

PRE-SERVICE TEACHERS' REFLECTIVE PRACTICES IN IMPLEMENTING THE SCIENTIFIC APPROACH OF 2013 CURRICULUM

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Abstract

The pre-service teachers undertaking a teaching practice program (PPL – *Program Pengalaman Lapangan*) are demanded to implement the Scientific Approach, the underlying teaching practices in the 2013 curriculum (K13), in the schools where they conduct their teaching practice. The recent study aims to examine pre-service teachers' problems in implementing Scientific Approach during a teaching practice program as reflected in their reflective journal entries. Also, this study seeks to find out how the reflective journal can help them improve their capability in implementing Scientific Approach when teaching English. The participants of this research were four pre-service teachers doing a teaching practice program in SMAN 8 Yogyakarta. This research employed a descriptive qualitative approach. The data were collected from participants' reflective journal entries. From the study, it was found that participants encountered problems in implementing Scientific Approach in terms of maintaining student-centeredness in the teaching and learning process, engaging students' participation, maintaining students' focus, and applying the five learning stages based on Scientific Approach. Further, it was discovered that the reflective practice can help improve the pre-service teachers' skills in implementing Scientific Approach in their English teaching practices.

Keywords: 2013 curriculum, pre-service teachers, reflective practice, Scientific Approach

Introduction

To fulfill the global demands on more competent human resources, the government of Indonesia through the Ministry of Education continuously makes efforts to improve the quality of education in Indonesia. One of the efforts is through revising the national curriculum. The recent curriculum, the 2013 curriculum (thereafter K13) that was first established in 2013 is the development of the competence-based curriculum (*KBK-Kurikulum Berbasis Kompetensi*) in 2004 and the school-based curriculum in 2006 (Azizah, Ariwidodo, & Adriana, 2015). The curriculum was designed not only to develop students' competency,

but also to build students' characters and moral (Mulyasa, 2013). K13 is also expected to equip students with the future competency, i.e. communication skills, critical thinking and problem solving skills, as well as the ability to consider moral aspects of a problem (Kemdikbud, 2013, as cited in Zaim, 2017).

The development of K13 is aimed to respond the tougher competition in the global world through the development of learners' holistic potentials, namely cognitive, affective, which includes spiritual and emotional factors, and psychomotoric behaviors (Fadlillah, 2014). Therefore, it is hoped that with their holistic development, learners are able to compete and face the challenges of the rapidly growing global civilization.

In the implementation, K13 uses Scientific Approach as the main principle of the teaching-learning conduct (Abidin, 2014; Hosnan, 2014; Yani, 2014). According to Hosnan (2014), Scientific Approach is a learning process designed to make learners construct concepts actively through some steps namely observing, formulating problems and proposing hypotheses, gathering data, drawing conclusion, and finally communicating the new concepts that learners have found. In other words, in Scientific Approach, learners are engaged to construct knowledge actively through exploring various learning sources and teachers are not regarded as the only source of knowledge. Therefore, student-centered learning becomes one principle of Scientific Approach (Wangid, 2014; Darsih, 2018).

In the efforts to achieve the goals of K13, teachers are required to conduct the teaching-learning activities based on the five steps of Scientific Approach, namely observing, questioning, experimenting, associating, and communicating (Hosnan, 2014; Azizah, et al., 2015). The demand of applying the new approach has created a new challenge for teachers, as they are required to move from the traditional teaching paradigm to the more innovative one. Also, teachers need to have a good understanding on how to implement the approach appropriately in classroom practices.

Despite the fact that K13 has been implemented for over four years, English teachers at school levels still encounter problems, particularly in the application of the Scientific Approach. As teacher candidates who have only received minimum number of trainings as well as experiences, pre-service teachers are believed to also have problems in teaching using the Scientific Approach.

In relation with this, reflective practices have been constantly promoted particularly in teachers' training programs as it has been proven to benefit pre-service teachers in improving their teaching practices (e.g. Kuswando, 2012; Ragawanti, 2015; Lee, 2018). Therefore, in this study, reflective journals with guided questions are adopted to accommodate the pre-service teachers' needs to reflect on their teaching and make plans for future improvements. Further, the pre-service teachers' reflective journal entries are beneficial to help answer the two research questions addressed in this study: 1) What are the problems encountered by some pre-service teachers during implementing the Scientific Approach in senior high school? 2) How can the reflective journal help the pre-service teachers improve their capability in implementing Scientific Approach when teaching English?

