

THE POST-CERTIFICATION PERFORMANCE OF MATHEMATICS TEACHERS

Zuli Nuraeni

Muhammadiyah Institute of Teacher and Educational Science of Kuningan
Mathematics Education Department, West Jawa, Indonesia
zulinuraeni.wsb@gmail.com

Heri Retnawati

Yogyakarta State University, Mathematics & Natural Science Faculty,
Mathematics Education Department, Yogyakarta, Indonesia
heri_retnawati@uny.ac.id

Abstract: This study aims to describe the post-certification performance of mathematics teachers of vocational high schools in Wonosobo Regency Central Java province of Indonesia. This was a descriptive study with qualitative and quantitative approach (mixed method). The subjects were all mathematics teachers of vocational high schools in Wonosobo Regency who have passed the teachers certification. The instrument consisted of teachers' self-assessment questionnaires, observation sheets, interview guide and sheets of studies document. Data analysis techniques used with categorized performance trends into 5 groups: *Very Good*, *Good*, *Fair*, *Poor*, and *Very Poor*. The results of research are the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson is in the *good* category; the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation is in the *good* category; the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning assessment is in the *very good* category; the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in the professional development is in the *very poor* category and needs to be improved.

Keywords: performance of teacher, certification, lesson plan, learning implementation, assessment, professional development

INTRODUCTION

Indonesia nowadays is preparing for the ASEAN Economic Community (AEC) of 2015. The impact of this AEC is a free market in the field of capital, the goods and services, and the labor. The purpose of the establishment of the ASEAN Economic Community (AEC) is to enhance economic stability in the ASEAN region, and it is expected to overcome the problems in the economics between ASEAN countries. For all of that, Indonesia must have superior quality of human resources, because superior human resources will be able to bring the nation to face and win the competition in this AEC era.

The quality of human resources is determined by the quality of education. According to Berdo (2010), "... that the education factor plays in the formation and development of human resources." Education has an important role in the formation and development of human resources. Sihombing & Sihombing (2011) stated that the quality of education is largely determined by the quality of the teachers as het actor. Therefore, the teachers are required to be a professional and have high performance in order to improve the quality of the young generation that Indonesia can be an intelligent nation and able to face the future challenges.

The research results from *Pearson Learning Curve* in 2013 on quality of Indonesia's education mapping showed that Indonesia is in position 40 of the 40 countries (Baswedan, 2014). In addition, the results of teachers competency test in 2012 on 460,000 teachers show that the average value of the competency test for teachers is only 44.5 of the standard value of the expected average, which is 70 (Baswedan, 2014). There are some aspects that trigger slow quality of education in Indonesia, such as slow students' achievement, poor quality of infrastructure, poor quality of the teachers, low welfare, low educational equity opportunities, lack of education relevanciesto the needs, and the cost of education is very expensive (Setyaji, 2011). Furthermore, Utami (2015, p.473) mentions the other problems of education in Indonesia are high number of unqualified teachers, the uneven teacher distribution and over supply contract teachers.

At the beginning of the reform era, two laws has been established and became the legal basis for the implementation of education, which are: Law of the Republic of Indonesia Number 20 of 2003 about *National*

Education System, and the Law of the Republic of Indonesia Number 14 of 2005 about *Teachers and Lecturers*. The laws are intended to facilitate improved management of the National Education System. In this view, the focus of national education reform requires changes in education policies and strategies, especially related to the management and development of teachers.

Teachers' development program is implemented through the teachers' certification program. Jalal, et al. (2009, p.1) state that certification has been adopted as a requirement for both in-service teachers, and is designed to establish a quality benchmark for all teachers, including government and non-government teachers. It will provide a public guarantee of the standards of training and competency required from teachers. Meanwhile, Parkay & Stanford (2010) explain that a teaching certificate is actually a license to teach. By having a teaching certificate, it is an evidence that someone is already meet the standards of eligibility to carry out his/her duties as a teacher. This means that teachers certification is one of the efforts made by the government that teachers in all parts of Indonesia can work professionally. However, the recent teacher certification program in Indonesia to raise teachers' quality is not yet seen, although it can raise teachers' welfare (Fahmi, Maulana, & Joseph, 2011). The analysis results of Wahyudi, Supranoto & Suji research (2012) shown that they were sharp disparities in percentage of certified teacher in each school category.

Expectation of the enactment of the teacher certification program is to obtain educators who have qualified, to increase the qualifications of educators and education, to level up educational management processes of teaching and learning, and to improve the quality of human resources of the nation (Dantes, 2009). Teachers who have been certified educator is expected to increase various competencies that can deliver the performance of teachers in a real professional function. If every teacher are embedded soul and spirit to understand the certification as a means to an end, the teacher will make various efforts to improve performance, dedication, quality of work that is able to prove that the educator function is a professional function (Siswanta, 2012).

