

STUDY ON THE CONTINUOUS PROFESSIONALISM DEVELOPMENT OF MATHEMATICS TEACHERS IN JUNIOR HIGH SCHOOL IN INDONESIA

Dr. Wardono, M.Si¹(Corresponding Author)

¹Lecturer of Mathematic Department, Mathematic and Natural and Sciences Faculty, Semarang State University, Semarang, Indonesia

Email: wardono.unnes@gmail.com
+628156619462

Abstract

The main problem of this study is how to develop a model of CPD (*Continuous Professional Development*) in order to improve competency-based performance of post-certification mathematics teachers in Junior High School in Semarang. (1) Is the management model of TM (Training and Mentoring) CAR (Classroom Action Research) effective in improving the teachers' performance? (2) Does the CAR CPD TM management model effectively improve the knowledge, understanding and skills of teachers about CAR? (3) Does the CAR CPD TM management model positively impact in increasing mathematics learning outcome of students in Junior High School in Semarang?

The method of this research is R&D using quantitative approach. The previous quantitative research studied the portraits of teachers' performance, factors that affect the teachers' performance, and the most dominant factor affecting the teachers' performance. This paper only presents the Development studies with experiment using "pretest-posttest with control group design". The population is Junior High School mathematics teachers in Semarang city who are already certified as many as 200 teachers. The sample was taken using proportionate stratified random sampling technique covering SSN 80 teachers, RSBI 16 teachers and RSSN schools 44 teachers. Instruments to take data from teachers and students were taken with questionnaire, test, focused observation sheet and interview guideline supported with validation sheet used by experts, practitioners, supervisors, and monitors of the FGD. The data analysis used descriptive statistics analysis, ANOVA and t-test using SPSS 16.0 and CFA SEM with LISREL 8.8.

The results of this research are: (1) CAR CPD TM management model effectively improve the teachers' performance, (2) CAR CPD TM management model effectively improve the knowledge, understanding and skills of CAR; (3) CAR CPD TM management model gives positive impact to improve mathematics learning outcome of students in Junior High School in Semarang city.

Keywords: development, professionalism, mathematics teacher, CAR CPD.

1. Introduction

In general, the Human Resources (HR) Indonesia is still low compared to other countries. Based on the survey of Human Development Index (HDI) report 2010 UNDP (United Nations Development Programme) HDI value of 0.600 and Indonesia only ranked on 108 of 169 countries studied (Klugman, 2010: 154). HR is still low due to this one because the quality / quality of education in Indonesia is still low. This can be seen from some of the following indicators. (1) The results of the survey Trends in International Mathematics and Sciences Study (TIMSS) ranks Indonesia at 34th in both Mathematics and at 36th position to the sciences of the 45 countries surveyed (Rival and Pure; 2009: 49); (2) Report of the International Educational Achievement (IEA) that elementary students's reading abilities of Indonesian was ranked at 38 of 39 countries surveyed; (3) academic quality among nations through the Programme for International Student Assessment (PISA) show that Indonesia ranked at 38th of 41 countries, while the field of mathematics and reading skills was ranked at 39th; (4) Report of the World Competitiveness Yearbook, the competitiveness of Indonesian human resources in the position 46 of the 47 countries surveyed; (5) The position of Indonesian universities were considered favorites, such as UI and UGM only in the position 68 and 77 universities in Asia; (6) The lag of Indonesia in the field of science and technology in comparison with neighboring countries, such as Malaysia, Singapore and Thailand; (7) A graduate of a school or college that is not yet ready to enter the workforce because of the lack of competencies possessed. Provision of skills gained from educational institutions memadahi not to be used independently, as studied in educational institutions all too often fixated on theory. Learners are less innovative and creative (Kunandar; 2007: 2).

The quality of education in Indonesia is still low, including the quality of learning, one of which is triggered by the quality of teachers is still low, in terms of the teacher plays a leading role and be the most influential factor on the outcome of quality education. For that all components of the Indonesian nation must always strive to improve the quality of its teachers to continue development in the field of education and education reform, especially in developing professionalism in improving performance so that teachers become competency-based professional and quality.

The government and all parts of Indonesia expects that the teachers that have been certified can be professional teachers and have high professional performance. But how the true phenomenon in the field? It is necessary to study the performance of the teacher profile photograph based on competence.

To realize the professional mathematic teachers, competent with a high performance need to do systematic efforts, synergistic and sustainable which can guarantee every teacher remain professional, competent and performing in accordance with the standards of competence. Departing from that facts, it is interesting to look for and find strategies to overcome these problems, one of the efforts is to implement Continuous Professionalism Development (CPD) or Professionalism Sustainable Development (PSD) to improve the performance of mathematics teachers based on competence.

CPD is a development program that conducted continuously through continuous learning programs as a basics to strength the knowledge, skills, ability, and behavior. The basic principle of CPD is continual improvement in action. So it would not be meaningful if the CPD program didn't conducted incoherent with applications in the field (and Ahmad Fuad; 2009: 94). CPD

implies that the increase in professional knowledge and professional skills improvement consciously made continuous / sustained throughout life by a teacher. This is a commitment to become a professional teacher, up to date, and always strive to improve and enhance the quality of self. This is the key to optimizing a person's career-opportunity teacher, either in the present or the future.

