

Capacity building model development to improve the professionalism of vocational school teachers in the field of mechanical engineering expertise

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ABSTRACT

The initial study has found several fundamental problems related to the professionalism of vocational teachers. These problems are in the form of 1) unequal teachers in getting the opportunity to participate in competency improvement programs; 2) lack of awareness in conducting research; 2) lack of desire to write articles and teaching materials, and 3) low level of desire to design instructional media in the field of mechanical engineering expertise. The objectives of this study were to 1) test the efficiency and effectiveness of the capacity building model; 2) find the determinants of success in professional development, and 3) produce a model for professional development of vocational teachers in the field of mechanical engineering expertise through effective and efficient capacity building. This study uses the Research and Development method. The subjects in this study were teachers in the field of mechanical engineering expertise in Bireuen Regency, the principal, two education management experts, and two mechanical engineering vocational education experts. Data collection techniques used in this research are through observation, interviews, FGD, documentation and questionnaires. Based on the research results, it can be concluded that the teacher capacity building model can improve teacher professionalism. These activities are carried out through the formation of learning communities, virtual self-education, writing, critical development groups, peer assistance, teacher exchanges, further studies, congregational action research, conferences and seminars, and ongoing training.

INTRODUCTION

The quality of teachers will be better if stakeholders are able to prepare competent teachers, so that teachers can make changes and adapt to the advancement of science and technology. For this reason, teachers are required to work in the corridor of professionalism. Professionalism is a performance of quality work as a demand for professional behavior in carrying out their duties. The level of teacher professionalism can be identified through an assessment of teacher performance. Performance appraisal is carried out to identify effective teachers in terms of knowledge, skills and competencies (Campbell et. al., 2016). This identification is carried out to assess the accountability and professional development of teachers. According to Stronge (2006), the main aspects related to performance appraisal objectives are accountability and professional growth. Accountability refers to the competencies needed to ensure effective teacher service. The aspects of professional devel-

opment refers to the need for development and improvement of teacher professionalism in carrying out their duties. The quality of education in Aceh has been classified as low so far, because some districts still prioritize physical development without being matched by improvements in the quality of teachers and the quality of infrastructure (Kemdikbud, 2015). To improve the quality of education, it is necessary to improve the quality of teachers through professional development. The initial study of this research has found several fundamental problems related to teacher professionalism, especially teachers in the field of mechanical engineering expertise at SMK in Bireuen Regency. These problems are in the form of: 1) unequal teachers in getting the opportunity to participate in competency improvement programs; 2) lack of awareness in conducting research; 2) lack of desire to write articles and teaching materials; and 3) the low level -

of desire to design instructional media in the field of mechanical engineering expertise. So it can be ascertained that the professionalism of teachers has not yet developed.

According to Buto (2016) teacher professionalism in Aceh is still low, especially in relation to teacher training, lack of allocation of funds to increase teacher professionalism, a decrease in motivation to develop teacher professionalism competencies, and a lack of teachers' ability to master ICT. This is because the pattern of teacher coaching that has been carried out in terms of technical frequency, coaching principles, coaching approaches, coaching places still does not have a significant impact on teacher performance (Wiyono, Kusmintardjo, and Supriyanto, 2014).

Grollmann and Bauer (2008) concluded that there is no good competency profile which is supported by theory and empirical data, especially regarding the job description of vocational teachers. In addition, there has been no comprehensive audit based on empirical facts regarding the quality and effects of vocational teacher-initiated learning. Based on this, it is necessary to formulate a good teacher competency profile based on empirical data as needed in schools. as stated by Surono and Wagiran (2016) that vocational teachers, especially the competency of machining engineering expertise, must always increase the relevance of the curriculum to the needs of a machining engineering teacher in the fields.

For that we need an activity model for teachers in developing their professionalism effectively and efficiently. This model is a capacity building model that can be implemented by schools. Bashori et. al (2015) explained that teacher capacity development is a continuous effort made by teachers with schools and education stakeholders to continuously develop themselves towards professional teachers who can inspire the achievement of optimal student achievement. The specific objectives of this study are to: 1) test the efficiency and effectiveness of the capacity building model; 2) find the determinants of successful professional development, and 3) produce a model for professional development of teachers in the field of mechanical engineering through effective and efficient capacity building in Vocational High Schools (SMK) in Bireuen Regency.

The importance of this research is carried out because teachers in the field of mechanical engineering expertise and schools really need a model of professional development that can be followed by all teachers. The resulting model can save the cost of implementing education and training activities because it can be implemented in each school.

