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THE PROGRAM OF TEACHERS' ACCOMPANIMENT ON THE LEARNING OF SCIENCE AT MADRASAH IBTIDAIYAH

Ade Yeti Nuryantini[1], Rima Wiana[2], Ea Cahya Septia Mahen[1]
[1]UIN Sunan Gunung Djati Bandung, Indonesia
[2] Elementary School (MI) Al Misbah Cipadung, Indonesia
E-mail: ade.yeti@uinsgd.ac.id

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Abstract

The program of USAID PRIORITAS has a follow-up activity in form of accompaniment program. The accompaniment is committed to ensure that the teachers apply the training results. One of the accompaniments is carried out at MI Al Misbah Cipadung Bandung to apply module 3 related to skills of science. Focus of the accompaniment is to observe the feasibility of accompaniment activities, examine students' skills in doing an experiment and making an experimental report. Data are acquired through observation and assessment rubric. The results of observation show that the teachers carry out six observed aspects, (setting of students' seats, teachers' role as facilitator, serving individual difference, paying attention to gender, the learning using the scientific approach, and students' works), while the aspect of assessment of authenticity and literacy is not carried out. The average of students' skills in carrying out and writing down the experiment belongs to good category.

Keywords: accompaniment; experiment; skill of science; writing ability

Abstrak

Program USAID PRIORITAS memiliki aktifitas tindak lanjut berhubungan dengan pendampingan guru. Program pendampingan dibuat untuk memastikan para guru mengaplikasikan hasil pelatihan. Salah satu bentuk pendampingan dilaksanakan di MI Al Misbah Cipadung Bandung untuk mengaplikasikan modul 3 yang berhubungan dengan kemampuan sains. Focus dari pendampingan adalah mengobservasi kemungkinan dilaksanakan kegiatan-kegiatan pendampingan, menguji kemampuan siswa dalam melakukan eksperimen dan menuliskan hasilnya. Data didapatkan melalui observasi dan penilaian berdasar rubric. Hasil observasi menunjukkan bahwa para guru memiliki enam aspek, (mengatur tempat duduk siswa, guru sebagai fasilitator, memahami perbedaan individu, memperhatikan perbedaan gender secara merata, pembelajaran menggunakan pendekatan saintifik, dan kerja siswa), di sisi lain otentisitas penilaian dan kemampuan literasi tidak digunakan. Rata-rata kemampuan para siswa dalam melakukan dan menuliskan hasil eksperimen berada pada tahapan baik.

Kata kunci: *pendampingan; eksperimen; kemampuan sains; kemampuan menulis*

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Introduction

Many of the training activities are committed by some institutes to improve teachers' competence. One of the institutes is USAID PRIORITAS (Prioritizing Reform Innovation and Opportunities for Reaching Indonesia's Teachers, Administrators and Students). USAID PRIORITAS is a five-year program which is funded by USAID designed to improve the quality of elementary education access in Indonesia. USAID provides the world class education access from elementary school/*madrasah* (Islam school) to junior high school/*madrasah* (Sarnapi, 2015; USAID PRIORITAS, 1999)

One of the USAID PRIORITAS training programs for teachers is the good practice in the learning. The good practice at elementary school/*Madarasah Ibtidaiyah* (MI) consists of three modules. In the third module of the high class learning, teachers of science (*Ilmu Pengetahuan Alam*/Natural Science) are trained to be able to develop the skills of science with practice.

The development of science skills is equivalent to the goal of learning science at elementary school/MI so that the students have the ability to develop knowledge and comprehension of the beneficial science concepts, can apply them in daily life, and develop the ability of process to investigate the nature, solve the problems, and make decisions (the Ministry of Education and Culture, 2013). By way of the learning of science, it is expected to be able to develop the students' competence which is needed for society's life at this time and in the future. The competence encompasses: (1) developing the religious attitude and high social ethics in social, national, and international life; (2) mastering the knowledge; (3) having the skill or ability to apply the knowledge in doing the scientific research, problem solving, and the making of creative works related to daily life (The Ministry of Education and Culture, 2016). To reach the competence, in the process of learning the students are trained to be a little scientist; that is, learning by doing the scientific process (USAID PRIORITAS, 2016; Wee & Leong, 2015). By way of the scientific process, the students are expected to be able to design their knowledge acquisition independently.

