

The Effect of Training Scientific Writing on The Improvement of Teachers' Understanding in Articles

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ABSTRACT

The purpose of this study was to determine the effect of scientific paper writing training on increasing the understanding of junior high school teachers in writing articles. This research method uses action research, which is to take action to provide training to overcome the problems of understanding teachers who do not understand the writing of scientific articles. The subjects of this study consisted of junior high school teachers. The procedure begins with problem identification, action formulation, action implementation, observation, and evaluation of action-reflection. The subjects of this research consisted of 215 teachers participating in the scientific paper writing training organized by Universitas Negeri Malang in collaboration with the Education and Culture Office of Mojokerto City, Indonesia. The data were collected using a Google Form questionnaire from the participants and the results of their actions. The analysis used descriptive techniques and the average difference in understanding before and after taking action. The results showed that most junior high school teachers who participated in the training experienced an increase in understanding of scientific article writing.

Keywords: training, writing scientific papers, developing teacher professionalism

1. INTRODUCTION

Scientific work is a written form of a person or group of people based on applicable scientific principles. There are various types, including theses, dissertations, research reports, papers, and (scientific) articles. In this context, scientific papers meant to be scientific works in the form of scientific articles / research-based articles (IPB, 2012; Bailey, 2006). This type of scientific work can be written by teachers, lecturers, academics, researchers, and people or parties with interest in the socialization and publication of research results.

Teachers have to make scientific papers. Writing scientific papers is one of the teachers' processes in continuous professional development in the long term, including the requirements for promotion (Permenpan RB, 2009). The level of teacher productivity in writing scientific papers is part of the indicators of the success of professional development. The more scientific papers, the more productive the teacher is, the easier it will be to get promoted (Noorjannah, 2015).

The existing problems show that there are still many teachers who are less than optimal in professional development as part of carrying out their duties. The results showed that there were dominant causes that resulted in teachers being less able to improve their

professionalism because teachers were less than optimal in carrying out action research and were less able to write scientific papers. (Sumardjoko, 2017). This result seems to be related to previous research that there are around 60% of teachers in Central Java who cannot be promoted due to constraints in writing scientific papers. There are 50.88% of teachers who have occupied the IVa rank, but only 0.5% can be promoted to IVb and beyond (Yunianto, 2007). It turns out that teachers still have obstacles or problems in writing scientific papers due to factors: (a) low motivation, lack of time to write, difficult to find data, clueless (stuttering technology), lack of references, many writing services, teacher group activities in the field of scientific work are still lacking and outreach from related institutions are still lacking too (Noorjannah, 2015).

It turns out that teachers still experience problems or problems in writing scientific papers due to factors: (a) low motivation, insufficient writing time, difficulty finding data, clueless (stuttering technology), lack of references, lots of writing services, teachers Group activities in the field of scientific work are still lacking and the reach of the relevant agencies are still lacking. Students tend to explore seriously when they have to complete lecture assignments, final study assignments, and articles that must be published. Dewi et al (2017)

stated that in career development, teachers required to write and publish scientific papers. The problem is, the ability and interest of teachers in writing scientific papers is still not high. They are busy with routine activities and do not have time to write scientific papers. Students tend to explore seriously when they have to complete lecture assignments, final study assignments, and articles that must be published.

Regarding the writing of scientific papers, the search results of various national and international journals show that writers are required to use the Mendeley application when sending manuscripts to the intended journal. Consequently, if the author is going to publish articles in journals, he must adjust and use the Mendeley application. Included in the writing of other scientific papers, now the tendency of writers to leave the old, manual and conventional methods are to switch to using the Mendeley application so that it will be more productive.

Several studies have led teachers to be able to compile scientific papers, namely through the implementation of a group academic supervision model with the think tank writes technique to guide the preparation of works. Nine scientific papers were produced from 10 teachers (90%) who were able to write scientific papers with good categories (Latifah, Samsudi, and Masrukan, 2014). The development of teacher professionalism through writing scientific papers is necessary. There is very necessary because teachers must make scientific work in a sustainable manner (Jaedun, 2011). Although, in its preparation, there is no indication and information whether or not it has used a digital currency.

