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The Technique of "Plan Do Check and Act" to Improve Trainee Teachers' Skills

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Abstract

The purpose of this research was to discover the contribution of the use of PDCA (*Plan Do Check and Act*) on the enhancement in the score of the teaching skills as the measurement of a professional teacher. The study was also undertaken to investigate on the dominant teaching skills that were used in each of the teaching steps. The research sample consisted of 12 teacher candidates who participated in the lecture of Micro Teaching at the Faculty of Teacher Training and Education in the round semester in 2012. The 12 teacher trainees were divided into four groups. The application of the PDCA circle was started from the level of the Preparation as the form of Plan, the Implementation level as Do, the level of monitoring process by the group members and teacher supervisor as the form of Check, and the level of small group reflections as the form of Act. The study employed mixed approach design. The method of analysis highly depended on the intensity of the reflections which was in line with the findings from FGD which analyzed the data based on the quality check points. The findings showed that although the application of the PDCA circle in the lecture of Micro Teaching gives the contribution of about 2.54 at the scale of 1 to 4; however, the contributions of the PDCA system to each of the groups indicated different score achievements. The reflection discussion of each group contributed to the enhancement of the teaching skills in the teachers. It was also found that every teaching step was dominated by different teaching skills.

Keywords: education, micro teaching, PDCA cycle, teacher candidates

1. Introduction

The success of preparing the teacher candidates who possess the specified qualifications cannot be achieved instantly. This factor has prompted the conduction of many research studies especially in the developing countries, which have been organized for the improvement of teacher's quality at the elementary and secondary level. The research in Turkey, for example, investigated the attitude of teacher candidates (Cengiz Şimşek, 2012), whereas the research in Namibia Africa criticized on the impacts of the teacher training program (Abdul Ghani Bin Abdullah, 2009).

In Indonesia, the micro teaching course at the higher education level such as at the Faculty of Teacher Training and Education plays its strategic roles in producing professional and quality teacher candidates. The strategic point can be reviewed at least based on three reasons. The first reason, which is the micro teaching (simplified as M.T) was ah subject that deals with the activity of the practical labour more than other pedagogical courses, namely the Lesson Planning and the Learning Strategy. The second reason is that the M.T course prepares the teacher trainees before they enter the school where they will perform their practical teaching, called the Field Experience Program (Daeng & Yustini, 2004; MohUzer Usman, 2006). The third reason is that the M.T course is the enrichment of the pedagogical subjects since it is learnt at the final part of the range of the pedagogical subjects, causing the M.T course to be considered as the quality control of the output produced at the Faculty of Teacher Training and Education.

With the position of the three strategic points, the M.T course challenges its instructors to be able to present the materials (theory and practice) so that the quality can be achieved monotonically and consistently. However, they have not possessed the standard rules which can be used as the guidelines to ensure the guaranteed maintenance of the quality. Consequently, every of the M.T course instructors possesses their own competence, and even generate their own competence. This situation is feared to cause the instructors to be trapped in the standards

which neglect the criteria of the quality regularity and constancy. The M.T course places strategic positions, yet the M.T course itself in terms of its operational level has not possessed the directional and measureable standards.

The elaboration of the above paragraph implies that there is a weakness in the maintenance of the M.T course, urging the execution of research regarding the subject and the implementation of the steps of improving the course. The improvement is hoped to strengthen the study program and faculty in the framework of preparing the candidates of professional teachers.

In the aspect of the maintenance of the quality (in the framework of preparing the candidates of professional teachers), the situation and condition as described above indicate the necessity of the organization of good quality-enhancement programs at the faculty or the study program level. In the long term, the situation and condition are feared to lead to the neglect of the quality guarantee.

The argument on the management of the education quality cannot be separated from its connection with a popular concept which contributes to the efforts of enhancing the quality of educational service. The concept is known as the 'Plan Do Check and Act" circle which is simplified into the acronym PDCA.

The PDCA circle is admitted to early emerge from the manufacturing discipline which was initiated by Shewhart and then developed by Deming in 1950 as the continuous quality improvement method (Sallis, 2005; Dahlgaard, Kristensen, & Kanji, 2007).

