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Attitudes and Approaches of the EFL Teachers on Scientific Approach in Indonesian School Context

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Abstract

The research explores the attitudes of EFL teachers and their teaching practices in the classroom about teaching and learning interaction using the Scientific Approach in the Indonesian school context. This study employs a descriptive study using a purposive sampling technique and taking 34 respondents from EFL teachers. The questionnaire and interview used to collect data on perception of EFL teachers on the scientific approach in the process of teaching and learning, and observation applied to gain the data on the EFL teachers' teaching practices in implementing the scientific approach in their classroom interaction. The result of this study showed that there were apparent differences in the way of EFL teachers perceive the scientific approach in their classroom teaching and learning practices. The differences lead the teachers to three group categories: (1) the highly implementing scientific approach; (2) moderately implementing scientific approach; and (3) poorly implementing the scientific

approach. This research expects to be a reference for teachers' professional development especially teachers capacity building implementing the 2013 curriculum.

Keywords: perception, Scientific Approach, classroom interaction

Introduction

The 2013 curriculum or character-based curriculum provides a new approach in the teaching process as the demand in Indonesian education. Therefore, it provides a scientific approach to develop the students' skill, knowledge, and attitude. In the scientific approach, it consists of learning phases constructed from observing, questioning, collecting information/experimenting, associating, and communicating (Menteri Pendidikan dan Kebudayaan, 2013). Moreover, students' attitude, skills, and knowledge become the goal while implementing this approach.

In line with the new curriculum emphasis, the teachers are expected to apply the three learning models such as discovery-based learning, project-based learning, and problem-based learning as part of the scientific approach. The study related to problem-based learning has been investigated in Indonesian EFL classroom by Sahril, Patak, & Naim (2013). The study revealed that problem-based learning is effectively improving students' achievement in English. The study also recommended having further study about implementing the problem based learning in an EFL classroom. This new curriculum also highly expects the school stakeholders such as headmaster, teachers, parents, government, and society to have a responsibility to design the curriculum with the competency-based orientation from the central government as a guideline.

As a new approach used in teaching English, both EFL students and teacher usually find difficulties in implementing this approach especially in making students interested in English lesson as a second language (Derakhshan & Shirmohammadli, 2015), and as the terms scientific approach is new for English teachers, and they have different perspectives on it (Al-Mekhlafi & Nagaratnam, 2011). It is therefore essential to investigate' EFL teachers' perception toward the Scientific Approach and how they translate these into their classroom teaching practices in the Indonesian school context, focusing particularly on their understanding, perspectives, and implementation of the scientific approach in the classroom. It aims at exploring teachers' perception and teachers' classroom teaching practices towards the scientific approach in their teaching and learning interaction.

The studies of teaching and learning have been the focus of some researchers (Alsayed, 2003; Bernardini, 2016; Bloom et al., 1956; Longstreet & Cooper, 2014; Nkhoma, Lam,

Richardson, Kam, & Lau, 2016; Petersen & Nassaji, 2016). Bloom et al. (1956) have an earlier study on this teaching and learning by developing a taxonomy that should be an educational-logical-psychological classification system. Further, it classified the educational domains as learning objectives into three major parts, cognitive domain, affective domain, and psychomotor domain. Further describe in these domains of taxonomy, the cognitive deals with the recall or recognition of knowledge and the development of intellectual abilities and skills; the affective domain deals changes in interest, attitudes, and values, and the development of appreciations and adequate adjustment; and the psychomotor deal with the manipulative or motor skill area. This taxonomy is suitable at the development of student's communication and learning in schools and colleges; it can even use in the development of educational curriculum.

A further study on learning objective in educational development dedicated by Longstreet & Cooper (2014) developed an educational design to support the instructors effectively and trainers from an objective learning perspective, emphasizing the importance of firmly establishing a connection between activities and intended learning outcomes. In the learning development, the learning innovation designed by experts to lead to the learning objectives. Following this, the development of learning models to consider how to facilitate the students to improve their learning motivation. Motivation plays a vital role in success in learning (Alsayed, 2003). Based on Bloom's taxonomy perspective, in the present study, three educational domains are useful as learning outline to develop a learning approach in Indonesian educational curriculum. This educational design is well known as Scientific Approach on the 2013 curriculum.

By Standard Competency of 2013 curriculum, learning objectives include the development of the domains of attitudes, knowledge, and skills that elaborated for each educational unit (Menteri Pendidikan dan Kebudayaan, 2013). The three of competence has different trajectory acquisition (psychological processes). In the implementation of Scientific Approach on the 2013 curriculum, there are learning models that need to be applied to support it in learning, this discovery learning, problem-based learning, and project-based learning.