To follow the teacher certification, the teachers must have competencies. Muzenda (2013) says that competence is regarded as a multidimensional construct teaching which encompasses numerous interconnected elements towards transformation of knowledge to learners. Meanwhile, Bhargava & Pathy (2011) say that competencies are specific and demonstrable characteristics or attributes inevitable for teaching professionals to create a convincing and learner friendly environment. Teachers competencies as knowledge and skills of teachers required for effective and quality education at higher education level. These include a set of teaching skills that a teacher at the tertiary level needs to possess, in order to be an effective teacher and these are pedagogical skills, management and assessment skills, and research skills (Aziz & Akhtar, 2014).

From several statements above, it can be concluded that competence is the main component of professional standards in addition to the code of ethics as professional conduct regulations set out in the specific procedures and surveillance systems. The competencies are: pedagogical competence, personal competence, social competence and professional competence. According to Ugbel & Agim (2009), teacher is expected to possess certain competence both professional and personal. Professional competences are both academic and pedagogical. Academic competencies are the teachers' knowledge on his subject.

Pedagogical competency is the art of teaching the subject, observing such principles as teaching from known to unknown, concrete to abstract, and from simple to complex. Relation to the professional competence of teachers is the teachers' ability to master of the material and the teachers' ability in applying learning methods/approaches. Professional competency refers to substantial knowledge and skills gained following professional education or training and professionals who undertake a specific paid job or self-employment duties (Guu, Lin, & Lee, 2014). Pedagogical competence is the ability with regard to student understanding and learning that educate managers and dialogue. This is consistent with the Myrberg & Ros statement (2013) that the teacher competence is likely to be a mix of subject-specific knowledge and pedagogical skills where a crucial skill is the ability to use different teaching approaches adapted to individuals and groups.

Personal competence is the ability of a stable personality, noble, wise and authoritative and become role models for others. Social competence is the ability of teachers to communicate and interact effectively and efficiently with other people both around the school and around the environment (Jalal, et al., 2009). All of them are integrated in teachers' performance. Teachers' performance is closely related to the competence of teachers. To have a good performance, teachers should be supported with good competence. Without having good competence, the teachers will not likely be able to have a good performance. Performance is a key element in the competency test which refers to a performance or a set of tasks. According to Marsh (1996), performance is another major element in competence-testing that typically refers to the performance of a role or set of tasks. It

means teachers' performance is the result of the work that can be achieved by teachers in educational institution in accordance with the duties and responsibilities in achieving educational goals.

A good teacher should possess a wide range of qualifications, which could be schematically classified as personality traits, attitudes and beliefs and pedagogical skills and knowledge (Liakopoulou, 2011). The same idea of Joy, Hamilton, & Ekeke (2013) say that a characteristic of a competent teacher is that the teacher encourages students to reflect on social reality and empowers them to transform the existing conditions that shape their lives. Moreover, a competent teacher is one who engages student in dialogue and manages through dialogue to achieve genuine learning because when student and teachers are engaged in shared critical dialogue, they mutually create and construct knowledge instead of passively transmitting it, since they can share their experiences, reflect upon them and finally make critical evaluation regarding the way they themselves have obtained that knowledge and those experiences.

Teacher experience has a significant effect on pupil performance in primary schools and at upper secondary level. Experienced teachers have greater of experience to be able to contribute insight and ideas to the course of teaching and learning. They are open to correction and are less dictatorial in classroom (Kosgei, et al., 2013). This supports the statement of Sato et al. (2008). They state that standardsetting performance on education assessment can be used to change the practice on how to improve the quality of learning.

Khaeruniah gives a statement (2013) that a teacher's competence is the ability of a teacher to realize the planned educational aim. Performance indicators are referred to the indirect performance assessment that is seen as performance indication. Therefore the shape tends to be qualitative or can't be calculated such as increased, accuracy, velocity, level, effectiveness, and others (Moeheriono, 2012). To determine whether a teacher's performance is quite optimal or not can be seen from various indicators. With a performance assessment, it will help teachers in identifying a better job so that the teachers will run the learning process as effective as possible for students' progress and education (Barnawi & Arifin, 2012).

Schacter (2000) splits indicator of teachers' performance in three parts, which are: (1) skills, knowledge, and responsibility of the teacher; (2) students' achievement at grade level; and (3) achievement in school. Meanwhile, Usman (2006) suggests that they are three indicators of the teachers' performance. First, the ability to plan a learning program that consists of: (1) mastering the outlines of the organization of education; (2) adjusting the analysis of the subject matter; (3) collating semester program; and (4) developing a learning program. Second, the ability to carry out the teaching and learning activities, are: (1) pre-instructional stage; (2) the instructional stage; and (3) evaluation stage and its implementation. Third, the ability to evaluate: (1) normative evaluation; (2) formative evaluation; (3) report the results of the evaluation, and (4) the implementation of the improvement and enrichment programs. Ditjen PMPTK, Ministry of National Education (2008) suggests that indicators on teachers' performance assessment should be conducted on three classroom activities, which are planning, execution and assessment.