Furthermore, the PDCA concept has been applied in the leadership discipline in an effort to establish, based on TQM or Total Quality Improvement (Dahlgaard, Kristensen, & Kanji, 2007). The employment of the concept has also been done in the discipline of educational service, especially in improving the process of conducting the M.T course, by Kilic (2010). His development of the method of the M.T course has produced the LCMT Model - *Learner-Centered Micro Teaching*. This model has three phases: the *Thinking process*, *Activities*, and *Main stages*. In the third phase, Kilic applied the PDCA system during the teacher candidate's practical teaching.

Considering the wide application of the PDCA concept and understanding that every setting has its own uniqueness/special characteristics, this study was directed to reveal the issues on how the PDCA concept contributes to the effort of preparing of professional teachers through the micro teaching course at the Faculty of Teacher Training and Education of Riau University.

2. Literature Review

2.1 The Concept of the Learning of Micro Teaching

Studies regarding micro teaching (M.T) were pioneered several decades ago, in 1963, by the Standford University. Micro teaching at that time was the means of the quality improvement of the pre-service teachers, especially in relation to teaching skills (Kenneth Jerich, 1987; Ahmad Rohani, 2004).

The meaning of the term M.T then was restricted to ""*… a scaled down teaching \designed to develop new skills and refine a new ones"* which refers to the development of the new teaching skills (for the pre-service teachers). The scaled down teaching is regarded as consisting of the *micro* characteristic, which means small, limited, and narrow; and *teaching*-which means educating or teaching (Ahmad Rohani, 2004).

Therefore, literally, *micro* teaching refers to an activity of teaching a class that is made small or moderate, containing about 5-6 students, conducted within a limited period which is approximately 10-15 minutes, using the teaching materials that comprise 1-2 items of moderate sub-arguments, and employing the teaching skill components focusing on only several teaching skills. The teaching activity is repeated and recorded/filmed, producing a recording that will be analyzed later.

The elaboration on the activities in the M.T course is not that simple, since M.T does only involve the *teach-re-teach* step during the practical teaching until the teacher candidates achieve the teaching skills at a certain level. The accomplishment of the objectives of the M.T course by developing the fundamental competence of teaching should be viewed as the circle of "teach and re-teach". A teaching step which associates with the next teaching step should be started with preparing the learning tools, implementing the instruction, observing-recording, reviewing the recording, re-organizing the teaching tools, re-observing and re-recording, determining the achieved progress, and analyzing the difference in the products obtained (Kilic, 2010).

There are eight teaching skills that need to be mastered by the pre-service teachers, encompassing the skills of (1) questioning, (2) providing reinforcement, (3) creating variations, (4) explaining, (5) beginning and closing the lesson, (6) guiding small group discussions, (7) managing the classroom, and (8) teaching the small groups and the individual students. These teaching skills must be effective and mastered in an integrated manner. To achieve

this, a systematic teaching practice conducted through the M.T course is required (Mulyasa, 2005).

2.2 PDCA: The Continuous Quality Improvement Cycle

Sallis (2005) stated that quality is contained in the product or service itself. Quality, according to Sallis, can be in the absolute form which is uncontested, as well as in the relative form. Firstly, a product or service can be regarded as having quality when it conforms to the standards or specifications set, fulfils the expectation or purpose, and meets the early specification. This is called the "*quality in fact*" which generally stands in the view of the producer, goods maker, or service provider. Secondly, quality is specified when it is appropriate with the customers' needs. This type of quality is defined as something that is able to satisfy the customers' desire or better known as the "*quality in perception*". The quality in perception stands in the interests of the consumers or buyers. Based on the quality limits (Sallis, 2005), it is believed that the concept of quality is closely-related to the concept of standards, which can be applied to the materials products or services.

Based on Sallis' opinions, it can be said that the quality limits of the educational service can be achieved after it has met the standards specified. However, we are concerned with whose standards? The educational service has its own primary uniqueness, which is the involvement of the customers that takes place only when the service is provided. Thus, the educational standards cannot escape from the involvement of customers. In the higher education context, the pre-service teachers (customers) indirectly specify the standards.

