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## Improving the Ability to Develop Scientific Articles among Physics Teachers

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# Improving the Ability to Develop Scientific Articles among Physics Teachers

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**Abstract.** There have been training scientific articles online for physics teachers. The purpose of this activity is to (1) improve Physics teachers in the ability to create scientific articles and (2) increase the number of scientific articles written by Physics teachers. Seventy-five physics teachers in Mojokerto attended the training. They implemented online by forming a synchronous meeting zoom class and continued with asynchronous assistance using WhatsApp group facilities. The success of this training workshop is evaluated using an assessment of the resulting article and a questionnaire of the trainee's response to the implementation of training activities. Scientific articles that have been obtained are included in the review process and have been revised to meet the criteria to be published in scientific journals. The article have been prepared aspects of the assessment of articles compiled by Physics teachers include titles and identities, abstracts, introductions, theoretical foundations, results and discussions, conclusions, and bibliography. The articles compiled have met the criteria well, with an average score of 87. The results of the trainee response questionnaire showed that 67 % strongly agreed and 33 % agreed. It shows that there is still a need to increase the quantity and quality of articles compiled by physics teachers.

## 1. Introduction

The learning from home policy began to be implemented on March 9, 2020, after the minister of education and culture issued circular number 2 of 2020 and number 3 of 2020 on online learning and working from home to prevent Corona Virus Disease (COVID-19). When the COVID-19 outbreak appeared, all human activities were restricted, including learning activities both at the elementary school level to the lecture level began to implement learning activities from home [1]. This is done to limit the spread of massive viruses [1].

Related to the position of teachers and lecturers, the Government has also implemented the Minister of Utilization of State Apparatus and Bureaucratic Reform No. 16 of 2009 concerning the Functional Position of Teachers and Their Credit Numbers. This regulation contains a change that the promotion and the class of teachers into higher class must make scientific papers or scientific articles [2,3]. This requires that all teachers, including high school teachers, must be able to compile a paper or scientific article [2,3]. Writing scientific work expresses ideas and conveys information effectively by using language so that others know and understand the information in descriptions, expositions, arguments, or persuasions [4]. Scientific articles are scientific studies in the form of ideas or thoughts based on empirical evidence or theoretical studies that can be proven true [5].



Related to scientific articles, many senior high school teachers who have not filled out articles in various media publications of articles or not many who make scientific journals [6]. The low ability to write senior high school teachers is also seen from the rareness of senior high school teachers who participate in seminar activities by becoming a companion in national or regional seminars [7,10]. The results of the observation of the community service team in the field at the time of community service in 2019 obtained information that most (almost all) senior high school teachers in Mojokerto Regency had conducted Class Action Research (PTK) and made their reports. However, from senior high school teachers who had carried out the PTK, there were still few who published their research into scientific seminars or scientific journals. The observations also show that teachers still have difficulty conducting *literature reviews* to complete article creation and compile literature-based *articles* review. A literature-based *review* article is an article to analyze topics using secondary data in the form of journals or other references to produce descriptive data about the results of an analysis that has been done [8]. It led to many senior high school teachers who stopped their promotions due to bumps on the requirements of proof of writing scientific papers [7]. On this basis, the Community Service team of the Department of Physics UNESA, together with partners, namely MGMP Physics Mojokerto Regency, agreed to hold an Online *Literature Review Based Article Making Training* activity for MGMP Physics High School in Mojokerto Regency. The main purpose of this effort is to increase high school Physics teachers' ability to make literature review-based scientific articles in the Covid 19 pandemic and increase the number of scientific articles based on literature reviews or based on research which written by Physics teachers.

## 2. Method

Research-based "Training of Writing Scientific Article based literature review ore based on research" to improve the skills of teachers in writing scientific articles was conducted in October - November 2020 online using the Zoom Meeting platform with links <https://zoom.us/j/96792119046?pwd=aHIITG1SY0NUWTF3ckk1eXJ2OFRJdz09> and WA group. The subjects used in this study were 75 trainees who were teachers of MGMP Physics members from high school and vocational school, the junior high school both public and private located in the District and Mojokerto City.