To prevent the problems, all we are to make the teachers become the researchers. As well as researchers, educators are able to reflect on the learning process in the classroom and practice by implementing CAR . Educators can test his own ideas in the classroom teaching through CAR. Professionalism has a very broad meaning if we look on this solution. It is also supported by the results of the study D'Oria (2004: 14) that concludes the application of CAR in learning can improve the professionalism of teachers. CAR can increase student's motivation, improve the acquisition of conceptual and practical learning, improve student's good behaviors, learning to care about studying equipments. But on the other hand, CPD and CAR not yet become a culture to the teachers. The reason that teachers do not understand the basic concept of CAR deeply because most of them are not familiar with a small portion of CAR and getting training CAR but obtained only conference papers (Santayasa, 2008: 101).

From the discussion above, indicates that there is a bound between work experience and academic qualifications include basic tasks, self-management and to teach basic-skills, coaching quality of teachers by principals and supporters as well as the type of effective school leadership, culture schools and school climate, teacher professional allowance, teacher job satisfaction, work motivation of teachers, teacher training and development to increase the professionalism of the Berke-advanced or CPD is one of the ways is by implementing CAR, competency-based teacher performance all of which will lead to the improvement of the quality / junior high school math teacher quality in the city of Semarang.

2. Problem Concerns

The main problem of this research is a model of how the United Nations can develop the professionalism of teachers in improving teacher performance competency-based mathematics in junior high school in the city of Semarang. While this research question is formulated as follows:

- (1) Is the training and development of management model TM CPD CAR can effectively develop the professionalism of teachers in improving the performance of math teachers competency based on SMP post-certified in Semarang?
- (2) Is the TM CPD CAR management model can effectively develop the professionalism of teachers in improving the knowledge, understanding and skills to CAR-post-certified mathematics teachers at junior high school in Semarang?
- (3) Is the TM CPD management model CAR can impact on the learning outcome of students in the junior high school math in Semarang positively?

3. Literatures

Teachers' perceptions about training CPD Lessing and Marike have observed that: In general, the teachers reported that Regardless of Reviews their teaching position, Qualifications, gender, or age they had experienced the CPD workshops positively (Lessing and Marike, 2007: 53).

CPD is believed by many countries that have implemented it as an effective effort in caring and increasing the professionalism of teachers due to be implemented on an ongoing basis, with synergistic involving local governments, supervisors, principals, and educational institutions. If the CPD is done by math teacher post-certified, predicted that teachers will continue to have a commitment to maintaining and improving their professionalism.

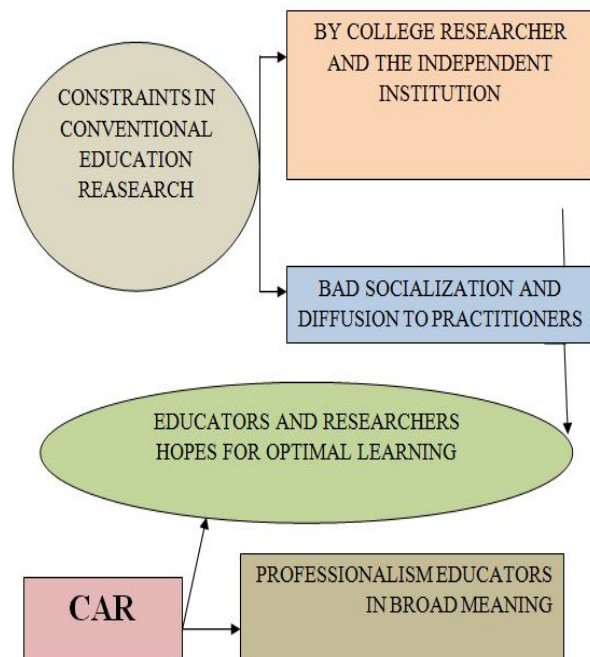
Examples of CPD were conducted independently by teachers : (1) reading books, journals, and education news; (2) study alone / independently; (3) look on special program; (4) make a note or diary to reflect their ways of teaching; and (5) doing an evaluation like doing CAR (Joubert, 2009: 1763).

CPD development as an effort to improve the performance of junior high math teachers competency based implementation was possible because : (1) In the city of Semarang already have MGMP, KKG, PSC, KKPS, PGRI and other forums. (2) The UN emphasizes empowerment and synergy among education stakeholders and in line with the spirit of regional autonomy and decentralization of education (3) the Technical Implementation Unit LPMP government, P4TK (4) LPTK 's experience in the implementation and certification of education and training of teachers. This research will be done about TM CPD CAR .