The training of science teachers is followed by the teachers from partner *madrasah*. In general, the training activity is not followed by a follow-up activity to ensure that the teachers apply their training results; whereas, the training program is a positive program for teachers in keeping up with the new development, improving the professionalism, and sharing their problems and ideas with colleagues (Bozkurt, Kavak, & Yamak, 2012). Teachers' productivity in elementary and intermediate education increases along with their experiences (informal on-the-job training) (Harris & Sass, 2011).

The program of USAID PRIORITAS is different from the training in general. The program of USAID PRIORITAS has a follow-up activity in the form of accompaniment program. The program of accompaniment is a partnership between schools and high educational institutes (Furlong & Maynard, 1995). The program of accompaniment aims to help teachers in applying the training results. The accompaniment is committed by facilitators who have acquired the training before at USAID PRIORITAS.

One of the accompaniment activities is committed at MI Al Misbah Cipadung Bandung as one of the *madrasahs* partner with USAID PRIORITAS and UIN Sunan Gunung Djati Bandung. The teachers accompanied are the teachers who have obtained the good practice training of the module 3. The results of interview with teachers gained some information

that beforehand the teachers frequently kept up with the training, but there was no a follow-up in form of accompaniment. In particular, for the learning of science, the students at MI Al Misbah Cipadung Bandung rarely do experimental activities, let alone make reports of the experimental results. In teachers' view, making reports of the experimental results is the activity committed at university. Therefore, in the level of elementary school/MI, making experimental report is not needed.

From the problem above, the purpose of this research is to acquire the descriptions about (1) the feasibility of accompaniment activity and (2) examining students' skills in doing the experiment and making the experimental reports.

Method

The research committed uses the descriptive method. The research population is the students in the fifth grade at MI Al Misbah. The sampling uses the saturated sample, that is, all the research populations are 25 students that will be enacted the sample research. The research instruments are observation sheets, which are used to observe the process of learning, and the assessment rubric to assess students' ability in doing the experiment and making the experimental reports.

The assessment rubric in doing the experiment covers three aspects: (1) determining tools and materials, (2) designing the experiment, (3) stringing up the tools. The assessment rubric in doing the experiment is categorized to two kinds, namely: able and unable.

Meanwhile, the rubric of ability assessment in making the experimental reports consists of seven aspects: (1) determining the title of the experiment, (2) formulating the problems, (3) making the tentative answers, (4) writing down the tools and materials, (5) presenting the steps of experiment: collecting and recapping the data, (6) explaining the results of experiment, (7) making a conclusion. The assessment rubric uses three levels of achievement, namely: 1 (poor), 2 (fair), 3 (good). Quantitative analysis of the students' ability in doing the experiment and making the experimental reports is committed by counting the percentage for each achievement with poor, fair, and good category based on the score total of each aspect. To acquire the value, the score is turned into the value of scale 100 with the following equality.

Table 1. Criteria of assessment in making the experimental reports

Criteria	Score Total	Value
Maksimum	3 x 7 = 21	100
Minimum	1 x 7 = 7	33,33
GOOD Category	17 - 21	76.20 - 100
FAIR Category	12 - 16	52,39 - 76.19
POOR Category	7 - 11	33,33 - 52.38

Then the gained values are grouped in accordance with the criteria of poor, fair, and good category. The category is based on the maximum value (3 x 7 = 21) and minimum value (1 x 7 = 7). The criteria are presented in table 1.

Results and Discussion

The Making of Lesson Plan

The activities of teachers' accompaniment are started by discussing the making of lesson plan together between facilitators and teachers of MI Al Misbah Cipadung Bandung and are attended by the headmaster. The planning is committed by reviewing the curriculum. Curriculum becomes an important part in designing the lesson. To involve students in

investigation of science, teachers need to effectively learn the curriculum in advance (Forbes, 2011).