It can be concluded that teachers' performance is the result that can be achieved by teachers in carrying out the duties which they are responsible is based on skills, experience, and sincerity to work within a certain time frame. Teachers' performance did not materialize for granted, but it is influenced by certain factors, both internal factors and external factors. Factors that affect performance include mental attitude (work motivation, work ethic), educations, skills, leadership management, income levels, salaries and health, social security, labor climate, infrastructure, technology and outstanding opportunities (Asf & Mustafa, 2013).

The performance assessment helps the teachers to know their job better (Barnawi & Arifin, 2012). Thus, teachers will carry out learning as effective as possible for student progress and education. In addition, teachers' performance assessment can provide valuable input and help them to achieve the needs of teachers on professional development and career, for example through training. Assessment is not meant to criticize and find fault, but to encourage teachers to develop into a more professional that will improve the quality of students.

Teachers' performance indicators are used as a basis for assessing the quality of teachers' performance, which is developed and modified from TR Mithcell's theory in Ditjen PMPTK, Ministry of National Education (2008), that a person's performance is a combination of motivation and ability. According to Robins (Ismail, 2010), performance is a function of the ability, motivation and chance (opportunity). Therefore, it can be assumed that the motivation and ability or competence are the elements that create the teachers' performance. It is similar with Keith Davis' opinion (in Wardana, 2013) that the factors that affect performance achievement are the capability and motivation factors, motivational factors defined a leadership attitude and employees of the employment situation in the environmental organization. Thus, the teachers' performance in performing their duties may be

affected by factors of competence/ability and motivation. Teachers' performance is a combination of ability or competence plus the teachers' motivation to perform the task and teachers' motivation to develop.

In this study, the teachers' performance are generally intended as a performance in the implementation of a teaching assignment with the four indicators, which are: (1) performance on planning the lesson; (2) performance in executing the learning program; (3) performance in learning assessment, and (4) the performance in professional development.

Government efforts to improve the quality of human resources have been carried out. Not only by improving the quality of teachers, but also improving the quality of students' graduates. Learners are equipped with the competence and expertise to be ready to work so that he/she can survive for life. Currently, vocational education becomes a priority of government, to create vocational education graduates who are ready to work outside and have the skills to work. Vocational education is built and developed with the needs and situation of the workforce to meet the growing market demands (Sriadi, 2011).

National development desperately demands of skilled workers, as the quality and quantity of vocational education is increasingly enhanced. One of government's efforts is to increase the ratio of the number of vocational rather than the number of high school teachers. The target in 2009, the ratio between vocational high schools (SMK) and senior high schools (SMA) is 50:50, and in 2014 is targeted to 67:33 (Sriadi, 2011). An increase in the ratio is due to vocational high schools graduates is considered to be more prepared to work through skills that can be applied, with expectation that vocational high schools graduates can reduce growing educated unemployment in Indonesia.

The reality is not as expected, which can be seen that 8.96 million people were unemployed in 2009. Approximately, 17.26% were graduated from SMK, 14.31% were graduated from SMA, 12.59% were from university graduates, and 1.21% were from diploma graduates (Sriadi, 2011). Based on these data, vocational graduates are most widely unemployed. This is because an increasing number of vocational high schools were not balanced with the quality and quantity of teachers as a major factor in learning. In 2009, Indonesia experienced a shortage of vocational teachers, which were about 34,000 people. As a result, the quality of vocational high school graduates was decreased, while the unemployment of graduates of vocational was increased (Sriadi, 2011).

Vocational graduates must have flexible required skills that allow them to enter variety of job. However, since the industrial world also requires proficiency in language, mathematics, science, communication, and social sciences, then these lessons should be integrated into vocational skills standard (Ministry of National Education, 2002). In vocational programs, science and mathematics material are need to be included through contextual learning model and should be relevant to the skills that they learn (Ministry of National Education, 2002, p.300). Mathematics for vocational levels including adaptive subjects which aims to be a support of professional expertise and self-development skills in order to follow the growth in science and technology (Ministry of National Education, 2002).

Meanwhile, the mathematics is still a frightening subject for some students of vocational high schools. The evidence can be seen from the acquisition of scores of mathematics national exam is lower than the scores of the other test subjects. Most of mathematics teachers at vocational high schools have not been able to package the element of mathematics well, such as the context, flexibility and mathematics as a fun subject, so that vocational students' achievement can't be maximized. Research results from Shadiq (2006) identifies the difficulties encountered some mathematics teachers of vocational high schools at mathematics learning such as teachers were tough on: (1) understanding and applying the philosophy of constructivism in contextual learning; (2) encouraging students to formulate their own problems in conducting discovery (inquiry); (3) encouraging and assisting students to make connections between the knowledge that have been had by the newly learned knowledge; (4) designing issues categorized as a problem; (5) getting a reference books that are relevant; (6) familiarizing the students to express ideas; and (7) the teachers were difficult in guiding students to formulate a conjecture of existing data.