The results of a preliminary study by researchers conducted from 10-14 August 2020 on teachers in the Mojokerto area, East Java, Indonesian, showed similar problems with the results of previous research. Scientific writing training participants have not used the Mendeley application to support writing scientific papers. Besides, there are problems related to writing titles, abstracts, introduction, research methods, presentation of results, discussion, conclusions, suggestions, and bibliography.

2. LITERATURE REVIEW

There are many kinds of scientific work, such as theses, dissertations, and articles (Aydin, 2019). Scientific works of the type of articles are very widely publication, because almost all theses, dissertations, and other research reports are required to be widely published. These articles have their respective formats, differing from one another, depending on the style of the neighborhood.

In general, an article template consists of the title, abstract, introduction, method, results, discussion, conclusions, suggestions, thanks, and a list of recommendations (Provenzale & Stanley, 2005;

Provenzale & Stanley, 2006; Menu, 2000). However, each journal has specificities by their respective agreements. Every writer must understand what to write for journal publication purposes. General templates and their contents must be strict and make it easier for editors and reviewers to process them.

Several things need to be considered in writing articles. First, the title, where the determination must be dynamic, informative, concise, and able to represent the main topic in the article. The effectiveness of writing the title is also stated to be able to facilitate article searches through search engines, so this will have an impact on the number of readers who cite the article. In addition, writing a good title will reduce the potential for errors of readers in accessing appropriate articles (Alexandrov & Hennerici, 2007; Bahadoran et al., 2019; Mack, 2016). Mack (2016) added, the title is the first thing the reader will see, but the title is the last thing that should be formulated by the author.

Second, abstract. The abstract must be written in a concise, concise, and clear manner taking into account the journal reader and the important points of the written article. In general, an abstract consists of a summary of: (1) background (includes what the subject already knows, problems that have arisen, what is not known about the subject, and what he wants to research); (2) research methods, which include information related to what has been done and how to do it; (3) the results must be presented in detail related to the findings that have been generated; and (4) conclusions, which includes the main message that the reader can easily grasp, the contrast between the findings and previous research, the importance of findings in related scientific studies, and the author's perspective on the matter. (Alexandrov & Hennerici, 2007; Andrade, 2011; Kukołowicz, 2017; Martín, 2014).

Third, preliminaries. This section consists of outline the importance of the research and the article to be read, and including literature reviews in it. The addition of this literature review is carried out to expose readers to relevant previous research results and to convey that the article was written in a professional manner. (Kukołowicz, 2017; Wells, 2004).

Fourth, method. In general, the method section consists of descriptions of the research respondents, the tools used to conduct the research (which can be tools for data collection), and how to analyze the results of this research. In short, in this section, the writer needs to describe the research procedure and the rationality in selecting the procedure (Kallet, 2004; Kukołowicz, 2017).

Fifth, results. This section describes the overall main findings of the research that has been carried out (Mack, 2016). In its preparation, the writer must present the results clearly (in the form of tables, pictures, and

graphics), and avoid ambiguous writing. It is no less important in writing this result is that the writer needs to focus on answering the research questions asked. (Alexandrov & Hennerici, 2007; Kukołowicz, 2017).

Sixth, discussion. In this section, it is necessary to include a summary of the research results/findings. These results were compared with the results of previous studies, formulated the strengths and limitations of the study, the follow-up that could be done by other researchers, and affixing relevant references. (Kukołowicz, 2017). Try to discuss using primary sources, prioritizing research results published in journals of international reputation.

Seventh, conclusion. According to Alexandrov & Hennerici (2007), In writing a conclusion, it usually consists of two statement sentences, namely related to a summary of the main findings and implications of the research conducted. Kukołowicz (2017) emphasized, that in essence the conclusion must be directly related to the research findings, without the opinion of the author. Usually arranged in one paragraph.

Finally, list of references. Writing a list of references or citations is defined as adding information from journals or articles that are read and used in the writing of individual an article. In writing the reference list, it is necessary to know the Citation Style Language (CSL) that will be used. CSL selection and reference of scientific papers are now made easier with the Mendeley application, which will be discussed next.

This scientific writing training focuses on the types of action research on problems faced by teachers. According to (Romijn et al., 2020) that policy and product development targeted at the interrelationship between expertise and practice regarding research diversity when preparing teachers to work in diverse classroom contexts to conduct research but have clear standards. Four standards are required in action research, namely: (1) researchers 'basic knowledge standards, (2) research process standards, (3) research feasibility standards, and (4) researchers' ethical standards, morality, and code of ethics (Boonchom et al., 2012). This training needs to be design to improve the quality of research writing (Kunlasomboon et al., 2015).

