1(1), 2022, 23-29

Journal of Social Research and Community Service

http://jurnal.fkip.unila.ac.id/index.php/jsrcs

Enhancing Teachers Knowledge and Skills to Write a Scientific Papers: A Case of High School Chemistry Teachers in Bandar Lampung

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How to cite:

Setyarini, Diawati, C., Kadaritna, N., & Fadiawati, N. (2022). Enhancing Teachers Knowledge and Skills to Write a Scientific Manuscripts: A Case of High School Chemistry Teachers in Bandar Lampung. *Journal of Social Research and Community Service*, *1*(1), 23-29.

Article Information:
Received : 11 April 2022
Accepted : 30 May 2022
Published : 10 June 2022
DOI: http://dx.doi.org/10.23960/jsrcs/v1i1.pp23-29

Abstract: The purpose of this study is to improve the ability of chemistry teachers in writing scientific papers. This activity was attended by 20 high school chemistry teachers in Bandar Lampung. Methods in the activities include presentations, discussions, questions and answers and guided practice, and independent exercises. The results of the evaluation of the activities were revealed through the pretest and posttest, as well as questionnaire responses by the training participants. Based on the analysis of participants' responses, the results showed that they strongly agreed with an average (83.75%) and an average agreed (16.25%) that the training opened insight into scientific article writing skills, helped motivate them to dare to publish scientific articles in journals. reputation, providing research ideas or ideas such as carrying out CAR so that the results can be used as material for writing articles, and if this training is continued, participants are interested in participating because it helps improve skills and the latest insights in writing scientific articles. Based on the results of the evaluation, it can be concluded that there is an increase in the knowledge, insight and skills of high school chemistry teachers in Bandar Lampung in writing scientific articles. In addition, participants responded positively to the implementation of scientific article writing training.

Keywords: scientific paper, high school teacher, training.

▪ INTRODUCTION

Teachers are professional educators with the main task of educating, teaching, guiding, directing, training, assessing, and evaluating students in early childhood education through formal education, primary education, and secondary education (Law Number 14 of 2005 concerning Teachers and Lecturers). The government through the Ministry of National Education as mandated by Law Number 20 of 2003 concerning the National Education System and Government Regulation Number 19 of 2005 concerning National Education Standards, will facilitate teachers to be able to develop their profession in a sustainable manner. Continuous professional development is the development of teacher competence which is carried out in accordance with the needs, gradually, to improve their professionalism (Regulation of the Minister of State for Administrative Reform and Bureaucratic Reform No. 16, 2009).

One type of continuous professional development is scientific publications in the form of research results or scientific ideas in the field of formal education. Regulation of the Minister for Empowerment of State Apparatus and Bureaucratic Reform No. 16 of 2009. dated November 10, 2009 concerning Teacher's Functional Positions and Credit Scores, it is mandated that one of the professional development activities is scientific publications. Scientific publications are scientific papers that have been published to the public. According to Arikunto, Suhardjono and Supardi, (2009), through the credit score system, it is hoped that a fairer and more professional award can be given to the rank of teachers which is a profession recognition and will then increase their level of welfare. The credit score can be used for promotions/classes for teachers.

Indonesian Law of National Education System, Teachers and Lecturers, and Government Regulation concerning National Education Standards mandate teachers must have qualifications academic competence, and certification of educators in accordance with their field of work. In addition, teachers are also required to develop their professionalism in a sustainable manner through lifelong learning. In this regard, the government has also strengthened the issuance of the Regulation of the State Minister for Administrative Reform and Bureaucratic Reform Number PER/16/M.PANRB/11/2009 concerning Teacher Functional Positions and Credit Scores. In the PAN Ministerial Regulation, teacher positions no longer consist of Primary Teachers to Primary Teachers but only consist of 4 levels of positions, namely: First Teacher (III/a and III/b), Junior Teacher (III/c and III/d), Teacher Intermediate (IV/a, IV/b, and IV/c), Main Teacher (Intermediate Main Trustees, group IV/d and Main Trustees, group IV/e). This certainly has a tremendous impact and consequence for teachers to develop their abilities and competencies.