In Wonosobo regency Central Java Indonesia there are 24 vocational high schools which consist of 8 state vocational high schools and 16 private vocational high schools with a total of vocational students in Wonosobo regency around 8,500 people. The number of vocational high schools in Wonosobo is growing rapidly, almost in every district in Wonosobo has vocational high schools with a variety of majors. This led to the need of more vocational teachers. To find out information about the teachers' performance that already have a mathematics teachers of vocational high schools certified with all the difficulties and problems faced by teachers in Wonosobo, it is necessary to do a research on vocational mathematics teachers' performance. This study aimed to describe the post-certification performance of mathematics teachers of vocational high schools in Wonosobo

regency in the lesson planning, the implementation of learning, the learning assessment and in the teachers' professional development.

METHOD

This study is a descriptive research with quantitative approach. Research was conducted at several vocational high schools in Wonosobo regency. There are 8 schools that has a certified mathematics teachers educators, they are: SMKN 1 Wonosobo, SMKN 2 Wonosobo, SMKN 1 Sapuran, SMKN 1 Sukoharjo, SMK Muhammadiyah 1 Wonosobo, SMK Wiratama 45.1 Wonosobo, SMK Purnama, and SMK Gema Nusantara. The subjects in this study are all of mathematics teachers of vocational high schools in Wonosobo regency, Indonesia which have passed the certification as many as 14 people.

The instrument to collect the data consisted of teachers' self-assessment questionnaires, observation sheets, interview guide and sheets of studies document. Teacher self-assessment questionnaire was used to uncover performance of mathematics teachers of vocational high schools on planning the lesson, the learning implementation, the assessment learning and the professional development after certification. Its scale inventory questionnaire was shaped by using Likert scale model of a modified form of multiple choices. Multiple choices were consisted of 4 answer choices, where each answer has been determined score.

Observation sheets were used to determine the performance of math teachers on the learning implementation. Observation sheets were filled by researcher and independent institution when the teachers were implemented the learning in the classroom. Interview guide was used to get the information of the performance of math teachers on the learning assessment, especially in the aspects of the implementing and reporting of assessment. Sheets of document study were used to measure performance of math teachers on planning the lesson and in the professional development.

The instruments validity in this study was proved by content validity and construct validity. Proving the validity of the content can be through expert judgment and then proved by Aiken's validity (Retnawati, 2014). it was continued through obtained the proof validity of the construct using analysis factor. Reliability of self-assessment questionnaire of the mathematics teachers of vocational high schools was implemented through Alpha Cronbach. Having obtained the coefficient of reliability of the instrument, then researcher calculated the Standard Error Measurement (SEM), to understand the size of the measurement error for assessment procedures of each instrument. Estimate of reliability and SEM of instrument can be seen in Table 1.

Tabel 1. Estimate of Reliability Instrument

| Instrument | | Reliability | SEM |
|---|----------------------------|-------------|-------|
| Teacher's self-assessment questionnaire | Planning the lesson | 0.904 | 2.087 |
| | Implementation of learning | 0.891 | 2.062 |
| | Assessment of learning | 0.868 | 2.025 |
| | Professional Development | 0.809 | 4.621 |

Data analysis techniques used in this research is descriptive quantitative. The effectiveness of performance of mathematics teachers of vocational high schools was determined based on the level of propensity to perform categorization of variables. Trend level of the post-certification performance of mathematics teachers of vocational high schools was divided into 5 categories as shown in Table 2.

Table 2. Categories of The Post-Certification Performance of Mathematics teachers of Vocational High Schools

| Formulas | Category |
|--|-----------|
| $X > \bar{X}_i + 1,8 \times sb_i$ | Very Good |
| $+ 0,6 \times sb_i < X \leq \bar{X}_i + 1,8 \times sb_i$ | Good |
| $- 0,6 \times sb_i < X \leq \bar{X}_i + 0,6 \times sb_i$ | Fair |
| $- 1,8 \times sb_i < X \leq \bar{X}_i - 0,6 \times sb_i$ | Poor |
| $X \leq \bar{X}_i - 1,8 \times sb_i$ | Very Poor |

Specification:

- X : score of respondents or actual score
- \bar{X}_i : a mean score of ideal
- SBi : ideal standard deviation

FINDINGS

Performance of Mathematics Teachers of Vocational High Schools on planningthe Lesson

Based on the results from self-assessment questionnaire of mathematics teachers of vocational high schools in Wonosobo regency (after certification on planning the lesson), the actual mean score is 24 (good category), the ideal mean score is 20, the ideal standard deviation is 4, the ideal maximum score is 32, and the ideal minimum score is 8. Meanwhile, the percentage of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson according to the teachers' self-assessment were 14%, which were in the very good category, 50% were in the good category, 14% were in the fair category, and 14% were in the poor category.

