Man In India, 97 (11) : 373-380

THE STUDY OF PEDAGOGICAL COMPETENCY AND COGNITIVE THROUGH WORKSHOP FOR PPG SM3T PARTICIPANT AT RIAU UNIVERSITY

Yustina* and Wansyafii**

Abstract: This study aim is to provide an overview of Pedagogy and Cognitive competency of SM3T PPG participants at Riau University through the workshop. This descriptive study was conducted in April 2015 until September 2016. Samples are 63 prospective teachers of PPG- SM3T at Riau University from 7 LPTK (teachers education institution) in Indonesia. The parameters of study included seven aspects: knowledge of pedagogy (lesson plans, worksheets learners, teaching materials, assessment instruments); cognitive (exam/test formative, local exam and national exam). Data is collected by questionnaires, performance assessment, observation sheets and portfolio. Data is analyzed to get mean score, percentage is shown in tables, and then analyzed descriptively. The research results show that four pedagogy and cognitive abilities that are relatively similar. The highest pedagogical ability is acquired by Physics Study Program and the lowest is Chemistry Study Program. Highest knowledge ability is acquired by Economic Study Program and lowest is Physics Study Program. Workshops can enriches teachers with relevant new information and knowledge through independent learning, group-discussions, and workshops are required to improve teachers' capabilities facilitated by professional instructor in pedagogical and cognitive. Workshop can improve pedagogy and cognitive competence of PPG SM3T participants at Riau University.

Keywords: Pedagogical, cognitive competencies, participants PPG-SM3T.

INTRODUCTION

Education is any situation affects the growth of individual. Higher quality of education will improve quality of human resources (Walder et. al., 2017; Syrmpass et. al., 2017). One policy of Indonesia Education Ministry in order to accelerate the education development is the Professional Teacher Education Program (PPG-SM3T) (Kemendikbud, 2015).

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

SM3T-UR program requires proper management. It can be viewed from the period of his managerial. Managerial requires the evaluation period as one chain

* Corresponding author, Biology Education Study Program Universitas Riau, Faculty of Education, Pekanbaru, Indonesia, Jln. Binawidya Km 12,5 Simpang Baru Panam Pekanbaru. (28293). *Email: hj_yustin@yahoo.com*

** Corresponding author, Biology Education Study Program Universitas Riau, Faculty of Education, Pekanbaru, Indonesia, Jln. Binawidya Km 12,5 Simpang Baru Panam Pekanbaru. (28293). *Email: wansya_ws@yahoo.com*

(Megan et. al., 2017). Program evaluation 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 can be used to design the process in accordance with desired product (McNew-Birren et. al., 2017). Based on idea modification of Ridlo (2014), it is described how the condition of competency evaluation needs pedagogy and cognitive competencies.

This study purpose is to provide an overview of pedagogical and cognitive of SM3T PPG-UR participants. Research contribution is as input to improve the implementation of PPG SM3T program in future and to determine the policy to accelerate development of teaching profession in Riau province and feedback to face a paradigm in professional education of teachers at PPG SM3T program for next year.

RESEARCH METHODS

This descriptive study was conducted in Riau University, especially in SM3T PPG Program from April 2015 to September 2016. The samples are 63 people with four (4) courses from seven LPTK (teachers education institution) in Indonesia, consists of Riau University (34 people), State University of Padang (11 people), Indonesia Education University Bandung (6 people), State University of Manado (4 people), Syiah Kuala University (7 people) and 1 people from Mulawarman University. Study parameters are four aspects of pedagogy, and three aspects of cognitive namely formative assessment of exam, local exam and final exam. Analysis and data collection instruments refer to instructions of PPG-SM3T (Kemendikbud, 2015). Workshops are divided into 6 cycles by half. To find out the pedagogical competence, content competence (cognitive), the PPG-SM3T participants answer seven aspects of evaluation as presented in Table-1.

The data collection was done in FKIP of Riau University from April to December 2015. Analysis data was conducted from April to September 2016 at Riau University, i.e., the percentage and average value, minimum and maximum values and data is presented by tables and then discussed descriptively.

