

# The Study of Pedagogical and Cognitive Competency Through Workshop For PPG SM3T Participants of Riau University

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Received: 8 October 2016, Accepted: 4 November 2016

Published online: 14 February 2017

**Abstract:** This descriptive study was conducted in April 2015 until September 2016 that aims to provide an overview of Pedagogy and Cognitive competency SM3T PPG-UR participants through the workshop. Applying the total sampling consisted of 63 PPG-SM3T UR participants of 7 LPTK in Indonesia. The parameters of the study included two aspects: knowledge of pedagogy (lesson plans, worksheets learners, teaching materials, assessment instruments) and cognitive (exam / test formative, local exam and national exam). Collecting data use questionnaires, performance assessment, observation sheets and porthpolio. Analysis of data is a mean score, percent shown in the form of a table, then analyzed descriptively. The results were obtained by the research results can be concluded from the four study program show pedagogy and cognitive abilities that are relatively similar. The highest pedagogical ability acquired by the program of study Physics and Chemistry lowest of the study program. As for the ability of highest cognitive acquired by Economic and lows of Physics. Workshops can enrich teachers with relevant new information and knowledge through independent learning, group-discussions, and workshops are required to improve teachers' capabilities which facilitated by professional instructor in pedagogical and cognitive. Workshop can improve pedagogy and cognitive competence PPG participants SM3T UR.

**Keywords:** Pedagogical; cognitive competencies; participants PPG-SM3T.

## 1. Introduction

Education is any situation that affects the growth of the individual. The higher the quality of education, the quality of human resources, the better. One of the policy of the Ministry of National Education in order to accelerate the development of education, namely the Professional Teacher Education program (PPG-SM3T) (Kemendikbud, 2015).

Learning system in PPG-SM3T program includes workshops and Field Experience Program (PPL). Workshop developed a learning device which educates which is an activity mainly training / workshop conducted at the stage-1. This workshop will produce a learning device (syllabus, lesson plans (RPP), worksheets learner (LKPD), instructional media, instructional materials, and assessment instruments).

SM3T-UR program requires proper management, can be viewed from the period of his managerial. Managerial requires the evaluation period as one of the chain. Evaluation of a program can be conducted during a program in progress. Components that can be evaluated include contracts, context, input and process (Stufflebeam, 2007).

Evaluation of these components makes it possible to design the process in accordance with the desired product. Based on the idea of Ridlo (2014) modification described how the condition and description of the competency evaluation needs pedagogy and cognitive competencies.



The purpose of this study is to provide an overview of pedagogical competency (PC) and cognitive competency (CC) participants SM3T PPG-UR.

Research contribution is as input for improving the implementation of PPG SM3T program forward and to determine the policy for accelerated development of the teaching profession in the province of Riau and feedback facing a paradigm in professional education of teachers at PPG SM3T program next year.

## 2. Research Methods

This descriptive study was conducted at the University of Riau SM3T PPG Program in April 2015 to September 2016. The research sample is a sample of the total population ie all the study sample consisted of 63 people with four (4) courses that are from 7 LPTK in Indonesia, consists of 34 people from UR, UNP (11), UPI Bandung (6), UNIMA-Manado (4 people), UNSYIAH (7) and 1 from UNMUL. Parameter study consisted of four aspects of pedagogy, and three cognitive aspects namely formative assessment of the exam, the local exam and the final exam, data collection instruments and the data refer to the instructions PPG-SM3T (Kemendikbud, 2015). Workshops divided into 6 cycles by half. To find out the pedagogical competence, competence cognitive PPG-SM3T participants performed seven aspects of evaluation are presented in Table-1.

The data collection is done in FKIP UR in April to December 2015. An analysis of the data was conducted from April to September 2016 at the University of Riau, mean score and the data is presented using tables and then discussed descriptive.

**Table-1.** Matriks relations aspects, assessment forms and methods of implementation of Activity Work Shop and Final Exam Value PPG-SM3T UR TA.2015 / 2016

No	Aspects Of Assessment	Form	Assessment Instruments	Method
<b>Pedagogical Aspects</b>				
1	Lesson plans (RPP)	Product	Portfolio	3KD/Cycle (6 Cycle)
2	Worksheets learner (LKPD)	Product	Portfolio	3KD/Cycle (6 Cycle)
3	Teaching materials (B.Ajar)	Product	Portfolio	3KD/Cycle (6 Cycle)
4	Assessment Instruments	Product	Portfolio	3KD/Cycle (6 Cycle)
<b>Cognitive Aspects</b>				
1	Formatif Test	Written test	Essay and objective	3KD/Cycle (6 Cycle)
2	NUTL	Written test	Essay and objective	Local Final Exam
3	NUTN	Written test	Essay and objective	Online Final Exam

Description: Form, instruments and methods of implementation refers Kemendikbud (2015).