Based on the results of a study document, the actual mean score of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson according to the researcher was 29.43 (very good category), while according to the assessment from independent institution was 28.14 (very good category). From the results of document study,the lesson planning data obtained according to researcher and an independent institution possessed actual mean score of 28.79 (very good category), the ideal mean score 18, the ideal standard deviation 4, the ideal maximum score 30, and the ideal minimum score was 6. The percentage of post-certification performance of mathematics teachers on planning the lesson documents was also obtained. Based on the results of a study by independent researcherand institutes,it has 100%, which were in the very good category.

Thus, it can be said that the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regencyon planning the lesson, was included the good category. In more detail, its percentage of performance assessment of mathematics teachers in vocational high schools at Wonosobo regency can be seen from Table 3.

Table 3. Percentage of Performance Assessment of Mathematics Teachers of Vocational High Schools based Teachers' Self-Assesment

| Category | Frequency | Percentage |
|-----------|-----------|------------|
| Very Poor | 0 | 0% |
| Poor | 2 | 14% |
| Fair | 2 | 14% |
| Good | 7 | 50% |
| Very good | 3 | 22% |
| Total | 14 | 100% |

The majority of mathematics teachers of vocational high schools in Wonosobo regency were used the syllabus that have been provided by the government and they only modified the identity of syllabus and add learning resources if needed. Ratings for this syllabus were objective because the mean value is almost the same. Syllabus are slightly different interms that the syllabus were prepared by the mathematics teachers of vocational high schools based on religion. There were also syllabus that were adapted to the school curriculum that want to build the character and morals of religious students.

Likewise for lesson plan, which is possessed by a mathematics teachers of the vocational high schools in Wonosobo regency are also almost similar, because the majority of teachers used lesson plans that were compiled together in Forum of Teachers Subject. Some teachers also used lesson plan they downloaded from the internet or used the lesson plan made last year. Even so, there were some teachers who still made up the lesson plan by themselves in order to adapt to the characteristics of the students. However, there were teachers who develop the lesson plans by themselves. That teacher wanted to be able to master the learning well, more than just read and practiced. However, they designedit themselves and practice it in the classroom. Therefore,the learning in the classroom will be more effective because of his/her lesson plan have been adapted to the characteristics of the students.

The post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson is in the good category, but every teacher have to be in particular to keep practicing develop the ability to create an attractive and better learning device and adapted it to the characteristics and the needs of their students. The things that should be improved teachers on planning the lesson, especially regardedthe use of teaching methods are to involve more varied and more active role of the student.Thus, that learning is not monotonous.

Performance of Mathematics Teachers of Vocational High Schools on the learning Implementation

Based on the results from self-assessment questionnaire of vocational high schools mathematics teachers in Wonosobo regency after certification on the learning implementation, the actual mean score was 29.93 (very good category), the ideal mean score was 22.5, the ideal standard deviation was 4.5, the ideal maximum score was 36 , and the ideal minimum score was 9. Its percentage was 50% that were in the very good category, 36% were in the good category, and 14% were in the fair category.

Based on observations, the actual mean score of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation according to the researcher was 37.07 (good category), while in the assessment of an independent institution was 35.88 (good category). Therefore, the results observation the learning implementation by researcher and independent institution, the actual mean score 36.48 (good category), the ideal mean score 30, the ideal standard deviation 6,671, the ideal maximum score 50, and the ideal minimum score 10. The percentage post-certification performance mathematics teachers on the learning implementation based on the observation by researcher and independent institution as much as 21% were in the very good category, 50% were in the good category, 21% were in the fair category good and 14% were in the poor category.

It can be concluded that the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation is in the good category. In more detail, the results of performance appraisal of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation based on observation by researcher and independent institution are shown in Table 4 below.

Table 4. Mathematics Teachers Performance Assessment of Vocational High Schools based Observation of The Learning Implementation

| No | Aspect of the rated | Mean | Category |
|-------------|----------------------------|-------------|-------------|
| 1 | Opening the lesson | 3,52 | Good |
| 2 | Questioning Skills | 4,85 | Very Good |
| 3 | Reinforcement Skills | 3,38 | Fair |
| 4 | Variation Skills | 4,69 | Very Good |
| 5 | Explaining Skills | 3,73 | Good |
| 6 | Managing class Skills | 4,29 | Very Good |
| 7 | Guiding group discussion | 2,15 | Poor |
| 8 | Individual learning Skills | 3,29 | Fair |
| 9 | Closure Skills | 3,40 | Good |
| 10 | Follow up | 3,15 | Fair |
| Mean | | 3,65 | Good |

Observation sheets filled by researcher and independent institution when they were implemented the learning in the classroom revealed the fact that most of teachers still used the conventional methods to teach. Teachers did lecture and dictated the material to the students and then gave examples and exercises, so students just sat down and listened, took notes and did what they're told the teacher. The learning implementation was still dominated by the role of the teachers. The teaching methods were used have not varied although the lesson plans has been planned using varied methods. It is certainly not accord with lesson plans that had been developed by teachers beforehand. In the lesson plan, teachers plan learning by using various methods but in his/her execution, the method used mostly just a lecture. Lesson plan which has made such a mature, often not applied in the classroom. In this case the lesson plan only as a formality to complete the teacher's administration. Although the quality lesson plan that a teacher is considered very good, but the application in the classroom not maximized.

