed.

However, this is not in accordance with the expectation, where the *Scientific Journal Rankings* (SJR) records Indonesia in the order of 64, while Malaysia 43. As a comparison of Singapore on ratings 32 and Thailand 42. In 2011, there were only 5 Indonesian journals that included in the world ranking of the 18,854 listed. This led to the emerging of the policy of Ditjen Dikti through circular letter 152/E/T/2012 dated 27 January 2012, so that the graduation of undergraduate level, postgraduate level and doctoral level after August 2012 are imposed the publication of scientific works (Dikti, 2012). Therefore, students at every level must have writing skills, in this case, scientific writing or articles that should be published in various media publications both national and international.

Writing skills are crucial in scientific communication. Writing can help students convey ideas, solve problems and understand the world's change (Research Brief, 2010). As an overview of the importance of writing problems, Peha (2007) explains that there are five important reasons to write: (1) a written output is a good way to assess students' knowledge; (2) writing is an important skill for students as they enter adulthood; (3) help students learn to express themselves with confidence in all areas of study that can contribute to the improvement of attitudes and self-esteem; (4) the student who writes clearly, thinks clear;

(5) writing is the power of students where students need to understand and control their lives to shape the future and determine their dreams.

McCormick (2010) reveals that the use of writing strategies in mathematical learning shows that writing integrated into math learning can improve students' ability in problem-solving, reasoning, proving, communication, connection and representation in learning and resolving mathematical problems. Thus, writing skills are needed to train the ability of students' mathematical problem solving (Syamsuddin, 2017; Bahtiar, Syamsuddin, Akib, 2017). Scientific article writing skills are characteristics of learning in higher education. McCarthy's study results (2011) stated that higher education that prepares the environment that allows students to write reflectively will have long-term and short-term impacts. Long-term associated with career development for its future and short-term related to professional development (Nilsson & Karlsson, 2017).

Further, research results from Lee, Woods and Tonissen (2011) showed that there were significant changes to the improvement of student communication skills after the implementation of a simple writing activity recognition strategy that integrated into the lecturing process. Writing activities on students also increases the effectiveness of learning indicated by higher student scores. Dymont & O'connel (2010) explains that the use of scientific journals can improve the visibility of students' thinking.

The explanation above explains that communication is one skill that needs to be developed based on the 21st-century learning framework (Partnership for 21st Century Skills, 2009). These skills can be developed through improving the writing skills that can help students convey ideas, solve problems and understand the change of the world. One way to see student communication skills is to implement an introductory strategy of simple writing activities integrated into one of the courses that are temporarily pursued by students such as a study in elementary school mathematics. Hence, the purpose of this research is to describe the ability of students in writing articles in mathematics learning studies in elementary school.

## II. RESEARCH METHOD

This research is a descriptive study using a quantitative approach. This study involved 20 students as samples of research that are studying in the graduate program of the Elementary Education at the Universitas Muhammadiyah Makassar, Indonesia. The instrument used to collect data is a task sheet of simple writing scientific articles with attention to the aspect of students' ability to identify (1) the purpose of scientific writing; (2) research methods (data analysis techniques); (3) the research results or the main meanings of the articles being examined; (4) to construct new ideas from the reading of the articles reviewed. Before using the instrument, it was tested for its validity by involving 1 person who is an expert in the field of educational evaluation, 1 lecturer in elementary school mathematics education and 1 teacher of elementary school mathematics. This is conducted to obtain instruments that can be used to collect data related to student writing skills of a master's degree in elementary education as a student communication skills. The instrument validation includes the validation and content validation related measurements of the students' simple article writing ability. Analysis of the instrument validation of the task sheet of the simple writing of the scientific articles analyzed in a quantitative descriptive, namely by the average score of each aspect assessed by the validator. The scoring guidelines are described in the following 4 categories on the Table I.(Laurens & Ratumanan, 2011).

