

# ***THE IMPLEMENTATION OF SCIENTIFIC APPROACH IN ENGLISH TEACHING AT SMAN 1 BUNGA RAYA IN SIAK***

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**Abstract:** *This research is aimed at investigating the implementation of Scientific Approach by English teachers of one senior high school in Siak Regency. The study is specifically aimed at investigating how the scientific approach is implemented in the classroom and identifying the problems faced by the teachers during the implementation. The researcher selected three teachers of SMAN 1 Bunga Raya Siak as the participants using total sampling method. This study employed mixed method, combining quantitative and qualitative methods of data collection. The quantitative data were collected from a survey while the qualitative ones were obtained through semi-structured interviews. The combination of the two types of data was deliberately chosen for the researcher intended to understand the depth of the data. The findings showed that the teachers have implemented the scientific approach relatively well. This can be seen from the results of the survey in which the overall mean score calculated was 4.4 and categorized 'very good'. However, the occurrence of some problems in the implementation was inevitable. In general, the problems can be classified into four: (a) insufficient English teaching hour; (b) the students' high diversity in terms of ability; (c) discrepancy between curriculum and national examination contents; and (d) lack of the school's and students' facility.*

**Keywords:** *Scientific Approach, implementation, English teaching, Siak Regency*

# PENERAPAN PENDEKATAN SAINTIFIK PADA PENGAJARAN BAHASA INGGRIS DI SMAN 1 BUNGA RAYA SIAK

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**Abstrak:** Penelitian ini bertujuan untuk mengetahui penerapan pendekatan saintifik/ilmiah yang dilakukan oleh guru Bahasa Inggris di salah satu SMA di Kabupaten Siak. Lebih spesifik, penelitian ini ingin meneliti bagaimana guru menerapkan pendekatan saintifik di kelas dan masalah apa yang dihadapi oleh guru dalam penerapan pendekatan saintifik tersebut. Subyek penelitian dalam penelitian ini adalah tiga orang guru Bahasa Inggris di SMAN 1 Bunga Raya di Kabupaten Siak yang dipilih melalui metode *total sampling*. Penelitian ini menggunakan penelitian campuran (*mixed method*) yang menggabungkan data kuantitatif dan kualitatif. Data kuantitatif diperoleh dari survei atau kuesioner sedangkan data kualitatif didapatkan melalui wawancara semi-terstruktur. Penggabungan dua jenis data penelitian ini dimaksudkan untuk memperoleh kedalaman data, bukan untuk tujuan generalisasi. Hasil penelitian menunjukkan bahwa guru Bahasa Inggris di SMAN 1 Bunga Raya Siak telah menerapkan pendekatan saintifik dengan relatif baik. Hal ini dapat dilihat dari skor rata-rata yang diperoleh dari keseluruhan butir survei yakni sebesar 4.4 dan dikategorikan sebagai ‘sangat baik’. Meskipun demikian, kendala dalam penerapan pendekatan saintifik di sekolah tidak dapat dihindarkan. Secara umum, masalah yang dihadapi oleh guru di sekolah dapat diklasifikasikan ke dalam empat jenis: (a) jam mata pelajaran Bahasa Inggris yang sempit; (b) perbedaan tingkat pemahaman siswa; (c) kesenjangan antara konten kurikulum dengan konten Ujian Nasional; dan (d) keterbatasan fasilitas sekolah serta fasilitas siswa.

**Kata Kunci:** Pendekatan Saintifik, penerapan, pengajaran Bahasa Inggris, Kabupaten Siak

## INTRODUCTION

From time to time, the Indonesian government has been making some significant changes and policy adjustments towards national education to improve the quality of education. Until 2018, Indonesian education has undergone at least ten time curriculum revisions. Through The Ministry of Education and Culture or Kemendikbud (now The Ministry of Elementary and Secondary Schools), since 2013, Indonesian government has established 2013 Curriculum as the latest and currently-used curriculum. Former Minister of National Education, M. Nuh stated that the main point of 2013 Curriculum development is in refining mindset, strengthening curriculum management, deepening and broadening the materials, reinforcing the learning process, and adjusting the study needs to balance the outcome of the learning process (Kemendikbud, 2013). In addition, compared to the previous curricula, 2013 Curriculum has its own distinctions. One of the differences is in terms of the learning approach recommended to use by teachers in teaching known as “Scientific Approach”.