The post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation have been in good category, but teachers also need to keep improving their abilities to carry out the learning. Teachers must add insight on how to implement the effective teaching in the classroom, for example by reading books, attending seminars/workshops or following the lesson study. The things should be improved, especially teacher in implementing the learning skills of guiding group discussions and individual learning skills. Because of the guiding group discussions with individual learning can improve interpersonal relationships between teachers and students, teachers can understand the ability of pupils better and students also feel more involved on planning the lesson activities (Usman, 2006).

Teachers whose performance were not maximized on the learning implementation can learn from teachers whose performance had been better, though discussion, question and answer session, or the lesson study programs. Such way teachers can see the learning directly implemented by the teacher. Skemp (1971, P.67) says "*... the best teachers are those who are still active learners.*" A good teacher is a teacher who never stop learning.

Performance of Mathematics Teachers of Vocational High Schools on the learningAssessment

Based on the results from self-assessment questionnaire of mathematics teachers, the actual mean score was 31.29 (very good category), the ideal mean score was 22.5, the ideal standard deviation was 4.5, the ideal maximum score is 36, and the ideal minimum score was 9. Then,64% were in the very good category, and 29% were in the good category, and 7% were in the fair category.

Based on the results of a study document, the actual mean score of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning assessment according to researcher was 4 (good category), while according to the appraisal from independent institution was 4.29 (very good category). The study documents of the learning assessment by researcher and an independent institution, the actual mean score was 4.14 (good category). The result of interview get the actual mean score 4.46 (very good category). Overall,the actual mean score was 13.07 (very good category), the mean ideal score was 9, the ideal standard deviation was 2, the ideal maximum score was 15, and the ideal minimum score was 3. In percent, 64% were in the very good category, and 36 % were in the good category.

It can be concluded that that the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning assessment can be categorized in the very good category. In more detail, the results of performance assessmentof mathematics teachers of vocational high schools in Wonosobo regency on the learning assessment based on the study of documents and interview are shown in Table 5 below.

Table 5. Performance Assessment of Mathematics Teachers of Vocational High Schools based Study Documents and Interview of Learning Assessment

| No | Aspect of the rated | Mean | Category |
|-------|--------------------------|-------|-----------|
| 1 | Planning the assessment | 4,14 | Good |
| 2 | Executing the assessment | 5 | Very Good |
| 3 | Reporting the assessment | 3,92 | Good |
| Total | | 13,07 | Very Good |

On the learning assessment, the form of daily test instrument is mostly essay. Some teachers used assessment instruments that have been made years earlier or took questions from textbooks. But there were any teachers who prepared the assessment instruments by themselves. The quality of test item that made by the teachers was already good because customized with the assessment indicators. The instrument replicated the midterm or semester final test used instruments made collaboratively with other mathematics teachers when MGMP.

Teachers examine the results of the students' answer with reference to the scoring guidelines and the teachers usually give a small note in the students' worksheet. Therefore, students can learn from his mistakes and give back the students' worksheets after it is corrected. Then, the results of assessment are analyzed to do instructional improvement programs and implement remedial programs for students whose value is still lacking. Remedial teaching isan improvement on the learning process if the value of student learning outcomes is still below or not meets the *cut score* or Minimum Completeness Criteria. However, most of teachers implement remedial during the process of assessment. Remedial that is done by carrying out re-examination, could be taken once or twice until the value of the students are able to reach the cut score or teacher can give assignments.

The post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning assessment is in the very good category. However, every teachers in particular must practice to develop the ability, in order to make better assessment instruments. The things that should be improved in the assessment of teachers are in the aspects of planning a study that assessment, especially in the preparation of assessment instruments. It is because the validity of the information the learning assessment are depends on the care that goes into the planning and preparation of tests and assessment (Miller, Linn, & Grounlund, 2009).

Performance of Mathematics Teachers of Vocational High Schools in the Professional Development

Based on the results from self-assessment questionnaire of mathematics teachers of vocational high schools in Wonosobo regency after certification in the professional development, the actual mean score was 12.57 (very poor category), the mean ideal score was 32.5, the ideal standard deviation was 10.83, the ideal maximum score

was 65, and the ideal minimum score 0. The percentage were 50% were in the poor category, 50% were in very poor category.