The results of discussion generate a decision that the accompanied teachers will teach in the fifth grade with material of water circle and its impacts. The basic competence for material of water circle and its impacts is to understand the water circle and its impacts on the phenomena in the earth as well as the living creatures' survival and making the works concerning the scheme of water circle based on the information from various sources (the Ministry of Education and Culture, 2016). The two competences are divided into three indicators, namely: doing experiment of water circle and its impacts on the phenomena in the earth as well as the living creatures' survival, re-explaining the phenomena of water circle and its impacts on the phenomena in the earth as well as the living creatures' survival, and making reports of the experimental results. The steps of learning committed can be seen in Table 2 below.

Table 2. The steps of learning by using the scientific approach.

Steps of Learning	Students' learning activities
Observing	Students observe the phenomena of water circle through the pictures provided by teachers carefully.
Questioning	Students are asked to submit the questions related to the phenomena of water circle observed from the pictures.
Collecting the data	Students do the experiment of steps in water circle, such as evaporation, condensation, precipitation, and making a tool of flood simulation as the impacts from the phenomena of the cut water circle.
Data managing	Students discuss the results of experimental activities related to the water circle and its impacts. Every group makes reports of the experimental results.
Communi-cating	A representative of each group presents the reports of the experimental results in front of the class.

The Learning Application in the Class

The lesson plan which has been approved together is applied in the class by one of the teachers. Facilitators and other teachers act as observers. Observation of the learning process is referred to some aspects, namely: setting of students' seats, teachers' role as a facilitator, serving individual difference, paying attention to gender, the learning using the scientific approach, the assessment is committed authentically, paying attention to students' literacy ability, students' works. The results of observation to the aspects above can be seen in the Table 3 below.

Table 3. The results of teachers' feasibility observation in the learning process.

The observed aspects	Done	Undone
Seat setting in groups	✓	
Teachers act as facilitator	✓	
Teachers serve the individual difference.	✓	
Paying attention to gender	✓	
The learning using the scientific approach	✓	
Paying attention to students' literacy ability		✓
The assessment is committed authentically.		✓
Generating students' works	✓	

The data explanations in the Table 3 above are as follows: in introduction activity at the beginning of learning, teacher had not committed the setting of seats in groups. Teacher appreciated and started the activities by inviting students to sing entitled flood which was composed from the song of climb-climb to the mountain top. The students who felt tense at first due to the observers' presence became more relaxed after singing. Then the teacher stuck the pictures of water circle on the blackboard and asked about what phenomena which seemed in the pictures. 40% students explained the phenomena in the pictures; however, in this activity there was no a student submitting the questions. The teacher did not give a chance to

students to submit the questions. It was the teacher who submitted the questions related to the phenomena in the pictures. Upon entering the activity to do the experiment, the teacher divided the students into five groups. The group division was committed by paying attention to gender because every group consisted of boy and girl students. Then every group was given tools and materials for experiment. The experimental-work steps were explained orally by the teacher. LKS (*Lembar Kerja Siswa*/worksheet) was not provided in this activity. The teacher went around, checking the experimental activity. If there is a group who needs some helps, the teacher gives the helps as the form of service. In this activity, all students actively took part dividing the assignments of each group. The students were enthusiastic and happy, let alone after they saw their successful experimental results. Through the activity of students' experiment, they could observe the phenomena of water circle and the flood as a result of the water which was not absorbed by the closed surface. On the committed experiment, the students observed the phenomenon of water absorption by the soil and the phenomenon of the water which was not absorbed by the surface which was inhibited by plastisin. Plastisin is a model for the soil surface which is closed by cement or asphalt.

After doing the experiment, the teacher did not discuss the results of students' experiments. However, the teacher directly asked the students to make the reports of experimental results on the report sheets which had been provided by the teacher. The report sheet contains the title, identity of group, introduction, formulating the questions, tentative answers, designing the experiment (tools and materials as well as mechanism), results of observation, and conclusion.

After the students had finished making the experimental reports, the teacher asked for a representative of each group to read aloud the reports in front of the class. The reports of the experimental results were then displayed on a display board, and the teacher gave the assessment by giving a token of star. The teacher did not do the assessment in the learning process; whereas in the learning process, it was very possible for the teacher to do the authentic assessment during the learning process. The findings of Fook, et al, show that the authentic assessment is more acceptable by students than the traditional assessment (Fook & Sidhu, 2010). The assignments which have to be done by students give the insight to the teachers and students on the thinking process of each group member and give the proof while the learning process takes place. Nevertheless, there is something which needs to be noticed in doing the authentic assessment, that it is must be thorough determining the criteria on the assessment rubric, and the assessment must not create students' anxiety.