As a professional teacher, of course, you must have various abilities, one of the abilities that a teacher must have is the ability to write scientific papers. By writing scientific papers, other than teachers can be promoted to rank, position and class so that they experience career advancement, teachers also get awards and recognition. It means that it is very important to have the ability to write scientific papers. But the reality in the field is that some teachers' ability to write scientific papers is still low.

Based on data from the State Civil Service Agency (BKN) in 2005 in Hadriyanto (2013) the number of teachers was 1.4 million, some of these teachers were in class III/a-III/d, which amounted to 996,926 teachers out of 336,601 class IV. Of the total number of teachers in group IV, there are 334,184 (99.28%) who are group IV/a and only 2,318 (0.69%) group IV/b, the rest are group IV/c as many as 84 (0.06%) teachers and group IV /d there are 15 (0.01%). It means "there is a thick wall that is difficult for most teachers

to penetrate to get promoted from class IV/a to IV/b". This wall is getting thicker and taller with the enactment of the PAN-RB Ministerial Regulation number 16 of 2009. According to Hadriyanto (2013) writing scientific papers is a must as an academic and administrative requirement for personnel related to promotions and positions. The importance of Law No. 14 of 2005 concerning Teachers and Lecturers states that professional teachers are proven to be able to write scientific papers which are a requirement for promotion and position. Likewise, the Ministerial Regulation (Permen) for Empowerment of State Apparatus (PAN) and Bureaucratic Reform (RB) Number 16 of 2009, dated November 10, 2009 concerning Teacher Functional Positions and Credit Scores, in Article 16 Paragraph (2) states that "For promotion /ranks at a level higher than the first teacher, junior administrator rank, class IIIa to main teacher, rank of main coach, class IVe room are required to carry out continuous professional development activities which include sub-elements of self-development, scientific publications, and/or innovative work. Meanwhile Article 17 explains that the promotion of teachers starting from class III b and above is required to submit scientific papers. This regulation came into effect in 2011 and is effective as of January 1, 2013, so from that date that the promotion of teachers starting from class III b and above is required to submit scientific papers, it has taken effect. This suggests to us that teachers must carry out self-development when proposing a promotion.

One of the self-development that can be done by teachers is to make scientific papers that are published in scientific journals. Unfortunately, the reality on the ground shows that many teachers have not yet written scientific papers published in journals or become co-presenters at national or regional seminars. In addition, it is known that most of the Chemistry teachers in Bandar Lampung have not mastered the writing of scientific papers in accordance with the rules of writing scientific papers. So it is not surprising that these teachers experience difficulties when they are promoted because they collide with the factor of writing scientific papers. Based on the problems above, researchers are interested in providing training and assistance for MGMP Chemistry teachers in Bandar Lampung to improve their ability to write scientific papers for future professional development. After this scientific paper writing training activity, participants are expected to be able to write scientific papers so that participants are able to write scientific articles which are then published in journals. To assist Chemistry teachers in publishing research results or critical thinking ideas. Based on the description above, it is necessary to strive for the professional development of Chemistry teachers through training in writing scientific papers for high school chemistry teachers.

▪ METHOD

The training activities were carried out for Chemistry teachers in Bandar Lampung. The method of activity is carried out through several steps, namely presentations and discussions by conveying material for writing scientific articles, class action research and making CAR proposals, as well as requirements for drafts of scientific articles to be accepted in reputable journals. Then it was continued with an exercise where participants in groups were trained to be skilled at writing drafts of scientific articles. Then the participants did the drafting of scientific articles independently. The evaluation was carried out at the end of the activity to find out how the participants' understanding of writing scientific articles improved. The evaluation instrument used was a pretest and posttest instrument to determine the increase in participants' insight about writing scientific articles. The Pretest and Post test questions consist of two Essay questions

which aim to explore participants' understanding of the components that must be included in a scientific article and important information that must be written in each component.

