NEEDS ANALYSIS OF CIMAHI AND WEST BANDUNG DISTRICT ELEMENTARY TEACHERS IN DEVELOPING SCIENCE CURRICULUM AND TEACHING SCIENCE

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ABSTRAK

Studi penilaian kebutuhan guru SD dalam mengembangkan kurikulum ilmu dan ilmu mengajar bertujuan untuk mengidentifikasi pengetahuan sekolah dasar dan keterampilan yang dibutuhkan oleh guru dalam rangka untuk membangun rencana pelajaran dan mengajar sains di sekolah dasar. Penelitian deskriptif dan pendekatan korelasi yang digunakan untuk analisis data yang melibatkan 30 guru di Cimahi dan Kabupaten Bandung Barat. Kuesioner, lembar observasi dan dokumen yang digunakan untuk mengumpulkan data. Analisis data menunjukkan bahwa guru-guru SD di Cimahi dan Kabupaten Bandung Barat memiliki latar belakang yang cukup dalam hal derajat dan pengalaman mengajar, tetapi kurang pengalaman dalam *in-service training* untuk kedua kurikulum SD dan pengajaran sains. Selain itu studi ini menunjukkan guru-guru SD di Cimahi dan Kabupaten Bandung Barat perlu meningkatkan pengetahuan dan keterampilan dalam: pengetahuan kurikulum, isi pengetahuan, pengetahuan pedagogis, pengetahuan isi pedagogi dan mengetahui peserta didik dalam beberapa komponen. Selanjutnya, studi ini menemukan bahwa tidak ada hubungan yang signifikan antara guru pendidikan, 'pengalaman mengajar dan guru latar belakang guru keterlibatan dalam pelatihan guru atau lokakarya dengan kinerja guru dalam mengajar ilmu pengetahuan dan mengembangkan rencana pelajaran. Prioritas kebutuhan guru adalah mengembangkan pemahaman guru terhadap sifat ilmu pengetahuan sebagai proses, produk dan nilai serta perencanaan dan pelaksanaan pembelajaran sains berdasarkan keterampilan proses sains.

Kata kunci: guru SD, siswa SD, kurikulum IPA, mengajar IPA

ABSTRACT

Study of elementary school teachers' needs assessment in developing science curriculum and teaching science aims to identify elementary school knowledge and skill needed by teacher in order to construct lesson plan and to teach science in elementary school. Descriptive study and correlation approach are used for the data analysis involving 30 teachers in Cimahi and West Bandung District. Questionnaires, observation sheet and document were used to collect the data. Data analysis reveals that elementary school teachers in Cimahi and West Bandung District have sufficient background in term of degree and teaching experience, but lack experience in in-service training for both elementary curriculum and science teaching. Moreover the study reveals those elementary school teachers in Cimahi and West Bandung District need to improve knowledge and skills in: curriculum knowledge, content knowledge, pedagogical knowledge, pedagogical content knowledge and knowing of learners in some component. Further, the study found that there were no significant correlation among teacher educational background, teachers' teaching experience and teachers' involvement in teacher training or workshop with teacher performance in teaching science and developing the lesson plan. The priority of teachers' need is developing teacher understanding to nature of science as a product, process and value as well as planning and conducting science teaching based on science process skill.

Keywords: elementary students, elementary teachers, science curriculum, science teaching

INTRODUCTION

Teacher plays an important role in teaching learning process. Educational background, ability and teaching experience related to the student achievement and quality of teaching learning process (Brophy & Good, 1986; Fraser, Walberg, Welch, & Hattie, 1987; Yager, 2008, Schibeci & Hickey, 2003; The Finance Project, 2005; Dresner & Worley, 2006), therefore the improvement of teacher competence in science instruction become more important. Widodo (2006) and Moeini (2009) argue that there are a lot of

government programs have not achieved the government goal. This is due to the program did not developed based on identification to the teachers' need as a curriculum developer. In order word it can be said that the program did not meet the teachers' need.