## 3. Results and Discussion

### 3.1. Research Result

#### a. Pedagogical Competences

Pedagogical competence is the development of learning tools for 6 cycles through the workshop. Pedagogical competence development learning tools that include lesson plan (RPP), teaching materials.

Based on the analysis of data in Table 2, it is known that the mean score of Pedagogical knowledge development learning tools (lesson plan, teaching materials, worksheets learners and assessment instrument) participant for all four study program of 80.87 categorized Good. The lowest mean value of 75.40 (Enough) and a high of 83.56 (Good).

**Table 2.** Pedagogical Knowledge Development Learning Tool Workshop participants PPG SM3T Riau University 2015

No	STUDY PROGRAM	N	RPP	B.Ajar	LKPD	Inst.	Mean	Ctg
1	CHEMISTRY PROGRAM	18	75.51	74.72	74.75	76.62	75.40	C
2	BIOLOGY PROGRAM	17	83.76	83.53	81.44	85.01	83.44	B
3	PHYSIC PROGRAM	16	82.16	84.02	84.33	83.74	83.56	B
4	ECONOMY PROGRAM	11	81.27	82.06	81.82	79.25	81.10	B
<b>Mean</b>			80.68	81.08	80.59	81.16	80.87	<b>B</b>

Category (Ctg) : B = Good, C = Enough

Four programs of study participant showed that participants PPG Chemistry study program has an average value of the most low of 75.40 Enough categories, thus the participants of the workshop PPG SM3T of Chemistry study program there are not able development learning tools well, despite the passing score is 70. The low worksheets learners value associated with the ability of teachers in the choice of media and the use of ICT. According to George, J.M., & (B.Ajar), worksheets learners (LKPD) and assessment instrument for all study program (Chemistry, Biology, Physic, and Economy) of workshop participants PPG SM3T University of Riau in 2015 can be seen in table 2 below.

Glasgow, J.L. (2002) that the media-based learning environment that is innovative and factual sources and variations in learning can be in practice by teachers using the environment around the school.

Teacher competences in developing worksheets learners in line with the development of the lesson plan, and linked to the teacher's skill in selecting approaches and models to suit the material. According to Rian, V and Kamisah, O (2014) stated that the new approach in the workshop can make the learning process effective that students can be active participate and make a real concept that he understands it, while at the same time can enhance 21st century skills eg literacy digital, inventive thinking, effective communication, high productivity, and character.

Of the four programs of study participant, Cognitive competency content knowledge field of study of the National Exam results showed that only participants PPG Economics programs which have achieved good category with a mean value is 82.18. While the three other study programs, study program Chemistry, Biology and Physics have a low average value is still Enough category. Thus the workshop participants PPG SM3T of courses Chemistry, Biology and Physics are still there who do not have the cognitive ability subject material content through a National Exam well, although the exam passing score of knowledge through local tests is 60. This is proven by the re-examination PPG SM3T for participants who did not achieve a score of 60.

**Table 3.** Mean Score Cognitive Competence Knowledge Material Content of Study Program Workshop participants PPG SM3T Riau University 2015

No	STUDY PROGRAM	N	Formatif	UTL	UTN	Mean	Ctg
1	CHEMISTRY PROGRAM	18	80.21	80.78	68.89	76.63	B
2	BIOLOGY PROGRAM	17	75.03	78.47	71.86	75.12	C
3	PHYSIC PROGRAM	16	70.25	74.97	75.78	73.67	C
4	ECONOMY PROGRAM	11	82.51	76.77	82.18	80.49	B
<b>Mean</b>			77.00	77.75	74.68	76.48	<b>B</b>

Category (Ctg) : B = Good, C = Enough

At the main national exam, participants are 15 people who graduated from Biology Education, 12 participants of Chemical Education and 4 participants of Physical Education, while participants from all Economic education pass (11). Having held first UTN with 20 participants, 10 participants are passed who 2 participants from Biology Education, 6 participants of Chemical Education and 2 participants of Physical Education. On second UTN, all participants from physic Education passed.

Unpassed participants facilitated by lecture on their study program. Furthermore, cognitive competencies covering the formative tests, local and Exam Written test write for all four courses of workshop participants PPG SM3T University of Riau in 2015 can be seen in Table 3.

Based on the analysis of data in Table 3, it is known that the mean score of cognitive competence knowledge material content of study program workshop is 76.48 categorized Good. The lowest mean score of 73.67 (Enough) and a high of 80.49 (Good). All of study program participant showed the lowest mean score is Physics study program at 73.67 (Enough) and Biology study program at 75.12 Enough category.

