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## CHAPTER II

### LITERATURE REVIEW

This chapter discovers five correlated parts. The first part is the concept of scientific approach in language teaching. The second part is the concept of scientific approach in the 2013 curriculum. The third one is the connection between learning stages and learning activities. The fourth part is the related studies and the last part is theoretical framework.

#### 2.1 The Concept of Scientific Approach in Language Teaching

The word science comes from the Latin root *Scientia*, meaning knowledge. Wolford, K (2013) in her journal states that the scientific method is inseparable from science. The earliest examples of its use have been found in Ancient Egyptian manuscripts. Aristotle further developed it by introducing an inductive-deductive method. Induction is making a general rule from a set of observations, while deduction is predicting observations based on a general rule. However, he mostly ignored induction as a method for scientific inquiry (Perry, J.,2001).

The modern scientific method emerged in the Middle Ages - first with Arabic thinkers such as Ibn Sina and Ibn al-Haytham, and later with European thinkers such as Robert Grosseteste (Wolford, K., 2013). Sir Francis Bacon was the first to formalize the concept of the right scientific method in the early 17th century. Bacon is essential because he was the scientific method's great proponent. He



argued with those who believed in Aristotle's method, instead advocating much experimentation to prove things

Bacon's 1620 method of proving knowledge to be true was via doubt and experimentation. His works established and popularized inductive methodologies for scientific inquiry or simply the scientific method. His demand for a planned procedure of investigating all things natural marked a new turn in the rhetorical and theoretical framework for science, much of which still surrounds conceptions of proper methodology today (Perry, J.,2001).

In the beginning, a scientific approach or method is a common term used in the field of inquiry. "Scientific method" initiated from the empiricist theory that views experience as a foundation or source of knowledge (Aspin, 1995: Wahyudin, 2015). This view also increased support from a philosophy of science called positivism that believes the goal of knowledge is derived from logical and report of the sensory experience of phenomena. In a positivist view of the world, science was the way to get at the truth, to understand the world well enough so that we might predict and control it. Therefore, this belief gave rise to a method of finding the truth called scientific approach. Many works of literature elaborate on the definition of "scientific approach" in education, particularly in the field of Science. It is defined as a logical, orderly approach that involves gathering data, formulating and testing the hypothesis, and proposing theories (Wicander & Monroe, 2006: Wahyudin, 2015). "Scientific method" is also the process of asking questions and doing experiments to find the answers. The definitions of "scientific method" proposed by some experts above can be summarized as a body of techniques for

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investigating phenomena, acquiring new knowledge, or correcting and integrating previous knowledge. Lately, the 2013 Curriculum in Indonesia views scientific approach as the way of teaching adapted from principles of discovery established by Dyer, Gregersen, & Christensen (2011) in Wahyudin (2015). According to Dyer et al. (2011), most successful innovators, entrepreneur, and executives show similar behavior which is involving several steps in discovering innovative ideas. These principles involve five main skills: observing, questioning, experimenting, associating, and networking or communicating.

There are six stages in scientific method based on Bacon; observation, question, hypothesis, experiment, analyze the data and draw a conclusion (Wolford, K., 2013). Systematic observation and experimentation, inductive and deductive reasoning, the formation and testing of hypotheses and theories were often identified as characteristic of science.

Brown (2001) in Hasan (2014) states several fundamental principles of learning and teaching on which we can rely on designing and evaluating classroom lesson. Approach to language teaching methodology is theoretically well-informed positions and beliefs about the nature of language learning and the applicability of both to pedagogical settings. Then, according to Anthony (1963) in Hasan (2014), was a set of assumptions dealing with the nature of the language, learning, and teaching. Approach or rationale for language learning and teaching, therefore, takes on great importance. The approach includes some basic principles of learning and teaching on which it can be relied for designing and evaluating classroom lessons. Approach to language teaching methodology is a theoretically informed global

understanding of the process of learning and teaching. It is inspired by the interconnection of all reading, observing, discussing teaching and that interconnection underlies everything that the teachers do in the classroom.

Meanwhile, Lado, R., (1954) in his writing “Language Teaching, a Scientific Approach” states that there are some significant areas that the language teacher should understand to follow a scientific approach to his work. Linguistics, the target and source languages human learning, the technique of teaching, testing, the language laboratory and other technological aids, reading, writing, cultural content and literature, teaching machines, and programmed learning are some of these areas. He also mentions that language discussed is based on linguistics and linguistics is a science.