To develop the professionalism of teachers of mathematics junior post-certified in improving the performance of competency-based training and mentoring CPD performed CAR . To know the of the training and mentoring of the UN CAR that can improve teacher performance, we will present CAR CPD training and mentoring, teaching materials and evaluation of training and mentoring programs CPD CAR. Improving the quality of education at this time is a very important focus in the development of education for Indonesia. Various efforts to improve the quality of education, among others, through research education, but the impact of such conventional research, for improving the quality of classroom teaching is less successful. The reason is (a) general education research conducted by experts and researchers from universities and research institutes are independent, so that the problems studied less internalized by educators, (b) diffusion of research results to educators take a very long time (Rachman, 2009 : 6).

To prevent the situation above need an alternative academic solution that an educator must be a researcher. Educators position as well as researchers, educators are able to reflect the learning process in the classroom and practice by implementing CAR. Educators can test his own ideas in the classroom teaching through CAR . The concept of professionalism of teachers is not narrow, but the professionalism it has a very broad meaning.

CAR is a kind of many types of research are recommended to reduce the gap between researchers and practitioners relations and increase the professionalism of educators-extensive with placing teachers or educators as well as researchers. Research activities by teachers as a learner, need to be done as a teacher or educator is often confronted with problems that are situated occur in every teacher's classroom. Problems in CAR is more focused on things relating to the improvement of the learning process in the classroom. A teacher as a professional educator, in addition to serving as a teacher / educator must have the attitude that is sensitive and responsive to the learning problems faced by the teacher in each classroom. Attitude that is sensitive and responsive to problems in the classroom, followed by taking action to improve the quality of learning to overcome the problems should always be done in a planned, controlled and accountable. That way is through CAR (Rachman, 2009: 8).



Picture 1. CAR makes a professional teachers (Rachman, 2009: 8)

The researches of Ellis and Castle “*Schools and school administrators searching for techniques to improve the learning that takes place in their school should strongly consider and support teacher research as an effective means of quality improvement*” (Ellis and Castle, 2010: 271).

From the result of survey and the data analysis of survey, known that dominant factors that affect the performance of mathematics teachers are training factor and improvement of teacher’s professionalism and based on teacher’s assesment need to get the training and supporting in CPD CAR . Based on researches made by Jones & Song, Kirkey, McIntosh dan Santyasa, found that in theory, CAR can be used for a foundation to teach profession and to improve teacher’s competence. (Jones dan Song, 2005: 3; Kirkey , 2005: 4 dan McIntosh, 2005: 2) yang juga disetujui Santyasa (2008: 110).

CAR can help (1) the development of teacher’s competence in solving the teaching’s problem includes the quality, efficiency, and efectivity, process,and the results refflected from students, (2) improvement in teaching that affect in improvement of pedagogic competence, personality, social, and professional teachers(Prendegast, 2002: 14; dan Santyasa, 2008 : 102). Prendergast’s explanation indicates that CAR is not only facilitate the teachers to improve their professionalism but also has a possitive effect in improvement of quality in process and the results refflected from students.

Joubert’s researches (2009: 3) about the effectivity of CPD with a conclusion that CPD is effective because it gives many of simple and useful explanation, and if the presentation of the material of CPD is arranged based on its topic, and told with an informative ways, then some of opinions told that CPD was very happy, interesting, evocative, challenging, etc. From that researches, we know that CPD is suitable to be implimented in Indonesia for a professiona teachers that have a learner’s cerificate.

Santyasa's researches (2009: 3), cultures : do CAR for the teachers is still low. The low of culture to do CAR caused by a low ability of the teachers to understand the concepts of CAR . The reason of this are that most of them do not understand about CAR and a little of them said that they attended in service training but they only got seminar papers.

In training activity for some teachers, the concepts of CAR have given to teachers from elementary schools until Junior High Schools. But the problem is did the implementation of CAR's training in some teachers used simple operational training models? This question give an inspiration and made for an interesting studying theme. It is important to do because in theory, CAR can be used to be a foundation to teach profession and improve the teacher's competence (Jones dan Song, 2005: 3; Kirkey , 2005: 4; McIntosh, 2005: 2 dan Santyasa, 2008: 110).

Developments in teachers professionalism in improvement of their performance using TM CPD CAR because of 2 simple reasons and academic reason. Simple reason because the development of teacher's career has an obstacle in doing researches that include into professional competence part that must be improved. If teachers follow TM CPD CAR then knowledge, understanding, and skills CAR will improve. Implementation of CAR by teachers that has a good supports from their friends in MGMP or by LPTK lectures will improve the spirits of the teachers in doing CAR until make the CAR's report. The academic reason because doing CAR can help (1) improvement in teachers competence in solving the studying problems includes quality, efficiency, and effectivity, process, and the results reflected by students, (2) improvement skill of study will affect in improvement in pedagogic's competence, personality, social and professional teachers (Prendegast, 2002: 14; dan Santyasa, 2008 : 102). Prendergast's explanation indicates that CAR is not only facilitate the teachers to improve their professionalism but also has a positive effect in improvement of quality in process and the results reflected from students.

