

Revitalization of Science Teacher Community to Accelerate Competency Achievement of Science Teacher in Urban Area

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Revitalization of Science Teacher Community to Accelerate Competency Achievement of Science Teacher in Urban Area

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Abstract. In line with the Industrial Revolution Era 4.0, teachers must also try to improve competencies by the demands of the times. The Science Teacher Community is a very relevant vehicle for building the profession of science education. Descriptive research has been carried out to observe the profile of activity in the Science Teacher Community, from excellence to limitations. The results of the observations can recommend solutions to improve the quality of Science Teacher Community activities to be able to accelerate the achievement of teacher competencies. The study was conducted by distributing open questionnaires to 38 science teachers in the urban area of the Regency. Content questions related to Science Teacher Community activities needed. The results of the study show some weaknesses in Science Teacher Community activities. Most respondents stated that there were time and distance constraints when participating in Science Teacher Community activities. Respondents were able to review their weaknesses in content (about physics), management and pedagogical practices of related content in developing 21st-century skills. They also showed weaknesses in IT usage. The recommended recommendation is to manage the practice of Science Teacher Community activities based on blended learning, focusing on efforts to overcome weaknesses in content and pedagogy content knowledge (PCK).

1. Introduction

The task of professional teachers is to facilitate students to have critical, creative, collaborative and communication thinking skills. This is impossible if the teacher himself stops learning to develop himself. The teacher can build well-being that is with his colleagues who can work together to develop themselves according to the pace of the times. Likewise teachers in urban areas who need the same attention. Teacher will foster a lifelong learning by mutual learning together, reminding each other and controlling each other. The social spirit of the teacher must always be fostered with full awareness because the essence of the teacher is the agent of the intellectual generation of the nation. Learning community aspects which include communicating; ask and respond; cooperate; be in a group; respect the opinions of friends and teachers, and responsibility has increased [1].

Teachers are expected to have technological literacy competencies to facilitate students in learning. The rise of the concept of blended learning in learning initiates the improvement of teacher competence through blended learning. Blended learning is a method that combines online and face-to-face learning.



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This method is expected to facilitate the improvement of teacher competencies in accordance with the demands of the era in the era of industrial revolution 4.0.

The teachers' knowledge of integrated science learning and literacy concepts are important assets for improving the quality of teaching and learning in the class [2]. A special strategy is that the students who will teach in the future also have good scientific literacy skills [3]. These digital literacy are also very useful for students [4]. These objectives will be achieved if the teacher has scientific literacy skills, scientific concepts, integrating science, digital science and the ability of pedagogy to teach it.

Countries throughout the world are currently embarking on an in-depth reform of their education system [5]. UNESCO suggested that teacher education implements four pillars of learning to enter the 21st century, namely learning to know, learning to do, learning to be, and learning to live together [6]. The education system developed will be carried out maximally if its human resources are also enhanced. Teacher competency is very mandatory to be developed to improve the quality of education.

Teachers are still lacking incompetence, but after attending workshops and peer teaching the ability of the Pedagogical Specific Subjects of prospective teachers has increased quite well [7]. The results of this research require continuing support in the form of professional development activities [8]. The results showed that professional development was effective for the intervention group [9]. Professional development in science education aims to support teacher learning with the ultimate goal of improving student achievement [10]. Professional learning communities need to meet regularly to overcome existing obstacles [11]. The constraints encountered in the implementation of the activities were funding issues, unstructured and discontinuous programs, the complexity of providing resource persons, absence of guidance and supervision, and lack of teachers' awareness [12]. Programs organized by the government such as training for subject teachers, Science Teacher Community, quality Teachers Working Group, improvement of the teaching profession, curriculum and workshop mentoring programs have not yet been innovated or developed [13]. Sustainable Professional Development training organized by Center for Development and Empowerment of Training and Mathematics Education Staff has not had much impact on changes in alumni behavior [14]. There is a need for innovative activities to increase teacher professionalism according to the needs of teachers in the urban area of Bogor.

