Strategy Assessment as Learning for Developing Pedagogical Competence of Indonesian-Thailand Mathematics Student Teachers

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Abstract. The SEA-Teacher Project purposes is to help students in developing pedagogical, teaching, and English-communication skills as well as providing experiences of studying the cultures of other countries. Student teachers who participate in this project should be able to develop their competence during implementation of (1) class observation, (2) teaching assistant, (3) teaching in classroom, and (4) reflection and lesson learned. This research aims to analyze the implementation of Strategy Assessment as Learning for developing pedagogical competence. This research used qualitative design that conducted with subject of Batch-4 SEA-Teacher Project student teachers in mathematics education. Research data were collected by questionnaire, observation, and interview method. The result of the research showed that Strategy Assessment as Learning help student teachers to do self-assessment in conducting teaching in classroom. Problems occur during the teaching and learning process in the classroom must be immediately addressed by student teacher with help of mentors. Student teachers discussed their weakness with mentors get fast-constructive feedback. Therefore, they used it as learning to improved their teaching while they still in SEA-Teacher Project.

1. Introduction

Due to globalization the content of education is changing. In order to cope with changes competence and skills have become an essential part in people apply knowledge. The implementation of 21st century skills in mathematics is to improve the preparation of students to the future world where they need to use it in the 21st century skills in practice [1]. Student should be able to think critically, reason effectively, make judgements and solve problem in mathematics. Teacher has the main role in this process in order to develop the students skills. Consequently, learning to teach mathematics in 21st century is a challenging goal.

Over the past two decades there has been a growing body literature concerning the preparation of pre-service mathematics student-teachers. The preparation of pre-service student teachers is viewed as crucial to the quality of teacher workforce both by national accreditation bodies and universities [2]. There are a variety kinds of knowledge, skills, and dispositions that certainly would be useful but the central skill needed by pre-services student teacher to one’s own teaching practices and that of others is analyzing teaching in terms of its effects on learning [3].
Field Experience Practice (PPL) is a preparation program designed for pre-service student teacher in facilitate the ability to improve practice in order to develop skills in preparing, implementing, and evaluating effective classroom teaching in schools. The SEA Teacher Project or the “Pre-Service Student Teacher Exchange in Southeast Asia” is a project that aims to provide opportunity for pre-service student teachers from universities in Southeast Asia to have teaching experiences (practicum) in schools in other countries in Southeast Asia. Based on the SEAMEO seven priority areas for the eleven SEAMEO Member countries to work together to improve the quality of education in Southeast Asia, “Revitalizing Teacher Education” is one of the priority areas in building and strengthening capacity of teachers in the region. SEAMEO Secretariat has embarked SEA-Teacher Project with objectives: (1) to enable pre-service student teachers to develop their teaching skills and pedagogy, (2) to encourage the pre-service student teachers to practice their English skills, and (3) to allow the pre-service student teachers to gain a broader regional and world view [4].

The SEA-Teacher Project is for the pre-service student teachers whose major are in math, science, English and pre-school to have opportunity to conduct their practicum teaching in other countries in Southeast Asia. The practicum period is for one month. The student teachers’ roles and responsibilities are assigned weekly during the one month period in activities: (1) class observation, (2) teaching assistant, (3) teaching in classroom, and (4) reflection and lesson learned. Moreover, the host universities will select the schools for the pre-service student teachers and provide mentors to supervise and monitor the students throughout the practicum period.

The 3rd batch of SEA-Teacher Project was held in 15 January-13 February 2017. There was 11 universities from Indonesia, 7 universities from Philippines, and 9 universities from Thailand participated in this project. Researcher from FKIP UNS collaborated with Tepsathri Rajabat University (TRU) Thailand conducted an initial research to analyze the difficulties of Indonesian-Thailand mathematics student teacher in implemented the 3rd batch of SEA-Teacher Project. It obtained that language is the main factors of student teacher to do learning activity in school with students whose mother language is not English. The limitation of teacher in English language also caused student teacher have difficulty to consult their problem and difficulties encountered. Curriculum and administrative differences also was caused student teachers' difficulties in conducting learning activities. The lack of knowledge about the curriculum in the host country causes also be difficulties of student teachers to prepare the lesson plan. Limitations in facilities and infrastructure such as ICT also inhibit students to apply ICT-based learning method. Besides, the limited time caused student teacher couldn’t evaluated the class practicum to improve their teaching. This in become an obstacle for them to develop their pedagogic competence.