In Mc REL International journal (2009) mentions that when the words “hypotheses” and “testing” written together, people automatically think we are talking about science. To be fair, sometimes we are talking about science, but not nearly as much as people think. Generating and testing hypotheses is just another way saying, “predict and determine how good your prediction turned out.” It can be used in all sorts of teaching situations. For instance, a language arts teacher might be leading students through reading a story and ask them to predict what actions the character will take next based on what they have read so far. Then as they read more, they discuss the accuracy of their predictions. Another example is a music teacher that teaches a unit on pop music and then asks the students to create their simple pop song. Creating music includes making many lyrical and melodic predictions and testing them out. A final example is the social studies teacher that

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asks students a big question like “What would our country be like today if the national heroes had not won the war?” Students are then asked to predict and investigate the feasibility of their predictions in a persuasive essay. Notice how the strategy tends to involve higher level thinking skills near the upper reaches of Bloom’s Taxonomy. Therefore, we must use scientific approach beyond just science class.

Scientific approach is defined as the process of finding out information in science, which involves testing the ideas by performing experiments and making decisions based on the result of analysis (Longman, 2014). It means that scientific approach is a body of techniques for investigating phenomena, acquiring new knowledge, and correcting and integrating previous knowledge. Tang et al. (2009) in Zaim (2017) says that scientific approach has the characteristics of “doing science.”

## 2.2 The Concept of Scientific Approach in the 2013 Curriculum

In the context of the 2013 curriculum development in Indonesia, curriculum change is needed a complicated undertaking (Sundayana, 2015). The characteristics of the 2013 curriculum, as it is stated in the document, covers the following. As to the goals, the 2013 curriculum underlines the importance of attitudes and learners’ needs to be covered. Competence standards in the previous curriculum, the 2006 curriculum, was based on the content standard. In addition to this, the standards did not cover the national goals of education, particularly the attitudes learning domain. In competency-based curriculum, this domain must be included. Besides, in the 2013 curriculum, competency standards are developed based on needs. It is hoped

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that by considering learners' needs, the selected competencies will be more relevant. About the contents, selection and organization of the contents are based on the expected competencies (Sundayana, 2015).

Viewed from the delivery system or presentation of contents, the 2013 curriculum suggests integrated and active learning processes that can help learners develop their skills including thinking skills, knowledge, attitudes and behaviors as well. Regarding assessment, the curriculum adopts a more authentic assessment which is adjusted to the nature of stated learning objectives or competencies.

In the Regulation of the Minister of Education and Culture No. 69 of 2013 on the Basic Framework and Structure of the Senior High School Curriculum page 3 described the characteristics of the 2013 curriculum as follows: 1) Develop a balance between the development of spiritual and social attitude, curiosity, and creativity, cooperation with intellectual and psychomotor abilities; 2) Schools are part of the community that provides a planned learning experience where learners apply what is learned in school to community and utilize the community as a learning resource; 3) Develop attitudes, knowledge, and skills and apply them in school and community situations; 4) Gives enough time to develop a variety of attitudes, knowledge, and skills; 5) Competence is expressed in terms of class core competencies detailed further in the subject's essential competencies; 6) Class core competencies become the organizing elements of basic competence, in which all basic competencies and learning processes are developed to achieve competencies expressed in core competencies; 7) Basic competencies are developed based on

accumulative principles, reinforced and enriched between subjects and levels of education (horizontal and vertical organizations).

Under the standard competence of the 2013 curriculum, learning objectives should include the development of the real of attitudes, knowledge, and skills. Attitudes are acquired through activity: accept, execute, respect, appreciate, and practice. Knowledge was gained through the activity of remember, understand, apply, analyze, evaluate, and create. Skills were acquired through activities of observing, asking, experimenting, reasoning, serving, and creating (Kemdikbud, 2013).

In this case, the teacher must be able to make decisions from appropriate judgment when learners have not been able to establish necessary competencies, whether learning activities are stopped, changed the method or repeat the previous lesson. Teachers must master the principles of learning, selection of instructional media, selection, and use of learning methods, skills to assess learners' learning outcomes and choose and use learning strategies or approaches.

It is possible, because the 2013 curriculum is character-based and competent, which conceptually has several advantages. First: The 2013 curriculum uses a natural approach, because it departs, focuses, and empowers the essence of learners to develop various competencies according to their respective contents. In this case, learners are the subject of learning, and the learning process takes place naturally in the form of work and experience based on specific competencies, not the transfer of knowledge. Second: The 2013 curriculum based on character and

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competence may underlie the development of other abilities. Mastery of science, and specific skills in a job, the ability to solve problems in everyday life, and the development of aspects of personality can be done optimally based on certain competency standards. Third: there are certain subject areas or subjects that are more appropriately developed using competency approaches, especially those related to skills.