METHOD

This study uses the research and development (Research and Development) method of Borg and Gall. The Borg and

Gall development research model was carried out in 10 stages, namely: 1) research and data collection; 2) planning; 3) product draft development; 4) initial field trials; 5) revising trial results; 6) field trials; 7) refinement of products from field trials; 8) field testing; 9) final product improvement; and 10) dissemination and implementation.

This study model was developed through four stages, namely: 1) preliminary study; 2) planning; 3) developing teacher capacity building models; and 4) model validation by evaluation. The research design starts from the analysis, design, development, implementation and evaluation phases. The capacity building model allows teachers to absorb knowledge, skills, attitudes, and interact with fellow teachers in obtaining and deepening knowledge. The results obtained by the teacher can be seen through reflection activities. For that we need steps in building an effective and efficient model for increasing the capacity of teachers in the field of mechanical engineering. These steps are related to the needs of teachers in developing their professionalism, formulating objectives, selecting methods, and evaluating. Evaluation is carried out to find out whether the teacher capacity building model is appropriate or not, and to compare the costs and benefits of various training programs that have been attended by teachers in mechanical engineering in order to choose which program is the best.

This capacity building model was developed in three stages, namely: 1) a preliminary study, which identified various problems related to the development of teacher professionalism; 2) planning, namely formulating goals, selecting effective methods and exercises; 3) developing a model for increasing the capacity of teachers; and 4) validation of teacher capacity building models by measuring the process and results of training for teachers in the field of mechanical engineering expertise. The evaluation activities include measuring the level of efficiency and effectiveness of the teacher capacity building model. This activity is carried out by conducting a self-assessment by teachers in the field of mechanical engineering of the teacher capacity building model training process they have participated in. Furthermore, the Step Wise Model regression test was carried out to find the determinants of the success of the professional development of teachers in the field of mechanical engineering expertise at SMK in Bireuen Regency.

The study location was carried out in Bireuen District, Aceh Province. Subjects in this study were 25 teachers in the field of mechanical engineering expertise at Vocational High Schools in Bireuen Regency, school principals, education management experts and educational experts in mechanical engineering vocational education. Data collection techniques were carried out through observation, interviews, Focus Group Discussion (FGD),

documentation and questionnaires. In addition, they also provide training and mentoring for teachers in the field of mechanical engineering expertise in implementing the capacity building model.

RESULTS AND DISCUSSION

Results

Principals of SMK in Bireuen District formulate programs that can increase teacher capacity and develop student potential through the start of the new school year meeting. Then the principal and teachers held a Working Meeting. Work meeting is a meeting with all school management. The results of interviews with key informants stated that: Work meetings are held at the beginning of each year. Many things were discussed at the work meeting, such as those related to teacher capacity building, teacher performance appraisal, promotion, continuing professional development for teachers.

Work meetings discuss school work plans for the next year. At the work meeting also discussed material on the performance evaluation of each position and plans for teacher capacity building. The results of the work meeting serve as a guide for each Vocational High School (SMK) in carrying out its activities for the next year.

The form of planning to increase the capacity of teachers in Bireuen Vocational High School (SMK) is carried out through activities that support the development of teacher professional performance in the form of education and training. The policy direction in the professional development of teachers in mechanical engineering vocational schools is carried out in a sustainable manner. Continuous teacher training implies that training is carried out continuously. This is based on the fact that all parties involved in the educational process must continue to learn. The training model that is carried out can be in the form of a workshop/in house training that presents speakers, experts, education practitioners and colleagues.

Schools regularly schedule teacher capacity building activities in order to create teacher professional development. Schools have the belief that every school must have the correct and properly trained teachers. Consistent teacher capacity development and following a clear and measurable flow of the school's vision and mission as written in the school work plan.

Based on the results of the development of a model for increasing the capacity of SMK teachers in the field of mechanical engineering as a continuous effort by teachers with schools to continuously develop themselves towards professional teachers who can inspire the optimal achievement of students. This is based on the fact that all of Allah's creation was created for the benefit of mankind.

DISCUSSION

Regarding the development of teacher capacity building, it refers to the clear and measurable vision and mission of the school that has been determined. Especially with regard to the development of the quality of human resources which is carried out in various forms of activities, either through education, training, or through development for teachers.

The model that has been developed which is carried out at SMK in the field of mechanical engineering as an effort to improve professionalism is as follows:

1. Build a learning community in schools

The principal and teachers and stakeholders have high enthusiasm and commitment to continue learning and developing. Through a high learning and sharing culture, the school community can develop together, not only students but teachers also develop so that the school can become a learning organization.