The latest professional development in Finland, which is a school community activity supported to activate various professional collaborations, design innovative community activities using a design-based approach with many partners, research in the fields of natural knowledge, technology, engineering and mathematics, and induction activity programs for new teachers [15]. Collective results from 10 studies show that well-developed Professional Learning Communities (PLCs) have a positive impact on teaching practice and student achievement [16]. The lesson study implementation needs to be developed in schools to improve the quality of learning by teachers to become professional teachers [17].

This study aims to describe the Science Teacher Community activities. The inventors will be recommended for improving teacher competency. This will accelerate teacher achievement in teaching.

2. Methods

This research is quantitative research with a descriptive approach. The study was conducted to observe the profile of The Science Teacher Community activities to find out the advantages to the limitations of activities carried out by teachers in the urban area. The subjects of this study were 38 science teachers in the urban area. The instrument of this research was an open questionnaire. The data analysis technique uses a descriptive statistical analysis. The results will be used to design teacher competency development.

3. Result and Discussion

The participants showed their difficult topic of science concept in various perceptions which are presented in Table 1.

Table 1. Level of Difficulty of Science Topics

	Topic	Score
1	Light and Optical Instruments	81 (53,29%)
2	Vibrations and Waves in Daily Life	86 (56,58%)
3	Substance Pressure and Its Application in Life	102 (67,11%)
4	Human Excretion System	131 (86,18%)
5	Human Respiratory System	144 (94,74%)

Table 1 informs that according to the teacher's assessment to sort from the most difficult to the lowest material topics obtained that the topic of physics is still a lot to make teachers difficult. The material taken is class VIII material with consideration of balanced chemical, physical and biological material composition. If the teacher has difficulty mastering science concepts, it will make it difficult for students to master science concepts. The need for strengthening material concepts in the Science Teacher Community activities. Professional development provides changes in teacher communication behavior in the Czech Republic, so it will enable students to participate in learning [18]. This is in line with the ability to develop teacher concepts and teacher pedagogy to realize learning goals. The need for pedagogy knowledge is also as important as mastering science concepts.

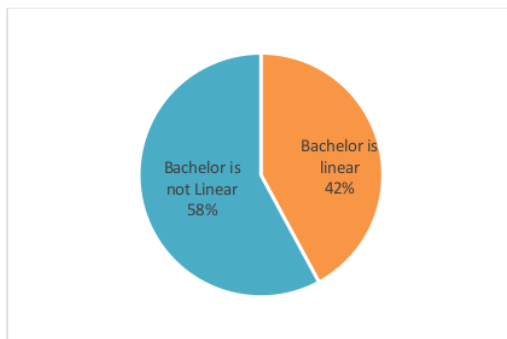


Figure 1. Background of Science Teacher Education

The educational background of the Bachelor science teacher is shown in Figure 1. The field of science teacher is said to be linear if it is by the scientific field of science education namely Physics Education, Chemistry Education, Biology Education and Science Education. The reality in the field is that there are non-linear scientific backgrounds such as physics, chemistry, biology, mathematics education, multimedia, animal husbandry, forestry, and education administration. Linear Teacher Education is 16 (42%) teachers and are not linear 22 (58%) teachers. These results indicate that the majority of teacher education backgrounds come from backgrounds that are not linear so that it requires a deepening of the subject. Besides, it turns out that Bachelor of science education is only 3 (8%) teachers, training in science integration is needed to see different undergraduate education backgrounds.