In this regard, in the 2013 curriculum, teachers are required to professionally design useful and meaningful learning, organize learning, choose appropriate learning approaches, determine learning procedures and establish useful competencies; as well as setting success criteria. Implementation of curriculum 2013 is the actualization of curriculum, in learning and the formation of competence and character of learners. It requires the activeness of teachers in creating and growing various activities following the plan that has been programmed. Teachers must realize that learning has a very complex nature because it involves pedagogical, psychological, and didactic aspects simultaneously.

Implementation of the 2013 curriculum requires teachers to organize learning effectively. There are at least five things to consider related to the organizing of learning in the implementation of the 2013 curriculum, namely the implementation of learning, procurement and development of experts, utilization of experts and community resources, and development and structuring policies.

Implementation of competency-based 2013 curriculum in learning can be done with various approaches. This approach is another contextual teaching and

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learning, role play, participative learning and learning, complete mastery learning. The lessons learned in the successful implementation of the 2013 curriculum reflect the entire learning process, the formation of the competencies and the character of the learners. For those purposes, the core competencies, essential competencies, standard materials, learning outcomes, and time should be set under the learning interests so that learners are expected to get the opportunity and the optimal learning experience. In this case, learning is necessarily a process of interaction between learners and their environment, so that there is a change of behavior in a better direction. In general, learning activities include the initial activity or opening, core activities or the formation of competence and character, as well as the end or closing activities.

According to the Ministry of National Education's Regulation No.22, 2016, in the Curriculum Implementation Chapter stated that in this curriculum, learning activities need to use some principles; they are using student-based center, developing the creativity of students, creating enjoyable and challenging circumstances, containing values, ethics, aesthetics, logic, and kinesthetic. It is also providing various learning experience through the application of fun, contextual, effective, efficient and meaningful learning strategies and methods.

The learning process in the 2013 curriculum is run through using this scientific approach. The learning process should touch the three domains, namely the attitude, knowledge, and skill. In the scientific approach-based learning process, the attitudes domain is developed to focus on the substance or the transformation of teaching materials, so that learners know about the "why." The skills domain

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focus on the substance or the transformation of teaching materials so that the learners know about the “how.” The knowledge domain focuses on the substance or the transformation teaching materials so that learners know about the “what” (Kemendikbud, 2013).

The result of this approach is an increase and balance between the ability to be a good man (soft skills) and people who have the skills and knowledge to live (hard skills) of learners that include aspects of competence, attitude, skills, and knowledge. With this kind of learning process, it is expected that the learning outcomes could lead the students to be a productive, creative, innovative, and capable human being through the strengthening of their attitude, skills, and knowledge integrative.

Scientific approach as the official recommended approach for teaching and learning in all subjects, including English subject. This approach in the context of teaching English adopts some principles and practices which are usually familiar in science class (Afrianto, 2017). Therefore, it is essential for English teachers to have a clear understanding of how it should be implemented. Because the scientific approach is an entirely new approach in the context of teaching English in Indonesia, it is possible that have some difficulties in the implementation of this approach in the classroom. Many of these challenges are likely to reduce the effectiveness of teaching English in schools, especially in Senior High School.

Scientific approach which is outlined in the 2013 curriculum, enable the learning activities that using student-based center, developing students’ creativity,

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generating enjoyable and challenging circumstances, including values, ethics, aesthetics, logic, and kinesthetic and presenting numerous learning experience through the implementation of amusing, contextual, effective, efficient and meaningful learning methods and strategies (Kemendikbud, 2013). The successful implementation of the scientific approach is undoubtedly also very dependent on the skills and understanding of teachers in the field (Afrianto, 2017).

This approach allows teachers to improve the process of learning by breaking the process down into steps or stages which contains detailed instructions for conducting students learning. These two ideas became the basic of using scientific approach to be the basis for implementing the 2013 curriculum.

Scientific approach has been carried out for Indonesia educational system after the enactment of the 2013 curriculum. For the first step of its implementation, some schools are chosen to implement the curriculum, while other schools still have a chance to use the previous curriculum. To make the school and its component ready, all the teachers in Indonesia must follow the training related to the implementation of the 2013 curriculum. Nowadays, almost all of the schools in Indonesia have applied the 2013 curriculum which using scientific approach in the teaching-learning process.

Teaching learning process on the 2013 curriculum uses a scientific approach in learning or a scientific-based approach. The scientific approach can use some learning models. The learning model is a procedure of learning that has the names, characteristics, syntax, preparation, and culture such as discovery learning, project-

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based learning, problem-based learning, inquiry learning. The scientific approach is believed to be a golden bridge to the development of attitudes, skills, and knowledge of students. In scientific approach, the scientists put forward the inductive reasoning rather than deductive reasoning (Afrianto, 2017). Deductive reasoning sees a common phenomenon to draw specific conclusions. In contrast, inductive reasoning looks at the phenomenon from specific situation to draw overall conclusions. Indeed, inductive reasoning puts specific evidence to a broader idea.