The quality limits also apply to the M.T course. Hence, the M.T course can be considered as a quality subject if the implementation of the lectures is based on the standards which provide the guidance/reference and fulfils the customers' requirements as stated in the objectives of the M.T course.

The connection between standards and quality in its implementation can be used in various ways. One the methods tested was through Deming's cycle model which is known as the Deming wheel or PDCA.

The abbreviation PDCA stands for the verbs **P**lan (planning), **D**o (implementing), **C**heck (reviewing), **A**ct (taking further actions). The abbreviation PDCA was used in this study due to its popularity compared to its full translation.

The PDCA cycle comprises the four-step work patterns which are useful to mend a process, including the problem analyzing process which is generally employed in the management of quality (HCI, 2010). Based on its principles, the PDCA cycle according to Masaaki (1991), is a process of achieving the specified standards, revising the standards, and then replacing the specifications with the new quality standards that are better (Sallis, 2005). The PDCA cycle is described in Figure 1.

Figure 1. PDCA cycle

Correspondingly, Killic (2010) expounded on the stages of PDCA as the third part of the LCMT Model. The following is the explanation of the implementation of PDCA components in the M.T course:

P *Plan* Teacher candidates prepare the lesson, including the materials to be taught, media to be presented, and actions and attitude to be shown during the instruction. All these are included in the daily lesson plans.

D *Do* Implementing the activities that are previously planned. In this context, the pre-service teachers have understood the teaching purposes and the steps of implementing the instruction correctly.

C *Check* During the Do stage, observation is made by two parties which consist of one of the pre-service

teacher's group members and his/her instructor of the M.T subject. Although the observation forms used are the same, the technique of filling out the forms is different. The group member filled out the observation form with narrative data that produces qualitative information, while the instructor filled out the observation form by stating down the achievement of the teaching skills in forms of numeric scores, which produces the qualitative information. These two types of data contain the quality issues which comprises the aspects of the teacher candidate's strengths and weaknesses.

A *Act* Involves the discussion between three parties, which are the teacher candidate, his/her group members, and lecturer supervisor. The discussion produces the new initiative and target to improve the quality aspect. It also produces the quantitative and qualitative records of the teacher candidate's progress.

3. Purpose of the Research

The purpose of this research was to find out the contribution of the use of PDCA to the enhancement of the score of the teaching skills as the measurement of a professional teacher. The study was also undertaken to investigate the dominant teaching skills that were used in each of the teaching steps.

4. Methodology

This study employed the qualitative approach and applied the case study as the research strategy with the explorative method. As a research strategy, the case study is used in various situations to sustain the knowledge regarding individuals, groups, organizations, society, politics, and many other phenomena that are related to those particular situations (Yin, 2003).

This study was about the application of PDCA concept in the micro teaching (M.T) course. The teacher trainees who are the teacher candidates enrolling in the M.T course functioned as the research respondents, which consisted of 12 persons in total. Research data comprised of two classifications. The first classification contained the qualitative data gained from each of the group members. The second one consisted of the quantitative data obtained from the lecturer's annotation. Both of the data were gained using the instrument of the observation form.

This research involved 4 major stages. The first stage was preparation. Before preparing the lesson, teacher searched for information regarding the syllabus progress, media, and teaching method. At this stage, the observation form was also prepared by the lecturer supervisor. The second stage involved the teacher candidate's implementation of activities according to the lesson plan. In this step, filming or recording were done. The third stage required the teacher candidate, supervisor lecturer, and the team members to review the recording. The fourth stage revolved around the focused discussion activities which are participated by all of the teacher candidates, the lecturer supervisors, as well as the invited lecturers of education.

5. Findings and Discussions

The quantitative data as illustrated in Table 1 was determined based on the teacher candidate's scores in the teaching practice activities in two observations, which is stated in the columns OBV-1 and OBV-2. The following Tables, from Table 1 to Table 4 show the scores obtained by Group A, B, C, and D.