TABLE 1: MATRIX RELATIONS ASPECTS, ASSESSMENT FORMS AND IMPLEMENTATION METHODS OF ACTIVITY WORK SHOP AND FINAL EXAM VALUE PPG-SM3T UR TA. 2015/2016

No	*Aspects of Assessment*	*Form*	*Assessment Instruments*	*Method*
		Pedagogical Aspects		
1	RPP	Product	Portfolio	3KD/Cycle (6 Cycle)
2	LKPD	Product	Portfolio	3KD/Cycle (6 Cycle)
3	Teaching materials	Product	Portfolio	3KD/Cycle (6 Cycle)
4	Assessment Instruments	Product	Portfolio	3KD/Cycle (6 Cycle)

No	*Aspects of Assessment*	*Form*	*Assessment Instruments*	*Method*
		Cognitive Aspects		
1	Formative 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: Based Competency (KD), form, instruments and methods of implementation refers Kemendikbud (2015).

RESEARCH RESULT AND DISCUSSION

Pedagogical competence is learning tools development, such as the development of learning development plan (RPP), work sheet learners (LKPD) for 6 cycles through the workshop, as presented in Table 2. Pedagogical competence of learning tools development include design development learning program (RPP), teaching materials, worksheets learners (LKPD) and instrument ratings for all four workshop of PPG SM3T participants at Riau University in 2015, as shown in Table 2 below.

TABLE 2: PEDAGOGICAL KNOWLEDGE DEVELOPMENT LEARNING TOOL WORKSHOP PARTICIPANTS PPG SM3T RIAU UNIVERSITY 2015

No	*STUDY PROGRAM*	*N*	*RPP*	*Teaching Material*	*LKPD*	*Inst.*	*Average*	*Desc.*
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
	Mean Score		80.68	81.08	80.59	81.16	80.87	B

Description: B = Good, C = Enough

Table 2 shows that average value of Pedagogical Knowledge Development Learning Tool (RPP, Instructional Materials, LKPD and Instrument Ratings) for all four courses is 80.87 and categorized Good. The lowest mean value is 75.40 (Enough) and a highest is 83.56 (Good).

From four programs of study participant, Knowledge Learning Pedagogy Development Kit (RPP, Instructional Materials, LKPD and Instrument Rating), of PPG Chemistry study program has lowest average value of 75.40, Enough categories. Therefore, the workshop participants of PPG SM3T of Chemistry study program cannot develops Learning Tool (RPP, Instructional Materials, LKPD and Instrument Ratings) rightly, despite the passing score is 70. The low value of LKPD software development relates to teachers ability to choice media and ICT usage.

According to George and Glasgow (2002), media-based learning environment that innovative and factual with many sources and variations in learning can be in practice by teachers through environment around the school.

Teacher competences to develop LKPD is consistent with RPP development, and linked to teacher's skill to select approaches and models that suitable with the material. Rian and Kamisah (2014) said that new approach in PBL through BIOMIND can make the learning process effective where students can participate actively and make a real concept that he understands, while at same time can enhance 21st century skills, eg digital literacy, inventive thinking, effective communication, high productivity and character.

From four programs of study participants, Cognitive competency of knowledge content field for National Written test show that only PPG economics programs participants achieved good category with a mean value of 82.18. While the three other study programs (Chemistry, Biology and Physics) have a low average value but still considered enough. Therefore, the workshop participants of PPG SM3T for Chemistry, Biology and Physics still do not have the good cognitive ability in subject material content through a national board exam, although the exam passing score for the knowledge through local exam is 60. This is proven by re-examination for PPG SM3T participants who did not achieve 60 score.

At main national exam, participants are 15 people who graduated from Biology Education, 12 participants from Chemical Education and 4 participants from Physical Education. Participants from all economic education (11) pass the exam. First National Written Exam to 20 participants get 10 participants pass the exam, 2 participants from Biology Education, 6 participants from Chemical Education and 2 participants from Physical Education. On second National Written Exam, all participants from physic Education passed. Unpassed participants are facilitated by lecture on their study program. Furthermore, cognitive competencies covering the formative tests, local and Exam Written test write for all four workshop participants of PPG SM3T at Riau University in 2015 can be seen in Table 3 below.