Writing scientific papers by teachers in the digital era and the era of a smart society, is required to use a variety of the latest applications. One of the Mendeley applications is highly recommended for its use in writing scientific papers (Setiawan, Hamzah, and Arlenny, 2019; Mardin, Baharuddin, and Nane, 2020). The Mendeley application is a software tool for citation and reference purposes in writing current scientific papers. Almost all scientific requires the author to use this application. Authors who use this application facilitated by tracking the referenced sources which automatically included in the list of references or bibliography (Djamaris, 2017).

Elsevier has also developed this application into a computer and web program used to manage and share research papers, search research data, and collaborate online (Pahmi et al., 2018).

There are advantages to using the Mendeley application for writers. The advantages include: (1) being able to track references easily, (2) building a good systematic literature review, (2) doing citations and inserting bibliographies into a reference list or bibliography quickly and accurately, (3) speed, the accuracy and systematization of citations and reference lists are very good, (4) Mendeley's application has been recognized for its sophistication by various parties (journal managers, academics, and article writers for today's journals), (5) the author can meet the requirements of writing scientific papers published in journals, and (6) increasing the cited author's h-index. That is, it can be briefly stated that the use of the Mendeley application provides maximum benefits to the author in terms of speed of finding references and citations, high accuracy in the citation of reference sources, and reducing mismatches between citations in the manuscript and the list of references. However, the Mendeley application also has a weakness, namely that the metadata in Mendeley is not always complete. The solution is that the writer must complete the data by matching the data from existing sources into the metadata in Mendeley. After being edited and completed, Mendeley can work and be used optimally to support the quality of scientific work

In order for the author to be able to produce quality scientific work supported by optimizing the use of the Mendeley application, several things need to be considered as follows. First, mindset formation, that is, the writer must understand and believe that the Mendeley application is very helpful in finding sources, citations, and writing a list of references or bibliographies. In order for the author to be able to understand Mendeley, several things that can be done are: (1) looking for various sources related to the Mendeley application, (2) practicing independently, (3) trying various basic operations of the Mendeley application, and (4) following various training. Post-source search needs to be continued by deepening what Mendeley's application actually is and its appearance by entering the next stage.

Second, install the Mendeley application with the following steps: (1) download Mendeley.com; (2) install Mendeley desktop; (3) install MS Word Plugin, (4) install Mendeley Web Importer; (4) searching online library sources in various ways and types of sources according to needs; (5) organize data or metadata, especially revising or completing the source metadata; (6) do the citation/referral process into the text; and (7) writing a list of references/bibliographies into the text (Isa, 2015; Soeprijanto, 2016; Arief and Handoko, 2016). Process 1-7 in more detail can be seen in Figure 1 and Figure 2.

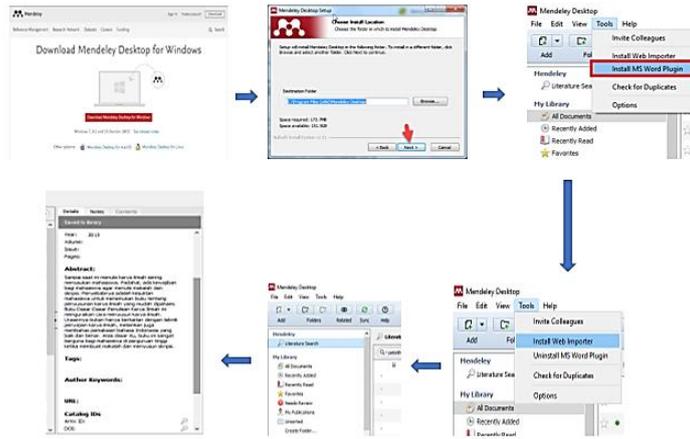


Figure 1 The Mendely Installation Process to the Metadata Completion Stage (Steps 1-5)