Literature Review

Scientific Approach is the main principle of conducting teaching and learning process within the K13. Unlike the more traditional point of view in teaching that highlights the transferring of knowledge, the Scientific Approach puts more emphasis on the discovery of knowledge (Ratnaningsih, 2017). Therefore, there are five stages that teachers need to implement based on the Scientific Approach principles, namely observing, questioning, experimenting, associating, and communicating (Hosnan, 2014; Azizah, et al., 2015). These five stages are performed in the teaching learning process in order to facilitate students in stimulating their intellectual development through student-centered learning activities (Ministry of Education and Culture, 2013).

There are several characteristics of Scientific Approach as elaborated by Hosnan (2014, p.36) including: 1) the application of scientific process in constructing new concepts, 2) the involvement of cognitive process, particularly the higher order thinking skills, 3) the development of students' character. In the cognitive aspect particularly, the Scientific Approach implementation is aimed to enhance students' higher order thinking skills (HOTS), namely analyzing, evaluating and creating skills as listed in the revised version of Bloom's taxonomy (Krathwohl, 2002).

As Scientific Approach is relatively new in Indonesia, the process of its implementation still meets some problems (Azizah, et al., 2015; Afrianto, 2017; Suyanto, 2018). Similarly, in the English Language Teaching context, Scientific Approach is considered as a new approach since its term is more likely to be associated with natural science, social science, and management (Suharyadi, 2013). In line with this, some research reports that there are problems in implementing the Scientific Approach in English, particularly the problems experienced by teachers. Azizah, et al. (2015) reported that some English teachers found it difficult to make students participate actively during the learning process. Consequently, the less active students cannot develop optimally, and they tend to be lagged behind the active students. Further, they also reported that the majority of the teachers had difficulties in motivating students to ask questions in the questioning stage. In other words, they had problems in growing students' curiosity on the learning materials. Another study conducted by Afrianto (2017) found that teachers feel dictated by the curriculum, which limits their freedom in teaching. Other than that, teachers also found problems in following the complicated assessment procedures mandated in K13.

The capability of implementing Scientific Approach also matters for pre-service teachers as they are candidates of future teachers. The practice teaching program (PPL) which is a compulsory subject for the English language education students aims to give the pre-service teachers the opportunity of doing professional preparations. One form of teachers' quality enhancement is through doing continuous reflection over their teaching practice performance. In fact, reflective practice has long been an important element in teachers' professional learning and development (Mathew, Mathew, & Peechattu, 2017). It becomes an effective way for student teachers to learn from their own professional experiences, rather than from any forms of formal learning. Thus, reflective

practice becomes an essential element of teaching as it can help students “see, evaluate, formulate, and reformulate” (Iswandari, 2017, p.60) their teaching experience.

The habitual reflective practice helps teacher candidates during the practice teaching program in a way that it encourages them “to think over and to examine their teaching, to connect the knowledge obtained to the on-going teaching practice” (Ragawanti, 2015, p.120). As they do this process, pre-service teachers are able to be more open-minded, thoughtful, and sensitive to their own learning process on becoming teachers. Through this, they will be more capable of identifying any teaching problems and therefore formulating the solutions to solve the problems.

Further, Kuswando (2014) mentions some methods in which reflective practice can be performed by pre-service teachers, including “individual reflection through writing reflective journals, creating an artefact such as collage, reflecting through the facilitation of a mentor, or social reflection which is done by peers in a group” (p.187). In this study, the method employed to conduct reflective practices is individual reflective journal writing. Reflective journals are a kind of “annotated chronological record or a ‘log’ of experiences and events” (Wellington, 2000, p. 118). Through writing individual reflective journals, therefore, the pre-service teachers are expected to use their own interpretation to write their teaching experiences and eventually be able to have a deep reflection on them.

Method

This study adopted descriptive qualitative approach. Descriptive research is aimed to describe certain phenomena in particular settings fully and thoroughly (Fraenkel, Wallen, & Hyun, 2011), which also fits the nature of this study. Using a purposive sampling technique, this study’s participants were four pre-service teachers who were the final-year students conducting teaching practice program (*PPL – Program Pengalaman Lapangan*) at SMA N 8 Yogyakarta in the odd semester of 2018/2019 academic year.