TABLE 3: MATERIAL CONTENT COMPETENCE FOR WORKSHOP PARTICIPANTS OF PPG SM3T IN RIAU UNIVERSITY 2015

No	*STUDY PROGRAM*	*N*	*Formative*	*UTL*	*UTN*	*Average*	*Desc.*
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
	Average		77.00	77.75	74.68	76.48	B

Description: B = Good, C = Enough

Table 3 shows that average value of Cognitive Sciences Material of Competence Content Field for all four courses participants is 76.48, categorized Good. The lowest mean value is 73.67 (Enough) and the highest is 80.49 (Good). From four programs of study participant of Field Study Competence for science content, the lowest average value is 73.67 for Physics study program with category Fair and Biology is 75.12 with enough categories.

It can be seen from the origin of institution, PPG participants come from several universities in Indonesia. Educational background origin affect their cognitive ability, although the requirement to become SM3T participants is GPA > 3.00. In addition, PPG participants from previous year follow the activities in disadvantaged areas. They do not apply their science to teach in primary school and little chance to teach in junior high school. Workshop does not specifically relate to subject material and curriculum. It relates to ability to construct a learning tool. It still relates material but the early cognitive capabilities are different. Students with strong basic capability will complete easily the task, while those who do not have the maximum cognitive ability would have difficulty in developing professional capability of study program.

Assessment of local written test for PPG SM3T participants shows that all participants passed with a value > 70. Local written test has opportunity to attend two times if it does not pass the first test. All participants does not pass in first test, because there are seven members of Physical Education did not pass. National board exam were given the opportunity to attend three times if does not pass on main National Written Exam at score 60. National Written Exam of SM3T PPG participants have 42 people pass from all 62 participants. Participants who pass are Biology (15); chemical (12) and Physical (4), while participants from all economic education are pass (11). Having held the first National Written Exam for 20 people, there are 10 people pass from Biology (2), Chemistry (6) and Physics (6). National Written Exam 2 is held to all participants (10 people) of Physical Education graduation.

Table 3 shows that average value of formative tests for cognitive competencies is 78.94 with Good category. The lowest mean value is 74.92 (Enough) and highest is 88.47 (Very Good). The score of local final written test LPTK has a mean of 78.44 with Good category. The lowest average value is 71.00 and highest is 85.50. The average value of national written test is 71.86 with Enough category. The lowest average value is 60.00 and highest is 93.33. Three cognitive values are obtained range values on National Written Exam, with a standard deviation of 8.85. This allows lowest value from 2 participants who do not pass the national examination phase 1. According to Edward and Kelley (2009), the linkages of a major decision risk with cognitive ability and control can reflect the dynamics of metacognitive knowledge and heuristic elaboration in search process.

Professionals teachers have expertise, responsibility and a sense of togetherness supported by strong professional ethics, they must have sufficient competence and qualifications as competence in intellectual, social, spiritual, personal and moral (Ryan et. al., 2017; Surya, 2003). According Kamisah and Vebrianto (2013) and McNew-Birren et. al., (2017), teachers need a various teaching mastery in order skilled in teaching and learning approaches to integrate him to use ICT in teaching. He stressed that ICT based learning based on learning activities require less mental processes as done repeatly.

According to Law of Republic of Indonesia Number 14 Year 2005, teachers are professional educators with primary task of educating, teaching, guiding, directing, training, assessing, and evaluating students on early childhood education, formal education, primary education and secondary education. These relate to cognitive competencies of teachers. Workshops and training can enrich new relevant information and knowledge related to subject. Later, this strategy will improve the quality of education. It is consistent with Caldwell and Spink (2008), which states that self-learning, group discussions and workshops can enhance the teacher's skills.

There are some significant strategies to improve the quality of Teaching Learning Strategies (SBM) practices, such as teacher professional development of self-learning, workshops, further research, and discussion groups. Professional development of teachers can increase motivation, commitment, and ability (Syahruddin et. al., 2013). Furthermore, teaching quality of teachers includes knowledge of content, effective learning, and knowledge on how to teach the material to students (Meiers, 2007). The impact of PCK are the learning can be applied to everyday life, for example, maintain student motivation, continuity between the material and moral, and other forms of student development. Furthermore, it is confirmed that required competencies by a teacher are pedagogical, social and professional competencies. It can be acquired through professional education (Kemendikbud, 2015).

CONCLUSION

Research results four studies show that pedagogy and cognitive abilities are relatively similar. The highest pedagogical ability is shown by Physics Study Program and the lowest by Chemistry Study Program. Highest knowledge ability is shown by Economic Study Program and the lowest by Physics Study Program. Workshops can enrich teachers with relevant new information and knowledge through independent learning, group-discussions, and workshops. They are required to improve teachers' capabilities which facilitated by professional instructors in pedagogical and cognitive. Workshop can improve pedagogy and cognitive competence of PPG SM3T participants at Riau University.