The components of the article writing skills are developed through three stages of training. They are the delivery of suitable writing materials, the implementation of scientific articles examples (or modelling) based on literature review or research, and the implementation of theories obtained into workshops to create literature-based or review-based scientific articles conducted in groups where group members come from several different schools within a month with technical coordination of online mentoring through WhatsApp. The instruments used in this study are article assessment instruments and the questionnaire response of trainees to implement training activities. The data was analyze by providing a maximum score of three an aspect. The assessment according to Tanjung and Ardial, includes title and identity, abstract, preliminary, theoretical foundation, results and discussion, conclusions, and bibliography [9]. The article assessment instrument concludes the feasibility of scientific articles and analysis of response questionnaires with categories strongly agree (SS), agree (S), disagree (TS), and strongly disagree (STS) on each indicator assessed to conclude the response to the conductivity of training.

## 3. Results and Discussion

### 3.1. Training activities

The performance of scientific article writing materials aims to understand trainees' benefits and technicalities of writing scientific papers. In this training, the materials presented include (1) continuous professional development, (2) theory literature review, (3) modelling literature review, (4) paraphrase engineering, and (5) scientific articles. then, practicing aspects of writing scientific articles include (1) collecting references of journals and other relevant references, (2) constructing abstract, (3) compiling introductions, (4) compiling literature studies, (5) conducting analysis preparations, and (6)

Concluding [11]. In general, the presentation of material and discussion activities went very well. Participants and keynote speakers showed a positive response with the number of questions that emerged from participants regarding the training material. This also showed that there were still many things that still needed to be known regarding the technical preparation of scientific writing articles to be published in online scientific journals. The process of conducting the training can be seen in Figure 1.

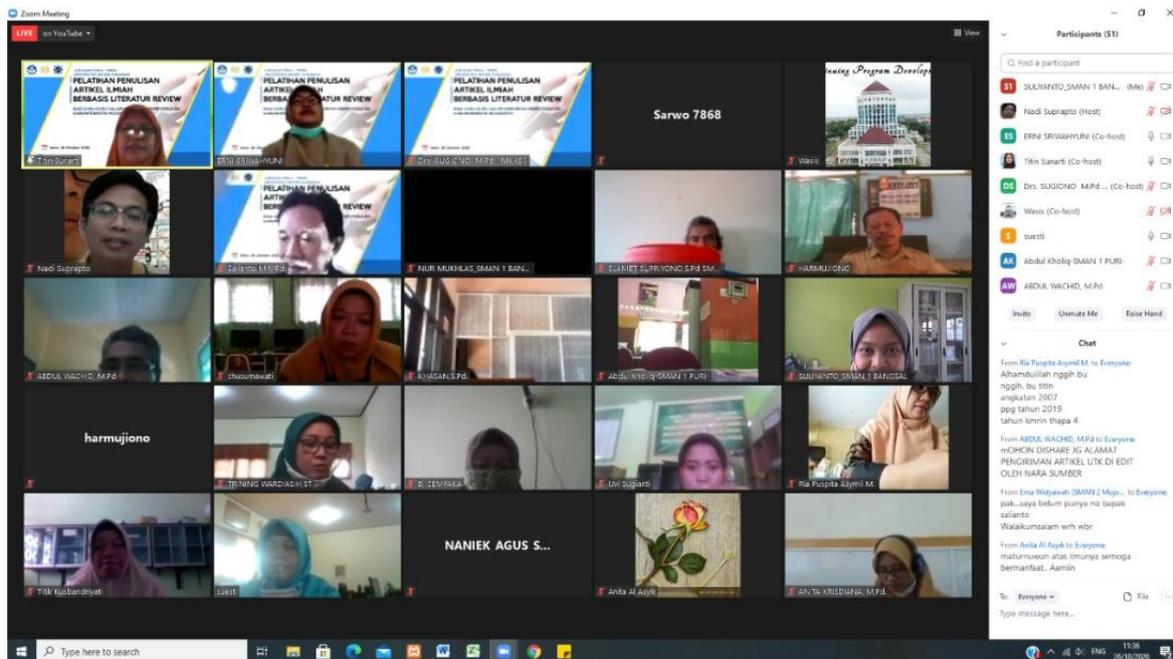


Figure 1. Screenshot of training activities

The implementation of training activities in Figure 1 indicates that the initial knowledge of participants related to the technical preparation of scientific papers to be published in online scientific journals is relatively lacking. However, after being given training, the understanding level of trainees showed promising results. This statement is reinforced by the results of the questionnaire on 30 participants shown in Table 1.

