

# Meta-Analysis Of The Effect Of The Inquiry Learning Model On Students' Writing Skills

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**Abstract.** This study aims to provide a broader picture of the effect of the inquiry model application on students' writing skills in learning Indonesian. The type of this research is a meta-analysis, which was carried out by summarizing, reviewing, and analyzing data from several studies that have been conducted. The research sample consisted of 10 articles on correlation studies of the inquiry model application to students' writing skills from national journals published in 2016-2021 with the criteria of loading pretest and posttest data. The data analysis technique calculated the Gain-mean, t-test, and effect size (ES), then calculated the mean. The results showed that the average n-Gain is 0.41 or there is an increase in the medium category, the results of the t-test obtained count of 8.25 which is greater than the table so that there is a significant difference between the conditions before and after treatment, while the results of the ES calculation obtained a value of 2.61 or it is in the high effectiveness category. These results indicate that the inquiry model is effective and recommended in improving the students' writing skills in learning Indonesian.

**Keywords:** meta-analysis; questions; writing skills

## 1 Introduction

Writing skills are one of the main achievements in learning Indonesian that writing skills are important for students because writing is the basis for thinking [2][41]. They are also important because they are used as an indirect form of communication carried out by a person to express their ideas, concepts, and thoughts in written language that can be read and understood by others [8][17]. In learning Indonesian, writing skills need to be one of the specific goals as a basic ability to think and communicate in everyday life as well as a basic ability to learn other sciences. Writing skills are also crucial for students because it enables the students to feel relationships, deepen their responsiveness and perception to solve problems, and arrange a sequence of experiences, so that one aspect of language that must be trained to students in writing. Tarigan explained that writing skills are the language skills that are used to communicate indirectly and they are not face to face with other people [44]. It shows that writing activities are productive and expressive activities. In this case, a person must be skilled in arranging words to produce good writing. The good writing means to enable the information to be reached by the readers. Therefore, a person is required to be skilled in language, especially writing. Writing skills are needed in almost all jobs and they can support, even determine the success in a person's job or position [39][15]. Teachers in learning Indonesian do not only focus on knowledge or language rules, but they must train the students in the skills to use language to communicate [16][40]. Therefore, they must facilitate the improvement of students' writing skills by using the effective learning strategies, including the application of the inquiry model.

The results showed that the inquiry model is a learning model that can improve the writing skills [4][12][14][23][34]. It is also effective in improving student's writing skills in learning Indonesian [38][43][9]. It is necessary to conduct a meta-analysis of the results of these studies to provide a broader picture of how effective the inquiry model is in improving the students' writing skills in Indonesian subjects.

## 2 Research Method

This research used meta-analysis, namely analyzing the articles about the effect of the inquiry model on writing skills in Indonesian language learning published in national journals. Data collection was conducted by browsing the articles on the Google Scholar search site. The keyword used in this search was the effect of the learning model on writing skills. The criteria for the articles used as data in this study were the research of correlation/effect that included data on the mean values before and after treatment. The selected articles were limited to the publication from 2016 to 2021. The data obtained was calculated on the average n-Gain with the formula as follows:

$$n - G = \frac{p - pr}{m - ps}$$

The result of n-Gain calculation categorized according to Melzer are presented in Table 1 below.

Table 1. Categorization of n-Gain value

n-Gain value	Categories
$g > 0.7$	High
$0.3 < g < 0.7$	Medium
$g < 0.3$	Low

The data was carried out by paired sample t-test to determine the significant difference between pretest and posttest with the formula below.

$$t_c = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2} - 2r \left( \frac{s_1}{\sqrt{n_1}} \right) \left( \frac{s_2}{\sqrt{n_2}} \right)}}$$

The last step was to find out how effective the inquiry model is on the writing skills, an effect size (ES) test was carried out using the Cohens d formula as follows.

$$Cohen's d = \frac{\bar{d}}{s_d}$$

The result of ES calculation was categorized as in the Table 2 as follows.

Table 2. ES Categorization

Range	Categories
ES < 0.2	Low
$0.2 < ES < 0.8$	Medium
ES > 0.8	High

### 3 Result And Analysis

Based on the results of data browsing through the Google Scholar search site, it was found 10 studies that met the requirements set out in this study. The data were analyzed through paired sample t-test calculations to prove whether or not the inquiry model had an effect on the writing skills, the n-Gain calculation was used to see the category of improving the writing skills before and after the application of the inquiry model, and finally the ES calculation was to see how effective the inquiry model in improving the writing skills in learning Indonesian. The research data are presented in Table 3 as follows.