References

Caldwell, B. and J. Spinks. (2008). *Raising the Stakes: from Improvement to Transformation in Reform of Schools*, Routledge: London.

Edward T. Cokely and Colleen M. Kelley. (2009). Cognitive abilities and superior decision making under risk: A protocol analysis and process model evaluation. *Judgment and Decision Making*; 4 (1) : 20–33.

George, J.M., & Glasgow, J.L. (2002) Culturing environmental education in Caribbean. *Canadian Journal of Environmental Education*; 7 (1): 117-132.

Kamisah Osman, Vebrianto, R. (2013). Fostering Science Process Skills And Improving Achievement Through The Use Of Multiple Media. *Journal of Baltic Science Education*;12 (2):191-204.

Kementrian Pendidikan dan kebudayaan (Kemendikbud). 2015. *Panduan Pendidikan Profesi Guru (PPG-SM3T)*. Jakarta

McNew-Birren, Jill, Leigh A. van den Kieboom. (2017). Exploring the development of core teaching practices in the context of inquiry-based science instruction: An interpretive case study. *Teaching and Teacher Education*, Volume 66, August, Pages 74-87

McNew-Birren, Jill, Leigh A. van den Kieboom. (2017). Teachers' self-directed learning and teaching experience: What, how, and why teachers want to learn. *Teaching and Teacher Education*, Volume 66, August, Pages 171-183

Megan Guise, Mireille Habib, Krystal Thiessen, Amy Robbins. (2017). Continuum of co-teaching implementation: Moving from traditional student teaching to co-teaching. *Teaching and Teacher Education*, Volume 66, August, Pages 370-382.

Meiers, M. (2007). Teacher Professional Learning, Teaching Practice and Student Learning Outcomes: Important Issues. In T. Townsend & R. Bates (Eds.), *Handbook Of Teacher Education: Globalization, Standards and Professionalism in Times of Change* (pp. 409-414). Netherlands: Springer.

Ridlo.S. (2014). Pengembangan karakter konservasi untuk mahasiswa program Pendidikan Profesi Guru Sarjana Mengajar di daerah Terluar, Terdepan, dan Tertinggal (PPG-SM3T). LIK. 43 (2). Diambil pada tanggal 22 September 2015 *http://journal.unnes.ac.id/nju/index.php/LIK*.

Ryan, Shannon V., Nathaniel P. von der Embse, Laura L. Pendergast, Elina Saeki, Natasha Segool, Shelby Schwing. (2017). Leaving the teaching profession: The role of teacher stress and educational accountability policies on turnover intent. *Teaching and Teacher Education*, Volume 66, August, Pages 1-11.

Stufflebeam, D.L. March 17, (2007). *CIPP evaluation model checklist*: *A tool for applying the fifth installment of CIPP model to assess longterm enterprises*. 2nd ed. [VersiElektronik]. Evaluation Checklists Project.Diambil pada tanggal 22 Agustus 2010 dari http://www.wmich.edu/evalctr/checklis.

Surya, M. (2003). *Percikan Perjuangan Guru*. CV Aneka. Semarang.

Syahruddin, Andi Ernawati, Muh. Nasir Ede. (2013). Teachers' Pedagogical Competence in School-Based Management. *Journal of Education and* Learning; 7 (4): 213-218.

Syrmpas, Ioannis, Nikolaos Digelidis, Anthony Watt, Mark Vicars. (2017). Physical education teachers' experiences and beliefs of production and reproduction teaching approaches. Teaching and Teacher Education, Volume 66, August, Pages 184-194.

Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 tentang Guru dan Dosen.

Vebrianto R, Kamisah Osman. (2014). BIOMIND: Strategic science learning approach towards preparing 21st century Indonesians. *Journal Of Society For Development Of Teaching And Business Processes In New Net Environment In B&H*; 9 (2): 361-368.

Walder, Anne Mai. (2017). Pedagogical Innovation in Canadian higher education: Professors' perspectives on its effects on teaching and learning. *Studies in Educational Evaluation*, Volume 54, September, Pages 71-82.