▪ RESULT AND DISCUSSION

Before and after the activity, a pretest and posttest were held to determine the increase in participants' knowledge of writing scientific articles. The profiles of the pretest and posttest results of a total of 24 trainees are presented in Figure 1.

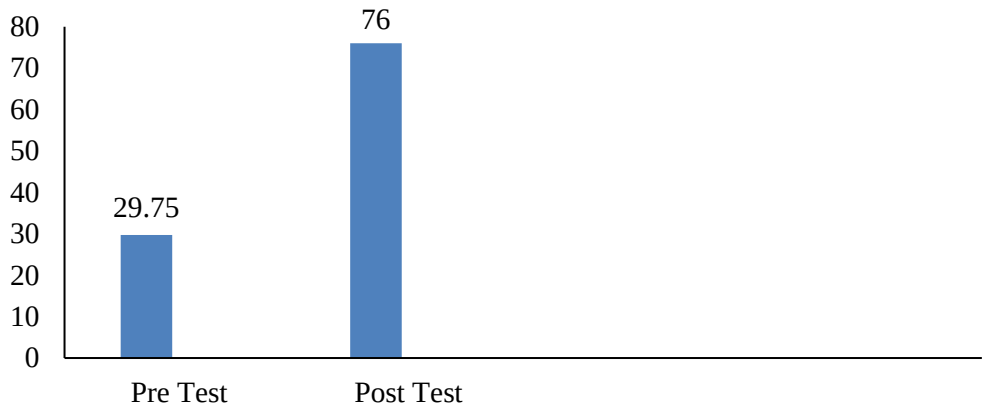

Figure 1. The pretest and posttest scores of the participants of the scientific article writing training for chemistry teachers in bandar lampung

Based on the information obtained from Table 1, information is obtained that the insight of the trainees at the beginning of the training is still low. For example, during the pre-test, participants were asked the question “A teacher wants to publish a scientific article in a journal. Explain comprehensively the criteria for writing a good Scientific Article so that the Scientific Article is published, write down what components must be in writing a scientific article and explain what important information is in each component of the scientific article". On average, participants wrote down the components in a scientific article, but it was not complete, and when asked to write down the information that should be written in each component, there were still many participants who did not answer. as shown in Figure 2 below.