The data in this study were obtained from pre-service teachers’ reflective journals. Throughout their practice teaching period, the pre-service teachers were required to write a post-teaching reflective journal in the form of narrative and they had to submit it every end of their teaching weeks. The journals were equipped with some questions in order to guide the participants in writing their reflections. Each participant submitted different numbers of journal entries since during the teaching practice program, they handle different numbers of classes. The numbers vary from two to five reflection journal entries per person. At the end of the teaching practice program, there were fifteen journal entries submitted in total.

The data were then analyzed by identifying the problems and obstacles related to participants’ effort in implementing Scientific Approach in their teaching activities. After that, the problems were classified. The next step was analyzing participant’s personal reflection to understand how they coped with the

problems and how the reflective journals could help them improve the way they implement the Scientific Approach in their teaching practices.

Findings and Discussion

This section elaborates the findings to answer the research problems. The first sub-section discusses problems encountered by pre-service teachers in the implementation of Scientific Approach. The second section is a discussion on how the reflective journals practice helps the pre-service teachers improve their capability in implementing Scientific Approach when teaching English.

Pre-service Teachers' Problems in Implementing the Scientific Approach Revealed in Their Reflective Journal Entries

After reading the participants' reflections, the researcher did thematic analyses to find the common themes regarding the problems encountered by the pre-service teachers. From the participants' journal entries, there are five identified problems related to the implementation of K13 Scientific Approach.

The first problem is regarding student-centeredness. The implementation of 2013 curriculum, in this case Scientific Approach should focus on student-centered learning, in order that students experience the opportunities to assimilate and accommodate new concepts and practice communication skills (Lazim, 2013, as cited in Zaim, 2017). The pre-service teachers, however, still found it problematic to create student-centered atmosphere when teaching. This is reflected in the following participants' journal entry.

To be honest, I didn't have much experience in this step (associating) because I 'feed' them with the material. ... I also realized that my teaching style is still teacher-centered and I need to change it into student-centered. I need to set some activities that make me less 'talky' and let the students explore themselves. [participant 1, journal entry 1]

From this journal entry, it is seen that participant 1 realizes that she talked and explained too much instead of letting the students explore new concepts by themselves. One probable reason why it is difficult for the pre-service teachers to create a student-centered environment is that they are accustomed to experiencing the traditional way of teaching, which is still teacher-centered, where teachers usually become the only source of knowledge.

The second problem found in participants' reflective journal entries is related to the difficulty to engage or involve students in executing the 5 steps in Scientific Approach, especially in the stages of questioning, experimenting, and associating. The following journal entry represents this problem.

... I personally intended them to have such questions (for menanya / questioning section) like "what ocean is that?" or "where did that happen?" and so on, but no one did. After that, I asked them to give their opinion and share their feelings after watching the video. It worked, but I had to trigger them with questions first and they

answered. After that, I gave them another video about asking and giving opinion and slides with the same topics that I have made. I asked them to analyze which one is asking and giving for mencoba (experimenting). I planned to have the students make a dialogue (in written form with certain topics that I have made. However, the students were not really involved. [participant 4, journal entry 1]

Based on the journal entry above, the biggest challenge that the pre-service teacher encountered was motivating students to ask questions in the questioning stage. Even though she had showed a visual material in the hope to arouse students' curiosity, it seemed to be not really effective in making students ask questions. Further in other learning stages, the pre-service teacher also found it difficult to make students participate actively during the whole learning process. This finding is in line with Azizah et al.'s report (2015) related to students' low participation.

Similar to the problem stated above, getting students' attention and maintaining students' motivation is another issue. Sometimes they get distracted by other things, such as physical condition. The following journal entry portrays this problem.

In the beginning of the lesson, the students were not really involved in the lesson. They were somehow bored and tired because English is the last subject they had on that day. ... I think I should make more interesting games or anything in the set induction part to grab their attention. [participant 4, journal entry 1]

Other than low stamina, students sometimes did not focus in the learning process because of the distraction from gadgets. Thus, the third problem reported by the participants is related to the improper use of smartphones by students in the classroom. Since the Scientific Approach in Curriculum 2013 promotes learners' empowerment in the learning process, it means that learners have the freedom to use any media and facilities for exploring and searching for information in order to understand certain concepts. Therefore, there are events when students are asked to search for information using their smartphones, for example in the questioning and experimenting stages. Nevertheless, in the activity using smartphones, another problem raises, as reflected in the following journal entry.

