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THE IMPORTANCE OF TRAINING NEEDS' QUESTIONNAIRE TO ARRANGE SCIENCE TEACHER TRAINING PROGRAM

M. C. Tapilouw[1,2]*, H. Firman[1], S. Redjeki[1], D. T. Chandra[1]

[1]Universitas Pendidikan Indonesia, Indonesia
[2]Yayasan Pendidikan Salib Suci, Bandung, Indonesia

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ABSTRACT

An ideal teacher training program is by participant's need. The major aim of this study is getting information about science teacher's perception and needs in their professional's life as a science teacher in Junior High School. The main idea of teacher training is to strengthen the integrated science of Natural Science concepts and problem-based learning. Data is gathered by spreading training needs questionnaire to 20 science teachers under an education foundation in Bandung. The questionnaire consists of six main parts which are teacher's profile, teacher's training, integrated science, problem-based learning, environmental problem and lesson preparation. The result of the training needs questionnaire is used as a basic of Science Teacher Training Program's Arrangement. There are four significant findings in training needs questionnaire. The first finding, the method of training is important. Most of the participant choose discussion method with sharing. The second finding, webbed model/ thematic approach in integrated science is unfamiliar for the participant. Therefore, the thematic approach can be a potential material for teacher training program. The third finding, 70% participants find obstacles in problem-based learning. This finding shows that the need to put problem-based learning material in teacher training program. The fourth finding, 65% participant, express opinions that material about lesson preparation is critical in teacher training. Based on the explanation above, we can conclude that training program for science teacher needs to be arranged according to teacher needs. So, the training program should use discussion method with sharing. Material about the thematic approach, problem-based learning and learning preparation are very potential to put into a training program for Junior High School science teacher.

Keywords: training needs' questionnaire; science teacher; integrated science; problem-based learning

INTRODUCTION

The ideal Science teachers have always been committed to developing science teaching as ongoing professional development opportunities. Teacher training is a form of professional development as a teacher. For teachers, professional development is a form of intellectual and personal endeavor in understanding new ideas about education, trying new learning activities and develop the practice of learning and self-confidence (Girvan et al., 2016). Therefore, the implementation of science teacher training needs to be looked at the requirements and motivations of the science teacher. One effort that can be done to investigate the needs and motivation of science teachers is by distributing questionnaires the science teachers' needs. It is done to make the science teacher training well targeted and appropriate as needed. A good training program is one which by the needs of teachers in teaching science in the classroom.

According to Avalos (2010), professional development of the teacher learning, study on how to learn and transform teachers' knowledge into practice for the development of the students. The professional development is a complex pro-

***Alamat korespondensi:**
E-mail: marisatapilouw@student.upi.edu

cess that requires the cognitive and emotional involvement of teachers. The teacher training is a part of professional development efforts. For teachers, the professional development includes personal hard work of intellectual and emotional, so that the teachers feel challenged.

The experiential learning is used in the professional development of teachers to develop classroom practice (Girvan et al., 2016). It can be a means of reflecting on learning through professional development activities. The teacher training is needed to support the ongoing professional development. The training is held as a form of professional development, sometimes organized by academic consultants or professional advisors (Aspfors & Fransson, 2015). In some countries, including Indonesia, the training is organized by the government and the private sector. Therefore, the teacher training will be effective if it fits the needs of teachers as a trainee. One way to capture the needs of science teachers is by distributing questionnaires. The main objective of this study was to obtain information on the perception of science teachers and their professional needs as a junior high science teacher.

METHODS

This research is a descriptive research. The flowchart research is described in Figure 1.

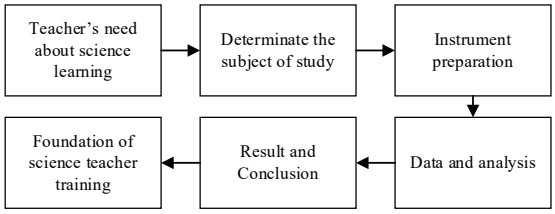

Figure 1. The Research Flowchart

The data are obtained by distributing questionnaires to 20 participants (junior high school science teachers) under an Educational Foundation in Bandung. The high schools spread across 11 cities/regencies in West Java.