Scientific approach is a new approach proposed by the government in implementing the 2013 curriculum. The implementation of scientific approach in English language teaching is new and even makes some problems and controversies in its application. However, the use of scientific approach can be fused with the previous approach, genre-based approach (GBA). It will be discussed further in chapter four of this research study.

In learning activity, scientific approach is applied through five steps: observing, questioning, experimenting, associating and networking or communicating while genre-based approach (GBA) is conducted through building knowledge of the field, modeling of text, join construction and independent construction.

Kemdikbud (2013) and Hosnan (2014) state that there are five central learning experiences in applying scientific approach in the teaching-learning process; the first is observing, the second one is questioning, the third is collecting information or experimenting, then associating and the last is communicating.

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These five learning steps are called by scientific approach. Steps of teaching and learning process in the scientific approach are as follow:

a. Observing.

Two main activities should be done to lead to do the observing stage. First, the teachers give students a full opportunity to do observation. The observation can be done through reading, listening, or seeing the object. Second, the teachers facilitate the students to do observation and train the students to observe the crucial things from the object. In this step, the students find the fact that there is a relationship between object observed with teaching material delivered or used by the teacher. The observing cover: watching video/film, listening, reading, role-playing and others. There are seven steps in the observing process, (1) determining the object to be observed, (2) determining the purpose, (3) determining the way of observation, (4) limiting the object, (5) doing observation carefully, (6) reporting the result of observation, and (7) comprehending the result.

b. Questioning.

Questioning functions are to encourage and inspire learners to learn and develop questions of and for itself actively; to raise skills of students in talking, asking questions, and the other can answer logically, systematically using proper and correct grammar; to encourage students' participation in discussing, arguing, developing the ability to think and draw conclusions; and to build an attitude of openness to give and receive opinions or ideas, enrich vocabulary, as well as developing social tolerance in gregarious. In this step, the teacher gives a question

model to the students first, and then the students give question and answer among them or to the teacher about what they have observed. The students can ask whatever based on their observation, but the teacher can focus the questions based on the teaching material discussed. If a student gives a question to the teacher, the teacher is hoped not to answer the question directly but give chances to the other students to answer it. Furthermore, if it is a silent class, the teacher can give probing and attracted questions to the students. The most important key to create an interactive language classroom in the initiation of interaction by the teacher. However non-directive teaching style is the one to provide the stimuli for continued interaction. These stimuli are essential at the beginning level of a classroom lesson as well as the entire lesson. Without such ongoing teacher guidance, classroom interaction may indeed be communicative, but it can easily fall prey to tangential chit chat and other behaviors that, of course, form the class objectives.

#### c. Experimenting

In experimenting, the steps are preparation, working, and follow up. There are five activities that can be done in experimenting, (1) grouping students into several groups, (2) asking students to discuss, (3) recording the finding, (4) supervising the learning process to ensure that all learners are actively involved in the discussion, and (5) directing the group that need help. In this step also, the teacher leads the students to practice, discuss, analyze and write a report either in pair work or a group work.

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d. Associating

Associating is the ability to analyze and associate the information that occurred within the group. Associating is the process of analyzing the information to find the relationship between one information to other information and to find the patterns of the interrelationship of the information so that one can conclude the pattern found. In this step, the teacher provides students to discuss teaching material that they have observed and proceed to give question and answer and analyze it. Furthermore, the students can find out the other facts or correlate the teaching material with real daily life. At last, the students can give a conclusion based on observation and give a question and answer about the teaching material.

e. Communicating

Communicating is the ability to conclude the facts that have been observed and experimented. There are four activities that can be conducted in communicating steps, (1) asking the students to read their work to the class, (2) asking each group to listen well and provide additional input about the work of each group, (3) giving explanation after the group discussion ended, and (5) structuring tasks and providing opportunities to the students to demonstrate attitude, skills, and understanding of the substance of learning given. In this step, the teacher facilitates the students to perform or present the reports based on the result of their work.

The students' role priority in the classroom is one of the primary implementations of the scientific approach. The responsibility of teachers and learners in the classroom becomes essential to be improved to gain the goal of

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learning. Briggs, (2014) stated that the teacher fulfills his/her role as a facilitator in language instruction by providing students with the tools necessary to communicate. Meanwhile, the students fulfill their role by using the input they are given as they interact with others in the target language. It indicates that a teacher is no more a single handler, but they act as the facilitator of the learning process (Shofwan, 2014).

According to Ministry of National Education's Regulation No.103, 2014, stated that in order to make a proper and reliable lesson plan, teachers should know the implementation of scientific approach by using direct or indirect learning method as a substance in applying various strategies and learning models which is appropriate with the target basic competence.