... the students' attention could not fully in me because of the Asian Games. When I asked them to browse (using their smartphone), one of the students yelled "CAH INDONESIA MENANG, JONATHAN CHRISTIE MENANG." [participant 2, journal entry 4].

... I think most of the students really pay attention to the lesson from the beginning. Only some of them (3-4 boys at the back of the class were not really involved because they were busy with their laptops and phones. However, when I asked the class to play Kahoot,

everyone was really excited and the boys went back to being on task.
[participant 4, journal entry 2]

Allowing students to use their smartphones for study purposes is necessary in the context of Curriculum 2013 classes since students are expected to explore knowledge from various sources (Ministry of Education and Culture, 2013). However, it creates another challenge for teachers to make sure that students use their smartphones for learning purposes, not other purposes. In both journal entries above, students got distracted by their gadgets during the class. Instead of browsing for the necessary information regarding the new concept, one of the students was reported to use his smartphone to watch a sport competition. In another class, some students were reported to be using their gadgets not to support the learning process. As a consequence, teacher control is highly necessary to supervise and guide students in making use of smartphones during the learning process despite the fact that supervising more than thirty students at the same time is not an easy task. After all, it is undeniable that technology is needed to support the Scientific Approach-based classrooms.

Another problem found was regarding the implementation of the five learning phases based on the Scientific Approach, namely observing, questioning, experimenting, associating, and communicating. From the reflective journal entries, it was found that some of the pre-service teachers could not successfully implement the five stages in one meeting because of time management issue, and they regarded this as a significant problem. The following journal entry reflects this issue.

Because of my bad time management, I run out of time to review or check the students' answer, so we just checked the jumbled paragraph. Then, I asked them to collect their worksheet so that I will check it and give them notes if they make mistake. [participant 2, journal entry 1]

In her journal, this participant reflected that her teaching did not run as planned. She planned the lesson until the communication stage, but she ran out of time. Consequently, the students did not get the opportunity to communicate the results of their group work, although communicating stage is crucial in demonstrating students' ability in presenting their development after a series of thinking process. In fact, not being able to execute the five stages of Scientific Approach in one meeting should not be a problem since teachers can always continue the process in the following meeting. However, for pre-service teachers, this becomes a problem since they do not have the opportunity to teach the same class in a row.

The fifth problem encountered by the pre-service teachers during implementing the Scientific Approach is that some of them apparently have incorrect understanding of the learning stages suggested in the Scientific Approach. The following journal entries portray this issue.

... for mengamati (observing), I can see most of the students pay attention to what I was explaining. For menanya (questioning), a few students asked the difference between some of the asking and giving opinion expression. For mencoba (experimenting), I picked 4 couples of students to practice expressing asking and giving opinion. For menalar (associating), I am not sure whether I have successfully implemented it in my class. Lastly, for mengkomunikasikan (communicating), I asked students to explain to me what I have explained earlier that day. [participant 3, journal entry 1]

From the journal entry above, it can be seen that the pre-service teacher reflected that she was not sure about her implementation of associating stage. In this case, she realized that she had not got a deep understanding on what learning activities should be provided in a particular stage of the Scientific Approach. On the other hand, even though the pre-service teacher did not explicitly mention her lack of understanding, it was implied from the reflection that she provided an unsuitable activity in the communicating stage. Here, the nature of communicating stage seemed to be misunderstood. The Communicating stage, in fact, needs to accommodate students in presenting the product of their analysis during the advance stage, which is associating (Sarwanti, 2016). Therefore, in communicating stage, students are not only asked to retell what they have learned on a particular day. Instead, further than that, students need to demonstrate the product built upon their understanding on certain concepts. In communicating stage, Hosnan (2014) emphasizes that students are expected to present the results of the conceptualization process in the form of spoken, written, or other uses of media. One example of activity in the communicating stage is when students present their findings or in front of the teacher and classmates, and other non-presenting students are to give comments, advice, or any forms of feedback as a process of mutual learning.

How reflective journals help the pre-service teachers improve their capability in implementing Scientific Approach to teach English

This section elaborates the answer of the second research question. In order to investigate the reflective journal practices on pre-service teachers' implementation of Scientific Approach, an adaptation of a scheme offered by Ragawanti (2015) is used. The modified scheme used in this research consists of two stages. The first is identifying the teachers' problems related to the implementation of the five stages in Scientific Approach, which has been done to answer the first research question. The second is seeing how the pre-service teachers come up with strategies to handle the problems as facilitated by the reflective journal entries. In the second stage, it is hoped that particular improvements are identified after the examination of reflective processes.

