The Implementation of "Listen-See-Do" Learning Strategies Based on Mini-Laboratory

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Abstract— Has conducted research that aims to obtain a condition of the use of learning strategies listen-see-do based on mini laboratory for student's science process skills (KPS) on the material quantities and units. The method used is a quasi-experimental design with a "one shot case study" conducted in class X MIA 1 Senior high school in Rokan Hulu district of Riau in the academic year 2014/2015. Data is collected by using science process skills test. Based on the analysis of data obtained by the KPS indicator: observing 89.23%, communicating 59.49%, predicting 10.26%, interpreting observations 33.33% and apply the concept of 85.32 %. It was concluded from the results that learning with learning strategies hear-see-do based on mini laboratory, impact on students science process skills (KPS).

Keywords— listen-see-do, mini laboratory, science process skills (KPS), quantity and unit.

I. INTRODUCTION

Natural science is a way or method of observing nature that is, observing the analytical world, complete, and accurate, as well as the connection between the phenomena with other phenomena, thus forming a whole new perspective on the object being observed.

Physics as one part of the Natural Sciences in general has applications in life, therefore the student's mastery of physics well will contribute to the achievement of the goals of education in general which is to prepare students to be able to face the development of science through training acting on the basis of logical thinking, rational, critical, effective, and efficient.

Teacher as a lecturer greatly affect the achievement of learning goals, therefore, teachers must be creative and imaginative to activate students in the learning process so that students are able to learn. One of the efforts of teachers are using teaching strategies and methods that can attract attention and stimulate students to be more directly involved in the selection of learning activities strategy in teaching methods whose fit, proper and precise allowing optimal achievement of objectives, learning strategies affecting the level of student success. Teachers should have the right method to deliver the student for achieve the expected goals.

The learning process with effective and efficient will be created, if the actors involved in the process are able to realize the teaching behavior accurately in order to create effective learning interactions in a situation that is conducive to teaching and learning. Learning means efforts to change behavior, so learning will bring a change in the individuals studied. The changes are not only related to the addition of science, but also in the form of skills, attitudes, understanding, self-esteem, interest, character, and self-adjustment. Thus it can be said that learning as a series of activities and soul, psycho-physical towards personal whole person development, which involves an element of creativity, taste, intention cognitive, affective and psychomotor (Sardiman, 2001).

According the cases study on prelimenary study in the school, Physics Education in schools is still limited understanding of the body of knowledge in the form of facts, concepts or principles. Actualization level is still relatively low. Low achievement of science education in Indonesia can be shown by various indicators, including results of the Third International Mathematics and Science Study, or TIMSS showed that Indonesia ranks 35th in the science and the order of 36 in mathematics among 48 countries the study. In addition, based on the results of a preliminary study on one of the high school at the end of the school year 2014/2015 using interviews that teachers are not willing to do practicum on certain materials because of the difficulty in dividing time and classroom management. In addition, the objectives of the understanding of the concepts and process skills that students are expected to see on practicum activity is not achieved optimally, it can be seen from the average student learning outcomes which tend to be low.

Some research says that the lab activities have a positive impact on activity and learning outcomes of students.. Suhermi and Sehatta (2002: 103) concludes that "the implementation of cooperative learning STAD using the mini lab can increase the average value of past learners by 31.35 points, or 49.9%", the results Rusmiyanti (1998: i) revealed that "the development of practical activities through mini-lab activities can improve the quality of learners". So also the result of research sohibun, etika and Onik (2010) concluded "the application of listen-see-do can improve student learning outcomes in schools that do not have a laboratory on aspects of the psychomotor and process skills". In fact there are many schools whose do not have a laboratory that is less than optimal in conducting activities in learning physics laboratories.

According to Sudjana learning strategies listen- see-do raised and developed on the basis of empirical experience in the field. That is reviewing the results-the results of the author's observation on the practice of teaching the teachers at school.

This fact was later analyzed from the point of theory in the teaching field, especially in terms of student learning activities in relation to the interaction of teachers and students.