The following recent studies concerned with learning models in Scientific Approach, discovery learning activities are inherently learner-centered and have a role to play in the development of thematic, technological and information mining competences (Bernardini, 2016). From problem-based learning, it prepares students for assessment and interpretation of multifaceted problems. In the learning process, students learn to combine with group problem solving, enhances professional skills development. Thus, problem-based learning is attributed to the high potential for promoting systematically analysis and problem-solving skills as well

as the proposed course of action (Nkhoma et al., 2016). As Petersen & Nassaji (2016) has found, almost all teachers indicated that project-based learning is an effective strategy for learning the language. It can take many different forms of projects to become active if implemented appropriately in the classroom. Accordingly, the three learning models of Scientific Approach are learner-centered and actively support the students in improving their learning ability, of course, with the direction of teachers appropriately.

Following the themes of the perspectives by Snyder, Bolin, & Zumwalt (1992), they proposed the perspectives features into three themes; they are fidelity, mutual adaptation, and enactment. The present study starts from the fidelity perspective by looking at the current implementation of learning models include in Scientific Approach as well as factors that facilitate or inhibit implementation, followed by the perspective of mutual adaptation, from which, ways Scientific Approach has been adapted in Indonesian EFL contexts are explored. Finally, the enactment approach used to look closely at how those factors identified to influence the implementation and why the decision for the formulated adaption. The analysis sought to answer the following research questions according to the teacher participants' perceptions.

1. What is the EFL teachers' perception on the implementation of Scientific Approach?
2. How do they translate into their classroom teaching practices in an Indonesian classroom context?

Methodology

The research employed a descriptive study using a purposive sampling technique in investigating the EFL teachers perceives on the Scientific Approach and how they put into their classroom teaching practices.

The targeted participants in the present study were 34 EFL teachers who were implementing Scientific Approach on 2013 curriculum or Character based Curriculum. These EFL teachers were selected because they were teaching English and used Scientific Approach method in their learning process in the classroom.

The data collection included three stages. First, a preliminary survey of the overall practices of the learning models in Scientific Approach conducted. In the questionnaire, the participants were requested to provide necessary demographic information, rate their practice of Scientific Approach and the three learning models in Scientific Approach from scale one (never practice) to five (fully practice) and indicate their difficulties (Brown, 2010). The three learning models included discovery learning, project-based learning, and problem-based

learning, which are commonly mentioned in the Scientific Approach and contextual in learning (Bruner, 1961; Hmelo-Silver, 2004; Hosnan, 2014; Markham, 2011).

The second stage was to conduct semi-structured follow-up interviews with three participants as the representative of each category from EFL teachers' questionnaires that consist of 'Fully Practice,' 'Frequently Practice,' and 'Occasionally Practice' categories. They were asked to narrate their learning using Scientific Approach, experiences with Scientific Approach practice, current EFL classroom practices, adaptation processes, challenges encountered, and concerns about adaptation. Some interview questions were generated based on the description of the Scientific Approach to find out the learning process in the classroom. The interviews, which lasted 10 to 15 minutes, were conducted in Indonesian to elicit more information from the participants. All of the interview data were transcribed and translated into English by the researcher.

The third stage was to conduct an observation of the three selected participants in their classroom practices representing each category. By using mechanical devices (Prosser, 2002), their classroom practices were observed to find out the sequence of the classroom management and teaching method using in the classroom practices. The lesson plan was provided blueprints for the participants. Data from observation were generated based on the lesson plan to delve into how each EFL teachers processed Scientific Approach in their classes. In sum, the data sources include 34 questionnaires, three interview transcripts, and three observational data.

Descriptive statistics were employed to tabulate the mean scores and percentages of the quantitative data. The contents and activity of the lesson plans were coded based on the Scientific Approach principles. The interview data were coded based on the themes of the three perspectives of classroom implementation theory. The codes included Practice of Principles 1-5 (fidelity), Concerns, Adaptation (mutual adaptation), and Reasons for Adaptation (enactment). Themes that emerged from coding were identified. The observation data were coded based on the lesson plan used by the EFL teachers. For trustworthiness, a lecturer in the English Department of Graduate Program at the State University of Makassar served as a second rater. Data from the questionnaire and the interview used to find out the data on the first research problem. Data observation supported by the lesson plans were useful to seek the second research problem.