Table 1. Scores of the teaching competence based on PDCA-group: A

Stages	Teaching Steps	OBV-1	OBV-2	Increment	Average
1	Opening				
	1. Conditioning the students	5.5	9	3.5	
	2. Motivating	5.5	7.5	2	
2	Lesson Content				
	1. Mastery of materials	5	8.5	3.5	
	2. Media appropriateness	6.5	10	3.5	
	3. Method appropriateness	4.5	8.5	4	
3	closure				
	1. Summarizing materials	5	9	4	
	2. Follow up activities	4	7	3	
	TOTAL	36	59.5	23.5	3.36

Table 1 indicates that there was an increment in teacher trainees' teaching competence with the average value of 3.36. The enhancement of the teacher trainees' teaching competence was at good level. This finding shows that the teacher trainees in Group A implemented the teaching method that conforms to PDCA. The biggest improvement is in the aspect of the suitability of methods and the summarization of materials.

Table 2. Scores of the teaching competence based on PDCA-group: B

Stages	Teaching Steps	OBV-1	OBV-2	Increment	Average
1	Opening				
	1. Conditioning the students	4.5	9.5	5	
	2. Motivating	4.5	7.5	3	
2	Lesson content				
	1.Mastery of materials	6.5	9	2.5	
	2. Media Appropriateness	5.5	8	2.5	
	3. method Appropriateness	5	8	3	
3	Closure				
	1. Summarizing materials	6	8.5	2.5	
	2. Follow-up activities	6	9	3	
	TOTAL	38	59.5	21.5	3.07

Table three denotes that the teacher trainees in Group B experienced an improvement in their teaching competence which is at good level, with the average value of 3.07. This finding shows that during the instructional implementation based on PDCA, the teacher trainees carried out the steps that were in accordance with every step of the processes taking place. The highest enhancement observed is in terms of accommodating the students.

Table 3. Scores of the teaching competence based on PDCA-group: C

Stages	Teaching Steps	OBV-1	OBV-2	Increment	Average
1	Opening				
	1. Conditioning the students	7.5	9.5	2	
	2. Motivating	5	7.5	2.5	
2	Lesson Content				
	1. Mastery of Materials	5.5	8.5	3	
	2. Media appropriateness	6.5	85	2	
	3. Method appropriateness	6	8	2	
3	Closure				
	1. Summarizing materials	6.5	8.5	2	
	2. Follow-up activities	6.5	9	2.5	
	TOTAL	43.5	59.5	16	2.29

Table 3 indicates the increment in the teacher trainees' teaching competence which was at the satisfactory level, with the average of 2.29. The highest improvement was witnessed in the aspect of the mastery of the learning materials.

Table 4. Scores of the teaching competence based on PDCA-group: D

Stages	Teaching steps	OBV-1	OBV-2	KENAIKAN	Average
1	Opening				
	1.Conditioning the students	4.5	6.5	2	
	2. Motivating	4	6	2	
2	Lesson Content				
	1. Mastery of materials	5	6.5	1.5	
	2.Media appropriateness	4.5	6	1.5	
	3.Method appropriateness	5	6	1	
3	Closure				
	1.Summarizing materials	5	6	1	
	2. Follow-up activities	5.5	6.5	1	
	TOTAL	33.5	43.5	10	1.43

Table 4 presents the increment in the teacher trainees' teaching competence which was at the low level, with the average of 1.43, indicating that the candidates have not managed to completely master the PDCA-based teaching. The highest increment was seen in the aspect of conditioning and motivating the students.

According to the research findings based on the quantitative data (from Table 1 to Table 4), it is observed that all of the groups achieved an increment in scores of their teaching practice, with an increase of scores of 2554. The rise in scores also occurred in each of the teaching steps (the opening, lesson content, and closure stages). The increment in the scores directly implies that there was an influence of the application of the PDCA cycle on the scores of the teaching skills in the M.T course. Nevertheless, the scales of the contribution were different among the groups.

With a scale range of 1 to 4, Group A and group B scored 3.36 and 3.07 respectively, which fell into the category of "good"; whereas Group C was categorized as "satisfactory". Group D, although experienced the increment of 1.43, the score was still low compared to the other three groups.