The implementation of scientific approach makes the students have more time to study the facts, a principle or practice a skill so that they can learn better. Study time at school, as well as assignments that are done at home, will advance students' learning. It is what we call as providing a sufficient amount of time for language learning. Meanwhile, in speaking practice, particularly in 2013 Curriculum, teachers offer students with chances for performing speaking skill. Teachers can also assist the students to revise their speeches and engage in informal conversation to communicate to the intended audience, the statement to be communicated, and the circumstances of the event where they were going to speak (Zulyetti, 2015).

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The five stages in scientific approach; observing, questioning, collecting information, associating and communicating make the students be able to learn to speak by discussing the possible developments to one and another's practice speeches. Positive experiences enlarged in speaking will help them to have better self-confidence in speaking in front of larger groups and increase the partaking of the students.

In scientific approach of the 2013 curriculum, it is emphasized for group discussion. It means that a student has to learn or to work with other group members more than working individually. Teachers may allow enough time for the students to practice an answer instead of hurrying it because it can make a disturbing experience for them. The third is subject relevancy. Try to make the lesson being attractive and directly connected to the students (Scott Aubrey, 2011).

Meanwhile, the aims of teaching English at the senior high school are to achieve the functional and informational level of literacy. In the functional level, students can use the language to fulfill their daily communication such as reading newspaper, and manual or instruction. In the informational level of literacy, students can access language with their knowledgeability (BSNP, 2006). The ability to communicate in English is the ability to deliver the message orally and in writing, the productive skills, the ability of speaking and writing. The ability to access knowledge is the ability to read the written text and to listen to the oral text, the receptive skills, the ability to read and listen (Zaim, 2013).

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### 2.3 The Connection between Learning Stages and Learning Activities

At the previous students' school level, it was a common emphasis on English grammar, rather than on speaking skill. It is just that the press point on the curriculum of 2013 is the increase and balance of soft skills and hard skills which includes aspects of attitude, skills, and knowledge competencies. Then, the position of competence that was originally derived from the subject changed into subjects developed from competence. In addition, learning is more integrative thematic in all subjects. Thus, it is understood that the 2013 curriculum is a curriculum developed to enhance and balance the skills of soft skill and hard skills in the form of attitude, skills and knowledge

The objective of learning English focus only on reading and writing, not to learn the language for daily conversation. This method made the students was placed as inactive students. Communication skills such as speaking, was almost totally ignored. Students rarely had the chance to practice English in the classroom. As the references show, when studying English in the class, the students had been troubled with grammar and developed a strong understanding of this part. Meanwhile, at the same time, they were very concentrated on avoiding grammatical error, when they want to speak with somebody; they have to think first about the tenses, whether it is right or wrong (Sawir, 2005). Because of these reasons, that is why five stages of scientific approach in the 2013 curriculum are so much needed to be applied.

The connection between learning stages and learning activities in the scientific approach (*Kemdikbud*, 2013) are as follow:

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a. Observing.

There are three main activities that should be done to lead to do the observing stage. They are reading, listening and viewing, without or with tools. Competencies developed in this stage are drill the earnestness, carefulness, seek information.

b. Questioning.

The learning activities in the questioning stage are asking questions about the information which is not understood from what students have observed or questions to get additional information about the material. Meanwhile, the competencies developed in this part are developing creativity, curiosity, and the ability to formulate questions to create critical thinking that necessary for smart living and lifelong learning.

c. Experimenting or collecting the information

In experimenting stage, there are four learning activities that can be done, (1) doing the experiments, (2) reading other sources than textbooks, (3) observing objects / events / activity, and (4) interviewing the resources. The competencies developed in this stage are developing a meticulous, honest, courteous, respectful attitude, communication skills, apply information gathering skills through various ways learned, developing lifelong learning and learning habits.

d. Associating

There are two main activities that should be done to lead to do the associating stage. The first is processing the information that has been collected either limited from the results of collecting activities / experiments as well as the results of observing

activities and information gathering activities. The second one is processing the information collected from that activity to increase the breadth and depth to the processing of information that is seeking solutions from various sources that have different opinions up to the contrary. Meanwhile, the competencies developed in this part are developing an honest, meticulous, disciplined, obedient, hard-working attitude, ability to apply procedures, inductive and deductive thinking skills in concluding.

#### e. Communicating

The learning activities that can be conducted in communicating stage is delivering the observations, conclusions based on the results of orally, written, or another media analysis. The competencies developed in this stage are developing honest, meticulous, tolerant, systematic thinking, expressing opinions briefly and clearly, and developing proper and correct language skills.