Based on the framework that explained above, the next step, it will do training implementation models and supporting in CPD CAR for mathematics teacher post-certified in Junior High Schools in the City of Semarang in hopes that after this, teachers can follow the training and supporting CPD CAR so the professionalism will be cared and improved in meaning there is an improvement in performance, improvement in understanding, knowledge, skills CAR that supports their professionalism and can give positive effects in developing the results of teaching mathematics in Junior High Schools in the City of Semarang.

The researches's method to answer the problems in this paper is R&D with quantitative approaches. The last quantitative researches examined the teacher's performance portrait and examined the factors that affected the performance of teachers and dominant factor that affected the performance of teachers. In this paper, only presented a researches Development with experiment "*pretest-posttest with control group design*". The populations are 200 mathematics teacher in Junior High School in City of Semarang that have been certified. The samples are take with *proportionate stratified random sampling* technique includes SSN 80 teachers, RSBI 16 teachers, and RSSN 44 teachers. The datas from teachers and students are taken by questionnaire, test, focused observation paper, and interview guides supported assessment form validator experts, practitioners, supervisors, monitors the FGD. The data analysis : using descriptive statistical analysis, ANOVA and t-test with SPSS 16.0 and CFA SEM with LISREL 8.8.

4. Data Analysis and Discussion

In the last researches had been taken results that the performance's protrait of mathematics teachers post-certified based on competence in Junior High School in City of Semarang has a high level. The value of performance's elements of mathematics teachers's personality post-certified based on competence is higher than the value of pedagogic's performance, the value of professional's elements and the value of social's elements. There is no difference in mathematics teachers's performance post-certified base on competence between the teachers graduated by portfolio with the teachers graduated by PLPG. Besides that, mathematics teachers's performance based on competence in Junior High School in City of Semarang that have RSBI status and SSN status are higher than RSSN status. Then, self management of teachers, quality coaching for teachers, training and developing the teachers's professionalism, school's culture and the most dominant teachers's motivation affect the teachers's performance simultaneously. Among self management factors, quality coaching for teachers, training and developing the teachers's professionalism, school's culture and the most dominant teachers's motivation, the most dominant factor that affect the post-certified mathematics teachers's performance in Junior High School in City of Semarang are training factor and development of professionalism. As for the results of researches ;

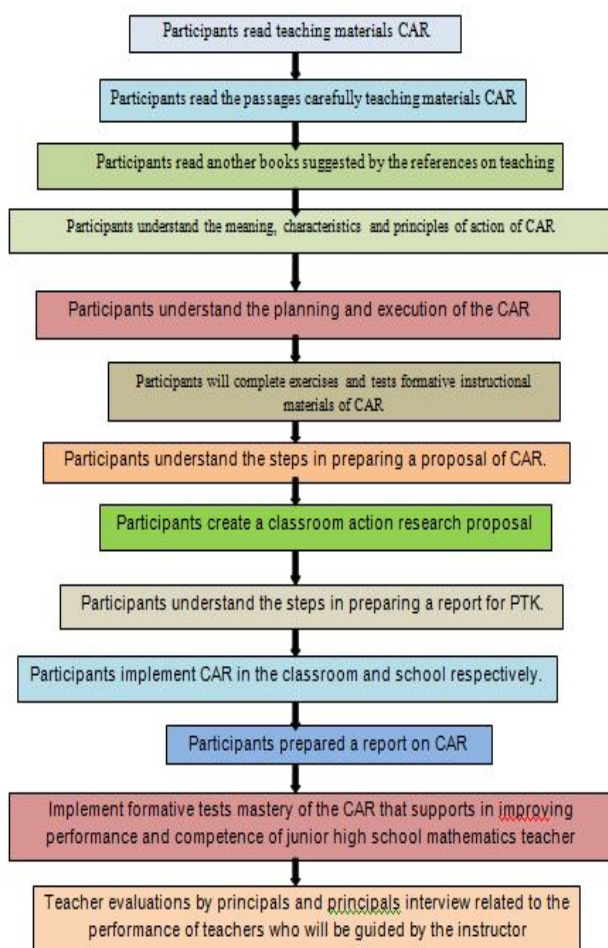
1. The Results of Developing the Models of TM CPD CAR that Can Improve the Post-certified Mathematics Teachers's Performance Based On Competence in Junior High School in City of Semarang.

