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Science Teachers View and Peer Involvement in Reflective Practice: Based on Learning Experience in School

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Abstract

The practice of reflection for teachers today is one of the keys to innovation and learning improvement. This is because reflective practice aims to promote analytical thinking from the teachers learning experience for better teaching and ultimately better learning and can be done collaboratively with peers. This study explores more deeply how the understanding of science teachers includes the involvement of peers in their reflective practice. Appointed based on the teaching experience conducted by 16 science teachers in junior high schools in Kendari City, Southeast Sulawesi. The analysis procedure uses data organization through interviews, documents, or observations. The results indicate that the teachers views on reflective practice are divided into 4 understandings: (1) The process of rethinking what has been learned whether it has going well or not, (2) Evaluating the problems faced in learning and teaching process, (3) Self-awareness in assesing in learning and teaching process and use it to improve the next one and (4) Consideration about strategies, tools/media used, material content and student understanding during learning. Most of the reflective practices carried out by science teachers themselves, without involving colleagues or other related parties, also without any supporting instruments or evidence. This study suggests that reflective practice and reflective forums can become a mandatory policy for every school in order to develop science innovation and learning in the future.

Keywords: Peer · Reflective practice · Science teacher

INTRODUCTION

Teacher capacity building in recent times is one of the most prominent crucial topics. Science teachers are continuously challenged to contribute positively in facilitating students to achieve their learning abilities holistically, both in terms of attitudes, processes and products through meaningful learning. This challenge can provide opportunities for science teachers to make changes and improvements in their teaching and learning processes. One of the skills that must be continuously improved apart from teaching skills is the ability to reflect on professional practice (Hickson, 2011; Marzano, 2012).

Reflective ability is very important because it is one of the indicators of performance assessment in the professional competence of teachers in Indonesia. Several studies have shown that teachers' reflective abilities can have a positive impact on professional development (Wise, et al.,1999; Korthagen, 2004) because they can provide opportunities for teachers to carry out the process of increasing deeper understanding of their teaching, so as to have better strategies for innovative learning development. (Panhoon, S. & Wongwanich, S. 2012). It was also reported that teachers' reflective practices when preparing student learning can improve the quality of content (Olteanu, 2017). In addition, reflective practice is also very effective for developing critical thinking and life-oriented learning (Bharuthram, 2018) for both teachers and students.

The practice of reflection in learning is related to social constructivist theory (Frisque & Chattopadhyay, 2017) so that in reflection, knowledge is built through social interaction with other people. Schon (1983) identified two types of reflection, namely reflection in-action and reflection-on-action. Reflection in action is a way of thinking and theorizing about teaching practices when teachers teach and is an automatic activity that is carried out unconsciously. Reflection-on-action is a conscious experience and thought process about the teaching practice that has been carried out and reveals the

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knowledge used in the situation (Ryan M, 2013). Based on the two types of reflection based on the theory, this research will focus on the type of Reflection-on-action because in addition to seeing the way science teachers think and theorize about their teaching practice through the process of reflection, this research will also reveal how the results of individual thinking, reasoning, and analytical thinking are produced. they get from learning experiences (Taggart & Wilson, 2005) used to be able to share good practices with colleagues. Basically, science teachers are not only be able to think reflectively but also act reflectively to perform a comprehensive and sustainable process of learning.

Several studies that have been conducted based on the views of science teachers on reflective activities, which focus on reflective areas and how to practice reflection show a high category (Aldahmash, et al., 2017) While research related to teachers' beliefs about reflection learning and reflection behavior and skills in Thailand indicates a moderate level (Wongwanich, et al., 2014) . This shows that the reflective practice is believed by the teacher well and knows how to practice it. However, there are still big problems regarding. First, how far the views of science teachers know the term 'reflection' or not. Second, teachers may have knowledge of the term 'reflective practice' and the importance of being a reflective teacher, but they do not actually apply it to their real teaching experience, because most of the knowledge does not directly lead to action (Çimer, et al., 2013) plus scientific studies investigating how the science teacher's perspective on reflective practice is still limited and has not been widely studied.