## 2.4 Related Studies

Reviewing the previous studies can be useful to the present research being conducted with different problems, but in the same context. Related studies need some formerly researches conducted by other researchers in which they are related to this research. Besides, the related studies must analyze what the point that focuses on, inform the design and find the conclusion of the previous researches, at least there are ten researches can be mentioned as related studies for this research, as follows:

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Azizah and Ariwidodo (2015) conducted the research of the implementation of scientific approach in the 2013 curriculum for English teaching. This study was aimed to (1) describe how the English teachers of the seventh-grade plan English learning process by using scientific approach, (2) how the implementation of scientific approach in teaching English of Curriculum 2013 at SMPN 1 Pamekasan, and (3) what problems or difficulties faced by the English teachers in implementing the scientific approach. This research is qualitative approach with the technique of collecting data by observation, interview and documentation. The data obtained shows that: (1) English teachers of the seventh grade at SMPN 1 Pamekasan plan their English learning process by writing the lesson plan first. (2) The implementation of scientific approach in teaching English of the 2013 Curriculum at SMPN 1 Pamekasan on the first year does not run well. (3) Most of English teachers of the seventh grade at SMPN 1 Pamekasan get difficulties in facilitating the students to ask and answer the questions to their friends or teacher. This earlier study was about the implementation of scientific approach in teaching English at junior high school level in Pamekasan. It remained the gaps due to context, content, and methodology. Though, this research did not take into the explanation about the teachers' implementation of the scientific approach in their actual teaching. The scientific approach which has been long and regularly employed in science can be adapted and adopted in English language teaching in some ways. Besides, lack of the attention toward the implementation of scientific approach and the influential factors of it were found. In the aspect of methodological gaps, the previous study

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mainly involved junior high school as the research site, in the meantime this study took senior high school as the research site.

Meanwhile, Sarwanti (2016) did a research about scientific method in English language teaching". In this research, writer adopted library research as the research method. The intentions of this research are not only to discuss the understanding the concept of scientific method and some important facts about it, but also to explore the conceptual and practical things about the implementation of the scientific method in the English classroom practices. The result of this research indicates that: (1) scientific method which has been long and commonly employed in science can be adapted and adopted in English language teaching in some ways. (2) It is true that how the students learn science and English, and how the teachers teach science and English are different in nature. (3) In spite of that it is still possible for the English teachers to apply the scientific method in their classrooms without replacing existing approaches and methods in ELT as the scientific method is only a set of fixed steps that can be used in teaching. The similarity between Sarwanti's research and this study was the exploring of teachers' understanding about the concept and practical things of scientific approach's implementation. Otherwise, the differences were about the research design, the research site, library research as the research methodology and less explained about the implementation and the influential factors.

In additional, Abdullah Hasan (2018) investigated about the effect of scientific approach on students' English achievement for Junior High School level in Riau Province, Indonesia. This study aimed at what are the effects of the



scientific approach through ICT towards the students' English achievement at junior high school level in Kampar regency and what are the differences among three school categories on the students' English achievement using the scientific approach through ICT. In this research, the researcher adopted quantitative research and the data which were analyzed by quasi-experimental study of the pre-test-post-test design. The participants were 160 students from three selected junior high schools in Kampar regency of Riau province and three English teachers. The result of this research indicates that: (1) The scientific approach through ICT on the integration of the strength of attitude, skill and knowledge could be successful to implement in Junior High School level in Riau Province, Indonesia. (2) The findings showed that there were significant effects of the scientific approach through ICT towards the students' English achievement at Junior High school level. (3) It could make an inference that the scientific approach through ICT could be implemented to any Junior High school levels in Indonesia. Similarly, the preceding research talked about the implementation of scientific approach in teaching English. It continued the differences due to context, content, and methodology. However, the previous study explained about the effects of the scientific approach through ICT towards the students' English achievement at junior high school level in Kampar regency and it could make an inference that the scientific approach through ICT could be implemented to any Junior High school levels in Indonesia. The earlier study did not take into explanation the teachers' implementation of the scientific approach in their actual teaching. In this regard, the studies mainly concerned with the understanding the concept of scientific approach and some

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important facts about it to the conceptual and practical things about the implementation of the scientific approach in the English classroom practices. Besides, in the aspect of methodological gaps, the previous study involved junior high school as the research site, quantitative as the research methodology and less explained about the implementation and the influential factors.

Furthermore, Zulyetti (2013) did a research about scientific approach for teaching English lesson in the 2013 curriculum. This article discussed a possibility to apply the scientific approach to the teaching of English as a foreign language. It will be focused on the characteristics of the scientific approach, the current practice of teaching English in Indonesia. It also discussed a suggested model for teaching English using the scientific approach. The similarity between Zulyetti's study and this study was about the characteristics of the scientific approach as a focus of discussion at the current practice of teaching English in Indonesia. Meanwhile, the differences were about the research method, the research site, research design and this previous study did not explain about the scientific approach implementation and the influential factors in teachers' actual teaching.