Management model of TM CPD CAR that generated by this researches is a model with Standard Operational Procedures (SOP) academic like presented in picture 2, while the organisocial of SOP presented in picture 3. As for the steps are ;

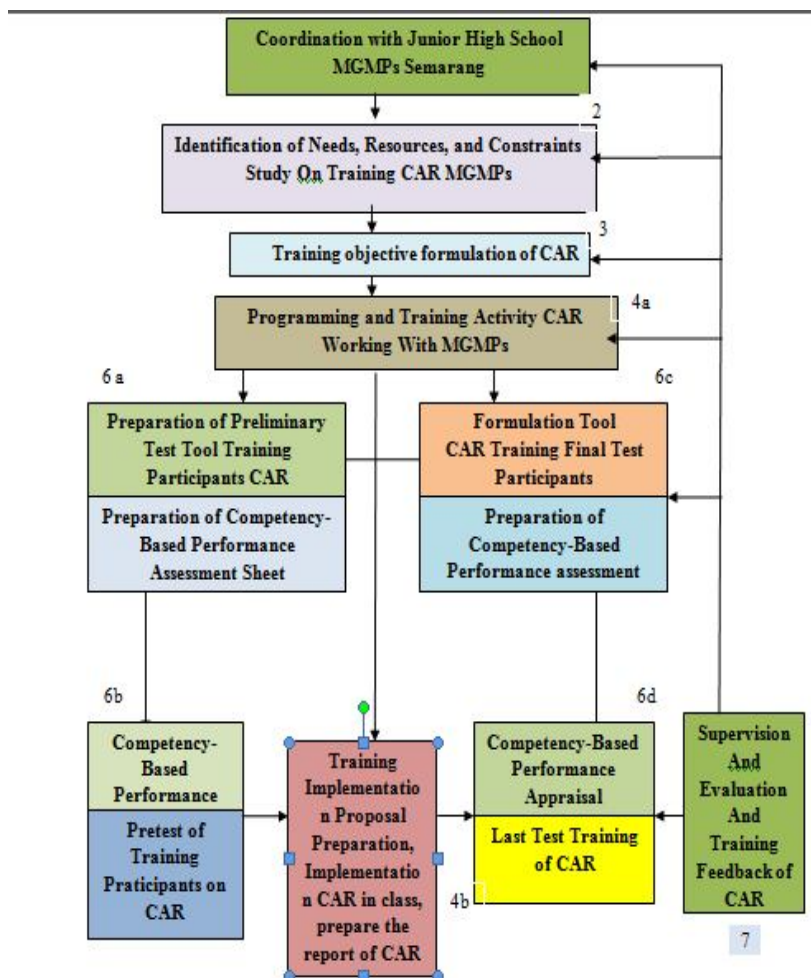
- (1) Coordinate with the committee of MGMP Mathematics Junior High School in City of Semarang;
- (2) Identify the needs of the teachers;
- (3) Search for the sources and obstacles TM CPD CAR from the survey's result to mathematics teachers in Junior High School at MGMP;
- (4) Try to focus on the purpose of training and supporting CPD CAR ;
- (5) Try to focus on preparation programs TM CPD CAR with the coordination of MGMP;
- (6) Try to focus on preparation equipments for pretest TM CPD CAR ;
- (7) Try to focus on preparation equipments for last test TM CPD CAR ;
- (8) Try to focus on preparation of observation papers of teachers's performance base on the last competence and after the TM CPD CAR ;
- (9) Try to focus on trainer in CAR to guarantee the sustainability in future;
- (10) Try to focus on pretest about knowledge, understanding, and skills CAR and pre-assessment of teachers's performance based on competence before TM CPD CAR ;
- (11) Do TM CPD CAR with trying to focus on theory and simple examples by providing training innovative management guide for mathematics teachers in Junior High School and management guide of TM CPD CAR ;
- (12) Try to focus on the existense of supervision, monitoring, evaluation and feedback TM CPD CAR ;
- (13) Try to focus on mentoring of CAR 's paper preparation;
- (14) Try to focus on mentoring of CAR 's implementation in the classroom;
- (15) Try to focus on mentoring of CAR 's report;
- (16) Try to focus on the last test of knowledge, understanding, and CAR skills and assessment of performance based on competence after TM CPD CAR ;and

(17) Try to focus on reflection of all activities TM CPD CAR against the development of teachers's professionalism in order to improve the teachers's performance base on competence and;

(18) Try to focus on reflection all of activities TM CPD CAR against the possitive effect : Improvement result of studying mathematics from students in Junior High School in City of Semarang. By these steps, TM CPD CAR will continously can develop the teachers's professionalism in order to improve the post-certified mathematics teachers's performance based on competence in City of Semarang.



Picture 2. SOP Academic TM CAR



Picture 3. SOP Organizational TM CAR

2. The Effectiveness Models of TM CPD CAR in Order to Improve the Teacher’s Performance Based On Competence and TM CAR for Teachers in Junior High School in City of Semarang

a. Teacher’s Performance before TM CPD CAR

hypothesis 1 will be tested is H1: There is a difference of mean of the value of mathematics teacher’s performance based on competence between teachers in control group with teachers in experiment group before TM CPD CAR .

From the data and result of calculation from hypothesis-test 1 with t-test on output SPSS in Table 1, give a result as this :

Table 1. Result of hypothesis-test 1

| Description | Value |
|-------------------------|-------|
| A | 0,05 |
| Value of sig (2-tailed) | 1,00 |

| | |
|--|-------|
| Mean of the teachers's performance in experiment group | 85,56 |
| Mean of the teachers's performance in control group | 85,56 |

Because from Table 1 the value of sig (2-tailed) = 1,00 > 0,05, so the conclusion is H1 is rejected. So, mean value of the post-certified mathematics teachers's performance in Junior High School in City of Semarang between control group and experiment group is the same. So, before TM CPD CAR mean value of teacher's performance in control and experiment group is not different significantly, or the two groups (experiment and control) departs from the same initial condition.

b. The teachers's performance after TM CPD CAR that present an effectiveness TM CAR can improves the teacher's performance

Hypothesis 2 will be tested is Ha: There is a different of mean value of teachers's performance between teachers in control group with teachers in experiment group after experiment of TM CPD CAR .