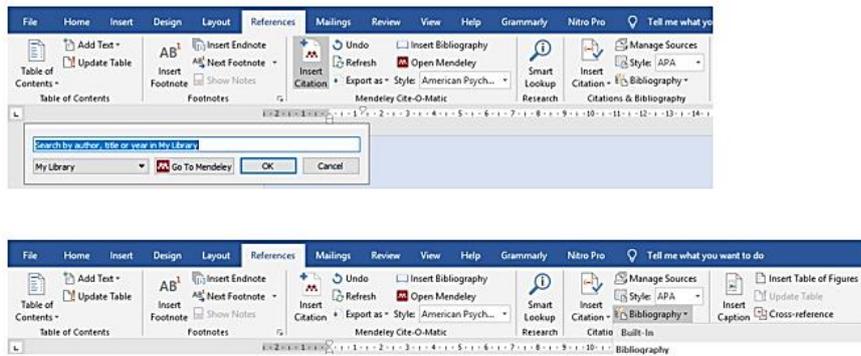


Figure 2 The Process of Writing Citation and Bibliography Using Mendely (Steps 6-7)

Third, if the second step has been taken, get used to the writer to work or write scientific papers with the with the Mendely application. Get used to searching for sources, organizing data, and metadata, as well as citing and inserting bibliographies with this application. If new writers regularly, periodically, continuously use the Mendely application, it can be assumed that they will produce good work on an ongoing basis. Teachers will be able to continue to develop independently to become professionals in the long term.

The results showed that the ability of teachers to write scientific papers, achievement motivation and work discipline had an effect on the speed of promotion of primary school teachers (Saputra, 2019). That can be understood because one of the requirements for promotion is to write scientific papers. The results of research related to scientific paper writing training; they (teachers) need training. Teachers have high hopes for the training in writing scientific papers that stay followed. They hope that scientific work writing training can help them produce quality work and promotion. The teacher

hopes too and gives suggestions for follow-up activities in the form of intensive guidance for teachers after training (Aunurrahman et al., 2019).

Based on this study, research is needed to determine the effect of the researcher’s actions (scientific paper writing training) on increasing the understanding of training participants in writing scientific papers for junior high school teachers.

3. METHOD

This research uses an action research approach, with a sequence of processes that include: (1) focus selection, (2) clarification of theory, (3) identification of research questions, (4) data collection, (5) data analysis, (6) reporting of results, and (7) taking action (Brydon-Miller et al., 2003; Sagor, 2020). This action research is based on the objective of knowing the level of understanding of participants in the scientific paper writing training before and after the training. This research activity is in the form of systematic and scheduled action research training.

The material includes the nature of writing scientific articles, journal templates containing the components of the title, abstract, introduction, results, discussion, conclusions, and references. Other training materials include the practice of using the Mendeley application in writing scientific papers. The study population consisted of 215 junior high school teachers in Mojokerto.

This study used purposive sampling, namely those who were registered to attend the Scientific Writing Training. The data collection uses an instrument in the form of a Google Form, in which the Google Form link is distributed to respondents after coordinating with the Mojokerto City Education Office. The collected data were analyzed using descriptive analysis techniques (mean scores of pre- and post-training), mainly to compare the respondents' understanding before and after the training in writing scientific papers.

4. RESULTS

This action research was conducted on the participants of the Scientific Writing Training held by the Task Force for the Institute for Research and Community Service, State University of Malang. The implementation starts from August 20, 2020, to August 22, 2020, online. The center of activity from the campus is distributed to Junior High School 3 Mojokerto City and is forwarded to respondents from each school. The number of respondents is 215 junior high school teachers in the city of Mojokerto and its surroundings. They consisted of 51 male participants and 164 female participants. Their ages ranged from 22-30 years as much as 27.9%, between 31-40 years as much as 27.4%, aged between 41-50 years as much as 26.5%, and aged between 51-60 years as much as 18.1%. Their data have worked as teachers, namely: (1) there are 31.6% who have worked for 1-5 years, (2) there are 12.1% who have worked for 6-10 years, (3) there are 23.3% who have worked 11-15 years, (4) there

are 11.6% who have worked 16-20 years and 21-25 years, (5) there are 4.7% who have worked 26-30 years and 31-35 years, and (6) there are 0.5% who have worked for 36-40 years.

Based on the descriptive data analysis by calculating the mean, the results obtained before and after the training, as presented in Table 1 and Table 2. Regarding the average increase per answer score per item, can be seen in Table 1 and Table 2. Comparison of respondents' understanding scores before and after training in making articles can be seen in Graph 1.