Based on the exposure of the results of the questionnaire in Table 4, the two appear that the average percentages of positive responses (Strongly Agree and Agree) is 64.75 % and 37.25 %, respectively. No one gives a negative response (Disagree and Strongly Disagree). This shows that all participants rate positively on the implementation of training activity. High assessments were given to participants for the response that the training supported the profession's development (86 %) and that facilitators mastered the training well (86 %). The benefits of training for participants (81 %) were relevant to the needs of teachers in schools (81 %). Slightly low assessments on delivery methods that were less attractive were done online (48 %), and participants provided less effective training responses because they could not be provided offline mentoring.

**Table 1.** Results of response training participants

No	Indicators	Response			
		SA	A	D	SD
1	This training is useful for me	81 %	19 %	0	0
2	Training materials are well organized	57 %	43 %	0	0
3	Have relevance to the needs of teachers in school	81 %	19 %	0	0
4	The delivery of training materials is communicative	58 %	42 %	0	0
5	Delivery of interesting training materials	48 %	52 %	0	0
6	The speaker mastered the training materials well	86 %	14 %	0	0
7	Training materials helped me in developing skills in literature review-based article writing	58 %	42 %	0	0
8	Through this training, I gained a clear picture of literature review-based article writing	58 %	42 %	0	0
9	The implementation of the training takes place effectively	48 %	52 %	0	0
10	Implementation time in accordance with training activities (not too long and not too short)	63 %	38 %	0	0
11	Support the improvement of the development of the teacher profession	86 %	14 %	0	0
12	If the FMIPA Unesa Community Service team holds another training, I will gladly take the training	53 %	47 %	0	0
<b>Average</b>		64.75	37.25	0	0

Information: SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

### 3.2. Results of Articles

Table 2 shows the implementation of the training activities in the form of writing literature review articles, scientific articles that have obtained input in the review process and have been revised so that they meet the criteria to be published in online scientific journals that have been prepared based on components assessed on scientific article assessment instruments.

Based on Table 2, participants' ability to compile scientific articles is excellent by getting an average of 87. The input and advice given, among others, are that the abstract's content includes a brief background, goals, methods, results, and conclusions in abstract writing. The background writing of the problem lists the references used.

**Table 2.** Average assessment of 2 articles of training participants

No	Rated Components	Maximal Score	Average Score
<b>Article Identity</b>			
1	The title of the article is written in the form of a phrase that does not mean double, describing the content of the article	3	3
2	Register the author's name, email address, and institution	2	3
<b>Abstract</b>			
3	Abstracts are arranged in the form of a single paragraph containing goals, methods, and results	3	3
4	Abstracts are arranged with a maximum number of 250 words and pay attention to conformity with keywords	3	3
<b>Introduction</b>			
5	There is rationalization and urgency of the problem/purpose studied supported by relevant references	4	3
6	The theoretical foundation is formulated in-depth based on theoretical and empirical studies relevant to the problem/purpose studied	4	3
7	Research ideas and ideas are formulated by prioritizing <i>state of art</i>	2	2
<b>Theoretical Foundation</b>			
8	Relevance of theoretical studies to research topics	6	5
9	Adequacy of supporting theories for use in the proof or resolution of the problems discussed	7	5
10	Validity/truth of the theory written	10	8
<b>Results and Discussions</b>			
11	Discussion of research results is carried out clearly and quickly, relevantly with the formula/ purpose, and the theoretical foundation used	10	9
12	Quality of argument or proof provided	10	8
13	Breadth and depth studied	10	8
<b>Conclusion</b>			
14	The formulation of the conclusion describes the full results of the study	7	7
<b>References</b>			
15	Libraries/references used are sufficient	3	3
16	Current reference sources used	3	3
17	Libraries/references used in accordance with the topic	3	3
<b>Language</b>			
18	The writing of symbols, formulas, notations, and terms is used appropriately	5	5
19	Articles are written in Indonesian/English that is good, correct, and following scientific rules	5	5
<b>Number of Scores</b>		<b>100</b>	<b>87</b>

Figure 2 illustrates the sample of scientific article produced through the training process. Accordingly, the paper aims to determine the effectiveness of simple KIT-based media in improving students learning achievement in dynamic electricity material as an example of the training results.