Needs assessment or needs analysis is one important step that should be carried out before the program developed. However Moeini (2009) said that this step is mostly forgotten by program developers. In Indonesia needs assessment is rarely implemented by teacher training developers.

Many countries that has good educational program carried out the study of need assessment before the program is implemented by using various method such as observation and distribute the questionnaires. Widodo *et al.* (2006) did needs analysis by using questionnaire to the teacher of junior high school in Bandung city to identify teachers need to teach science in junior high school.

The study of needs assessment in Cimahi and West Bandung District has not been yet done before. On the other hand this study is urgently needed due to the result of pre-observation teachers in these two district have difficulty in developing science curriculum and conducting science teaching.

Based on the background that has been explained above, the study of needs assessment in Cimahi and West Bandung district is important to carried out. The problem of the research stated as follows: "What aspect do the teachers' need to improve their skill in developing curriculum and teaching science?"

METHOD

Method used in the study was descriptive to explore teacher educational background, teacher experience, teacher involvement in teacher training and teacher perception to nature of science and science teaching by using questionnaires. Descriptive method is also used to observe teacher competency in the area of content knowledge, pedagogical knowledge, pedagogical content knowledge and knowing of learners by using observation sheet.

The study involved 30 teachers from public elementary school located in Cimahi and West Bandung District. Schools were selected with using purposive sampling and teachers were selected by using convenience sampling technique.

Steps of research were drawn in a diagram 1.

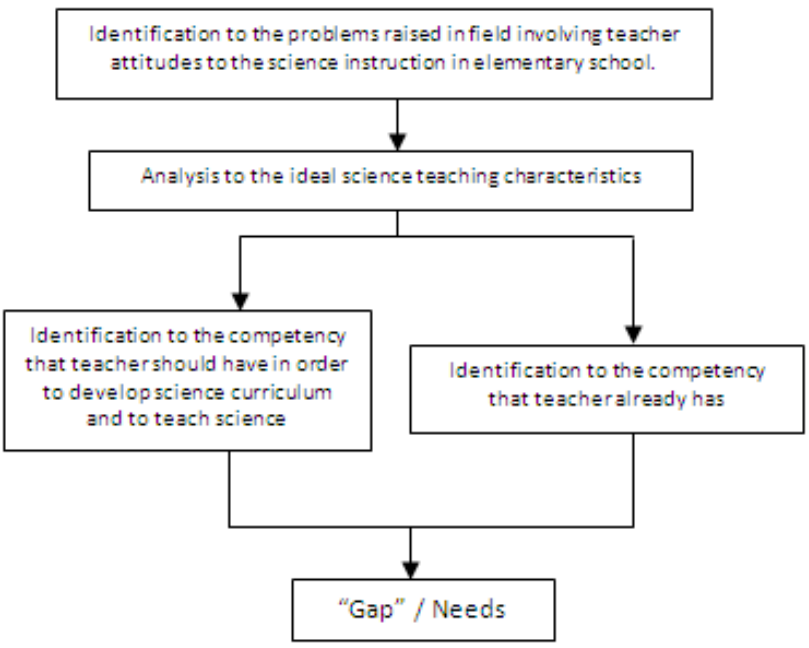

Diagram 1. Research Procedure

RESULTS AND DISCUSSION

Figure 1 shows result of teacher background.

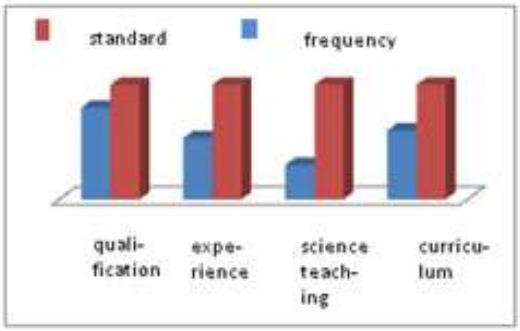

Figure 1. Teacher Background

Figure 1 shows that teacher has good background in term of qualification and teaching experience, however the gap to the involvement to the science teacher training is high. There are only few teacher (9 person or 30% teacher) involved in science teacher training.