Increasing respondents' understanding of scientific article writing training materials can be seen based on the score of answers per item (Mean line) on each aspect. The respondent's understanding of the following aspects: (1) the article template is known to be 2.93 for pre-training and 3.32 for post-training, (2) the title is known to be 3.14 (pre-training) and 3.49 (post-training), (3) the abstract is known to exist an increase from a score of 2.99 (pre-training) and 3.42 (post-training), (4) preliminary with a score of 3.07 (pre-training) and 3.47 (post-training), (5) method with a score of 2.93 (pre-training) and 3.35 (post-training), (6) results with a score of 2.90 (pre-) training and 3.32 (post-training), (7) discussion with a score of 2.91 (pre-training) and 3.27 (post-training), (8) conclusion with an initial score of 3.15 and a final score of 3.52, (9) suggestions with a score of 3.14 in pre-training and a score of 3.48 at post-training, (10) bibliography with a score of 3.17 in pre-training and a score of 3.50 at post-training. training, (11) citations with an initial/prior score of 2.35 and a final / after the score of 3.28, (12) bibliography with a score of 2.34 in pre-training and 3.27 at post-training, and (13) using the Mendeley application with a score of 2.34 at pre-training and 2.93 at post-training.

Table 1 Table Type Styles

	PR1	PR2	PR3	PR4	PR5	PR6	PR7	PR8	PR9	PR10	PR11	PR12	PR13
Mean	2.93	3.14	2.99	3.07	2.93	2.90	2.91	3.15	3.14	3.17	2.35	2.34	2.34

Table 2 Table Type Styles

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
Mean	3.32	3.49	3.42	3.47	3.35	3.32	3.27	3.52	3.48	3.50	3.28	3.27	2.93

Table 3 Table Type Styles

Mean Scores	PR1	PR2	PR3	PR4	PR5	PR6	PR7	PR8	PR9	PR10	PR11	PR12	PR13
Pre-Training	2.93	3.14	2.99	3.07	2.93	2.90	2.91	3.15	3.14	3.17	2.35	2.34	2.34
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PO13
Post-Training	3.32	3.49	3.42	3.47	3.35	3.32	3.27	3.52	3.48	3.50	3.28	3.27	2.93
Improvement (%)	13	11	14	13	14	14	12	12	11	10	40	40	25
Mean Improvement (%)	18												