In general, the study documents about the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in the professional development, showed the actual mean score was 14.14 (very poor category), the ideal mean score was 15, the ideal standard deviation was 2, the ideal maximum score was 15, the ideal minimum score was 3. The percentage of the post-certification performance of mathematics teachers in professional development based on the study document were 100%, that can be categorized in the very poor category. Thus, it can be said that the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in professional development were very poor and needs to be improved.

Most of the teachers, who have been certified to be senior teachers at the school and if attendance or invitation for training is needed in schools, will be given to the young teachers. Therefore, the opportunity of develop the profession for teachers who have passed the certification are very limited. In addition, a minimum teaching time of 24 hours can make teachers unable or very difficult to develop. And it coupled with the teachers' administrative that was very much. Most of teachers complain about it, because the teachers did not have time to just read the book and add insight about the latest learning strategies.

In more detail, the results of performance assessment of mathematics teachers of vocational high schools in Wonosobo regency after certification in professional development is based on the study of documents are shown in Table 6.

Table 6. Results of Performance Assessment of Mathematics Teachers of Vocational High Schools based Study Documents of Professional Development

| No | Aspect of the rated | Mean | Category |
|-------|---|------|-----------|
| 1 | Participation in the relevant courses with the teaching competences | 1 | Very Poor |
| 2 | Participation in the upgrading and workshop/teacher training | 3,36 | Fair |
| 3 | Participation in the work or joint activities | 1 | Very Poor |
| 4 | Participation in the scientific activities | 1 | Very Poor |
| 5 | Presentation in a scientific forum as a speaker | 1 | Very Poor |
| 6 | Do scientific publication of research results and ideas in the education formal | 1 | Very Poor |
| 7 | Create article/popular scientific in education | 1 | Very Poor |
| 8 | Create a learning dictate | 1 | Very Poor |
| 9 | Create a modules | 1 | Very Poor |
| 10 | Do class action research | 1 | Very Poor |
| 11 | Create appropriate technology for mathematics subject | 1 | Very Poor |
| 12 | Create/modifications matematics props | 1 | Very Poor |
| 13 | Participation in the development of standard setting, lattice or test guideline | 1 | Very Poor |
| Total | | 1,18 | Very Poor |

Mathematics teachers of vocational high schools in Wonosobo regency, especially those who have passed this certification are mostly women. Besides their profession as a teachers, they also act as a housewife who has a lot of activity in the house. Therefore, the mathematics teachers of vocational high schools in Wonosobo regency is not so keen to develop the profession and promotion. Thus, the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency still is in poor category. No mathematics teachers of vocational high schools in Wonosobo regency wrote popular scientific articles in education, textbooks, modules, appropriate technology for mathematic, as well as modifying the mathematical props. Also, there were no one ever done a scientific publication of research results or ideas knowledge in the formal education.

Discussion

Based on the description of the results of research obtained information that the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson based on self-

assessment is in the good category, where half (50%) of the number of teachers who have been certified were in the good category, and 21% were in the very good category, while 29% were in the fair category and poor category. From the results of study documents, all teachers (100%) showed very good category about the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency. Such result because the teachers have been complete had a learning device.

Overall, mathematics teachers of vocational high schools in Wonosobo regency after certification have good performance on planning the lesson aspects. This was confirmed by the results of Khodijah's research (2013, p.95) on the post-certification performance of Religion teachers in the province of South Sumatra which revealed that the performance of teachers on planning the lesson was in the good category. The results of Palupi's research (2011) about the post-certification performance of Science teachers in the city of Yogyakarta also revealed that the performance of teachers on planning the lesson was in the good category. Slightly different from the results of Kartowagiran's research (2011) which states that the post-certification performance of teachers in Sleman regency in aspect of created the lesson plan at least is still maintained with quality of lesson plan is excellent category.

In terms of the learning implementation based on self-assessment, mathematics teachers' performance after certification showed the good category, which half (50%) of the number of teachers who are already certified his/her performance on the learning implementation is also has very good category. Meanwhile, 36% of teachers have the good category, while 14% more teachers were the fair category. From the observation, it is showed that the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation is also in the good category. Meanwhile, 21% the number of teachers who have passed the certification of teachers were in the very good category, and 50% of teachers or the others were in the fair category.

Overall, mathematics teachers of vocational high schools in Wonosobo regency after certification have good performance on the learning implementation aspect. This was confirmed by the results of Khodijah's research (2013) on the post-certification performance of religion teachers in the province of South Sumatra which revealed that the performance of teachers on the learning implementation is in the good category. The results of Palupi's research (2011) about the post-certification performance of Science teachers is in the city of Yogyakarta also revealed that the performance of teachers on the learning implementation in the good category. It is slightly different from the results of Kartowagiran's research (2011) which states that the post-certification performance of teachers in Sleman regency in the implementation aspect of learning undertaken by teachers is in excellent category.