Figure 2 shows the result of teachers' view to nature of science and science teaching.

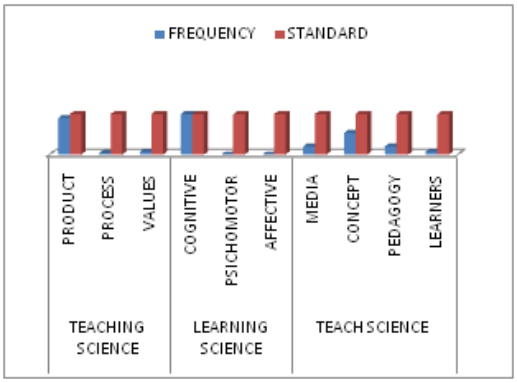

Figure 2. Diagram of "Gap" in Teachers' view to the nature of science and science teaching

Figure 2 shows that aspect which has high gap is view to the nature of science. Almost all teachers said that teaching science is delivering the concept Based on literature it was revealed that of science to the students. Aspect that most teachers considered important is science concept attainment. Teacher also viewed that teaching science is mainly focused cognitive aspect.

Result of teachers' gap in content knowledge, pedagogical knowledge, pedagogical content knowledge and knowing of learners is shown in figure 3

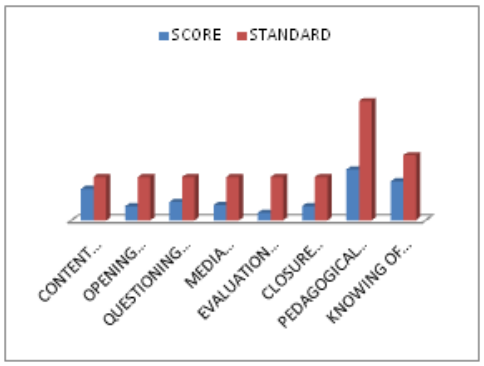

Figure 3. Gap in Teaching Science

Figure 3 shows that the highest gap is found in pedagogical content knowledge. Teacher has good ability in knowing of learners. Small gap in content knowledge did not indicate that teachers are good in science concept. This case happens because most of teachers are highly depend on text book when they carried out teaching leaning process.

Result of curriculum knowledge shows in figure 4.

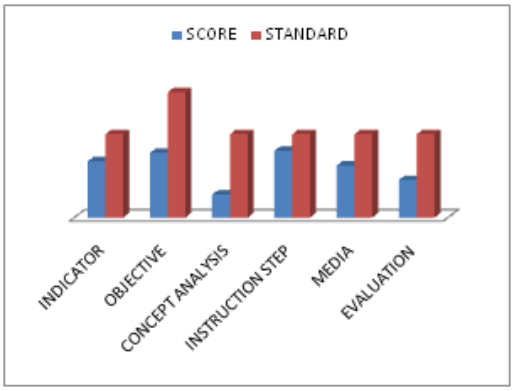

Figure 4. Gap in Curriculum Knowledge

Figure 4 shows skill that mostly teachers have is make step for science instruction and the lowest skill that teachers possess is make analysis to the science concept. The statement of indicator and objective mostly focused on cognitive aspect. Only few teachers make indicator and objective that focused on psychomotor and affective aspects.

Evaluation developed in lesson plan is mainly focused on low level thinking. The question begins with "What" is mostly written for the evaluation.

Based on the correlational statistics it was found that teacher background was not significantly correlated to the teacher performance in teaching science and developing the lesson plan. There are two possibilities that causing of low value *r* in this study. First is low variability in variables that Goodween & Lech (2006) say range restriction, restriction of range or truncated range. Second is the lack of involvement in science that due to teacher involvement in teacher training is also very low.

The study reveals that Cimahi and West Bandung District teachers have sufficient background in term of educational background and experience. However they still need improvement in term of involvement in teacher training mostly for science teaching. Arlington (2008) argues that aspect influence teacher professionalism by qualification, experience in teaching and involvement if teacher training. However, teacher view to the nature of science, that science is product, teaching science focused on cognitive aspect and the most important in learning science is science concept made the teaching of science theoretically by giving simple and basic science concept.

