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IMPLEMENTATION OF DIRECT INSTRUCTION LEARNING MODEL BASED SAVI TO INCREASE STUDENT LEARNING OUTCOMES ON ACID BASE MATERIAL OF XI GRADE SENIOR HIGH SCHOOL

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Abstract

This research aims to describe the learning implementation of Direct Instruction learning model with SAVI, student activity and student learning outcomes. This research used "One Group Pretest-Posttest Design" with the subject of research were 32 student of class XI MIPA 7 SMAN 1 Manyar Gresik. The results of this research showed that (1) The implementation of more than 2.1 with very good category with the quality of implementation at the first meeting was 3.44 (very good), the second meeting was 3.60 (very good and the third meeting was 3.89 (very good) (2) The time spent on somatic activity amounted to 28% of the total time at the first meeting, at 26% of the total time at the second meeting, and 25.3% of the total time at the third meeting. The time spent on auditory and visual activities amounted to 12% of the total time at the all meetings. The spent on intellectual activity amounted to 12% of the total time at first meeting, at 11.33% of the total time at the second meeting, and 10.67% of the total time at the third meeting. This indicated that the students have activity and study the acid-base material well (3) Student learning outcomes obtained by 94% achieving classical completeness. *Gain score* of 93.75% student get category improvement of learning result height and 6.25% student get category improvement of result of learning medium. *Gain score* of 93.75% of students obtained gain score were high categories and 6.25% of students obtained gain score were medium category.
Keywords: Direct Instruction, SAVI, learning outcomes.

INTRODUCTION

Indonesia's education world continues to grow. The change and improvement of educational curriculum is one of the efforts undertaken to improve the quality of education to have used the curriculum 2013. Learning process in the educational unit held interactively, inspirationally, challengingly, motivationally learners to participate actively, and providing sufficient space for initiative, creativity, and independence according to the talents, interests, and physical and psychological development of learners [1]. Based on the results of pre-research data at SMAN 1 Manyar Gresik it is known that the way of learning that students want to help in understanding the subject matter of chemistry is 28% of students learn by listening to teacher explanation; 41% of students learn by using a variety of appropriate media tools, such as movies/videos, tape recorders, pictures, demonstrations, and so on; 12% of students study with students read on their own and try on their own, so get a new concept as well as 19% of students learn by discussing in groups. The use of various ways of learning in accordance with the wishes of students make learning more fun and can make it easier for students to understand the material being studied. This will affect student learning outcomes.

Learning completion criteria determined by the educational unit that refers to the standard of graduation competence by considering the characteristics of learners, the characteristics of the subject, and the condition of the educational unit [2]. Thus, the students' learning outcomes have an assessment standard where the learning completeness criteria one of them refers to the standard of graduation competency by considering the characteristics of the subject.

Chemistry is one of the subjects of academic aims to develop the competence of attitudes, competence of knowledge, and the competence of the learners' skills according to their interests, talents and academic ability in scientific subject group [3]. One of the chemicals taught in class XI is the acid-base material. Based on the results of pre-research data at SMAN 1 Manyar Gresik note that acidic basa material is a material that is considered quite difficult. This is evident from 32 students 69% of students rather difficult and 31% of students difficult to be understood the basic material of acid bases. In addition, students get poor results in daily tests on basic acidic materials that is equal to 65% of students still have a value below 75 which is the value of *KKM* from school.

Basic acidic materials have basic competencies to be achieved by students including understanding the concepts of acids and bases as well as their strength and ionizing equilibrium in solution and determining the pH change route of some indicators extracted from natural materials [4]. Based on the competence of acid-base material states that the subject matter of acidic bases is a subject of declarative and procedural knowledge [5]. Declarative knowledge on acid-base matter is the knowledge of a concept on acid-base materials such as acid-base theories. Procedural knowledge on acid-base matter is the knowledge of how to do something like the stage in doing the practicum. In its application, it is necessary to model learning in accordance with the characteristics of learning materials. One of the learning models that match the characteristics of the material is Direct Instruction learning model.

Direct Instruction learning model is one of the teaching models that can help students learn basic skills and obtain information taught step by step. This learning model is designed specifically to improve student learning outcomes about procedural knowledge and declarative knowledge well, which can be taught step by step [6]. The Direct Instructions learning model consists of five phases: conveying goals and motivating students, demonstrating knowledge and skills, providing guided training, checking understanding and providing feedback, and providing follow-up exercises.

Some research on the application of Direct Instruction learning model has been proven to improve student learning outcomes on acidic base material. Research conducted Khairudin showed that 94.28% reach individual completeness but there are some students who have not reached the completeness of the individual despite being given treatment in the form of application of Direct Instruction learning model [7]. Student learning disregard result occurs due to two factors, that is factor come from student itself (internal) and external factor come from environment (external). Factors that come from within the students is the ability to capture a subject matter where each student has different abilities [8]. In addition, the provided student worksheet has not accommodated the student learning style. According Sukidin one of the criteria of effective learning is able to serve the learning style and speed of learning of different students, so that the process of teaching and learning can achieve the objectives in accordance with the specified program [9].