Based on the problem, student teacher need a system that allows them to analyze, use it in mathematics teaching class, evaluate, and improve their pedagogical competence. Accordingly, Indonesian government policy and regulation defined teachers’ pedagogical competence as the understanding of basic education, students, curriculum development, lesson plans, dialogical teaching and learning process, learning evaluation, and students potential developments [5]. SEAMEO INNOTECH collected data about Pedagogical Competencies in the eleven country of South East Asia. In Indonesian and Thailand there are several pedagogical competence that are the same: (1) select long term goals and short term measurable objectives based on a prescribed national and/or school, (2) uses creative and innovative instructional strategies that are appropriate to a lesson’s objectives and students’ abilities, interests, and learning styles, (3) selects and uses appropriate resources and available teaching to suit students’ abilities, interests, and learning styles, (4) states objectives of lessons and skills that students need to master in relation to past and future lessons, (5) give concise but clear directions for students to follow, (6) explains concept, terms, vocabulary, and principles related to lessons clearly and provides examples when necessary [6]. The similarities in competence become the rationale that Indonesian-Thailand student teacher should be able to develop their pedagogical competency during the implementation of SEA-Teacher Project.

Assessment as Learning (AaL) is strategy that facilitate the student teacher in developing pedagogical competence for working towards achieving them during the International PPL period.
Assessment as learning helps students take more responsibility for their own learning and monitoring the next directions. Reliability in assessment as learning is related to consistency and confidence in student teacher self-reflection, self-monitoring, and self-adjustment [7]. The role of the mentor as a facilitator who provides input and feedback on the constraints and weaknesses of International PPL students. Assessment as Learning is the ultimate goal, where students are their own best assessors[8]. Assessment as Learning is based on the conviction that students are capable of becoming adaptable, flexible, and independent in their learning and decision-making. When teachers involve students and promote their independence, they are giving them the tools to undertake their own learning wisely and well[7].

Based on those overall thought and theory, this research conducted to analyze the implementation of Strategy Assessment as Learning for developing pedagogical competence of mathematics student teacher from Indonesia and Thailand in the 4th batch of SEA-Teacher Project. The 4th batch was held in 7 August-5 September 2017. FKIP UNS was sent eleven student-teacher for SEA-Teacher Project. There are one student-teacher in mathematics education program FKIP UNS that have been sent to Thailand.

2. Method

This research used qualitative design method to collect data about the implementation of Assessment as Learning during four activities of SEA-Teacher Project: carrying out class observation, assist in teaching, independent teaching, and reflection and lessons learned. The subjects were four mathematics student teachers participated in Batch 4th of SEA-Teacher Project, two student teachers are from Indonesia and two others are from Thailand.

Questionnaire is used to collect data about how participants apply assessment as learning and its impact on the development of their pedagogic competence. In addition this study used dept interview method to dig deeper about the problems faced by participants, their deficiency in the implementation of the program, and their way to overcome the problem. The follow up is they can use it as learning to improve their pedagogical competence. Interviews conducted by researchers by using their mother language. Thus, the data obtained will be more complete because the research subjects can freely express their problems, effort and activity related to the implementation of strategy Assessment as Learning. Observation is also done to know the development of teaching and pedagogical competence of student teacher at the implementation of Assessment as Learning. Observation was done directly and through video. Data collected with research instrument questionnaire, interview guides and observation sheet.

The data that has been collected was analyzed to be presented in descriptive form. The result of the data analysis is also used to formulate the conclusion expected to be the suggestion and evaluation for the implementation of SEA-teacher project in the next batch. Thus the things that become difficult for the participants can be prepared before the participants carry out the SEA-Teacher activities so that when encountered the same difficulty it can be immediately found the solution.