TABLE I  
SCORING CRITERIA OF INSTRUMENT VALIDATION

Category	Description	Score
B	Good	4
CB	Fairly Good	3
KB	Less	2
TB	Poor	1

The assessment of the validation result uses a scale conversion of achievement because in the assessment, it is required the achievement standard (score), and adjusted to the specified category. The following qualifications are presented assessment qualification (Laurens & Ratumanan, 2011) on following Table II.

TABLE II  
QUALIFICATIONS OF FEASIBILITY BASED ON THE PERCENTAGE

Achievement Rate	Qualification
3,6 – 4	Very Valid
3 - 3,5	Valid
2,1 - 2,9	Less Valid
1 – 2	Not Valid

Based on the validators' assessment results, obtained the average assessment related to the developed instrument based on aspects of the format, content and use of the language is 3.54 so that the instrument is valid and feasible to be used as the instrument in collecting data and obviously after revision was done based on the advice and suggestion of the validators. Furthermore, instruments are used to collect data related to student article writing ability and the obtained data were analyzed using descriptive statistical analysis by observing the lowest value elements, highest value, the average, median and mode values as well as standard deviation are outlined through a frequency distribution based on the categorization of written communication skills outlined in the following Table III.

TABLE III  
FIVE-SCALE PAP CONVERSION GUIDELINES ON STUDENT SCIENTIFIC ARTICLE WRITING SKILLS AS STUDENT WRITTEN COMMUNICATION SKILLS

Score Interval	Criteria
90-100	Very High
80-89	High
70-79	Fair
60-69	Low
50-59	Very Low

### III.

### RESULT AND DISCUSSION

Here are presented research results data on the ability to write scientific articles as a students' written communication skills from 20 research samples reviewed on 4 (four) aspects of proficiency outlined in table 4 below.

TABLE IV  
STUDENTS' SCIENTIFIC ARTICLE WRITING ABILITY DATA

Aspect	Identification Ability			
	The Purpose of Scientific Writing	Research Method	Research Result	Construct New Ideas
Average Score	56,67	51,67	55	50

If the above 4 (four) aspects are put together in the assessment of comprehensive, then obtained a description of the research results described in the Table V below.

TABLE V  
STUDENTS' SCIENTIFIC ARTICLE WRITING ABILITY DATA

Data	Score
The Amount of Sample	20
The Highest Score	100
The Lowest Score	33,33
Mean	53,33
Median	50
Mode	50
Standard deviation	2,63

According to the table above, if referring to the categorization of student writing skills in table 1, obtained the result of student ability measurement in simple article writing is in low category. This indicates that the student has not yet had the competence in terms of utilizing communication skills to write simple articles both in identifying (1) the purpose of scientific writing; (2) research methods (data analysis techniques); (3) the research results or the main meanings of the articles being examined; (4) to construct new ideas from the reviewed articles.

The students' communication skills in writing articles are low because they are less able to express ideas effectively through writing. In addition, students do not have the skills to read and understand the article well because the students do not possess proficiency in English whilst the majority of articles are presented in English. Thus, students are not able to conduct critical assessments of the articles studied. Students have not been able to identify carefully the purpose of the article being studied, because they are not familiar with the article presented. When it is viewed from students' ability to identify research methods or data analysis techniques used in the articles discussed, students have not been able to properly identify the data collection techniques and data analysis used.

Moreover, the students have not been able to find the main points of study results in detail so that students are difficult to explain again in the form of writing related to the research results of the article. Students are less creative in constructing new ideas because the students' lack of readings references that support their research ideas. This is because students' lack of information and skills in accessing articles or reputable journals to serve as the main reference in determining research ideas.

#### IV. CONCLUSIONS

The results of this study give an overview of the students' ability to write scientific articles as one of the communication skills that students must possess. From the data analysis of reseach result, obtained the idea that the average value of students' ability to identify research objectives is 56.67, for aspects of identification in research method acquired the average of 51.67, while on The ability to identify the research results is 55 and the aspect of the research idea is 50. The average value of the four aspects of this research study in comprehensive acquired by 53.33 and is in low category. This indicates that the student article writing skills are still low. Therefore, it can be concluded that the student's written communication skills are in low category.

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