Findings and Discussion

The EFL Teachers' Perception of Scientific Approach

As an indication of the extent EFL teachers' perceive to which Scientific Approach on 2013 curriculum is implemented in Indonesia, of the 34 respondents to the survey, 18 (79%) claimed to be practicing Scientific Approach to some extent, whereas 5 (14.71%) said they were occasionally. Eleven of the participants (32.35%) claimed to be implementing it fully. As Table 1 shows, the mean level of implementation among the practicing group was 3.98/5 or approximately 80%.

Table 1. The rate Scientific Approach implemented based on its' models

	Mean	**Percentage**
Scientific Approach	4.54	91%
Discovery Learning of Scientific Approach	3.99	80%
Problem Based Learning of Scientific Approach	3.71	74%
Project-Based Learning of Scientific Approach	3.66	73%
Average	**3.98**	**80%**
Note. (N=18)		

These results suggest that according to the EFL teachers, although Scientific Approach is not practiced its fullest extent, EFL teacher make efforts to adhere to its principles. The following representative excerpts from the interviews show that EFL teachers were aware to the beneficial of these learning models including in Scientific Approach. This approach were beneficial in the learning process instead of the previous curriculum or School-based Curriculum but necessary adjustment in accordance with the activities of the learning materials and students' needs based on the essential competencies and indicators of achievement on 2013 curriculum. As the teacher says: "a lot of the subject matter contained in textbooks, but still need adjustments to the learning indicators contained in the 2013 curriculum, it is not necessarily directly used as the subject matter", (T2 Interview). Another teacher has a similar statement: "learning steps in Scientific Approach can be applied well but necessary adjustments to the activities of its learning model…. learning to write, read something, and listen to has a different way of teaching". (T3 Interview).

How Do They Translate Into Their Classroom Teaching Practices?

Classroom Management

The number of EFL teachers' experiences in teaching has a significant influence on their ability to manage their classroom, regardless of their fluency using English as a language of instructions; they will be able to build relationship among their students, organizing time and space, and accommodating diversity of culture and behavior (Basri, Abduh, & Hudriati, 2018; Lima & Passos, 2015; Scarlett, 2014).

As observation data pointed out, the three participants as a representative from each category could apply their learning practices well from beginning to the end of the class. Furthermore, it showed the EFL teachers' ability to deliver the learning materials to students. For further clarification regarding their classroom management based on the data observation of the three participants as follow:

a. From "Fully Practice" category, RR, he used English and Indonesian for a little during the learning process, but he got the problem to manage the classroom. Based on the first video observation at minute 22:00 - 29:16, it was clear that the students were playing and did not focus on the subject material.
b. From "Frequently Practice" category, SA, she used English during the learning process, and she could set the class with a very smooth and disciplined. Based on the second video observation at minute 6:27 – 14:16 and 18:39-29:59, it was clear that the students followed their teacher's direction well.
c. From "Occasionally Practice" category, NR, she used little English to explain the material during the classroom process, and the classroom was not conducive. Based on the third video observation at minute 7:03 – 14:35, it appeared that most students did not focus on the learning material.

To recap the results, the experiences and knowledge of the EFL teachers in this study reveal that accommodating students' learning motivation should become the primary concern. Throughout the whole process, adequate encouragement, incentives, guidance, monitoring, and regulation become factor to be a recommendation as motivation for students as well as to maintain their accountability.

Teaching Method in Classroom Practices

As well as classroom management, EFL teachers' prior knowledge to teaching method has a major impact in determining the success of students in learning. Using the appropriate teaching method that is suitable for the students' learning materials will optimize students

understanding of the learning materials. 2013 curriculum has translated some of the learning models that are expected to optimize students learning the process in school (Hosnan, 2014). They are discovery learning, problem-based learning, and project-based learning.

As observation data pointed out, the three participants as a representative from each category could apply general learning steps of Scientific Approach. Lesson plan from EFL teacher did not specify the type of learning model used but only use a scientific approach as outline steps of the activities. Observer identifies learning model used by teachers based on measures of activity and the type of material taught by the teachers. For further clarification, regarding the teaching method used by the EFL teachers based on the data observation of the three participants as follow:

a. From "Fully Practice" category, RR, applied discovery learning. It appeared from the fulfillment of discovery learning model-learning steps ranging from aspects of the stimulation problem statement, data collection, data processing, verification, and generalization.
b. From "Frequently Practice" category, SA applied discovery learning. It appeared from the fulfillment of discovery learning model-learning steps ranging from aspects of the stimulation problem statement, data collection, data processing, verification, and generalization.
c. From "Occasionally Practice" category, NR applied discovery learning. It appeared from the fulfillment of discovery learning model-learning steps ranging from aspects of the stimulation problem statement, data collection, data processing, verification, and generalization.