This research contributes to revealing the views that science teachers have about reflective practice, and how reflective practices carried out in schools are related to the involvement of colleagues, so that in particular they are able to provide an overview of reflection practices for science teachers to have an open mind to accept other people's thoughts or learn from them. peers and able to plan follow-up plans. A science teacher who can effectively reflect on his own professional experience and share good practices, with colleagues and the environment.

METHODS

In this study, an online questionnaire was used to explore the participants' initial data. The questionnaire was divided into two parts. First, explore the identity of the participants and their length of teaching experience. Second, it contains questions that lead to research answers. The questionnaire was developed using closed-structured questions followed by open questions to identify further statements or give reasons for each answer/response that were previously given. The research subjects were 16 science teachers from 16 junior high schools in Kendari City, Southeast Sulawesi. Interviews and observations were carried out on certain participants only to clarify or dig information deeper regarding the required data when the responses given were not sufficient to provide a clear picture of the aspect studied. Data analysis was carried out using data organization derived from interviews, documents, or observations (Creswell & Creswell, 2013)

The analysis procedure is carried out by identifying the main intended data based on the answers/responses for each of the problem statements of the study followed by checking and re-examine the data from the respondent's response. The next stage in data analysis is using the strategy of selective coding which is carried out by identifying, developing, and evaluating the themes generated from the coding. Finally, the main concepts and categories generated are then used in reporting the findings.

RESULTS AND DISCUSSION

The results of the participant's initial data analysis about the background can be seen clearly in Table 1.

Table 1. Demografic of Participats

Aspect	**Gender**	**Eduaction Qulification**	**Teaching Experience**
	(Female/Male)	**(S1/S2/S3)**	**(≤ 10/≥ 10) year**
Participants N=16	F = 10 M=6	S1= 15 S2=1	≤ 10 =4 ≥ 10 =12

Based on Table 1, it can be seen that the science teachers who participated in this study were dominated by female teachers. This indicates that all of these science teachers have met the minimum qualification standards for the competence of educators required for a teacher in Indonesia (UU No. 14 of 2005 article 8). However, some of these teachers expressed that they were not satisfied enough with their current qualifications and wanted to improve their qualifications. This expression shows that these teachers have the desire and motivation to continue to learn and improve their knowledge. From the aspect of teaching experience, it can be seen that most of the science teachers (n=12) have had teaching experience of more than 10 years and only a small proportion (n=4) are under 10 years. This teaching experience can make a positive contribution to perform a more flexible and more focused learning and teaching process (Mulhayatiah, et al., 2018).

The understanding of reflective practice differ among the teachers where based on data analysis it is grouped into 4 main themes of perspective. The highest first understanding expressed by 43, 75% out of 16 participants who viewed reflection action as the process of rethinking whether or not the learning and teaching process was going well (a). 25% of participants claimed that reflection action is an evaluation of problems faced in learning (b) and 18.75% of them consider reflective action is the thought about strategies, tools/media used, material content and students' understanding during learning and teaching process (c). 12.5% of the participants thought that reflection action is self-awareness in assessing the teaching and learning process to improve the next one. The results of data analysis are briefly described in Table 2. teacher's views on reflective practice.

Table 2. Teacher's Views Recapitulation

Reflection Action (n)	Perspective Recapitulation About Reflective Practice	Participant's Answer (%)
Always Be Reflective (n=16)	a.The process of rethinking what has been learned whether it has going well or not	43,75
	b.Evaluating the problems faced in learning and teaching process	25
	c.Self-awareness in assesing in learning and teaching process and use it to improve the next one	
	d.Consideration about strategies, tools/media used, material content and student understanding during learning	18,75
		12,5

Based on the four perspectives summarized from the answers of all participants, it can be seen that the tendency of participants' understanding patterns is limited to the thinking process or self-awareness in seeing how learning can take place well. This is supported by data from interviews when the teachers were asked whether they used instruments or notes to record their self-reflection most of the teachers answered that they did not use instruments or reflection notes. Based on the study of teachers' teaching and learning plan documents it can be found that there are no changes or improvement as a result of reflections that have been made. Likewise, teachers also do not have other documents such as notes of reflection results in the form of reflection journals (Zulfikar & Mujiburrahman, 2018), journals, interview reflections, peer observation conferences, group discussions, videos, blocks, and electronic portfolios (Yuliyanto, et al., 2008).