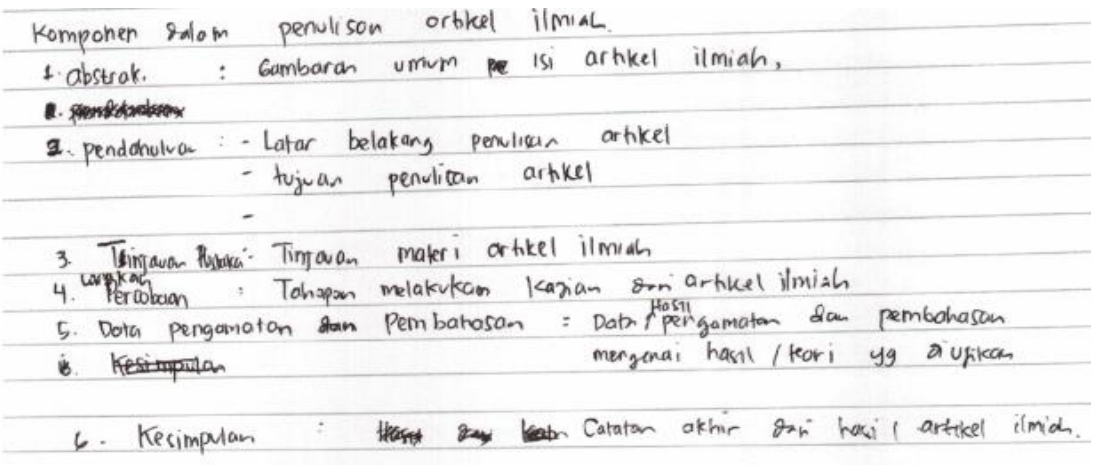

Figure 2. Example of participants' pre-test answers to question 1

Based on Figure 2, information is obtained that participants have written down the components that must be included in writing a scientific article, but it is not complete, there is no title, author's name, also a bibliography or reference. In the answer to the pretest, participants have not been able to explain the important information contained in each component in the scientific article. Furthermore, the training participants participated in the training enthusiastically and were actively involved in the discussion when the presenters delivered the training materials. The activeness of participants in participating in the training has an impact on increasing the understanding of the trainees. Based on Figure 1 above, there is an increase in understanding between the pretest and post-test mean of 46.25% and the average n-gain of 0.66, categorized as moderate (Hake, 1999). This is understandable because, after attending the training, on average, participants can explain the components that must be included in writing scientific articles more clearly at the time of the post-test. Examples of participants' answers during the post-test are presented in Figure 4.

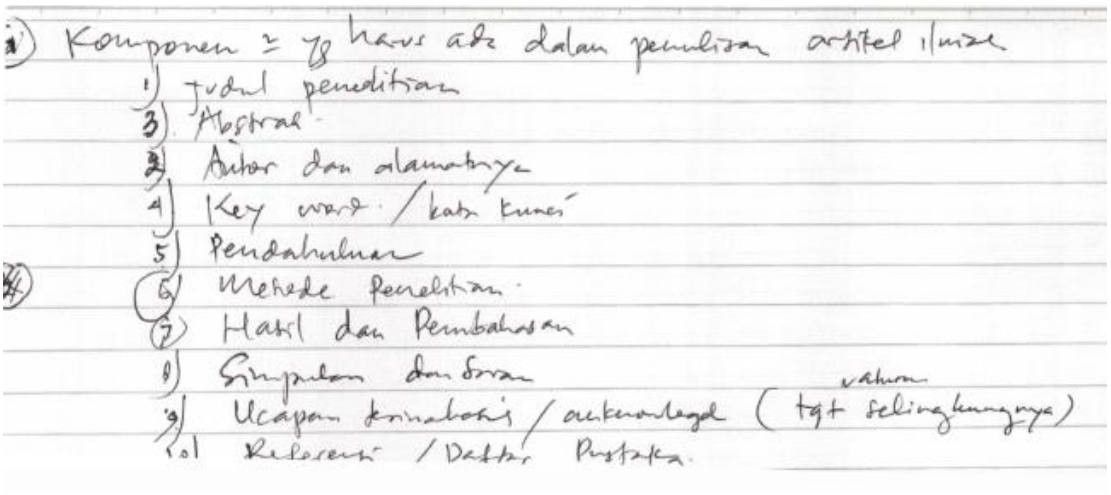

Figure 4. Examples of participants' answers to the post-test in part a.

Based on the results of the participants' post-test answers as presented in Figure 4 above, it can be seen that participants have been able to write down the components in scientific articles coherently and clear. Similarly, participants can explain important information that must be written in each component of a scientific article, as presented in Figure 5. At the end of the training participants were given an instrument for responding to the implementation of the Article Writing training. scientific. The results of the participants' responses are presented in Table 2.