In its early establishment, there were some pro and cons situations toward the implementation of the 2013 Curriculum. One of the reasons was because some schools were not ready to adopt this new curriculum. However, since January 2017, 2013 Curriculum is no longer optional, as it is stated in Peraturan Permendikbud (Regulation of Ministry of Education and Culture) No. 81A/2013 about the implementation of 2013 Curriculum. As the result, every teacher is mandated to use this curriculum, in particular, the scientific approach.

The essential idea of the scientific approach is that teachers are suggested to apply the principles or activities that are commonly used in natural science classes. To be more specific, the materials (handout) provided by Kemendikbud (2013) for teachers training explain that Scientific Approach is an approach that refers to investigating techniques towards some phenomena, acquiring new knowledge, and correcting and combining the background knowledge. The pointed steps of the 2013 Curriculum’s Scientific Approach in learning are: *observing, questioning, associating, experimenting, networking, and creating*.

As the compulsory approach in the curriculum, every teacher is expected to be able to implement the Scientific Approach in a learning process in the class, including English teachers in Siak Regency. However, it is possible that some problems and issues on the implementation of the approach in the class will occur (Afrianto, 2017). Many of these problems are likely to impede the effectiveness of English teaching and learning process in schools. Thus, the research was intended to study how English teachers of a senior high school implement the scientific approach in their classrooms. To be specific, this study is aimed at answering two research questions: (1) to what extent do English teachers implement the scientific approach in English teaching?; and (2) what problems do the teachers encounter during the implementation?

Under the 2013 Curriculum, the learning process should touch the three domains of education; affection, cognition, and psychomotor. In the scientific approach based learning process, the affective domain is developed with a focus on the substantial transformation or the teaching materials so that the students know about “why”. The psychometric domain focuses on the substantial transformation or the teaching materials so that the students know about “how”. Meanwhile, the cognitive domain emphasizes the substantial transformation or the teaching materials so that the students know about “what”. The expected final result is the improvement and balance between the ability to

be a good person (soft skills) and the ability to be a capable and competent person to have a good life (hard skills) which cover the three competency aspects. With such learning processes, it can be expected that the learning result will yield learners who are productive, creative, and affective, through an integrated reinforcement on affective, cognitive, and psychometric aspects.

As described in Permendikbud 81A/2013 and 22/2016, Scientific Approach is done in the following steps: observing, questioning, experimenting, associating, networking and creating. In a recent revision of 2013 Curriculum, a note regarding to the steps in the Scientific Approach is that those steps do not have to be done in a fixed sequence. The sequence can be altered depending on the needs of the teaching and learning.

The activities in the *observing* step are related to the human senses such as seeing, listening, reading, or watching. The observation object used by the teacher can be in the form of visual object (e.g. pictures, images, texts, charts, etc.); audio (e.g. recordings, songs, etc.); or audio-visual media (e.g. videos, short movies, etc.). The objects to observe can also be in the form of concrete objects or specimens (if relevant to the topic discussed). To do this observation, the teacher should prepare an observation guidance like observation sheet or the instructions. Teachers' creativity is essential in this process in order to achieve a meaningful learning. Of the competencies that students are expected to perform are seriousness, curiosity, and thoroughness.

Next, *questioning* step is the process of constructing knowledge through a group or class discussion. In this step, students' curiosity and critical thinking ability should be developed. Therefore, the questions or problems should be elevated into a high level of thinking activity and the teacher lets students to open up for questions about the topics given. The students are expected to perform an active participation. To do so, the teacher should guide the students to be able to give a concrete to more abstract question related to facts, concepts, procedures, and hypothetical things. The questions given by students then become the bases for digging deeper information. Among the competencies that the students are expected to perform are developing creativity, building curiosity, and improving critical thinking ability.