Equality of learning model applied by EFL teachers participants shows that this approach is generally more suitable for use in language learning, especially in English. As discovery, learning is adequate to foster students learning, and as the similarity of concepts remains powerful when combined with discovery learning, similarity-based discovery learning should be recommended for practice (Mandrin & Preckel, 2009; Paramma, 2018).

Discussion

The present study provided that there were marked differences in the way the EFL teachers perceive the scientific approach in their classroom teaching practices. These differences related to their training and teaching experiences in using the scientific approach in their classroom teaching practices.

As a result, the EFL teachers' attitude and practices are classified into three group categories: (1) Highly Implementing Scientific Approach (HISA); (2) Moderately Implementing Scientific Approach (MISA); and (3) Poorly Implementing Scientific Approach (PISA). These EFL teachers' categories are related to the EFL teachers' knowledge of scientific approach and their classroom teaching practices as can be seen from the questionnaire, interview, and observation data of EFL classroom covering the 34 EFL teachers' attitude and practices toward scientific approach as follows:

Table 2. Percentage of EFL Teachers' Practices of Scientific Approach

Interval	Categories	Frequency	Percentage (%
73-100	Highly Implementing Scientific Approach	11	32.35
48-72	Moderately Implementing Scientific Approach	18	52.94
20-47	Poorly Implementing Scientific Approach	5	14.71
	Total	**34**	**100**

Highly Implementing Scientific Approach

The HISA group teachers are characterized as the classroom teachers who have score interval from 73 to 100 as categorized 'High Implementation'. Teachers with this category consisted of 11 persons (32.25%). These teachers had varieties of teaching methods in their classroom teaching practices such as using discovery, problem-based, and project-based learning interchangeably and interactively.

Moderately Implementing Scientific Approach

The MISA group teachers are characterized as the classroom teachers who have score interval from 48 to 72 as categorized 'Moderate Implementation'. Teachers with this category consisted of 18 persons (32.25%). These teachers had lower varieties of teaching methods in their classroom teaching practices with only a couple of teaching methods used interchangeably.

Poorly Implementing Scientific Approach

The PISA group teachers are characterized as the classroom teachers who have score interval from 20 to 47 as categorized 'Poor Implementation'. Teachers with this category consisted of only five persons (14.71%). These teachers still maintained their conventional teaching methods in their classroom learning and teaching practices with no intention at all of

using the scientific approach in their classroom avoiding the recommendation from the present curriculum (2013) implemented in the Indonesian school system.

Conclusion

The findings here demonstrate the differences in the way of EFL teachers perceive the Scientific Approach in their classroom learning and teaching practices. They have adapted and enacted the principles of Scientific Approach in ways that respond to students need. Their teaching and training experiences using the scientific approach in their classroom have a significant influence on the way they apply and modify the scientific approach and its learning model based on their needs. The study classifies the EFL teachers' attitude and practices into three group categories: (1) Highly Implementing Scientific Approach (HISA); (2) Moderate Implementing Scientific Approach (MISA); and (3) Poorly Implementing Scientific Approach (PISA). They are related to the EFL teachers' knowledge of scientific approach and their classroom teaching practices. The study suggests that to practice Scientific Approach on 2013 curriculum in Indonesian context successfully, EFL teachers have to understand and compensate the use of three learning models in Scientific Approach as support of interactive learning process in classroom practices. In addition, training about Scientific Approach need to carry out for teachers, so they understand to implement it.

What is evident is that the more competent and the more positive attitude toward the use of scientific approach in the classroom teaching practices, the better output of the learning process reflecting the current curriculum implemented in Indonesian educational system. This evident reflects the theories of Kemp & Dayton (1985) of the basic principles of the relative perception, rather than absolute; perception is selective, organized, and influenced by set. This evidence is also supported by the theory of (Hosnan, 2014) on the great benefits of the scientific approach in the classroom teaching practices.

Further study needs to be conducted in relation with implementing the scientific approach in Indonesian classroom context. It has to be conducted consistently by looking at the comprehensive practices of the teachers in teaching all subject matters, so that all constraints in implementing the scientific approach can be anticipated for better teaching and learning process in producing students with sufficient knowledge, better skills, and right attitude.

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