Table 2. Constraints on Conventional Education and Training

	Item	Highly Agree	Agree	Disagree	Highly Disagree
1	The distance from school to the training center is too far away	44 (28,95%)	60 (52,63%)	12 (15,79%)	1 (2,63%)

2	The teacher must leave teaching activities during the training	36 (23,68%)	33 (28,95%)	30 (39,47%)	3 (7,89%)
3	Have additional assignments besides teaching assignments at school	16 (10,53%)	63 (55,26%)	22 (28,95%)	3 (5,26%)
4	Feeling heavy leaving the family	20 (13,16%)	33 (28,95%)	32 (42,11%)	6 (15,79%)
5	Feeling tired in attending class offace-to-face class	8 (5,26%)	18 (15,79%)	46 (60,53%)	7 (18,42%)
6	Feeling lazy in listening to the lecture	8 (5,26%)	24 (21,05%)	38 (50,00%)	9 (23,68%)
7	Feeling lazy in taking notes	4 (2,63%)	18 (15,79%)	40 (52,63%)	11 (28,95%)
8	The cost of conventional training is more expensive in terms of facilities and infrastructure	16 (10,53%)	42 (36,84%)	28 (36,84%)	6 (15%)
9	The number of participants participating in the training is limited	20 (13,16%)	51 (44,74%)	22 (28,95%)	5 (13,16%)
10	Training is too instructor-centered so trainees are less active	16 (10,53%)	57 (50,00%)	28 (36,84%)	1 (2,63%)
11	Training results have less impact on teacher quality	12 (7,89%)	30 (26,32%)	38 (50,0%)	6 (15,79%)

Teachers who respond to Highly Agree (HA), namely (a) the teacher must leave teaching activities during the training. The Agree Teacher (A) (a) the distance from school to the training center is too far away; (b) have additional assignments besides teaching assignments at school; (c) feeling heavy leaving the family; (d) the cost of conventional training is more expensive in terms of facilities and infrastructure; (e) the number of participants participating in the training is limited; (f) training is too instructor-centered so trainees are less active. Teachers who Disagree (D) are (a) feeling tired in attending class offace-to-face class; (b) feeling lazy in listening to the lecture; (c) feeling lazy in taking notes; (d) training results have less impact on teacher quality.

Testing with Bivariate Pearson Correlation to determine the relationship of teacher responses in the conventional training obstacle questionnaire. The results of the correlation between HA, A, DA, and HAD are presented in table 3.

Table 3. Correlation of teacher responses to the constraints of conventional training

	HA	A	DA	HDA
HA	-	.534	-.756**	-.424
A	.534	-	-.904**	-.893**
DA	-.756**	-.904**	-	.718**
HDA	-.424	-.893**	.718**	-

** . Correlation is significant at the 0.01 level (2-tailed).

In table 3. HA has a positive correlation with A and also DA has a positive correlation with HDA at level 0.01. There is a negative correlation between HA and DA, between HA and HAD and between A and DA, between A and HDA. The findings indicate that positive responses and negative responses have the opposite correlation. This can be interpreted that the teacher has a lot of positive answers, so the response that answers is slightly negative. Based on the test, it can be said that the deception or response choice has a good function. The results of the study can be identified that there are obstacles in conventional training.

The method of training is important [19]. Table 2 shows that teachers need a cheap, flexible method of distance and time. This is suitable for applying blended learning methods in learning. As is done in

other countries, workshops on the use of cellphones for the development of teacher professionalism have a profound impact on their skills. The teacher has an instinct to teach his colleagues, so the learning objectives can be achieved [20]. This supports the existence of Science Teacher Community activities, so that strategies for implementing competency improvement programs are selected using Lesson Study [9, 17, 21-24].

4. Conclusion

This study shows that most of the backgrounds of science teacher education in urban area are not linear with the science field. Teachers need to strengthen the content of science, pedagogy and science integration. The development of teacher professionalism requires a cheap, flexible method of time and distance so that the suitable method is a blended learning method and uses the lesson study approach. Increasing teacher professionalism is not only the responsibility of the teacher itself, but all related parties also have the responsibility to advance education. The government program which instructed to activate The Science Teacher Community activities received positive responses from science teachers. The most important thing about The Science Teacher Community record activities is the existence of policies, instructions and support from related parties. This is very necessary because activities will not work without awareness. Starting from further coercive activities, The Science Teacher Community activities will become useful routines.

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