Another step in the scientific approach is *experimenting*, or also called 'exploring'. Experimenting step is the step where students collect some information or knowledge and internalize the knowledge and skills that have been just learned. In this process, students practice to express the new things they have learned and try to use that skill in real situation activities both inside and outside the class. The students are expected to try the new knowledge they get and share that knowledge to each other. It can be in the form of paired or group activity. Teachers can also bring other learning sources to provide more information to the students such as different textbooks, references, or an expert to be interviewed.

Next, *associating*, also called as reasoning, is another step in the scientific approach. Associating is a process of developing the ability to group and compare various phenomena and ideas to, later on, be inserted into some pieces of memory. The pieces that have been stored in the memory then relate and interact with the previous pieces of information that have been stored way before. In other words, association is done through information processing. It can be in the form of extending the depth of the information, to finding resolution from different sources that have linear or even opposite views. Honesty, thoroughness, discipline, and concluding ability development are some of the competencies that the students are expected to perform.

Furthermore, *networking* or communicating activity is aimed to develop students' ability to present all knowledge and skills that have and have not been acquired in spoken and written expressions, or with other media. The teacher should make sure that every student in the class has the equal right to express his or her ideas. In this process, not only the ability to communicate matters but also do the problems and successfulness the learners have during the learning process.

The "recent" step in the scientific approach implementation is *creating*. The idea in this creating step is that the students can create something as the manifestation of the learned knowledge. The creation can be in the form of individual or group work. The teacher can assign the students to create something by considering the materials availability and students ability level.

## METHODOLOGY

This research used a mixed-method, a method that combines both qualitative and quantitative methods of research. The combination of mixed-method studies is concretely operationalized at the technique level, or the shop floor, of research: that is, at the level of data collection and data analysis (Sandelowski, 2000). The blending of qualitative and quantitative data in a single study is advantageous because they are complementary and represent the two fundamental language of human communication; words and numbers (Polit & Hungler, 1995). Besides, the combination of qualitative and quantitative data balances the strengths and weaknesses of each type of data and results in the most convincing answer to the research question at hand (Lederman & Lederman, 2013). The reason for collecting both qualitative and quantitative data is to confirm the quantitative measure with qualitative experiences. Also, it is because quantitative or qualitative research alone is insufficient to fully understand the problem.

Nonetheless, this research is more qualitative-oriented, since the data processing was dealing with more non-numerical data. The data can be in the form of sentences, statements, or documents. In addition, the nature object of the research is basically more in the forms of qualitative entities such as social phenomena, perceptions, and issues in the process of the Scientific Approach implementation.

Three English teachers at SMAN 1 Bunga Raya in Siak were chosen to be the participants of the research. In regard to the confidentiality of the research participants, the teachers' names were replaced with their initials along this paper.

Since mixed method research is actually a combination of quantitative and qualitative method, then the data were gathered and analyzed accordingly. The quantitative data were collected from a survey while the qualitative ones were obtained through semi-structured interviews. The questionnaire used in this research is basically a modified survey of Kemendikbud's and Utami's (2015) in her thesis. It was a 5-point Likert Scale ranging from "always" on one end to "never" on the other with "sometimes" in the middle. The items of the questionnaire were mainly developed based on the research objectives and research questions.

The survey was created using Google Form platform and sent to the teachers via online. The items were translated into Bahasa Indonesia to clear the point and help the respondents answer the survey more conveniently. The link of the questionnaire was distributed through social media groups of MGMP (Musyawarah Guru Mata Pelajaran)

English subject teachers in Siak. This method helped the researcher distribute the survey more efficiently.