The research instrument is a questionnaire of training needs. The six parts of the questionnaire are:

1. Teacher's Profile
2. Teacher Learning
3. Integrated Science
4. Problem-based learning
5. Environmental Issues
6. Learning Preparation

The main mission of the questionnaires is to identify the opinion of participants regarding a range of methods and training materials that appropriate with the needs of the participants. The questionnaires consist of 28 questions in the form of choices. The results of the questionnaires were analyzed to derive the basis for developing a training program for the junior high school science teacher.

RESULTS AND DISCUSSION

This research was conducted in December 2016. The main purpose of the study is to collect information on the needs of teachers in training. The results are expected as a cornerstone for the junior high science teacher training program.

The subjects were the junior high science teacher in an educational foundation in Bandung. The teachers were grouped into five age groups; they were under 25 years old (10%), 25-29 years (20%), 30-39 years (30%), 40-49 years (25%) and 50-59 years (15%). It could be seen that the largest age group is 30-39 years group.

Pennings et al. (2014) revealed that the quality of teachers would be able to motivate the students. The educational background is an interesting topic to discuss (Figure 2). There are five types of educational background; they are Biology Education (35%), Physical Education (30%), Chemical Education (5%), Mathematics Education (10%) and Non-Educational background (20%). The interesting thing is that there is a Mathematics teacher who taught science.

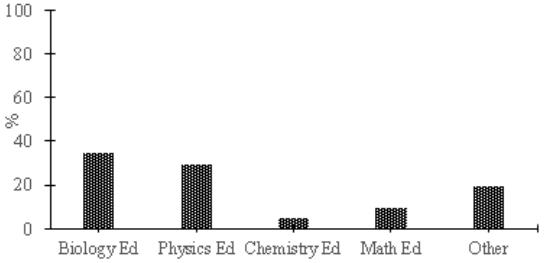

Figure 2. The Educational Backgrounds

The length of science teachers' experience in teaching is explored further through questionnaires. There are six groups of teachers' teaching years; they are the first year (10%), 2-5 years (30%), 6-10 years (15%), 11-15 years (5%), 16-20 years (15%) and >20 years (25%). The largest group is the group of 2-5 years of teaching and then followed by years of teaching of 25%. It became a potential regarding sharing experiences between teachers who have experience of >20 years with teachers who have fewer years

of teaching experience. Fernet et al. (2016) explained that teachers' teaching experience might be the greatest motivating factor in their career. The satisfaction of teaching of a teacher can also determine the orientation of a teacher's performance. It was disclosed by Skaalvik & Skaalvik (2013), namely that teacher performance can be supported by colleagues. If colleagues often hold discussions, the quality of learning will increase.

Claessen et al. (2016) in his study explained that a teacher confidence would increase along with the teaching experience. The important thing is the process of learning between teachers with lots of experience in teaching and novice teachers. The teacher educational background can determine the materials that will be taught to students (Blomeke et al., 2016). Therefore, it is needed to be held training to improve the knowledge of a science teacher. Sheldrake (2016) said that the background of teachers would increase teachers' confidence and motivation in performing his profession as a teacher.

A method of training will determine the effectiveness of a training program (Piper & Zuilkowski, 2015). The type of the desired method was discovered in the questionnaires of the science teacher training needs. Hendrickxa et al. (2016) also revealed that the training that used a social context and increased the discussions would produce an effective training. Based on Figure 3, the method of training which is expected by the respondents is an open discussion (85% of respondents strongly agree), active learning (75% of respondents strongly agree), sharing (65% of respondents agreed), group discussions (70% of respondents agreed). Therefore, these four methods will be used in the training of junior high school science teacher.