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### Media Innovation Based on Simple Kit for Dynamic Electricity Learning

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#### ABSTRACT

This study aims to determine the effectiveness of simple KIT-based media in improving student learning achievement in dynamic electricity material. The sample used was the students of class grade 12 of IPA-3 Madrasah Aliyah Negeri 2 Mojokerto, totaling 35 students. The type of research used is research development (Research and Development). The research data were obtained from questionnaire responses during learning and the results of the pre-test and post-test. The questionnaire's responses were as many as 85.14% of students who thought that the development of KIT-based learning media was very effective in using dynamic electricity learning. Moreover, as many as 14.85% think that KIT-based learning media is creative and interactive learning and is an additional supplement in the teaching and learning process. From the test results given to students, there was a significant increase in students' achievements. This indicator can be seen from the t count value is smaller than the t table (t count < t table), then H1 (learning with media treatment) can be applied in learning. Another indicator is that the value of p-value is smaller than alpha 5% (0.05) Ho (learning without treatment) is rejected, so it is concluded that there is a significant increase between learning outcomes before using Simple KIT-based media after implementing learning media using simple KIT.

**Figure 2.** Sample of scientific article as a product of the physics training

Figure 3 illustrates the sample of scientific article produces through the training process. Accordingly, the paper aims to determine the effectiveness of simple KIT-based media in improving student learning achievement in dynamic electricity material as an example of the training results.

#### ABSTRAK

**Salianto : PENGGUNAAN QUIPPER SCHOOL DALAM PEMBELAJARAN JARAK JAUH PADA MASA PANDEMI COVID-19 DI SMAN 1 BANGSAL KABUPATEN MOJOKERTO**

**Kata Kunci :** Penggunaan Quipper School, Pembelajaran Jarak Jauh.

Pemerintah Indonesia menerapkan kebijakan untuk memutus penyebaran Covid-19 memunculkan berbagai dampak pada kehidupan masyarakat, termasuk bidang pendidikan dengan mengubah metode pembelajaran dari mayoritas tatap muka menjadi Pembelajaran Jarak Jauh (PJJ). Pembelajaran Jarak Jauh (PJJ) digunakan untuk mengajar kelas maupun berkomunikasi dengan siswa. Untuk itu bermunculan begitu banyak platform yang menawarkan kemudahan, isi, dan harga yang bervariasi.

Penelitian ini untuk mendeskripsikan hasil belajar siswa materi Teori Kinetik Gas dengan menggunakan platform Quipper School. Sampel penelitian adalah siswa Kelas XI MIPA. Lebih dari 20% waktu guru bekerja dihabiskan untuk membuat tugas, mengoreksi, dan menilai hasil kerja siswa. Dengan memanfaatkan teknologi, Quipper School membantu meringankan beban guru dalam :1) Mengelola kelas, 2) Mengirim tugas ke siswa, 3) Mengoreksi, menganalisa, dan menilai hasil pekerjaan siswa secara efisien, 4) Merangkum performa individual siswa.

Dengan strategi menggunakan Quipper School, diperoleh hasil rata-rata nilai mata pelajaran Fisika materi Teori Kinetik Gas pada siswa kelas XI MIPA 82,5. Nilai rata-rata ini memenuhi ketuntasan pembelajaran klasikal di SMAN 1 Bangsal Kabupaten Mojokerto. Sehingga dapat disimpulkan bahwa penggunaan Quipper School sangat bermanfaat dalam peningkatan kemampuan memahami konsep Fisika dalam materi Teori Kinetik Gas.

**Figure 3.** Another sample of scientific article as a product of the physics training

The purpose of this study was to describe the effectiveness of using Quipper School in distance learning for the Kinetic Theory of Gas. So it can be concluded that the use of Quipper School is very useful in improving the ability to understand the concepts of Physics in the Kinetic Theory of Gases

Both articles have complied with the rules of article writing, in terms of titles and identities, abstracts, introductions, theoretical foundations, results and discussions, conclusions, and bibliography.

#### 4. Conclusion

Based on study results, it can be concluded that the article compiled by physics teachers in Mojokerto has met the criteria both with an average score of 87 with aspects of assessment in the form of titles and identities, abstracts, introductions, theoretical foundations, results and discussions, conclusions and bibliography. The results of the trainee response questionnaire showed that 67 % strongly agreed and 33 % agreed. This shows that there is still a need to increase the quantity and quality of articles compiled by physics teachers.

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