After the data of the survey were obtained, the data were then analyzed to find the frequency and the mean of the responses. Firstly, the scales were converted into numbers; always = 5, often = 4, sometimes = 3, rarely = 2, never = 1. Then, the frequency of each option was multiplied by each value to get the mean score. The mean and the percentage of each section and each item of the survey were then analyzed and presented using Microsoft Excel 2010. The results of the analyses were classified into one of these categories:

Table 1 Criteria Code for Interpretation

MEAN INTERVAL	CATEGORY
>4.2 – 5	Very Good
>3.4 – 4.2	Good
>2.6 – 3.4	Fair
>1.8 – 2.6	Poor
1 – 1.8	Very Poor

(Mustafa, 2009)

For the qualitative data, the study used in-depth semi-structured interviews, which means the interviewer (in this case, the researcher) was collecting data by asking the interviewee (the participants) a series of questions. In-depth interviews are useful in getting detailed information about a person's thoughts and behaviors or exploring new issues in depth. Interviews are often used to provide context to other data (such as outcome data), offering a more complete picture of what happened in the program and why (Boyce & Neale, 2006). Nonetheless, an interview protocol as the basis of initial question was prepared before the semi-structured interview. The interview protocol is used as a guide in order the conversation will not deviate from the main focus since the questions might expand based upon the situation or interviewee's answer. The interview took around an hour or less for each participant and it was recorded with a notification and allowance request to the participant before conducting the interview. The result of the interview was written in the form of interview transcripts and then was analyzed.

The data analysis was done by transcribing, editing, classifying, reducing, and presenting the data. In regard of this study, the collected data were analyzed inductively by referring to the three procedures introduced by Flick (2002): *open coding* (a phase where all themes are found and categorized), *axial coding* (a stage where the researcher is looking for relationships among themes), and *selective coding* (a phase where the researcher is choosing the more relevant themes to be explored further in the discussion).

## FINDINGS AND DISCUSSIONS

### The Result of the Questionnaire

The questionnaire consists of two main sections: preparation and teaching stages. The results of each questionnaire item per section and sub-section are presented below. The results specifically show the frequency of the response the participants have chosen [presented in percentage (%)] and mean score of the chosen responses per section and sub-section.

#### Preparation Stage

In the *preparation stage* section, there are six items that highlight the questions whether the teachers actually understand some theories related to the scientific approach and do some preparations before writing their lesson plans. Respectively, the items relate to whether a teacher (a) writes lesson plans; (b) uses 2013 curriculum as a guide; (c) understands components of a lesson plan; (d) understands scientific approach steps; (e) gets 2013 curriculum training/workshop; and (f) gets 2013 curriculum insight from fellow-teacher. Most of the answers are distributed to 'always', 'often', and 'sometimes'. For overall responses in this section, 'always' is the upmost response with 44.44% while none of the survey-takers answered 'never'. The detailed responses can be seen from the following table:

Table 2 The percentage of the survey items in the preparation stage

No	Item	OPTION										N
		always		often		sometimes		rarely		never		
		f	%	f	%	f	%	f	%	f	%	
1.	1	2	66.67	0	0	1	33.33	0	0	0	0	3
2.	2	1	33.33	2	66.67	0	0	0	0	0	0	3
3.	3	2	66.67	0	0	1	33.33	0	0	0	0	3
4.	4	2	66.67	0	0	1	33.33	0	0	0	0	3
5.	5	0	0	1	33.33	0	0	2	66.67	0	0	3
6.	6	1	33.33	2	66.67	0	0	0	0	0	0	3
<b>Σ</b>		<b>8</b>	<b>44.44</b>	<b>5</b>	<b>27.78</b>	<b>3</b>	<b>16.67</b>	<b>2</b>	<b>11.11</b>	<b>0</b>	<b>0</b>	<b>18</b>
<b>Mean</b>											<b>4.0</b>	

Those data were then calculated by relating them to the classification proposed by Mustafa (2009) to see how good the teachers implement the Scientific Approach in the preparation stage. Based on the categorization of the mean obtained, the teachers' performance in preparation stage is categorized 'good'. It means that the teachers of SMAN 1 Bunga Raya have prepared the teaching using the scientific approach relatively well.

## Teaching Stages

In *teaching stages* section, the respondents were asked a number of questions related to the detailed implementation of the Scientific Approach in their actual classroom activities. This section consists of three stages of teaching: (a) opening the class, (b) implementing the scientific approach; i.e. observing, questioning, associating, experimenting, and communicating (whilst-teaching), and (c) closing the class.