Based on the qualitative data, it was discovered that the implementation of the PDCA cycle was executed conforming to the plan of the research, beginning from the preparation phase as the step *Plan*, the

implementation phase as the step *Do*, the phase of the observation done by the group members and lecturer supervisor as the step *Check*, and the phase of making reflections in small groups as the step *Act.*

According to the results of FGD or the *Focus Group Discussion,* it was found that the scores of Group A and B which fell into the "good" category were achieved due to their practice of never stopping from exchanging inputs for improvement with each other. They also cooperated in improving the content of the media and the selection of the learning models.

Specific annotations must be done to emphasize that the low scores of Group D were due to the failure in establishing the reflection cycle. Some of the reasons leading to poor rates of the reflection are;

1) The low level of communication among the members of Group D. The difficulty in finding an agreed time to conduct the meeting and discuss the improvement steps was the main point which caused the low establishment of communication.

2) The little time was available during the group's meeting led to the low level of interactions. Furthermore, the group members were also occupied with going to the improvement lecture, attending the briefings on the Real Work Lecture, and dealing with other personal constraints.

3) The low level of the involvement and the sharing of ideas as well the desire to find the initiatives to keep communicating.

The three reasons which have led to the poor establishment of group cooperation among the members of Group D at the reflection stage, clearly describe the failure in producing the outcomes of group learning. On the other hand, if the group work was executed, the achievement of the common goals by the group members would be accomplished.

According to the explanation of the reasons that determine the high and low scores of the good groups and poor groups , and based on the unexpected research findings, it was obvious that the reflection cycle can be established by the strengths of the group members in cooperating as suggested in the concept cooperative learning.

During the implementation of a number of teaching practices throughout the study, several obstacles and constraints were discovered:

1) The overall research processes really took time especially in terms of preparation which involved the organization of the schedule that is suitable with the materials, formulas required, techniques of using the recording device, and classroom setting.

2) The majority of the teacher trainees were still busy with the participation in other courses to improve the values.

3) The Micro Teaching room was still not satisfactory in terms of the area of the room, room layout, lighting, and availability of electricity.

4) The time allocation for Micro Teaching (equaled to two semester credit units) was clearly insufficient considering the fact that the reflection stage is a very important part which requires the time allocation that equals to more than three semester credit units.

In addition, through FGD, it was also found that there were certain teaching skills that appeared to be dominant at each of the teaching steps. At the first stage, which was the opening session, the skill of questioning was dominant. This skill was required to instruct and motivate the students so that they could concentrate on the materials to be learnt. The teacher candidates evaluated the questioning skills as very important at this opening stage. At the second stage, which was the response towards the lesson content, the skills of explaining, reinforcing, and guiding group discussion were the most dominant compared to other skills. The third stage, which was the closure, was dominated by the skills of managing the classroom as well as the skills of providing reinforcement.

5. Implication

The findings of this research show that there were a group of trainee teachers who possessed low ability in learning. This suggests that the lecturer consider the various factors of the trainee teachers in implementing instructions, based on PDCA. The concept of PDCA cycle can be used as the formal guidelines in conducting the M.T course at the study program or faculty level by executing the trials of the PDCA cycle twice from what had been done in this research. Moreover, the trials should also be done at the representatives of the study program, which is appropriate with the clumps of knowledge. The varied scores obtained by each of the groups were

obviously influenced by the strengths in the elements of group cooperation. This implies that the cooperative learning model can be one of the elements contributing to the score attainment.

6. Conclusion

The findings of the study provides the guidelines regarding the implementation of the Micro Teaching course so that it will be more targeted and measureable, which can be done by following the PDCA cycle especially in teaching practices. The PDCA cycle is able to help in targeting the quality points on the teaching skills achievement. The teaching stages (that include the opening, lesson content, closure) were dominated by different teaching skills.

The cooperative learning model is able to contribute to the strengths and successes of the trainee teachers during the instructional implementation based on PDCA, specifically at the stage of reflection. The cooperative learning model appears as an effective model or example for the trainee teachers, the professional teacher candidates, during the fulfillment of their teaching practice in the Micro Teaching Course.

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