Zaim (2017) conducted a research about implementing scientific approach to teach English at senior High School in Indonesia. This study examined three English teachers who teach at grade ten. This research was to find out: (1) the way how teachers implement the scientific approach in teaching English descriptive, narrative, explanation, and functional texts, and (2) the effectiveness of the implementation of the scientific approach in teaching English descriptive, narrative, explanation, and functional texts. This research is a descriptive research. To



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problems they encountered during the implementation of the approach. Three English teachers were randomly selected as the participants of this research. Data were collected through semi-structured interviews with each participant. The findings showed that the English teachers were rather skeptical with the scientific approach. They did not really follow all stages of teaching mandated in the scientific approach during the implementation.

All the participants reported most of the time they made some adjustments during their teaching procedures. Two participants reported that the main problems they faced during the implementation of scientific approach were about challenges to make the students active and the complicated procedures of assessment. Lack of supervision on the new curriculum implementation has also been reported as another major problem. The findings imply that the implementation of this new curriculum may have been not working well in the field yet. It requires an integrated and well-planned effort from related parties to make sure that the suggested approach can positively affect the effectiveness of English teaching in the field. Related to the previous study by Afrianto with the similar subject, this study found out that the lack of the scientific approach implementation was influenced by the three main factors. This challenged the study of Afrianto (2017) that concluded it was due to teacher's hesitation to switch to the scientific approach.

Moreover, Safitri Windasaro Sinabela (2016) investigated the implementation of curriculum 2013 in English teaching-learning process at SMA Negeri 1 Lubuk Pakam. The intent of this study was to explore what are the teachers' effort in English teaching-learning process by applying scientific

approach, how is the teachers' implementation in English teaching learning process by applying scientific approach, and what are the teachers' reasons to for the implement the scientific approach on that way. Data collected from qualitative research design. The design was observational case study of two teachers at XI IPA 1 and X IPS 1. The technique of collecting data were observation, interview. The data was analysed by using Interactive Model by Miles, Huberman, and Saldana. The result of this study were: (1) The teachers' effort in implementing the curriculum 2013, (2) Then teachers did not implement all the curriculum 2013 steps correctly, (3) It was found that the teachers' reasons for the implement curriculum 2013 on their way because the teachers had many experience in teaching, curriculum 2013 was done only because of the rule from the school. Other reasons were because they had short time in teaching and lacked the books for material in curriculum 2013. The similarity between Sinabela's research and this study was both talked about the implementation of scientific approach in teaching English at senior high school. Then, they were focus on teachers' effort in implementing the scientific approach in the 2013 curriculum. They had the differences due to context, content, and methodology. However, one of the results of this previous study was teachers did not implement all the steps in scientific approach in the 2013 curriculum correctly.

Ira Maisarah, et al. (2018) has done the research about the designing affective instrument based on scientific approach for English language learning. The intent of this study was to describe the designing of instrument for affective assessment in English language teaching. Data collected from English teachers of

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senior high school through observation sheet. The result showed that the designing was also notice to the affective taxonomy such as receiving, responding, valuing, organization, and characterization. Then, three key words were used as the indicator to show the five levels of affective taxonomy such as seriously, volunteer, and without asked by teacher. Furthermore, eighteen types of affective such as religious, honesty, responsible, discipline, hard work, self-confidence, logical thinking, critical thinking, creative, innovative, independent, curiosity, love knowledge, respect, polite, democracy, emotional intelligence, and pluralist were put on each stage of scientific approach. The similarities between this preceding research and the researcher's study were about the theme, scientific approach for English language learning and the participants as well, the English teachers at senior high school level. Some differences were showed between both studies. Maisarah's research talked about the designing of instrument for affective assessment in English language teaching. Meanwhile, this researcher's study explored about the teachers' basic understanding on scientific approach, the implementation of scientific approach in teachers' actual teaching and influential factors of it.

Furthermore, Desi Sugiarti, et al. (2017) did a research about an analysis of the implementation of assessment techniques in English subject based on curriculum 2013. It is helpful to examine what are the assessment techniques used by English teachers at SMPN 1 2X11 Kayutanam based on the 2013 curriculum and how is the English teacher at SMPN 1 2X11 Kayutanam applies assessment-based techniques curriculum 2013. The study utilized the descriptive research with qualitative and quantitative method. The data collecting technique that the writer

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student's presentation by using attitude observation sheet. In short, it can be concluded that most of the Japanese teacher of senior high school in Buleleng Regency have good perception on the scientific approach in the implementation of the 2013 curriculum. The similarity between Kadek's research and this study were about the exploring of teachers' understanding about the concept and practical things of scientific approach's implementation. However, this previous research talked about the perception of Japanese teachers of Senior high school in Buleleng Regency toward the scientific approach in the implementation of the 2013 curriculum. Otherwise, the differences were about the research method and the research finding, less explained about the implementation of scientific approach in teachers' actual teaching and the influential factors this mandated approach.