The reflection process occurs spontaneously only when it is considered important, especially when they experience problems during the learning and teaching process or there are things that hinder the students' effective learning, both in terms of learning strategies, material content, use of learning tools/media, practicum procedures and learning environment.

This analysis illustrates that in fact for the teachers reflections are actually still limited to reflective thinking and have not led to reflective practice which are supported with evidence. This becomes very important because empirical thinking and thinking in a scientific scope requires evidence in the process of finding or compiling scientifically correct statements (Brown, et al., 2010). Peer engagement is a process that involves the collaboration of colleagues in terms of sharing ideas, thoughts

and observations, about teaching practices. Through this process teachers can take the various perspectives that emerge from this collaborative process and use them to derive conclusions and essence information for better teaching and ultimately better learning. The results of data analysis can be shown as Figure 1.

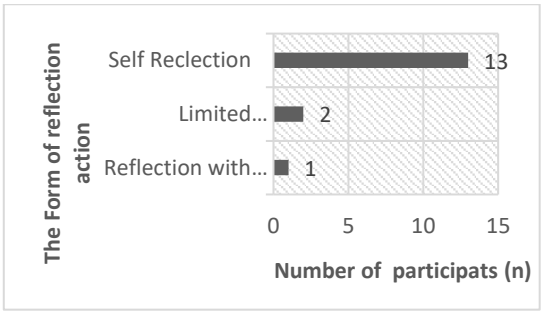

Figure 1. Peer Involment

Figure 1 illustrates that self-reflection on their own, reflection carried out by the teacher him/herself was done by 13 participants, limited collaborative reflection with colleagues was done by 2 teachers, and collaborative reflection which involved colleagues, school principals, supervisors and other parties is done only by 1 participant. Based on the results of the interviews, it was revealed that the form of reflection actions taken by the teacher is highly dependent on the school's policy in facilitating reflection activities.

The tendency of teachers to prefer to do self-reflection on their own is due to 3 factors. First, in terms of teacher experience; teachers know more about the characteristics of their students and the problems that occur during learning. Second, in terms of time spent; thinking reflectively, planning and making improvements and plans for follow-up does not take much time. Third, the number of colleagues who teach the same subject; the existence of peers who teach the same subject makes it possible to reflect or share teaching experiences. Based on this study, science teachers who had friends with the same subject/family were only found in 6 schools.

The form of reflection that is rarely carried out by science teachers is to reflect together with other people or in groups. It can be seen from the data that there is only one teacher who does this activity. Based on the answers given, this activity is not carried out regularly and continuously but is only when the teacher is involved in certain programs. This condition can be caused by the fact that teachers are not accustomed to doing teaching reflection in groups, both in their small professional community in school or bigger professional community outside the school (Aldahmash, 2016) In fact, the existence of this community can be a forum for science teachers to continuously achieve effective classroom quality and improve student performance as well as a vehicle for achieving professional learning, expertise, and performance skills development (Lawson & Van Veen, 2015).

CONCLUSION

This study concludes that the practice of reflection according to the science teacher's view is more inclined to the process of rethinking or self-awareness to evaluate oneself related to the learning given to students. It has not led to a reflective practice accompanied by a follow-up as a result of thinking done. Reflection actions are mostly carried out if they are considered important, namely if the teacher in learning encounters problems that are quite disturbing in the learning process.

Most of the reflective practices are carried out by science teachers themselves, without involving colleagues or other related parties, as well as without any supporting instruments or evidence. Reflection actions carried out together with colleagues only occur if the school has 2 or 3 science teachers. Teachers assume that the change or development of their reflection practice focuses more on changing teaching practices in the classroom because this is considered more impactful for students. Based on these results, this study suggests the need for a policy for each school in providing a community or reflective forum in order to develop innovation and science learning in the future.

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