Items no. 7 to 10 in the questionnaire are closely related to activities in opening the class. Respectively the statements relate to whether the teacher (a) checks the attendance; (b) makes sure the classroom in good condition; (c) asks the students' wellbeing; and (d) motivates the students. The responses for these items are homogenous as all the teachers answered 'always' to those numbers. This means that all of the teachers carried out the activities pointed out in the statements.

Next, items 11 to 14 are also related to some activities a teacher does in the opening or pre-teaching stage. Among the four items, item no. 11 (asking if the teacher carries out icebreaking) is the one with the most varied responses, as for the other items, none of the participants answered 'sometimes', 'seldom' or 'never'. The following table shows the percentage of each item in opening class stage.

Table 3 The percentage of the survey items in the while-teaching stage

No	Item	OPTION										N
		always		often		sometimes		rarely		never		
		f	%	f	%	f	%	f	%	f	%	
1.	7	3	100	0	0	0	0	0	0	0	0	3
2.	8	3	100	0	0	0	0	0	0	0	0	3
3.	9	3	100	0	0	0	0	0	0	0	0	3
4.	10	3	100	0	0	0	0	0	0	0	0	3
5.	11	1	33.33	1	33.33	1	33.33	0	0	0	0	3
6.	12	1	33.33	2	66.67	0	0	0	0	0	0	3
7.	13	2	66.67	1	33.33	0	0	0	0	0	0	3
8.	14	3	100	0	0	0	0	0	0	0	0	3
<b>Σ</b>		<b>19</b>	<b>79.16</b>	<b>4</b>	<b>13.33</b>	<b>1</b>	<b>3.33</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>
		<b>Mean</b>										<b>4.7</b>

Regarding the five steps in the Scientific Approach, they are put in the statements number 15 to 34, provided at least three items each. The distribution of the steps on the questionnaire items is shown on Table 4. In *observing* stage, for instance, one hundred percent of the respondents acknowledged observing in their teaching, which means all of the teachers always carry out observing in their classes. However, when asked about what kinds of media that the teachers frequently use in their observations (items no. 16 - 19), their answers were varied.

Taking a look to the next step in the Scientific Approach, items no. 20 – 22 are to check whether the respondents do *questioning* step in their teaching. All of the respondents admitted that they always do 'questioning' in their class.

Furthermore, as many as four items (starting from item 23 to 27) are asking about the *experimenting* step of the Scientific Approach. Taking a look to the responses to item no. 24 asking how frequently the teacher instructs the students to try on



something that has been learned, the teachers responded ‘always’ (66.67%) and ‘often’ (33.33%).

Another step in the Scientific Approach is *associating*, and it was elaborated in questionnaire items number 28 to 30. On item number 28, the teachers were asked about how often they get the students to analyze the differences and/or similarities between the discussed topic and related topic. All respondents answered ‘often’ to correspond it. Next, item number 29 asked the next level of associating activity which is finding relationship between one topic to others, and all the teachers who were asked this also answered ‘often’.

Next, some of the principles or activities done in *communicating* stage are covered in the next four items; items no. 31 – 34. Take item 34 as an example, stating; “I inquire the students to talk about the difficulties or problems during the learning process.” Among all the participants, one teachers (33.33%) chose ‘always’ to respond this statement and the other two (66.67%) chose ‘often’.

In an overall view for the implementation section, it can be seen that ‘always’ is the most selected answer with 50% followed by ‘often’ with 38.33%, ‘sometimes’ 6.67%, ‘never’ 3.33%, and ‘rarely’ 1.67%. The complete percentage of the results of implementing section can be seen in the following table.