From the data and result of calculation from hypothesis-test 2 with t-test on output SPSS in Table 2, give a result as this :

Table 2 Result of hypothesis-test 2

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of sig (2-tailed) | 0,00 |
| Mean of the teachers's performance in experiment group | 91,97 |
| Mean of the teachers's performance in control group | 85,83 |

Because from Table 2 the value of sig (2-tailed) = 0,00 < 0,05, so the conclusion is Ha is accepted. So, mean value of the post-certified mathematics teachers's performance in Junior High School in City of Semarang between control group and experiment group is different. So, after TM CPD CAR mean value of teacher's performance in control and experiment group is different significantly. Because mean value of teachers's performance between experiment group and control group before the training departed from the same initial condition, after the training, the mean value of teachers's performance in experiment group = 91,972 > mean value of teachers's in control group = 85,833, so mean value of experiment group is higher than control group. In conclusion : The training and coaching TM CPD CAR can improve the post-certified mathematics teachers based on competence in Junior High School in City of Semarang.

3. The Effectiveness models TM CPD CAR in order to improve knowledge, understanding, and skills TM CAR of teachers in Junior High School in City of Semarang

a. Teachers's TM CAR before TM CPD CAR

Hypothesis 3 will be tested is H_a : There is a different in mean value of knowledge, understanding, and skills of CAR of post-certified mathematics teachers in Junior High School in City of Semarang between teachers in experiment group before experiment TM CPD CAR with teachers in control group.

From the data and result of calculation from hypothesis-test 2 with t-test on output SPSS in Table 3, give a result as this :

Table 3. Result of hypothesis-test 3

| Description | Value |
|---|-------|
| A | 0,05 |
| Value of <i>sig</i> (2-tailed) | 0,829 |
| Mean of the teachers's TM CAR in experiment group | 47,72 |
| Mean of the teachers's TM CAR in experiment group | 47,08 |

Because from Table 3 the value of sig (2-tailed) = 0,829 > 0,05, so the conclusion is H_a is rejected. So, mean value of knowledge, understanding, and CAR skills of the post-certified mathematics teachers's performance in Junior High School in City of Semarang between control group and experiment group is the same. So, before TM CPD CAR mean value of knowledge, understanding, and CAR skills of the post-certified mathematics teachers's performance in Junior High School in City of Semarang in control and experiment group is not different significantly, or the two groups (experiment and control) departs from the same initial condition.

b. Teachers's TM CAR after TM CPD CAR that present an effectiveness TM CPD CAR can improve TM CAR of the teachers

Hypothesis 4 will be tested is H_a : There is a different in mean value of knowledge, understanding, and skills of CAR of post-certified mathematics teachers in Junior High School in City of Semarang between teachers in experiment group after experiment TM CPD CAR with teachers in control group.

From the data and result of calculation from hypothesis-test 4 with t-test on output SPSS in Table 4, give a result as this :

Table 4. Result of hypothesis-test 4

| Description | Value |
|---|-------|
| A | 0,05 |
| Valu of <i>sig</i> (2-tailed) | 0,00 |
| Mean of the teachers's TM CAR in experiment group | 88,64 |
| Mean of the teachers's TM CAR in control group | 47,08 |

Because from Table 4 the value of sig (2-tailed) = 0,00 < 0,05, so the conclusion is H_a is accepted. So, mean value of knowledge, understanding, and CAR skills of the post-certified mathematics teachers's performance in Junior High School in City of Semarang between control group and experiment group is different. So, after TM CPD CAR mean value of teacher's performance in control and experiment group is different significantly. Because mean value of teachers's performance between experiment group and control group before the training departed from the same initial condition, after the training, the mean value of teachers's performance in experiment group = 88,64 > mean value of teachers's in control = 47,08, so mean value of experiment group is higher than control group. In conclusion : The training and coaching CPD CAR can improve the post-certified mathematics teachers based on competence in Junior High School in City of Semarang.

4. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang

a. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : RSSN 1)

Hypothesis 5 will be tested is H_a : There is a different in mean value of the results study of students in Junior High School (status : RSSN) before and after the teachers do CPD CAR
From the data and result of calculation from hypothesis-test 5 with t-test on output SPSS in Table 5, give a result as this :

Table 5. Result of hypothesis-test 5

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of sig (2-tailed) | 0,00 |
| Mean of the result of study before CPD CAR | 54,00 |
| Mean of the result of study after CPD CAR | 62,74 |

Because from Table 5, the value of sig (2-tailed) = 0,00 < 0,05, so the conclusion is H_a is accepted. So, mean value of the studying result of mathematics in Junior High School (status : RSSN 1) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly. Because mean value of studying result after teachers do CPD CAR = 62,74 > mean value of studying result before teachers do CPD CAR = 54,00 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status RSSN 1).

b. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : RSSN 2)

Hypothesis 6 will be tested is H_a : There is a different in mean value of the results study of students in Junior High School (status : RSSN 2) before and after the teachers do CPD CAR. From the data and result of calculation from hypothesis-test 6 with t-test on output SPSS in Table 6, give a result as this :

Table 6. Result of hypothesis-test 6

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of <i>sig</i> (2-tailed) | 0,025 |
| Mean of the result of study before CPD CAR | 58,75 |
| Mean of the result of study after CPD CAR | 73,21 |

Because from Table 6, the value of sig (2-tailed) = 0,025 < 0,05, so the conclusion is H_a is accepted. So, mean value of the studying result of mathematics in Junior High School (status : RSSN 2) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly. Because mean value of studying result after teachers do CPD CAR = 73,21 > mean value of studying result before teachers do CPD CAR = 58,75 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status RSSN 2).

c. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : SSN 1)

Hypothesis 7 will be tested is H_a : There is a different in mean value of the results study of students in Junior High School (status : SSN 1) before and after the teachers do CPD CAR. From the data and result of calculation from hypothesis-test 7 with t-test on output SPSS in Table 7, give a result as this :

Table 7. Result of hypothesis-test 7

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of <i>sig</i> (2-tailed) | 0,00 |
| Mean of the result of study before CPD CAR | 55,15 |
| Mean of the result of study after CPD CAR | 85,94 |

Because from Table 7, the value of sig (2-tailed) = 0,0 < 0,05, so the conclusion is H_a is accepted. So, mean value of the studying result of mathematics in Junior High School (status : SSN 1) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly.

Because mean value of studying result after teachers do CPD CAR = 85,94 > mean value of studying result before teachers do CPD CAR = 55,15 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status SSN 1).

d. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : SSN 2)

Hypothesis 8 will be tested is Ha: There is a different in mean value of the results study of students in Junior High School (status : SSN 2) before and after the teachers do CPD CAR
From the data and result of calculation from hypothesis-test 8 with t-test on output SPSS in Table 8, give a result as this :

Table 8. Result of hypothesis-test 8

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of <i>sig</i> (2-tailed) | 0,00 |
| Mean of the result of study before CPD CAR | 38,41 |
| Mean of the result of study after CPD CAR | 59,91 |

Because from Table 8, the value of sig (2-tailed) = 0,0 < 0,05, so the conclusion is Ha is accepted. So, mean value of the studying result of mathematics in Junior High School (status : SSN 2) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly. Because mean value of studying result after teachers do CPD CAR = 59,91 > mean value of studying result before teachers do CPD CAR = 38,41 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status SSN 2).

e. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : SSN 3)

Hypothesis 9 will be tested is Ha: There is a different in mean value of the results study of students in Junior High School (status : SSN 3) before and after the teachers do CPD CAR
From the data and result of calculation from hypothesis-test 9 with t-test on output SPSS in Table 9, give a result as this :

Table 9. Result of hypothesis-test 9

| Description | Value |
|--|-------|
| A | 0,05 |
| Nilai <i>sig</i> (2-tailed) | 0,00 |
| Mean of the result of study before CPD CAR | 69,70 |
| Mean of the result of study after CPD CAR | 91,97 |

Because from Table 9, the value of sig (2-tailed) = 0,0 < 0,05, so the conclusion is H_a is accepted. So, mean value of the studying result of mathematics in Junior High School (status : SSN 3) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly. Because mean value of studying result after teachers do CPD CAR = 91,97 > mean value of studying result before teachers do CPD CAR = 69,70 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status SSN 3).

f. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : RSBI 1)

Hypothesis 10 will be tested is H_a : There is a different in mean value of the results study of students in Junior High School (status : RSBI 1) before and after the teachers do CPD CAR. From the data and result of calculation from hypothesis-test 10 with t-test on output SPSS in Table 10, give a result as this :

Table 10. Result of hypothesis-test 10

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of sig (2-tailed) | 0,001 |
| Mean of the result of study before CPD CAR | 67,96 |
| Mean of the result of study after CPD CAR | 76,30 |

Because from Table 10, the value of sig (2-tailed) = 0,001 < 0,05, so the conclusion is H_a is accepted. So, mean value of the studying result of mathematics in Junior High School (status : RSBI 1) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly. Because mean value of studying result after teachers do CPD CAR = 76,30 > mean value of studying result before teachers do CPD CAR = 67,96 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status RSBI 1).

g. The Effects of TM CPD CAR Against The Result of Students that Study about Mathematics in Junior High School in City of Semarang (Status : RSBI 2)