Based on the description above, I tried to change the method of learning by applying listen-see-do based on mini Laboratory at schools that do not have laboratotium to improve student learning outcomes and student's process science skill aspects, so I interested in conducting research with the title: the implementation of Learning Strategies Listen-See-do based on Mini Laboratory for student's Science process Skills (KPS) in senior High School.

II. LITERATURE REVIEW

A. *learning strategies "listen-see-do"*

Learning strategies listen - see - do is a model of teaching and learning model combining the active learning with ekspository and inquiry. This teaching model emphasizes the learning activities of students, starting from the hearing followed by activities see, and ending with work or doing activities. Three of these activities are in the inseparable unity of each others. in this model teacher's task is to give stimulation to students in three ways, namely stimulation of the auditory (listening), visual stimulation (see), and motor stimulation (doing).

Hearing activities and see activities for students are the result of the teachers' activities or stimulation of teachers, for example in the form of the teacher's explanation. This phase is actually one of the basic characteristics of teaching models is ekspository, while working on the activities of the student as a result of or demand stimulation is one of the characteristics of teachers teaching model of inquiry.

B. *Mini Laboratory*

Mini laboratory is a lab activities that can be done in the classroom for schools that do not have laboratory facilities. According to Lucy, et al. (in Sehatta, 1999: 21) mini lab activity (mini lab) involves students in learning the scientific method, so it can be used to train critical thinking skills. Lab mini requires a minimum of equipment and learners to participate actively in it. Lucy (in Sehatta, 1999: 21) conclude about the advantages of lab mini are: a) the equipment that minimum, the learners can undertake practical activities, b) to facilitate students in understanding the subject matter because learners are faced with direct object, c) can guide students to find their own ability, and d) to develop their students can think critically.

Collins *et al*. (in Sehatta, 1999: 21) says that "mini lab gives students the opportunity to investigate and found to work in groups or work alone. To avoid the alienation of learners in learning by using a mini lab before doing lab activities, students are given worksheet (LKS) as a guide to what activities should be done learners. According to Zainuddin (1997: 7-8), the domains can be developed in the lab are included in the mini-physics laboratories are cognitive, psychomotor, and affective.

The tools of science physics lab made a simple educational tools, can be made by teachers and students under the direction of teachers without the need for special tooling. But the practical tools developed through a mini lab can be effectively used in physics science lab. A practical device when it is designed to be developed by teachers of physics through mini lab. Development tools according Wahyana physics lab science let meets the following requirements: "1) the economic value, 2) educational and psychological value, 3) the value of sociological, 4) sustainability-function, 5) internal visibility , 6) accuracy, 7) of adequate size, 8) all simplicity in maintenance, 9) ease of use, and 10) the security of students when using .So that the validity of the tools of high physics science lab can be tested also by teachers of precision and accuracy of the data obtained through the use of tools developed mini lab practicum to some experiments in accordance with the subject matter of the tools developed. Likewise validation by a physicist or a group of teachers that the devices practicum developed not only serve as props, but can further serve as a trial.

C. *learning strategies "listen-see-do" based on mini laboratory*

Listen-see-do strategies used in the instructional stages(stages of teaching). This stage will be divided into three steps, namely hear-see-do. The illustrated schematically in the diagram shown below:

TABLE I. ROLE TABLE OF LISTEN-SEE-DO LEARNING STRATEGIES BASED ON MINI LABORATORY

Stages Teaching		Aim	Activity
A. Prainstruksional		Conditioning and motivate students to learn.	A perception through repetition of materia lthat has been given.
B. instruksional		Realizing the teaching and learning activities	Teach new material to students
	listening process	Describing teaching and stimulates students.	Teaching the teacher or the student explanation, question and answer teacher-student or students.
	See process	Clarify thestudentinsightsaboutteaching materials.	Demonstration teacher or student, teacher or student demonstration, observation of students, and others.
	Doing process	Apply and generalize the teaching materials.	Solving problems by students, to draw conclusions.
C. Evaluation		Achieveddeterminewhetherthe purpose of teaching, orgivingconsiderationberhsilwhetherthe teaching process.	Provide questions to students verbally, or in writing regarding materials that have been in learn it.