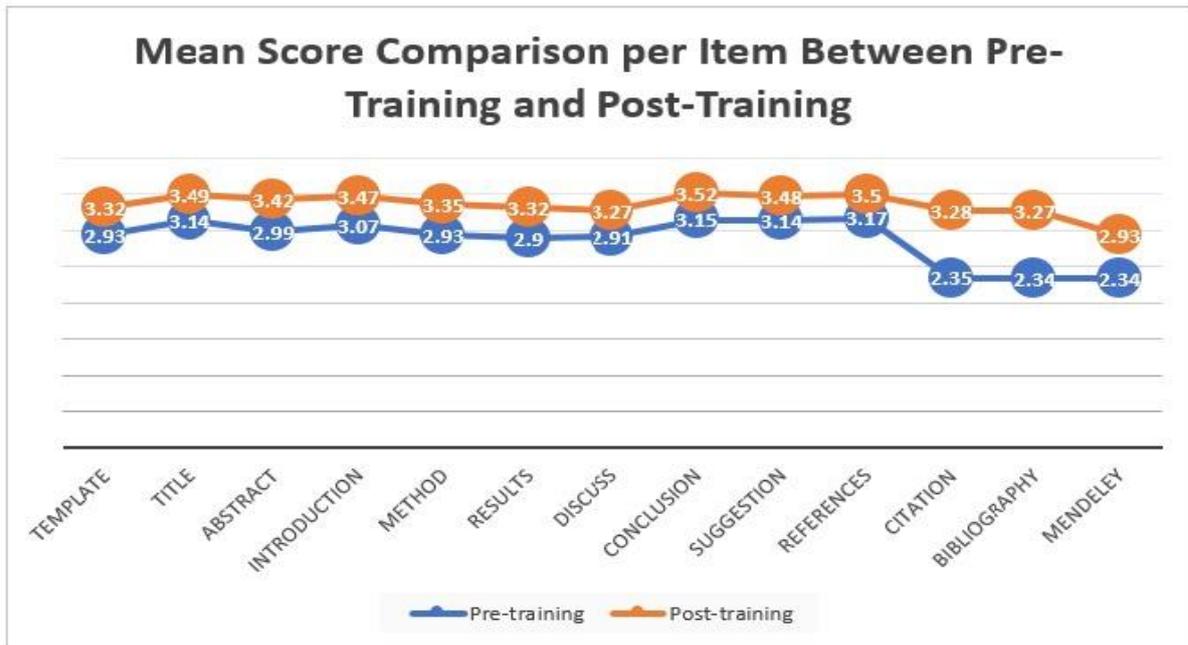


Figure 3 Mean Scores Comparison between Pre-Training and Post-Training

Based on Table 3 and Figure 3, it can be seen that the average score increase per item in the pre-training and post-training stages. In general, there was an increase in respondents' understanding of the training material by 18%. In detail, after rounding off, the increments are as follows. Understanding aspects of: (1) article templates with an increase of 13%, (2) titles with an increase of 11%, (3) abstracts with an increase of 14%, (4) introduction with an increase of 13%, (5) methods with an increase by 14%, (6) results with an increase of 14%, (7) discussion with an increase of 12%, (8) conclusions with an increase of 12%, (9) suggestions with an increase of 11%, (10) bibliography with an increase of 10%, (11) citations with an increase of 40%, (12) bibliography with an increase of 40%, and (13) use of the Mendeley application with an increase of 25%.

5. DISCUSSION

Action research is described as a process that aims to solve problems through a systematic approach continuously (Rose & Grosvenor, 2013). In the context of education, action research is mostly carried out for teacher professional development programs (Rosa & Mujiarto, 2020), where teachers act as researchers who carry out continuous investigations related to problems relevant to learning practices and problems (Marzano et al., 2012; Stringer, 2010). Although, it cannot be denied that even in conducting research, there are still teachers who are hampered by limited time and other resources related to institutional / school support (Sato & Loewen, 2019).

As is well known, teacher professionalism has recently become a special concern in education studies,

given that teacher professionalism is one aspect of teacher quality assessment based on Law Number 14 of 2005 concerning Teachers and Lecturers and is considered an inherent aspect of professional development (Tannehill et al., 2013; Wardoyo et al., 2017). The development of professionalism needs to be carried out by the teacher continuously because it is useful for improving the quality of teaching in the classroom, which will directly impact the achievement of students (Adalbjarnardottir, 2007; Cheung, 2013; Yoon et al., 2007). Taylor et al. (2011) added, so that the development of professionalism can last a long time, the role of leadership is very influential, both in developing experience and in adding to teacher insights. Besides, support in the form of morale, policy, infrastructure, and finance is also needed in increasing the professional development of teachers (Tanang & Abu, 2014).

For teachers or other education practitioners, action research as a prerequisite for professional development can be used as a reflective material for learning, as well as a reference for problem-solving both in the classroom and in school (Rose & Grosvenor, 2013; Stringer, 2010). Discussing the common problems faced by most teachers, both in the classroom and in handling students, action research is deemed necessary to provide solutions to this (Norton, 2018; Sato & Loewen, 2019). In other words, the findings of action research carried out by one teacher may be of benefit to other teachers, so the findings need to be published, not just for oneself.

Based on the results of this study, it is known that before the implementation of the training, teachers' understanding regarding the writing of scientific papers was still lacking. These results support previous research

which states that teachers have not been able to be productive in producing scientific work because teachers do not fully understand the concept of scientific work. This lack of understanding is added to the difficulty of teachers in writing scientific papers which include limited time and ideas, low motivation, demands for school administrative completion, and the absence of writing culture in the organization (Marto, 2019; Rosa & Mujiarto, 2020; Sato & Loewen, 2019; Sumardjoko, 2017).

Sumardjoko (2017) stated, that one way to overcome teacher difficulties in understanding the writing of scientific papers is to involve teachers in workshops, seminars, or workshops related to scientific work. This statement is in line with the results of this study which show that after training activities, teachers' understanding of scientific writing tends to increase (Table 1, Table 2). In general, several literature reviews state that the provision of training tends to have an impact or show an increase in individuals who attend the training continuously (Hen & Sharabi-Nov, 2014; Janssen et al., 2019; Ningtiyas & Jailani, 2018; Postareff et al., 2007).