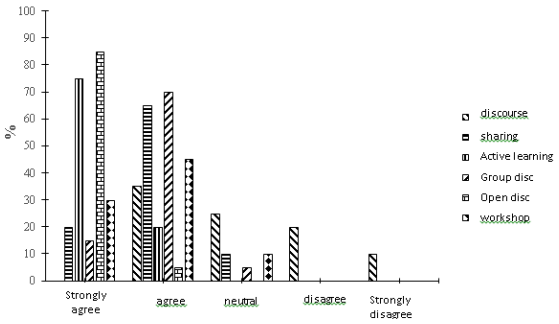

Figure 3. Teachers' opinions on the types of training methods

Hyry-Beihammera & Hascherb (2015) revealed that the teacher training would improve the performance of the educational process at school. Meanwhile, Girvan et al. (2016) revealed that the training by sharing experiences would help increase the professionalism of a teacher. Learning in the classroom is an important impact of the teacher training, Sledova et al. (2016) revealed that the communication factor in the teacher training is important. The active learning, discussion, and sharing methods can stimulate the communication between teachers and of course between teachers and students as a result of the training. The research conducted by Sukma and Ibrahim (2016) suggested that the active learning will improve the quality of learning.

Integrated science teaching in junior high school is the combination of the concept of Biology, Physics, and Chemistry. In the questionnaire, respondents were asked to select the type of integrated IPA that familiar with the integrated science teaching. Based on the analysis, 50% of respondents answered the type of webbed / networking is a model that is familiar. It can be a potential for deepening the integrated science material of the webbed type in the training of science teachers. The integrated science teaching in groups and independently allowed the search of overall concepts through learning (Parmin et al., 2015).

Science teacher must master the concepts of Biology, Physics, Chemistry in integrated science teaching. The confidence of a teacher is critical in front of science class (De Boer et al., 2016). To improve self-confidence, a science teacher must master each concept of science and science teacher training may be a useful tool. According to Park et al. (2006), a science teacher needed to develop the competence to implement the creativity of science learning through training programs. Creativity was related to one another in learning science. Through professional development programs, a science teacher can obtain refreshment and increase creativity (Park et al., 2006 & Pruski et al., 2013). According to Parmin et al. (2015), the scope of the concept of integrated science involved the concept of elements, energy, earth, universe.

The fourth section of the questionnaire is about the problem-based learning. As many as 90% of respondents knew about the problem-based learning. On the other hand, respondents find difficulties in implementing problem-based learning (70%). Figure 5 showed that the percentage of respondents who found obstacles in the implementation of problem-based learning is more than the respondents who did not. It may be potential to deepen the problem-based learning materials in the science teacher training program for the obstacles in the implementation of

problem-based learning problems can be reduced and found a solution.

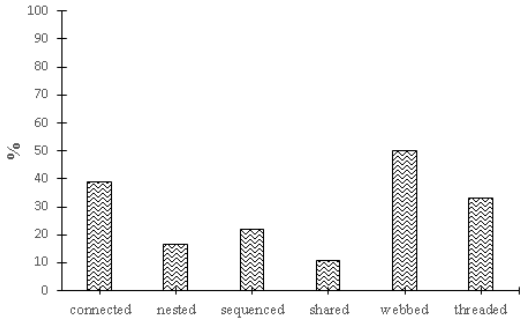

Figure 4. The familiar types of integrated science

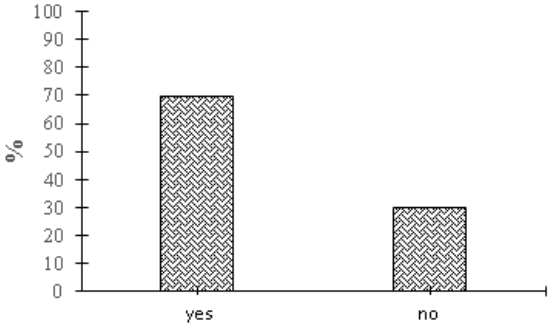

Figure 5. The obstacles in implementing the problem-based learning

According to Ermeling (2010), the professional development of teachers has been stressing on inquiry and problem-based learning. It aimed to enrich teachers with contextual issues and related to the school. The professional development should be collaborative, approach to the problem and is different from the conventional development program. A professional teacher can use problems in science learning, thus improving the ability of students to construct knowledge and its application (Winarsih & Mulya, 2012).