D. Science Process Skils

Procees Skills can be defined as the process of insight or fad of Intellectual skills development, physical and social abilities derived from fundamental principle has existed on students. According Herlen (the Ark) process skills (process-skill) as the cognitive processes including interactions with the content (content). Another opinion suggests that the overall process skills is directed scientific skills (both cognitive and psychomotor) that can be used to develop a concept that has been there before, or to perform denial of an invention (falsification). Thus, science process skills is a basic skill experiment, scientific method and inquiry.

In the student's process science skills involves intellectual skills, manual, and social. Intellectual or cognitive skills involved because the student can use his mind. Manual skills, because they involve the use of tools and materials, measuring, arranging or assembly tools. While social skills meant they interact with process skills, for example, discuss the results of observations (Rustaman, 2007).

According to Bryce et al, 1990 (MONE 2006) science process skills include basic skills (basic skills) as the ability of the lowest, followed by the skills of the process (process Skill). Basic skills include: (a) making observations (observational skills), (b) record (recording skills), (c) take measurements (measurement skills), (d) implementing procedures (procedural skills), and (e) follow the instructions (following Intructional). Skills process comprises: (a) menginferansi (skills of inference), and (b) selecting a variety of ways or procedures (selection of procedures). Investigative skills in the form of skills to plan and implement, and report the results of the investigation. Such skills must be based on scientific attitude like a enthusiasm, perseverance and so on.

III. RESEARCH METHODS

A. Types of Research

This research is pre experiment as in research given treatment (treatment). Pre-experimental study conducted in a group that gives a certain treatment to a group (class) students (Arikunto, 2003). The treatments were given in this study is the application of listen-see-dolearning strategies Based on Mini Lab.

The research design used in this study using pre experiment the One Shot Case Study, which is a pre-experiment conducted in the absence of a comparison group, and also without any preliminary tests. The goal is quite simple research is to know the effect of the treatment given to the group without regard to the influence of other factors. Scheme of the design of this study are as follows: (Arikunto, 2003)

Treatment	Post test
X	T

B. Data Collection Techniques

Data collection techniques are a technique test / administration of the test, where data is collected by providing test student's science process skils. Awarding student's science process skilstest is done after learning through the application of active learning strategies based mini lab is over.

C. Data Analysis Techniques.

Data analysis techniques used in this research is descriptive analysis. Descriptive analysis is analyzing data about students' science process skills (KPS) after learning to use listen-see-do learning strategies based on Mini labs and student's science process skils. This analysis is done by giving an overview of student's science process skils level students in a particular class, after learning to use listen-see-do learning strategies based on mini laboratory.

IV. RESULTS AND DISCUSSION

A. Results

The purpose of this study was to examine the student's science process skils receiving learning by using a model listen-see-do based on mini laboratory, assess and describe the advantages of a mini laboratory to support learning model listen-see-do. To achieve these objectives do data processing using SPSS 15 for Windows and Microsoft Office Excel.

1. Data Calculation Results
a. Analysis of Grain Problem
Reliability: 0.74 (Height)

TABLE II. RESULT OF STUDENTS SCIENCE PROCESS SKILS

Number's exam	Validity		Reliability		level of difficulty
	Score	*category*	*Value (%)*	*category*	*category*
1	0.403	Medium	0.440	Medium	Easy
2					Medium
3					Difficult
4					Difficult
5 and 6					Medium

TABLE III. SCIENCE PROCESS SKILL PER INDICATORS

No	Science process skill	Persentage
1	observe	89.23%
2	communicate	59.49%
3	foresee	10.26%
4	Interpret observations	33.33%
5	applying the concept	85.32%

B. Discussion

Based on the calculation of data at tebel.2 the student's science process skils per indicators as follows:

1) Observe

Observing skills students based on test results obtained 89.23% of the 39 students were able to observe well and is an indicator of the highest student's science process skill, while it is based on the observation when they conducted experiments,

it appears from the 39 students were able to observe with both groups. It is directly proportional to the results of the test student's science process skils who have been made after the end of the study using a listen-see-do learning strategies based on Mini Lab. Base laboratory mini strongly support the learning (especially the activity observed), because students are actively ndirectly involved in the learning process.