Students' Ability in Doing the Experiments and Making the Experimental Reports

Focus of the learning results on the accompaniment activities committed is students' ability in doing the experiments and making the experimental reports. The aspects observed refer to students' science process ability (Karamustafaoğlu, 2011; Wee & Leong, 2015). The learning process trains students to be a little scientist, that is, learning by doing the scientific process as committed by Wee (Wee & Leong, 2015). The results of assessment data as seen in the Table 4.

Table 4. Students' ability in doing the experiments

The observed aspects	Able	Unable
Determining tools and materials		✓
Designing the experiments		✓
Stringing up the tools	✓	

The learning is not directed to the problem solving, so that the students are not involved in determining the tools and materials as well as the experiment designing; however, the teacher has prepared the tools and materials which are needed for the experiments. The tools and materials are handed out to each group, and the teacher explains how to do the experiments. The students are not given the chance to be able to determine the tools and materials and to design the experiments. However, the students are very skilful in designing the tools and experimental materials.

Students' average ability in making the reports on each aspect can be seen in the Table 4. In assessing students' ability in making the reports, teachers should be careful. There should be the accordance between the writing assignments and the goals on the science instructions (Keys, 1998). Therefore, the writing ability on this research is referred to seven aspects related to science, namely: determining the title of the experiment, formulating the problems, making the tentative answers, writing down the experimental tools and materials, presenting the steps of experiment, explaining the results of experiment, and making the conclusion.

Table 5. Students' average ability in making the experimental reports on each aspect.

The observed aspects	Ability Category
Determining the title of the experiment	Poor
Formulating the problems	Fair
Making the tentative answers	Good
Writing down the experimental tools and materials.	Good
Presenting the steps of experiment	Good
Explaining the results of experiment	Fair
Making the a conclusion	Fair

In making the reports of experimental results, the students did not make the title of the experiment, as the teacher had determined it in advance. Therefore, that their ability category was graded poor. On problem formulation, there were four groups submitting a question, while one group submitted three questions. The tentative answers which were submitted referred to the problem formulation. However, all the groups made the tentative answers without seeing the source books as references. This was because the teacher did not provide the reading materials related to the materials which were being taught, so that the learning did not hone the students' literacy ability. Students' abilities in making the tentative answers, writing the tools and materials, and presenting the steps of experiment belong to good category. The students completely wrote down the used tools and materials and wrote down the steps of experiment by using passive sentences. Meanwhile, students' abilities in explaining the experiment and making the conclusion belong to fair category. The students only wrote down the results of observation but did not give the explanation of two phenomena of water absorption by the soil and plastisin, while the conclusion which was made did not fully direct to the submitted questions. Instead, the conclusion contained the explanation towards the results of experiment.

Students' average ability in making the reports belongs to good category with the average value 80. Figure 1 shows the average ability in making the reports of each group.

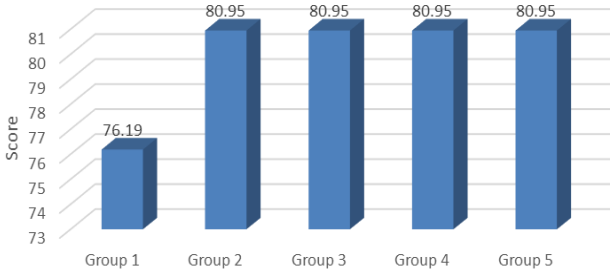

Figure 1. The average ability in making the reports of each group

Conclusion

The accompaniment program has been successfully committed at MI Al Misbah Cipadung Bandung to apply module 3 related to skills of science. The teachers carry out six observed aspects (the setting of students' seats, teachers' role as facilitator, serving the individual difference, paying attention to gender, the learning using the scientific approach, and students' works). While the aspect of assessment of authenticity and literacy are not carried out. The average of students' abilities in carrying out and writing down the experiments belongs to good category with the average value 80.

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