Hypothesis 11 will be tested is H_a : There is a different in mean value of the results study of students in Junior High School (status : RSBI 2) before and after the teachers do CPD CAR. From the data and result of calculation from hypothesis-test 11 with t-test on output SPSS in Table 11, give a result as this :

Table 11 Result of hypothesis-test 11

| Description | Value |
|--|-------|
| A | 0,05 |
| Value of <i>sig</i> (2-tailed) | 0,00 |
| Mean of the result of study before CPD CAR | 72,40 |
| Mean of the result of study after CPD CAR | 84,60 |

Because from Table 10, the value of sig (2-tailed) = 0,00 < 0,05, so the conclusion is H_a is accepted. So, mean value of the studying result of mathematics in Junior High School (status : RSBI 2) before and after the teachers do CPD CAR is different. So, after TM CPD CAR mean value of studying result before and after the teachers do CPD CAR is different significantly. Because mean value of studying result after teachers do CPD CAR = 84,60 > mean value of studying result before teachers do CPD CAR = 72,40 so mean value of studying result after teachers do CPD CAR is higher than before. This concludes that training and coaching CPD CAR has positive effect as it can improve the studying result of the students in Junior High School (status RSBI 2).

From the result of the researches in all of status including RSSN, SSN and RSBI proves that training and coaching in CPD CAR has positive effect as it can improve the studying result of the students in Junior High School in City of Semarang.

5. Conclusion

- The management model of TM CPD CAR with a management in training plan function, training implement function, and training assessment program function by SOP academic as picture 2 and SOP organisational as picture 3 will continuously can develop the teacher's professionalis in order to improve the post-certified mathematics teachers's performance based on competence in Junior High School in City of Semarang.
- The management model of TM CPD CAR with a management in training plan function, training implement function, and training assessment program function are effective to develop the teacher's professionalis in order to improve the post-certified mathematics teachers's performance based on competence in Junior High School in City of Semarang.
- The management model of TM CPD CAR with a management in training plan function, training implement function, and training assessment program function are effective to develop professionalism in order to improve knowledge, understanding, and CAR skills of the post-certified mathematics teachers's performance based on competence in Junior High School in City of Semarang.
- The management model of TM CPD CAR with a management in training plan function, training implement function, and training assessment program function have positive effect as improves the studying result of the students in Junior High School in City of Semarang

References

- Ellis, C. dan K. Castle. 2010. Teacher research as continuous process improvement. *International Journal of Quality Assurance in Education*, Vol. 18 Iss: 4, pp.271 – 285. Oklahoma : Emerald Group Publishing Limited.
- Fuad dan Ahmad. 2009. *Integrated Human Resources Development*. Jakarta: Grasindo.
- Jones, P. Dan L. Song. 2005. *Action Research. Fellows at Tousesan University*. <http://www.nipissingu.ca/oar/PDFS/V832F.pdf>
- Joubert, M. et al. 2009. *Professional Development For Teachers of Mathematics: Opportunities and Change*. Proceedings of CERME 6. January 28th- February 1st 2009. Lyon France © INRP 2010. <http://www.inrp.fr/editions/cerme6> p 1761-1770.
- Kirkey, T.L. 2005. *Differentiated Instruction and Enrichment Opportunities: An Action Research Report*. <http://www.nipissingu.ca/oar/PDFS/V833E.pdf>.
- Klugman, J. 2010. *Human Development Report 2010. The Real Wealth of Nations: Pathways to Human Development*. Newyork: United Nations Development Programme, hal 154.
- Kunandar. 2007. *Guru Profesional. Implementasi Kurikulum Tingkat Satuan Pendidikan (KTSP) dan Sukses dalam Sertifikasi Guru*. Jakarta : PT Raja Grafindo Persada.
- Lessing, A. dan D.W. Marike. 2007. The Value of Continuous Professional Development : Teachers' Perceptions. *South African Journal of Education*. Copyright © 2007 EASA Vol 27(1)53–67.
- McIntosh, J.E. 2005. *Valuing The Collaborative Nature of Professional Learning Communities*. Tersedia pada <http://www.nippissingu.ca/oar/PDFS/V82E.pdf>. Diakses pada 1 Maret 2010.
- Prendergast, M. 2002. *Action Research: The Improvement of Student and Teacher Learning*. <http://educ.queensu.ca/~ar/reports/MP2002.htm>.

Rachman, M. 2009. *Penelitian Tindakan Kelas*. Semarang: UNNES PRESS

Rivai, V. dan S. Murni. 2009. *Education Management*. Jakarta : Rajawali Pers.

Santyasa, I. W. 2008. *Keberadaan dan Kepentingan Pengembangan Model Pelatihan Untuk Pembinaan Profesi Guru*. Laporan Penelitian. Singaraja : Universitas Pendidikan Ganesha.

-----, 2008. *Dimensi-Dimensi Teoretis Peningkatan Profesionalis-me Guru*. Artikel. Singaraja: Universitas Pendidikan Ganesha.

Sudjana, S. 2007. *Sistem & Manajemen Pelatihan Teori dan Aplikasi* . Bandung : Falah Production