Not all training will have an impact on teacher productivity. As stated by Harris & Sass (2011), that formal training has no effect on teacher productivity. Teachers who are psychologically considered adults tend to be more attracted to training that is relaxed and less taxing on the mind. In accordance with the opinion Mulyatiningsih (2018) dan Sunhaji (2013) which states that one of the principles in education and training is that adults, in this case, teachers, will be able to learn well if they are practical, useful, and do not burden work and mind as a whole. Formal training will result in the teacher working with full discipline and feeling depressed, if there is no trainer, the teacher will not be productive as which is the desired goal in training. The statement provides a reference for training activities to reduce the level of formality so that teachers will feel more comfortable and productive.

Regarding publication efforts, several things that need to be considered so that scientific papers can be published are: (1) explanation of research rationality and research objectives, (2) research design, (3) series of research processes, (4) findings of results, (5) aspects recency and analysis, and (6) the implications of the findings (Blackwell & Martin, 2011). As for individuals, success in article publication really depends on the variables that influence it. Some of the variables referred to include achievement motivation and work discipline (Saputra, 2019). Individuals who have high motivation can trigger themselves to produce good and productive scientific articles. This can also be supported by self-discipline in writing articles. If the two can be combined well, the individual can produce good scientific work in the long run.

Scientific paper writing training will not have an impact on teacher productivity if there is no clear and practical follow-up carried out by the work unit, in this case, the Mojokerto City Education Office. according to the opinion of Arthur (2018) Support for training alumni by encouraging efforts to improve policies in the culture of researching, compiling scientific papers, and financing and publication in their respective work units is an important matter. Therefore, there needs to be an encouragement to facilitate teachers in writing scientific papers. The success of the training apparently cannot stand alone, the role of the work unit of each participant has a big role in the success of the training. The potential of teachers to develop themselves in conducting research and producing scientific papers needs to be facilitated after training (Muhali et al., 2019). This opinion shows that there is a need for a follow-up to the scientific writing training program that needs to be carried out in comprehensive collaboration with the work units of each teacher to provide a cultural motivation for researching up to the financing of its publication.

The results of the training conducted found that scientific writing training had an impact on teacher productivity in writing. according to the opinion of Hayuhantika (2017) dan Ilfiandra et al. (2016) he participants felt the benefit of the training activities for writing scientific papers, especially class IVa teachers who would be promoted to IVb, because it was a solution to the difficult problem of advancing from IVa to IVb. This scientific paper writing training is a strategic program to provide services for the development of knowledge, skills, and motivation, and teacher productivity, particularly in planning, implementing, and making reports, to publishing the results of action research. This opinion states that scientific paper writing training can increase knowledge up to teacher productivity in writing scientific papers.

After the action research has been converted into article form, the next activity is to publish the article in indexed journals. However, some publication constraints were found in these training activities. According to research Pardjono et al. (2017) Some of the inhibiting factors for the publication of scientific papers by teachers in indexed journals originate from external factors, namely busy work, high costs, limited subscriptions to print journals, limited online journal subscriptions, and limited access to printed journals. The hopes for increasing the productivity of the publication of scientific papers in indexed journals are improvements and improvements in socialization, access to information and services, training in writing and English, free language translation assistance, and collaborating with various parties. According to Luo & Hyland (2016). If managed properly by institutional support, collaboration with universities can help more teachers to scale their research into articles published in quality journals. This statement shows that writing training and collaboration with

various parties is needed. In this training, researchers collaborated with the Mojokerto City Education Office and the State University of Malang.

6. CONCLUSION

There are two conclusions that can be drawn from the results of this study, namely the stages before training and after training. In the pre-training stage, it was found that the training participants (in this case the teacher) lacked understanding of scientific writing, especially in terms of writing citations and using the Mendeley application in writing a list of references. As for the post-research stage, there was an increase in understanding by training participants/teachers in writing scientific papers evenly, not only in writing citations and using the Mendeley application. Based on the description of the discussion, training requires continuous follow-up and follow-up so that training activities can actually increase teacher productivity in writing scientific papers, which in this training is focused on writing action research-based articles.

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