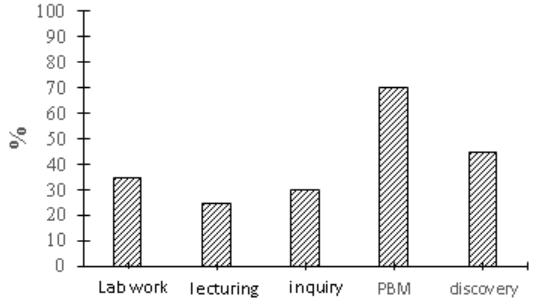

Figure 6. The learning model/approach that is difficult to be applied

Figure 6 showed that 70% of respondents found difficult to apply problem-based learning. Incorporating problem-based learning in science teacher training may be potential. Problem-based learning is effective if students are learning in a group/collaborative (Zhang & Peck, 2003). The development of problem-based learning frequency can improve collaborative learning. Nariman & Chrispeels (2015) argued that students from different cultural backgrounds learned collaboratively in problem-based learning so that students will learn to solve contextual problems. The application of models/methods / strategies of learning science can be used, one of them was the environment content such as acid rain, pollution, greenhouse (Rubini et al., 2016).

The fifth part of the questionnaire aimed to determine the extent of respondents' opinions on the preparation materials for science learning in teacher training. It is intended to meet the pedagogical aspects of a science teacher training program. As many as 65% of respondents believed that the preparation of learning materials is very important to be trained in the science teacher training program.

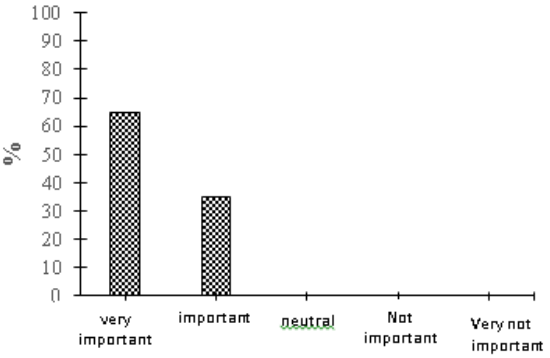

Figure 7. The opinions on the materials of learning preparation in training

The last question in the questionnaire is to find out the opinions of teachers about the importance of science teacher training. As many as 55% of respondents said science teacher training program is very important. Therefore, the science teacher training can be organized based on the needs of the respondents. There are no respondents who said that the science teacher training is not important.

Various studies on teacher training had been carried out. Aspfors & Fransson (2015) argued that teacher training is organized as professional development, sometimes carried out by the educational consultants or by the universities. Something similar happened in Scotland, the teacher training that organized by the authorities / local governments sometimes just for documen-

tation. In Japan, an induction program is compulsory, but the coach/mentor is not properly trained. Hyri-Beihammera & Hascherb (2015) also revealed that the training strategy should be in line with the education reform. It aimed to make training to be effective. The opportunities to improve the quality of teachers can be done through a professional development program (Lidqvist & Nordanger, 2016). Therefore, the development of teaching practices can be done through a professional development program (Ellis et al., 2015). Through a training program, teachers are expected to acquire knowledge and new insights about learning in school.

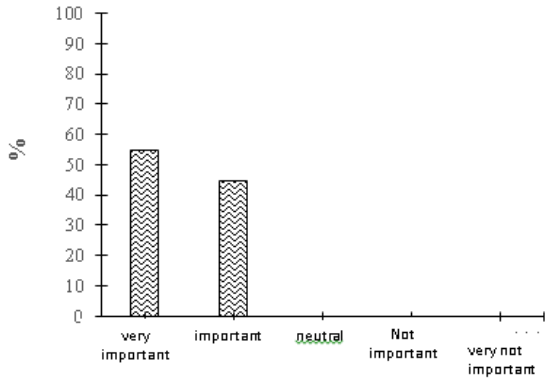

Figure 8. The opinions on science teachers training

CONCLUSIONS

From the results of the comprehensive research, there are two main conclusions in this study. First, the training needs questionnaire can be used as the basis for the establishment of a science teacher training program so that the science teacher training programs will be on target and effective.

The second conclusion is about the contents and methods of the training. Based on the analysis of training needs questionnaire, discussion, sharing and active learning methods are the suitable methods for the needs of respondents. The materials that are potential to be presented in the science teacher training program are the thematically integrated science learning, problem-based learning, and preparation of integrated science teaching.

Based on the results and discussions, it is advisable for the organizers of the science teacher training program to learn the materials and methods of training required by science teachers. It is done to obtain the best science teacher training programs and agrees with the needs of science teachers.

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