As revealed in the first section of the findings, the first problem is regarding how to create student centeredness. Participant 1's first journal entry portrays this problem. It can be seen from her first journal entry, participant 1 reflected some difficulties in making the students the center of learning. In response to this

problem, she tried to give more opportunities for the students to do their part. The following is the excerpt of her reflective journal entry.

I went better by using student-centered method to teach. Before, I use teacher-centered method. (now) I manage to make students find the formula of using intention by themselves. [Participant 1, journal entry 2]

In her first class, the pre-service teacher admitted that she “feeds” the students with the knowledge. After looking back at her teaching practice, she knows that she needs to eliminate that, and she managed to let her students find a concept by themselves in the second meeting. Here, it is obvious that the participant succeeded to cope with the problem since she kept on reflecting her teaching practice. In short, the participant gained improvement in shifting the teaching from teacher-centered method to student-centered method.

According to the findings in the previous section, one factor causing the unsuccessfulness of implementing the five stages of the Scientific Approach is pre-service teachers’ time management issue, for example as experienced by participant 2, as reflected in her first journal entry. To cope with this problem, she managed to improve her time management skill as portrayed in the following journal entries:

...for the upcoming teaching, I would be more and more pay attention to my time management and how to be calmer. [participant 2, journal entry 2]

... I learned how to handle the class, the real class management. I learned how to be creative to maximize the time management. [participant 2, journal entry 4]

As it is shown in the reflective journal entries, in this case, writing reflective journals helps the pre-service teacher to examine her practices. From her second and fourth journal entries, it can be seen that she continuously examined her progress on time management matter, and at last found that she had improved herself in this matter.

Other problems in the implementation of Scientific Approach as reported in the previous section are the difficulty to involve students in the activation of knowledge during the implementation of Scientific Approach, and the improper use of smartphones or other gadgets that distracts students’ focus during learning. Participant 4, who experienced this problem as shared in her first reflection entry, did further reflections on the way she tried to cope with this problem. The following journal entries portray how participant 4 gradually reflected on this matter.

... One thing that went pretty well was my teaching media. They liked playing Kahoot, it was new and fun for them. I did not expect they would be really enthusiastic to have this game. I think I should have or make more fun games like this to make the students engaged. [Participant 4, journal entry 2]

... I think I could deal with misbehaved students better than in my previous teaching practices. I also tried to use another technology (lyrics training) to be the learning tool. I will try to explore more media to make my teaching better and more interesting. [Participant 4, journal entry 4]

From the reflective journal entries above, it is seen that she found an effective way to engage her students, which is by using fun games, named Kahoot. Further, she continued reflecting on the same matters repeatedly, until she found out that varying the teaching media could make her teaching more interesting, and thus could engage the students better. In this case, the pre-service teacher learned positive things that could help her enhance her teaching performance.

Besides the problem of having to gain students' focus during learning activities which participant 4 has successfully coped with, she also wrote in her reflection that she found it difficult to make students active in the process of building knowledge, for example in the questioning and experimenting stages. However, unfortunately, participant 4 did not write any further reflection dealing with her actions in coping with that problem. As a consequence, whether or not the problem has been successfully solved remains unknown.

Conclusion

Despite having been implemented for over five years, the implementation of 2013 curriculum (K13) is still challenging, particularly for pre-service teachers. Through the investigation of reflective journals, this small-scale study has revealed the problems encountered by pre-service teachers in presenting the five stages of Scientific Approach as mandated in K13. In coping with these problems, the reflective journals writing was performed to facilitate the pre-service teachers in doing reflective practices on their teaching performance. Some positive contributions of writing reflective journals were revealed in this research. The result shows that writing reflective journals helps the pre-service teachers look back to evaluate their teaching performances, discern their problems, as well as formulate and provide solutions to solve the problems.

Reflective practice is proven to have improved the pre-service teachers' pedagogical skills, particularly in implementing the Scientific Approach. This finding implies that having pre-service teachers conduct reflective practices is still relevant; therefore, its implementation should be accentuated in any teacher preparation programs. A further challenge that educators should pay attention to is on making sure that the reflections student teachers write are meaningful, rather than just becoming a repetitive habit that yields no values. The evaluation of

current existing practices of reflection and the creation of more innovative reflection method and media should become the concern of future research.

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