Table 4 The percentage of the survey items in the while-teaching stage

No	Item	OPTION										N
		always		often		sometimes		rarely		never		
		f	%	f	%	f	%	f	%	f	%	
a. Observing												
1.	15	3	100	0	0	0	0	0	0	0	0	3
2.	16	1	33.33	1	33.33	1	33.33	0	0	0	0	3
3.	17	0	0	2	66.67	1	33.33	0	0	0	0	3
4.	18	0	0	2	66.67	0	0	1	33.33	0	0	3
5.	19	0	0	3	100	0	0	0	0	0	0	3
b. Questioning												
6.	20	3	100	0	0	0	0	0	0	0	0	3
7.	21	2	66.67	1	33.33	0	0	0	0	0	0	3
8.	22	2	66.67	1	33.33	0	0	0	0	0	0	3
c. Experimenting												
9.	23	2	66.67	1	33.33	0	0	0	0	0	0	3
10.	24	2	66.67	1	33.33	0	0	0	0	0	0	3
11.	25	2	66.67	1	33.33	0	0	0	0	0	0	3
12.	26	1	33.33	1	33.33	1	33.33	0	0	0	0	3
13.	27	0	0	0	0	1	33.33	1	33.33	1	33.33	3
d. Experimenting												
14.	28	0	0	3	100	0	0	0	0	0	0	3
15.	29	0	0	3	100	0	0	0	0	0	0	3
16.	30	2	66.67	1	33.33	0	0	0	0	0	0	3
e. Networking												
18.	31	3	100	0	0	0	0	0	0	0	0	3
19.	32	3	100	0	0	0	0	0	0	0	0	3
20.	33	3	100	0	0	0	0	0	0	0	0	3
21.	34	1	33.33	2	66.67	0	0	0	0	0	0	3
<b>Σ</b>		<b>30</b>	<b>50</b>	<b>23</b>	<b>38.33</b>	<b>4</b>	<b>6.67</b>	<b>1</b>	<b>1.67</b>	<b>2</b>	<b>3.33</b>	<b>60</b>
<b>Mean</b>											<b>4.3</b>	

In the last sub section, all respondents were asked to respond to six items regarding the activities in closing the class. The activities are wrapped in the items number 35 to 40 which respectively are about: (a) concluding the lesson; (b) doing a reflection; (c) giving some feedback; (d) giving assessment; (e) assigning following-up task; and (f) mentioning the upcoming lesson plan. Table 5 shows that none of those activities is missed by the teachers since there is no single respondent answered ‘never’ or ‘rarely’ in their responses. It is fair to say that most of the teachers taking this survey never skip all the six activities in closing stage judging from the fact that ‘always’ has the highest mean rate of overall responses (72.22%).

Table 5 The percentage of the survey items in closing the class

No	Item	OPTION										N
		always		often		sometimes		rarely		never		
		f	%	f	%	f	%	f	%	f	%	
1.	35	2	66.67	1	33.33	0	0	0	0	0	0	3
2.	36	1	33.33	1	33.33	1	33.33	0	0	0	0	3
3.	37	3	100	0	0	0	0	0	0	0	0	3
4.	38	3	100	0	0	0	0	0	0	0	0	3
5.	39	2	66.67	0	0	1	33.33	0	0	0	0	3
6.	40	2	66.67	1	33.33	0	0	0	0	0	0	3
<b>Σ</b>		<b>13</b>	<b>72.22</b>	<b>3</b>	<b>16.67</b>	<b>2</b>	<b>11.11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>
		<b>Mean</b>										<b>4.6</b>
		<b>Total Mean</b>										<b>4.4</b>

The overall mean score of the Teaching Stage is 4.4, derived from the results of the three subsections calculated together. The classification of how good the teachers implement the Scientific Approach in Teaching Stage is categorized into ‘very good’. It means that the teachers of SMAN 1 Bunga Raya have followed all the steps in the scientific approach relatively well. Nonetheless, if it is taken a closer look, among the steps in the Scientific Approach, associating and networking appeared to be the least frequently employed steps as most of the teachers chose ‘often’ on their responses. This can mean that there are times that the teachers do not include associating and/or networking in the teaching. This situation may happen because of many reasons. It may be because the teacher intends to carry out different sequence of the steps on different lesson. This is advantageous to the teaching because it can make the teaching “on point” with the characteristics of the lesson or competency. However, it is also possible that the altering of the sequence may cause some problems such as students’ confusion that can lead to their passiveness in the classroom.