**Table 3.** Research Result Data

Studies	Research (year)	Level	Average Writing Skills		Deviation (d)	n-Gain
			Before	After		
1	Hartidini et al. (2018)	SMA	69.27	78.30	9.03	0.29
2	Safitri & Sumardi (2018)	SMA	52.15	77.42	25.27	0.53
3	Azmi et al. (2020)	SMP	62.37	81.45	19.08	0.51
4	Mandasari et al. (2017)	SMP	68.37	81.63	13.26	0.42
5	Syahfitri (2018)	SMP	76.41	84.76	8.35	0.35
6	Safitri et al. (2021)	SMA	64.72	83.05	18.33	0.52
7	Syahputri et al. (2020)	SMA	59.76	71.12	11.36	0.28
8	Dewi et al. (2018)	SMP	51.04	72.57	21.53	0.44
9	Nofalia et al. (2018)	SMP	72.92	84.11	11.19	0.41
10	Hidayati et al. (2016)	SMA	68.95	80.95	12.00	0.39
<b>Average</b>			64.60	79.54	14.94	0.41
<b>Standard Deviation (s)</b>			8.37	4.67	5.73	
<b>Variants (s2)</b>			70.10	21.77		

Table 3 shows that the mean value of n-Gain is 0.41. This means that the improvement of students' writing skills after learning with the inquiry model is in the medium category. The results of the paired sample t-test with a value of  $\alpha = 0.05$ , it was obtained a count of 8.25. It is bigger than the table which is 2.26, so it can be concluded that the mean of the two groups is not the same, or in other words, there is a significant effect of the inquiry model application to students' writing skills. The results of ES calculation show that the ES score is 2.61 or in the high category. This shows that the inquiry model is very effective in improving student's writing skills in learning Indonesian.

The inquiry model is effective in improving students' writing skills. This is in accordance with the results of researches concluded that the inquiry learning model is effective in improving the writing skills [4][12][14][23][34]. Inquiry model has the advantage that it can develop cognitive, affective and psychomotor aspects in balance so that learning is considered to be more meaningful because the students can explore and learn based on their own experiences [19][18][36][35]. The main purpose of learning with inquiry-based learning is to teach and require the students to take their active responsibility in the learning process and apply the learning concepts in new situations [7][6][37][35].

The National Research Council explained that developing the ability to understand and engage in this kind of activity requires hands-on experience and continuous practice with the inquiry process [30]. The students do not understand inquiry by simply studying words such as "hypothesis" and "conclusion" or by memorizing procedures such as "steps of the scientific methods", but they directly experience inquiry so that its characteristics can be understood in depth. But the experience itself is not enough. There must be a balance between experience and understanding. They need to introduce the students to the basic elements of inquiry. They should also help students to reflect on the characteristics of the process in which they are involved. According to Millar and Driver the basic ability of inquiry is that the students are able to combine science process skills (e.g., observation, inference, and experimentation) with scientific knowledge because using scientific reasoning and critical thinking will develop the students' understanding of science [29]. They must use evidence and analytical tools to derive the scientific claims to justify their decisions. They should

be able to assess the strengths and weaknesses of their claims. The development of knowledge claims and the reflection on those claims underlie the ability of inquiry.

Implementation of inquiry learning means carrying out a continuous process or continuous cycle starting from asking questions, researching answers, interpreting information, presenting findings and reflecting. Student activity in the learning process is an emphasis in inquiry-based learning [25][21][1][46]. Students are more facilitated to explore ideas and ask questions from various points of view related to the subject matter [45][7]. Based on this explanation, the students carry out activities systematically and are required to think analytically, critically and creatively in inquiry learning in order to find solutions to the problems given independently and then communicate their ideas, in this case through writing. Inquiry models in language classes need to be framed in real contexts, making it possible to express and develop ideas that have meaning for students outside the classroom [3][11][20][10]. This shows that the implementation of inquiry in learning trains the students to be skilled at writing.

## 4 Conclusion

The inquiry learning model is effective in improving students' writing skills because it facilitates the students to carry out the scientific process, namely making observations, formulating problems, formulating hypotheses, testing hypotheses, and communicating the results through reports. In this case, the students will be trained to communicate their ideas through scientific writing so that students' writing skills are getting better. The inquiry learning model can be recommended as one of the learning strategies to be applied in Indonesian language learning.

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