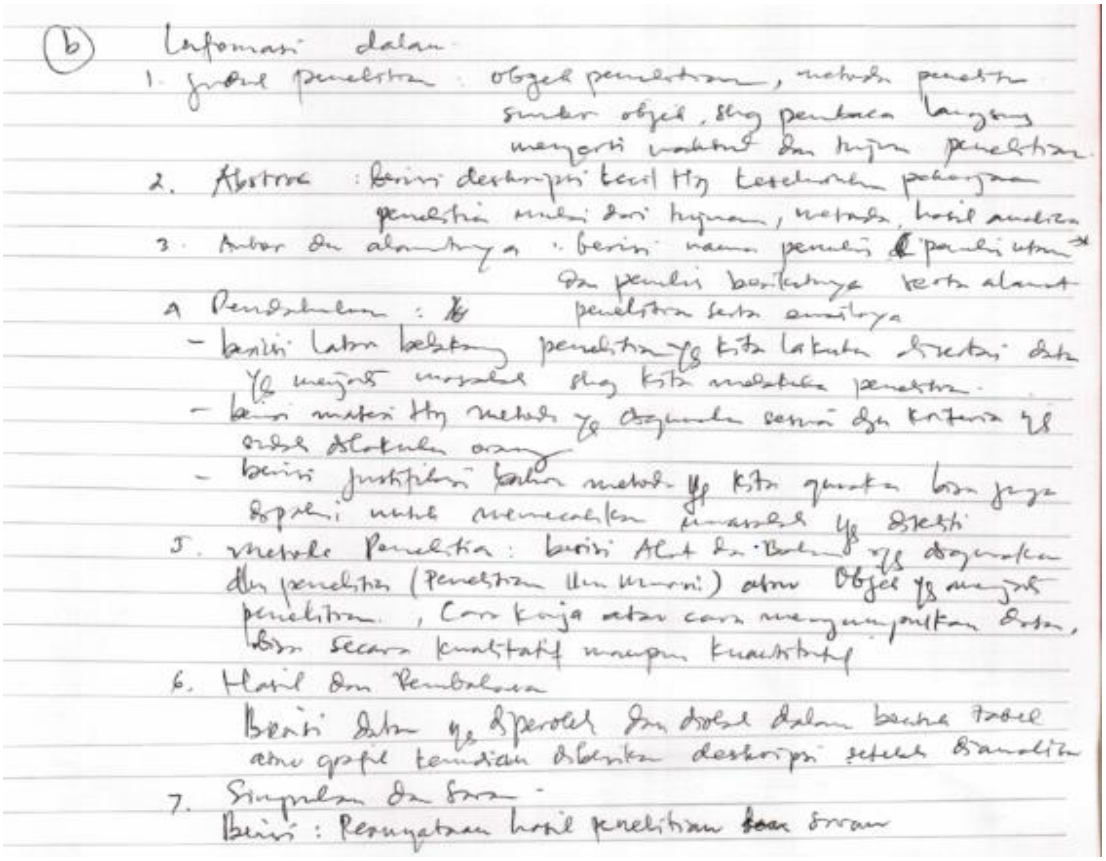

Figure 5. Example of answers to the participant's posttest in part b

Table 2. Responses of participants in the scientific article writing training

No	Statements	SS (%)	S (%)	TS (%)	STS (%)
1	The training provides insight into the skills of writing scientific articles	80	20	0	0
2	The training helps motivate them to dare to publish scientific articles in reputable journals	85	15	0	0
3	The training provides ideas or research ideas such as carrying out CAR so that the results can be used as material for writing articles.	90	10	0	0
4	If this training is continued, I will be interested in participating because it helps me improve my skills and latest insights in scientific article writing.	80	20	0	0
Average		**83.75**	**16,25**	**0**	**0**

The teachers also strongly agree with the average (83.75%) and agree on the average (16.25%) that the training provides insight into article writing skills scientific research, helps motivate them to dare to publish scientific articles in reputable journals, provide research ideas or ideas such as carrying out CAR so that the results can be used as material for writing articles, and if this training is continued, participants are interested in participating because it helps improve skills and the latest insights in writing scientific articles.

▪ CONCLUSION

Based on the description of the evaluation results of service activities, it can be concluded that there is an increase in the knowledge and insight and skills of high school chemistry teachers in Bandar Lampung in writing scientific articles. There was a positive response from the participants towards the implementation of the scientific article writing training.

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