At last, from all the two sections combined, it is clear that the results of the survey show that the implementation of the Scientific Approach by English teachers of SMAN 1 Bunga Raya is in the ‘very good’ level with the total mean 4.4. This means that the teachers have shown a good level of understanding of the principles in the approach. This can also mean that the teachers show a positive reception on the using of scientific approach in English teaching in their classrooms. The positive results of teachers implementing the scientific approach steps are also shown in some other schools in Indonesia through some studies by Sofyan (2016) and Ratnaningsih (2017). From their studies, it is reported that the teachers shared similar perception in which the

scientific approach is regarded as an approach that integrates students' attitude, skill, and knowledge by implementing the steps in the teaching and learning process.

### The Result of the Semi-Structured Interviews

As pointed out in the introduction section of this paper, the research was aimed at finding out the two aspects through the semi-structured interviews: (a) to what extent the teachers implement the Scientific Approach; and (b) what problems the teachers encounter during the implementation of the Scientific Approach.

One of the questions asked during the interview was "How do you implement the Scientific Approach in teaching English in your class?" This question was intentionally asked to explore the teachers' basic understanding about how to apply the scientific approach. It is believed that the teachers clear understanding and their positive perception on how to implement the mandated approach will significantly determine the success and the effectiveness of the classroom teaching. Their understanding will guide them in implementing the approach.

When asked about the question, the teachers gave relatively similar answers. They basically described some steps of the Scientific Approach in the teaching activity. Mr. D, one of the participants, clearly mentioned five steps in the scientific approach. Meanwhile, the other participant, Mr. E did not explain all the steps in the scientific approach. He only mentioned two steps; 'observing' and 'questioning'. However, he added that by using the approach in today's curriculum, his teaching is more directed. He claimed that he does not want to go to other steps before one step is successfully done.

The data from the semi-structured interviews also revealed some problems reported by the teachers while implementing the scientific approach. The dimension of the problems can be said as something complex. However, in general these problems can be classified into four main issues:

Table 6. Problems of the Implementation

No.	Problems of the Implementation
1.	insufficient teaching hours
2.	students' high diversity
3.	discrepant curriculum content
4.	lack of facility

In the most recent revision of 2013 Curriculum it is stated that the teaching hour for English subject in high schools is reduced from four hours a week to be two hours a week (2 x 45 minutes). This reduction, among other problems, was the problem that most participants complained about. When asked about the problem in the scientific approach implementation, two of the participants, Mr. D and Ms. B straightforwardly voiced about the time reduction. In his answer, Mr. D questioned the rationale behind the reduction and stated that the reduced time does not feel like supporting the standards for students to achieve which he thinks are high. He deemed that the time allocation is insufficient for a teacher to do all the steps and therefore cannot meet with the expected goal that the student must achieve. He then added that even with the previous time

allocation, it was quite challenging to raise students' achievement in English, let alone when the time is reduced.

“The problem of this curriculum is I think in terms of the time reduction, sir. Two hours. Meanwhile, the challenge is high.”

(Mr. D)

“First, the problem is about the time sir, [speaking of] this 2013 Curriculum. Only two hours, from four hours. Consequently, our chance [as a teacher] to give broader knowledge to the student is, uh, limited.”

(Ms. B)

The challenge with the time reduction is even more complex when it meets with the condition of the students. In fact, two respondents were rather disappointed that the time is reduced because the stake does not meet with the students' ability in that area. According to Mr. D, the level of students' ability in SMAN 1 Bunga Raya varies, even most of them are categorized in medium to low level.

“Here [in this school], the ability of the students happens to be very drastic. Some are good, some are not. And some are quiet.”

(Mr. D)

“The students' ability is just like what I said before; some are very smart, some others are extremely low.”

(Ms. B)

The spirit of 2013 Curriculum is to promote students-centered learning. This is evidenced by the emphasis in the scientific approach whose steps were designed to arouse students activeness in the class. In questioning step, for instance, the students are expected to be curious and therefore give some questions about the topic given. Students' lack of motivation clearly becomes a problem that can impede the success of the scientific approach implementation since it can lead to students' passiveness in the class.