3. Results and Discussions

Batch 4 SEA-Teacher Project was implemented within one month, 7 August-5 September 2017. Stages to be followed by participants are: 1) class observation, (2) teaching assistant, (3) teaching in classroom, and (4) reflection and lesson learned. The time given for each stage is not the same, depending on the policy of each school. At the class observation stage participants are given the opportunity to observe the classroom conditions and facilities of class. This time also used by the participants to develop a corresponding learning plan. Before practicum of SEA-Teacher project in host’s country student teacher no yet informed about the school curriculum and the learning model regularly used. Subjects observed learning activities in 4 to 6 meetings. Implementation of assessment as learning is done by analyzing that knowledge about curriculum and teaching method in school where teaching is still very limited. Therefore the student teacher follow-up that deficiency by doing interviewed the teacher for curriculum information and method they regularly used feedback and
discussed result of observation with other SEA-Teacher project participant. Obstacles are still encountered by the participants in communicating with the mentor teacher, but it can be overcome by the presence of a translator who is ready to help the communication between participants and mentors. Participants from Indonesia also discussed their observation result with their advisors in university then asked for suggestion with online media Padlet and Goformative. Follow-up results at this stage used by student-teacher as learning how to design the lessons plan according to the school curriculum, student conditions, facilities, and methods that teachers often use.

Assist in teaching is the next stage that participants must pass to follow-up the observation result. Participants conducted assistance to prepare learning activities in the classroom, to manage the classroom, and to perform learning assessment. At this stage SEA-Teacher participants from Indonesia must adapt to large class conditions where special skills are needed to keep class conditions conducive. This is overcome by the development of a fun learning but still focus to achieve learning objectives. Participants from Indonesia also have to adjust class facilities that are less likely to use technology-based media. This obstacle is overcome by participants in Indonesia by developing a manual instructional media that can be used without ICT facilities. One participant from Thai practice in a school whose student input is good, so he must adjust the prepared matter. This is because the students at the school have become accustomed to high order thinking level question. While other participants from Thailand have difficulties when the students who will be taught enough passive, therefore he tries to design the learning with good-question so that it can spur the activity of students.

In the stage of self learning activities student teachers are welcome to conduct learning independently. The teacher keeps accompanying participant in the class to provide assessment and input. Previously the student-teacher should consult the lesson plan that has been made with the mentor teacher. Disadvantages to the lesson plan should be improved for future use in practice teaching in class. Observation sheet that has been filled by the teacher then discussed with the participants about what can be improved from their performance. When doing self-learning activities, participants also observed how did the student learn when the teaching session on going. The overall inputs and results of those observations form the basis of the implementation of assessments as learning at this stage. Participants should be able to overcome the shortcomings when teaching and overcome student responses to achieve learning objectives. Research subjects used a combination of learning methods such as giving explanation, giving task, question answer making, and research by student. The challenge that Indonesian participant experienced the Thailand language and I do not understand about it we need a translator or pointing something. While the challenges experienced by participants from Thailand when students can solve the problem quickly so he should be able to develop the learning so as to accommodate the high ability of students. These constraints can be overcome by student teacher by discussing it with teacher mentor. These inputs are used by student teacher as learning to improve teaching for the next meeting. This should be immediately followed up with improvements due to the limited of time of self learning stage.

At the last stage of the SEA-Teacher the reflection and lesson learned, participants together with the mentor conducted an evaluation. The evaluation was done by analyzed each stage of SEA-Teacher implementation to know the development of pedagogic competence of the participants. In addition, the participants also know based on the assessment of mentor teachers, what competencies are still to be improved. Based on the results of questionnaires and interviews of research subject, they stated that the limited of time in teaching practice causes them to not be able to explore their teaching skills maximally. They prefer observe and teaching assistant be more compacted so that there is time left for them to have more teaching practice in class. But they believe that applying Assessment as Learning could help them in recognizing their abilities. This self-assessment encourages them to optimally use their existing capabilities and develop less perceived capabilities. Through the assessment of the mentor teachers participants also get a lot of input as a material for "learning" and followed up with improvement. The assessment activity here is not limited to formal assessments, but can be done as soon as possible after the participants take action. Points of shortcomings and weaknesses could be noted which then sought how to solve them either independently or in
consultation with mentors and other participants. Thus the implementation of Assessment as Learning will not be end when the participants have finished following SEA-Teacher project. It is expected that these inputs can be used as ‘learning’ when they taught in school to be competent and professional teacher in the future.