Performance of mathematics teachers of vocational high schools in Wonosobo regency after certification on the learning assessment based on self-assessment is in the good category, where more than half (64%) of the number of teachers who certified, were in the very good category. Meanwhile, 29% were in the good category and 7% others is in the fair category. Then, the results of observational studies and documents regarding the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in learning assessment also shows very good category, where more than half (64%) of the number of teachers who have been certified performance is in the very good category, and 34% teachers' performance is in the good category.

Overall, mathematics teachers of vocational high schools in Wonosobo regency after certification have good performance on the learning assessment aspect. This was confirmed by the results of Palupi's research (2011) on the post-certification performance of Science teachers in the city of Yogyakarta revealed that the performance of teachers on the learning assessment was in the very good category. It is slightly different from the results of Khodijah's research (2011) which states that the post-certification performance of religion teachers in the province of South Sumatra which revealed that the performance of teachers on the learning assessment in the fair good category

Performance of mathematics teachers of vocational high schools in Wonosobo regency after certification in professional development based on self-assessment showed is still not good, in which half (50%) of the number of teachers who are already certified, the performance mathematics teachers in professional development is in the poor category and half more (50%) is in the very poor category. Meanwhile, the results study show that the performance of all documents (100%) mathematics teachers of vocational high schools in Wonosobo regency after certification in professional development is still weak and need to be improved again.

Overall, mathematics teachers of vocational high schools in Wonosobo regency after certification have very poor performance in the professional development aspect. This was reinforced by the results of Khodijah's research

(2013), which examines the post-certification performance of teachers in the province of South Sumatra in professional development, which was still need some improvement. The result of Wibowo & Jailani's research (2014) also indicate that the mathematics teachers of junior high schools in Wonosobo regency are still has some difficulties in developing their teaching , especially in terms of scientific publications and innovative work. Teachers are also obliged to continuously improve and maintain the professionalism competence as a professional teacher. Therefore, the teacher must develop its professionalism to be more stable and more professional.

Overall profile of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in the planning, implementing, and the learning assessment and in the professional development are shown below.

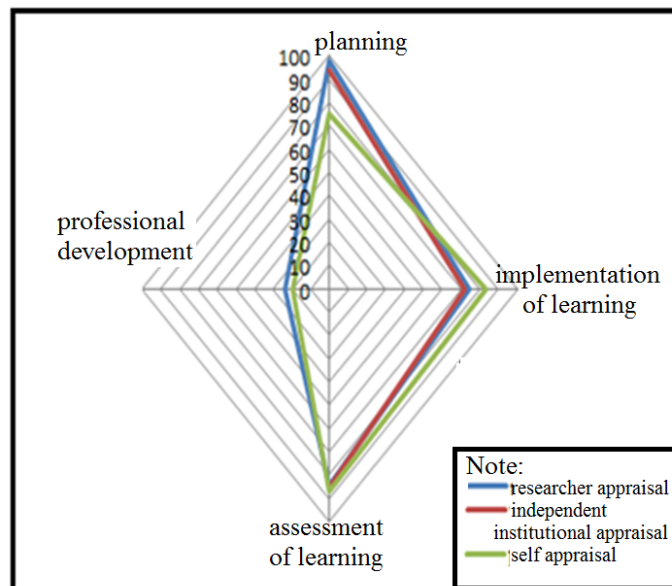


Figure 1. Assessment of the post-certification performance of vocational high schools mathematics teachers in Wonosobo regency on Planning, Implementation, and Assessment of Learning and Professional Development

Mean score of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson and on the learning assessment are in the very good category, while the mean score of the post-certification performance of their learning implementation is in the good category. Whereas, mean score of the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in professional development is in the very poor category.

CONCLUSIONS AND SUGGESTION

Conclusions

Based on the analysis of data and discussion, four conclusions can be made, which are: (1) the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on planning the lesson is in the good category; (2) the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency on the learning implementation is in the good category; (3) the post-certification performance of mathematics teachers of vocational high schools in Wonosobo, on the learning assessment is in the very good category, and; (4) the post-certification performance of mathematics teachers of vocational high schools in Wonosobo regency in the professional development is in the very poor category and needs to be improved.

Suggestion

Based on the discussion and conclusions of research then offered five suggestions, which are; (1) the principal shall schedule a post supervising teacher certification periodically and communicate the results to the teacher supervision. Therefore, teachers can maintain professionalism and improve his/her shortcomings. The principal should also provide the opportunity for teachers to continuously improve and develop their work. For example, teachers are given the opportunity and included in a teachers training, seminar, and scientific work competition, as well; (2) the schools should be frequently held IT training because many teachers who have passed the certification have not been adept at using IT tools. It limits them in accessing information; (3) the relevant institution, in this case, the *Dikpora* Wonosobo should not be selective in providing opportunities for teachers to

participate in self-development training; (4) universities as educator producers, should add organized coaching programs and equip students with the writing and researching ability, and; (5) for mathematics teachers of vocational high schools, it is expected to always improve his/her ability into classroom action research, the preparation of the learning, mastery learning methods and theory, and the manufacture of paper or scientific work.

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