2) Communicate

Communication skills of students based on test results that 59.49% of students are able to communicate well. Communications were measured in this test is the student's skills in describing and calculating the results of the experiment using a measuring instrument scale, students are able to present the results of an experiment in writing and orally. If seen during the learning process so he found students who are competent and reason that high are able to speak to express their opinions and the results of measurement, it is directly proportional to the results of the test student's science process skils conducted found that only about half of 39 students who are able to communicate well.

3) Predicting

10,26% students were able to predict. Predict students' skills measured from a written test and an indicator of student's science process skill which are at least mastered by the student, the student at the micrometer scale predict scrup deliberately not given scale. But these skills are not observed directly by observation because the learning process does not facilitate these skills. If viewed from the type of questions on this matter is not much different from the previous exercise. Seen most of the students focused on the number or scale of reference and make them fooled for predict or guess the scale empty, level of difficulty in this matter at the level of hard and be one factor in student student's science process skill indicator is low or at least owned by students.

4) Interpreting Observations

Percentage of skills to interpret observations of students is 33.33%, this percentage is obtained from the test results. Students are given questions about the caliper and is a matter of the type with about the student's science process skill indicators predict. Careful inaccuracy students on the reading scale shown in caliper causes the student's science process skill indicator considerably lower. If viewed from the criteria matter to the learning that has been done, then students tend to be sloppy and reckless when answering and counting scales in caliper, it appears that only a third of the 39 students who master this student's science process skill indicator.

5) Applying Concepts

Skills to apply the concept measured by using the test and obtained a percentage of 85.32%. These skills are not observed using the observation. Seen that the mini lab-based learning can be reinforcing the concept that must be understood by the students it is seen 85% of 39 students were able to apply the concept that has been first obtained on learning. Student's science process skill indicator to apply the concept-based learning supported by a mini lab for the presence of a mini lab students actively seek and find the concept at the time of trial and find instantly concept, so that students easily in applying the concept.

Overall indicators of science process skills is said to be pretty good student using a listen-see-do learning strategies based on mini lab. This is consistent with Confucian theory is the theory of active learning in the Silberman (2006) which says:

I hear, I forget.

What I heard and saw, I slightly remember.

I hear, see, and question or discuss with other people, I began to understand.

From what I hear, see, discuss, and apply, I get knowledge and skills.

I teach to others, I mastered

Collins, et al (in Sehatta, 1999: 21) says that "mini lab gives students the opportunity to investigate and found to work in groups or work alone". Listen-see-do learning strategies with a mini laboratory which combines the expository method and inquiry that are supported by a mini laboratory activities will demand students to be actively involved in the learning process. Inquiry Learning is a learning model of research that actively involves students in exploring the content (content), problems, and questions on subjects or concepts taught (carl. J.wenning.2010), thus making the science process skills to be a good, So that students easily understand the concepts that must be controlled by the student, the teacher is easier to convey the concept of physics. At skills process of science students, the indicators should be owned by the students will be supported or supported in its control using lab activities mini is, and be obtained that the indicator KPS most are owned and controlled by students is the indicator KPS observe and apply the concept while the lowest in the KPS indicators predict and interpret observations. Low KPS This could be due to the individual character of each student associated with the precision and the carelessness of the students, this can be minimized by activity or repetitive exercise independently. But overall listen-see-do learning strategies based on mini laboratory for high school students in senior high school 2 Ujungbatu MIA grade one support in mastering the students science process skills (KPS) and students quite well.

V. CONCLUSIONS

Based on the results of data research and discussion in the previous chapter, it can be concluded:

1. Learning Model listen-see-do based on mini laboratory-active role in achieving the mastery of student's science process skills (KPS).

2. Indicators student's science process skill who are most easily controlled and owned by the students is the indicator student's science process skill observe and apply the concept while the student's science process skill indicators predict and interpret the observations are indicators KPS most not owned by the students.

3. overall, the data shows that it learning strategies making a positive or good impact for student's science process skill

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