Furthermore, despite the suitability for enjoyable learnings, there seems to be a discrepancy between the contents of 2013 curriculum and of the National Exam according to Mr. E. The curriculum, especially the scientific approach, was designed in order to make the learning activity enjoyable. This is true, referring to the Process Standards by Kemendikbud (2013) saying that the teaching and learning process in school should be established in an interactive, inspiring, and fun way in order for students to be active. However, it does not seem to concur with the national examination content in which it requires the students to think analytically.

“In the National Exam, even though [the learning] has been done using 2013 Curriculum, still, the form [of the questions] is about understanding about the text, right? ... Meanwhile in 2013 Curriculum, those are no longer encouraged. ...with the five steps (5M) done, it oddly seems to only result enjoyment, not preparing [the students] for the National Exam.”

(Mr. E)

Another problem found in the implementation was in terms of the facility. The dimension of this problem includes both school and students' facility. The problem regarding the students' facility was in terms of the learning sources or textbooks. The school did provide textbooks to the students, but not to all. Also, the students were not supported with modules and/or references books. This phenomenon affected on the effectiveness of the teaching since learning sources play an important role in the teaching and learning using the scientific approach. In experimenting step, for example, students are expected to dig out more information about the lesson either from discussion with friends, interviews with an expert, or reading other source materials.

In terms of the school facility, one respondent reported that it was until early 2018 SMAN 1 Bunga Raya finally got electricity. The creativity of the teacher was challenged there. The goal to liven up a 'fun and active' learning in the class was a bit difficult to realize.

"The challenge in the implementation of the five steps (5M) that is very problematic is in [the condition of] village area like here, sir. Like what we'd been through, you know, we've just got the electricity source since the last couple months ago. It was difficult to realize a teacher who is creative, a more creative teacher, a more innovative teacher, like that."

(Mr. E)

Lack of facility, in terms of both students' and school facilities, has been a huge problem in many schools, especially in schools in small towns or rural areas. The findings of this research alone caught a great deal of reports about the lack of learning facilities. Through separated interviews, each teacher in the school expressed the problems they face regarding the facility.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusions**

Based on the results of the survey and semi-structured interviews, it can be said that the scientific approach has been relatively well implemented by English teachers of SMAN 1 Bunga Raya Siak. This can be drawn from the results of the 5-point Likert scale survey filled in by the three teachers. The survey consisted of two main sections respectively relating to preparation and teaching stages. The means of the two sections were calculated and they were respectively categorized into 'good' (4.0) and 'very good' (4.4). The overall mean of the survey is 4.4, categorized into 'very good'. This means that the teachers have shown a very positive reception and understanding about the principles of the scientific approach.

The result of the survey was later crosschecked, enriched, and supported with the qualitative data; i.e. semi-structured interviews. It was found that the teachers have implemented the Scientific Approach in the classroom relatively well. It can be seen from the interviews that all the teachers have implemented the five steps in the approach although not every step was always carried out. Observing, questioning, and networking appeared to be the most-frequently implemented steps compared to the other steps

(associating and experimenting). There is an indication that it occurs due to the lack or trainings experienced by the teachers.

Furthermore, an occurrence of some problems during the implementation was inevitable. Among some other problems, insufficient teaching hours and students' extreme diversity were the main issues the teachers voiced during the interviews. In addition to the problem, the mismatch between the contents of the 2013 Curriculum and of the National Exam seems to be another major issue in the implementation.

## **Recommendations**

In regard of the time allocation that seems to be one of the major issues encountered by teachers that can impede the success of the scientific approach implementation, it is suggested to the government or the policy makers to reconsider the time allocation especially for English subject.

In addition, the results of the survey and interviews seem to present a rather different tone of the findings. It might be because the survey was not set to figure out the problems in the scientific approach implementation. It was the semi-structured interview that was designed to answer the research question regarding the problems as well as to confirm and enrich the data gained from the survey. Moreover, the data from survey and interviews might have not been able to vividly report what actually happened in the class. Therefore, another data collection technique like observation or field study is recommended to use for further researches.

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