It can be seen from the origin of the institution. PPG participants from several universities in Indonesia. Thus, the origin of educational background affect their cognitive ability difference, although the requirement to be able to join the participants SM3T with GPA > 3.00. In addition, participants PPG a year earlier following the activities in disadvantaged areas, they do not apply the science-owned, because they was teach in primary school and little chance to teach in junior high school. While at the workshop, does not specifically related to the material study program, curriculum rather the ability to construct a learning tools. For participants with strong basic capability it will be easy to complete the task well, while those who do not have the strong cognitive ability to the would have difficulty in developing professional capability of study program.

Based on the results of the assessment of local exam PPG SM3T participants, all of participants passed with a value > 70. Local exam is given the opportunity to attend two times if it does not pass the first test. In the first test was not all participants pass because there are seven (7) members of the Physical study program which did not pass. National exam were given the opportunity to attend three times, if it does not pass on the main UTN passing score is 60. In the main UTN SM3T PPG participants who pass only 42 people out of 62 participants. Participants who pass are 15 people of Biology Education, 12 participants of Chemical Education and 4 participants of Physical Education, while participants from all Economic Education pass (11). Having held the first UTN 20 people pass as many as 10 people are 2 participants of Biology, 6 participants of Education Chemistry and of Physics Education passed only 2 participants. Having held the UTN 2, all participants (10 people) of the Physical study program.

Based on the analysis of data in Table 3, it is known that the mean score of formative tests cognitive competencies of 78.94 categorized Good. The lowest mean value of 74.92 (Enough) and a high of 88.47 (Very Good). The value of the final local exam from LPTK obtained a mean of 78.44 categorized Good. The mean score low of 71.00 and a high of categories 85.50. The mean score of national exam was 71.86 categorized Enough. The average value low of 60.00 and a high of 93.33. Of the three cognitive values obtained range of values as high as on the value NUTN, with a standard deviation of 8.85. This allows encountered lowest value, in order to get as much as 2 participants who do not pass the national examination phase 1. According to Edward T. Cokely and Colleen M. Kelley (2009) linkages risk of a major decision with cognitive ability and control to reflect the dynamics of metacognitive knowledge and elaboration heuristic in the search process. The model of cognitive control and the effects of process models that are at risk in the decisions that are discussed.

Teachers are professionals who have the expertise, responsibility, and a sense of colleague supported by strong professional ethics, for it must have sufficient competence and qualifications include competence intellectual, social, spiritual, personal and moral (Mohamad Surya, 2003). According Kamisah, O and Rian, V (2013) that teachers need a variety of teaching professionals who are skilled in teaching and learning approaches as oriented himself in using ICT in teaching. He stressed that ICT based learning according to the learning activities which require less mental processes as jobs done more.

According to the Law of the Republic of Indonesia Number 14 Year 2005, the teachers are professional educators with the primary task of educating, teaching, guiding, directing, train, assess, and evaluate students on early childhood education, formal education, primary education and secondary education, it is related to cognitive competencies of teachers. However, through workshops and training can enrich new relevant information from teachers and knowledge related to the subject. Later, this strategy will improve the quality of education. In line with the research Caldwell and Spink (2008) and Musfah (2010), which states that the self-learning, group discussions and workshops can enhance the skills of teachers.

It is found that there are some significant strategies to improve the quality of teaching learning strategies (TLS) practices, such as teacher professional development of self-learning, workshops, further research, and discussion groups. Meanwhile, the professional development of teachers to increase motivation, commitment, and ability (Syahrudin et al, 2013). Furthermore, the quality of teaching in touch with teachers Pedagogical Content Knowledge (PCK), which it includes knowledge of content, effective learning, and knowledge of how to teach the material to students (Meiers, 2007). The impact of PCK can be applied to learning daily life, for example, maintain student motivation, continuity between the material and moral, and other forms of student development. Further confirmed that the competencies required in their entirety by a teacher includes pedagogical competence, social competence and professional competencies acquired through professional education (Kemendikbud, 2015).

#### 4. Conclusion

Based on the research results, it is concluded that four study programs show pedagogy and cognitive abilities that are relatively similar. The highest pedagogical ability acquired by Physics while Chemistry is lowest. The highest ability of the cognitive competency is acquired by Economic and Physics is lowest. Workshops can enrich teachers with new relevant information and knowledge through independent learning, and group-discussions. Workshops are also required to improve teachers' capabilities which facilitated by professional instructor in pedagogical and cognitive. Workshop can improve pedagogy and cognitive competency of PPG participants of SM3T UR.

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