Based on the results of questionnaires, interviews, and observations it is known that the implementation of Assessment as Learning strategy is used to prepare student-teacher to be ready in providing quality learning to students. Teachers to teach mathematics learners’ learning [9]. Through assessment as learning at student observation stage teacher can selects and uses appropriate resources and available teaching to suit students' abilities, interests, and learning styles (the 3rd of pedagogical competence). This is shown by participant from Indonesia that adapts to mathematics learning media because limited facilities in school. So she used learning non-ICT media to help deliver mathematics material. In addition participant from Thailand can also adjust student ability by providing problem solving questions with difficulty level in accordance with the high-ability of students. This indicates that the student teacher has developed pedagogical content knowledge. It is necessary for teachers to understand student misconceptions, to know how topics are organized and taught, as well as to influence the ability to adjust lessons catering for all learners [10].

According to the data during the student teacher's assist in teaching, they prepare a lesson plan where short-term goals and learning designs to achieve them have been developed. Assessment as learning requires them to make improvements based on input from the teacher mentor. For the pre-service teachers constructing new pedagogical understandings and/or altering existing views required both teaching successes and failures with pedagogy [11]. Therefore they could selected the best short term measurable objectives based on a prescribed school (1st pedagogical competence) and also used creative and innovative instructional strategies that are appropriate to a lesson’s objectives and students’ abilities, interests, and learning styles (2nd pedagogical competence).

During self-learning activities, student teachers develop their competence in delivering mathematics material, using variety methods and media. Language was the most challenging when student-teacher tried to give concise but clear directions for students to follow (5th pedagogical competence). English is not a mother language for students, either in Indonesia or Thailand. Assessment as learning at this stage is done by student teacher by learning the language in place of student-teacher teaching. With the skills they can explained concept, terms, vocabulary, and principles related to lessons clearly and provide examples when necessary (6th pedagogical competence) using mixed language (English and local languages). Overall student teacher in this study could implemented strategy Assessment of Learning to developed their pedagogic competence, but they still have to improve their competence to gain higher level of teacher pedagogical competence.

4. Conclusions

Focusing some attention to this study result, there are several constraint faced by student teacher when they practiced teaching in host-country. Language is the main factors of student teacher to do learning activity in school with students whose mother language is not English. The limitation of teacher in English caused student teacher have difficulty consult their problem and difficulties encountered. The lack of knowledge about the curriculum in the destination country caused difficulty by student teachers to prepare the lesson plan that match with school curriculum. Although at the same level of school, curriculum differences are found in the form of standards in content formulation, learning administration such as the lesson plan format, teaching materials, learning process and evaluation activities. Differences of systematic writing of learning plan experienced by student teacher especially from Thailand because they not accustomed to writing of lesson plan with complete systematic like in Indonesian. Student teachers also had difficulty in adapted to the different circumstances of class. Indonesian student teachers had difficulties in schools with large capacity classes so they must be able to control the class. Limitations in facilities such as ICT also hinder students to apply ICT-based learning method.
That analysis results were used to develop microteaching guideline in mathematics subject, Padlet and Goformative instruction to implement strategy Assessment as Learning. The research product in the form of guidelines is given to research subject that student teacher from Indonesian-Thailand in Batch 4 SEA-Teacher Project. That guideline lead the student to prepare a lesson plan and apply it in the classroom. Padlet and Goformative instruction are used by student teachers to design online learning and assessment for their students in the classroom. It was also used to communicated with mentor and discuss about their problem in four activity of SEA-Teacher Project. Student teacher can do self-assessment and learn how to improve their abilities in deliver mathematics material. Focusing some attention to this study result, that the implementation of Assessment as Learning could help student teacher in developed their pedagogical competence. Student teacher done self-assessment and ask some suggestion from mentor was the key for them to do assessment that follow up as learning activity in order to improve their teaching. They are required to always improve their ability to analyze the student's condition and learning limits, adjust it to design the lesson plan and the media to be used, to implement it in classroom learning, and to evaluate each stage.

Based on the results of this study, we suggest that the implementation of observations and teaching assistants can be compacted so that much time can be used for student teachers to do self learning. They have time to do assessment as learning which is realized by doing better teaching. Furthermore, guidebooks with three languages (English, Indonesian, and Thai) will also greatly assist student teachers in providing materials to students. Equally important is the introduction of the curriculum in the school destination should be done before the participants deployed in the school. The goal is the student teacher can prepare lesson plan in accordance with the existing curriculum.

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