The gap occurs in curriculum knowledge, pedagogical knowledge, pedagogical content knowledge and knowing of learners made the teaching characterized by rote learning, teacher centered, transfer of knowledge, and did not develop psychomotor aspect and thinking skills (*minds-on* and *hands-on*) (Olga, 1987; Cano, 1990; Ball, 1991; Abell & Smith, 2003; Annetta & Dotger, 2006). High degree of teacher without supported by sufficient involvement of teacher training did not guarantee that teachers have sufficient skill in constructing lesson plan and teaching science.

Teacher training in countries that good in science education is the most important aspect in order to improve science teacher professionalism. Wei *et al.* (2009) and Kyriadikes *et al* (2009) states that the key to success in teacher professionalism development is involvement of teacher in teacher training.

Need in this study was determine based on criteria stated by Wentling (1993) and Kauffman (2000). Based on the criteria, teachers need to improve knowledge to the nature of science and skill in content knowledge as well as pedagogical content knowledge. No correlation among teacher background and teacher performance in teaching science and constructing curriculum can be used as a basis that teacher training program that will be developed doesn't not focused based on the teacher background. The program could be given for all participants.

Overall, teachers need to improve science teaching and construct science curriculum shows in table 1.

Table 1. Teachers' need based on gap priority

NO	ASPECT	TEACHERS NEED
1	*Content knowledge*	Improve knowledge to the nature of science as process and value, improve knowledge to science content.
2	*Curiculum knowledge*	Improve skill to plan the teaching by using science process skill, structuring indicators and objective which focused on psychomotor and affective, organized science concept from simple to complex, select media which appropriate with content characters, construct evaluation to higher thinking skill.
3	*Pedagogical content knowledge*	Improve skill to use science process skill, interaction between student and other student, student with teacher and student with content.
4	*Pedagogical knowledge*	Improve skill to attract student attention, motivates and explore prior knowledge, improve questioning

NO	ASPECT	TEACHERS NEED
		skill (mostly productive question) and use various level and form of evaluation in teaching, improve using media in teaching.
5	*Knowing of learners*	Improve skill to conduct joy full learning and motivates students to do the task.

Pedagogical content knowledge (PCK) in science teaching is considered the most important aspect that teacher should possess (Hudson, 2004; Hammond & LePage, 2003; Loughran *et al.*, 2006; Wong & Lai, 2008). PCK is defined as individual skill that developed personally based on teacher experience, teacher skill in understanding the content and using pedagogy. Teacher who is good in pedagogical content knowledge aspect is one who has good knowledge in understanding science concept and science pedagogy to run science teaching as it is suggested by science educator.

One of the components of PCK is science process skill. Rustaman (2002) argues, elementary school teachers should be able to conduct science teaching by using science process skill. They have to be able to promote their student to do the observation, collect data and communicate the result of their observation. With this kind of approach teacher can promotes student curiosity to the nature (Tytler *et al*, 2004). Teacher who is able to conduct sciece teaching by using science process skill can improve their skill in pedagogy as well as in knowing of learners.

Tytler *et al.* (2004) support Rustaman statement that science process skill is the most important skill elementary teacher should possess. Science process skill is a basic skill that will be used when student do inquiry. Alongside with this, Strawitz (1993) argues that science process skill promotes science learning as student has to argue and question on their inquiry to the nature. Based on these arguments it can be concluded that science process skill is the most important skill elementary student should possess.

CONCLUSION

Elementary school teacher in Cimahi and West Bandung District have sufficient background in qualification and experience, but lack of involvement in science teacher training activity based on their needs. Teacher view to the nature of science, science teaching and lack of skill in curriculum knowledge, content knowledge, pedagogical content knowledge and learning of learners in some component made the science teaching become text oriented, focused on cognitive aspect without developing student thinking skills, psychomotor aspect as well as affective aspect. Teachers need to improve pedagogical content knowledge mostly constructing lesson plan and conducting science teaching by using science process skill.

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