Achmad Yudi Wahyudin and Didi Sukyadi also did a research about the implementation of the 2013 curriculum in Indonesia. They asked about should the scientific approach be used in EFL classroom. The integration of the scientific approach into teaching English as a foreign language (TEFL) in Indonesia has become a controversial issue in Indonesia as the National Curriculum 2013 requires the teachers to follow each step of the scientific approach in the classroom practice when some experts believe that there is no literature in the history of TEFL that supports the use of scientific-based learning to teach English (Chodijah, 2013 cited in Prathivi, 2013; Natahdibrata, 2013; Richards, 2014). Consequently, EFL teachers, particularly at schools piloting the Curriculum 2013 in Indonesia are faced with a dilemmatic condition where they need to follow the recent curriculum demand and expectation. In relation to this issue, this paper attempts to portray the

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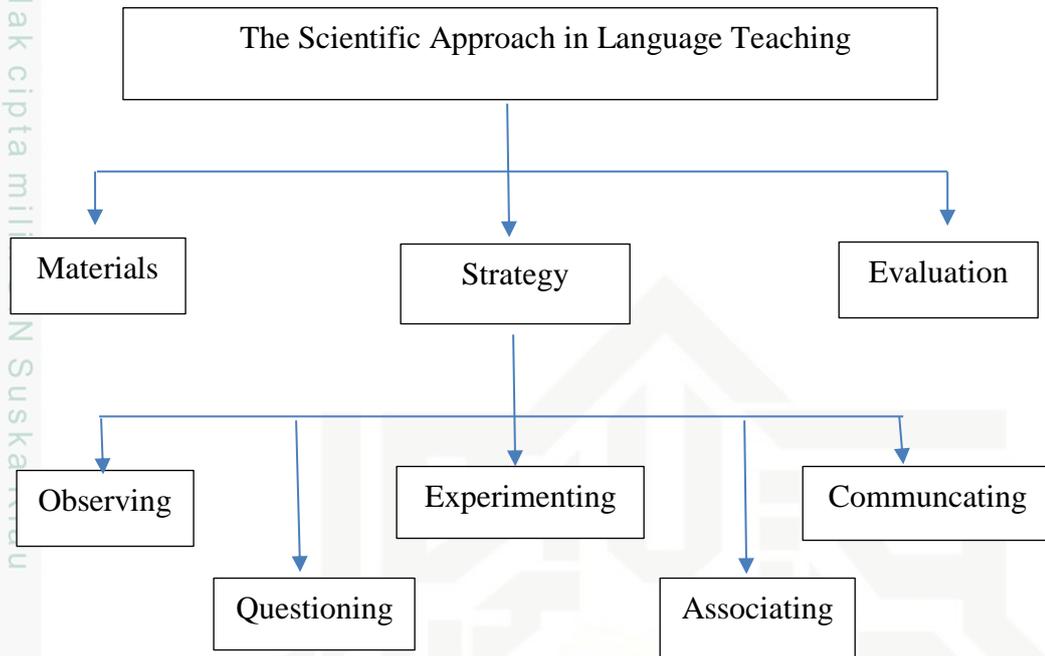
teacher's effort in integrating the scientific approach to EFL classroom in senior high school level. Involving an English teacher and 30 students in a science class, the researcher employed classroom observation to collect data in a case study to explore whether EFL teachers can implement the scientific approach effectively in classroom practices. This paper also shares some considerations to readers regarding the integration of the scientific approach into EFL classroom practice. The similarity between Wahyudin's research and this study were about the exploring of teachers' implementation of scientific approach, the concept and practical things as well. However, this previous research talked about should the scientific approach be used in EFL classroom. The integration of the scientific approach into teaching English as a foreign language (TEFL) in Indonesia has become a controversial issue in Indonesia as the 2013 curriculum requires the teachers to follow each step of the scientific approach in the classroom practice when some experts believe that there is no literature in the history of TEFL that supports the use of scientific-based learning to teach English. Otherwise, the differences were about the design of the research and the research finding, less explained about the implementation of scientific approach in teachers' actual teaching, their basic understanding and the influential factors this current approach.

Likewise, the previous researches discussed about the implementation of scientific approach in teaching English in Indonesia also remain the gaps due to context, content, and methodology. However, these studies did not take into explanation the teachers' implementation of the scientific approach in their actual teaching. In this regard, the studies mainly concerned with the understanding the



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**Figure 2.1 Theoretical frameworks of the scientific approach implementation**