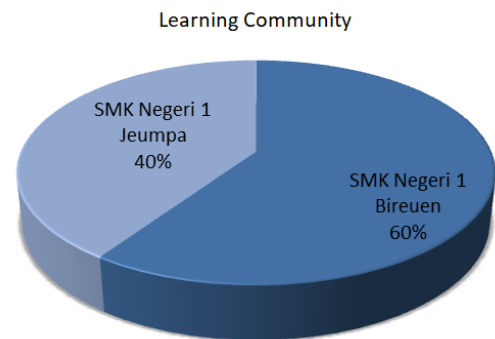


Figure 1. Learning community

2. Teachers do Virtual Self-Education

Teachers, school leaders, and support staff are all adults who have a need for continuous learning in order to keep up with the changes that society, professions, and disciplines need. The application of e-learning-based school management can support teacher capacity development through integrated learning activities with daily teacher activities. With certain systems and features, teachers are encouraged to carry out reflective activities, such as: teacher reflection, collaboration in solving problems, data-based decision making and teacher evaluation.

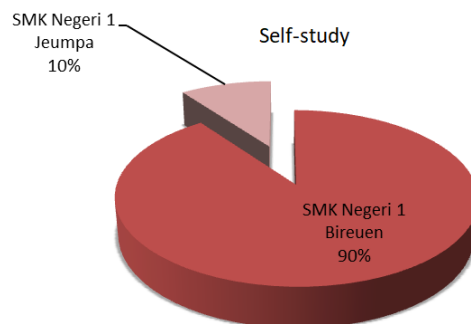


Figure 2. Virtual Self-Education

3. Teacher capacity building through writing

Schools facilitate teacher professional development by creating writing programs for teachers. As a form of strengthening and a sustainable coaching mechanism, the results of the teachers' writings were published in the daily *Serambi Indonesia*, the opinion column of *Serambi Indonesia* and the vocational education journal.

Through the development of teacher capacity in writing, teachers in SMK are trained to be more observing, find something that attracts attention, analyze phenomena, and re-express it in written form. Writing is also very helpful for teachers to think in a systematic and structured manner. An ability that is indispensable in order to be an inspiring teacher.

4. Critical development groups

Teacher capacity building can be done through empowering critical groups in schools. These small groups, usually ten or more in number, meet regularly to explore learning issues. These critical development groups are: peer-like working groups, topic-centered groups, teacher research groups, professional book discussion groups, problem discussion groups, and school-based groups.

5. Peer assistance

In the peer mentoring program, teachers at SMK share expertise, provide feedback, support and assistance with each other, with the intention of improving existing skills, learning new skills, or solving related classroom problems. Peer mentoring is also provided in the form of in-class training by peers who try to support and help other teachers apply the learning skills they have acquired through workshops.

6. Teacher exchange

The teacher exchange has provided direct experience to teachers in SMK teaching at other schools. Teacher exchanges have been carried out with vocational schools in Padang and Bandung. This inter-school teacher exchange is a capacity building model designed to help teachers understand the needs of students, experience the challenges they face in different cases and develop qualified teachers.

7. Advanced study program

The teacher capacity building model consistently provides opportunities and funds for the teachers to continue their studies to a higher level. Teacher capacity building through further studies is carried out so that teachers have the ability or self-competence which is manifested through teacher professional identity, autonomy and collaboration at the school level.

8. Advanced study program

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ability or self-competence which is manifested through teacher professional identity, autonomy and collaboration at the school level.

9. Conferences and seminars

Mechanical engineering vocational teachers in attending conferences and seminars are encouraged to make field notes. Through this activity, teachers are expected to capitalize on the results of conferences and seminars that are attended in several ways, namely: developing action plans, implementing new teaching procedures they have learned, writing journal articles, and contributing reflections to school website pages.

10. Ongoing training

Teacher training refers to policies and procedures designed to equip prospective teachers with the knowledge, attitudes, behaviors and skills they need to perform their duties effectively in the classroom, school and society at large. In this context the emphasis is on the type of training that is carried out in a systematic, structured and sustainable manner. This is important to do because it is to ensure the continuous development of teacher competence, according to their respective learning needs. After prospective teachers have been accepted to become teachers, they are provided with continuous training. This means that the training is given from being a prospective teacher to becoming a teacher at SMK. The training for prospective teachers is in the form of: initial training before the prospective teachers enter the classroom as teachers who have full responsibility, and training and support during the teacher's first few years of teaching.

CONCLUSIONS

Based on the research results, it can be concluded that the teacher capacity building model can improve teacher professionalism. These activities are carried out through the formation of learning communities, virtual self-education, writing, critical development groups, peer assistance, teacher exchanges, further studies, congregational action research, conferences and seminars, and ongoing training. So that there is a good coordination between the parties involved, namely teachers, colleagues, principals and supervisors can work together and support each other so that teacher capacity building activities can increase the professionalism of teachers in the field of engineering.

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Conflict of Interest

The authors declare that they have no competing interests.

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