Each student has different ways and styles of learning to absorb new information or knowledge provided by the teacher. The results of the pre-research questionnaire at SMAN 1 Manyar Gresik stated that in one class of 32 students as many as 25% students have somatic learning style, 18.75% of students have auditory learning style, 31.25% of students have visual learning style, and 25% of students have learning style intellectual. This shows that in one class there are different learning styles. To accommodate the kind of learning styles that students have is required through the SAVI.

SAVI is a constructivist-based that emphasizes that learning must utilize all the sensory devices that students have. The term SAVI is short for, somatic means body movement (physical activity) where learning by experiencing and doing; auditory meaningful learning through listening, listening, speaking, presentation, argumentation, expressing opinions, and responding; visual means learning to use the senses of the eye through observing, drawing, demonstrating, reading; and intellectual means learning to use thinking ability, using mind concentration and practicing using it through reasoning, investigating, identifying, discovering, creating, constructing, solving problems, and applying [10]. SAVI also has the potential to address the diversity of student learning types in the classroom. Each learner in a class basically has a tendency to different learning styles in understanding the subject matter [11].

One solution that can accommodate the diversity of learning styles to improve learning outcomes is to combine learning models with appropriate learning approaches to teach the material that is considered quite difficult by students is by applying the Direct Instruction with SAVI in the learning process. The effective teacher that can serve the different learning styles of students [12]. This is especially important to create a conducive and enjoyable learning environment. In accordance with the basic concept of the SAVI is that learning takes place quickly, fun and satisfying. Meanwhile, to prove the results of student learning is the result of application of Direct Instruction with SAVI it is necessary to observe the implementation of learning done by teachers and observation of student activities in learning activities. A learning will take place optimally if intellectual activity and all the sense devices are combined in one learning event.

Based on the above background description, the researcher took the title "Implementation of Direct Instruction Learning Model based SAVI to

Increase Student Learning Outcomes on Acid and Base Material of XI Grade Senior High School".

METHOD

This research is pre experimental research, because research using subject of one class without comparative class by using research design of *One Group Pretest Posttest design*

O1 X O2

Information :
O1 = pretest to know the initial state of the student before the SAVI Direct Instruction-based instructional model is applied on acid-base material
O2 = posttest to know the final state of the student after applied SAVI Direct Instruction based instruction model on acid-base material
X = *Direct Instruction* learning model with SAVI on acid-base material

The sample of research is the students of class XI MIPA-7 SMA Negeri 1 Manyar Gresik which amounted to 32 students. Learning devices used in this study are syllabus, Lesson Plan, and student worksheet. While the research instrument used is the observation sheet of learning syntax, student activity observation sheet, pretest and posttest questionnaire.

The data obtained from the learning activity is then analyzed by finding the average assessment of each observed aspect. Furthermore, the results are analyzed using the criteria of learning management constraints:

$$\text{CTF} = \frac{\Sigma \, learning \; scores \; obtained}{\Sigma \, syntax}$$

Information :
CTF: Quality of the Implementation of Learning The quality of the implementation score is then converted to the value of the learning implementation with the following criteria:

Table 1 Implementation of Learning Criteria

No	Limits	Criteria
1	3.1 – 4	Very good
2	2.1 – 3	Good
3	1.1 – 2	Enough
4	0.5 – 1	Bad
5	0	Not done

[12]

The data analysis of student activity observation was analyzed by finding the percentage of somatic, audio, visual and intellectual activity of each student, with the following calculation:

$$Student\ Activity_{(S/A/V/I)} = \frac{A}{B} \times 100$$

Information :
A: Time of a certain activity
B: Total activity time

Analysis of test data has several processes that are test data analysis of learning outcomes and analysis of learning outcomes (Gain Analysis). Here's the calculation to know the completeness of student learning outcomes in classical:

$$\text{Value} = \frac{Scores\ obtained}{maximal\ score}$$

These results are then obtained mastery by classical:

$$\text{Completness} = \frac{\Sigma \, jumlah \; siswa \; yang \; tuntas}{\Sigma \, jumlah \; siswa \; keseluruhan} x \; 100$$

Here's the calculation to know the improvement of learning outcomes of each student [13]:

$$<g> = \frac{<G>}{<Gmaks>} = \frac{(<Sf> - <Si>)}{(100 - <Si>)}$$

Information:
<g> = n-gain score
<Sf> = The average value of *posttest*
<Si> = The average value of *pretest*

These results are then interpreted in the following n-gain score categories:

Table 2 *n-gain score* category

Value <g>	Category
<g>≥ 0.7	High
0.7 ><g>≥ 0.3	Medium
<g>< 0.3	Low

RESULTS AND DISCUSSIONS

Implementation of Direct Instruction Model Syntax Learning

The implementation of the Direct Instructions instructional syntax with the SAVI approach of chemistry students UNESA uses a syntax of learning syntax at each meeting. Management of learning is said to happen if the value of the quality of implementation ≥ 2.1 or are on good or very good criteria. The graph of the results of the syntax

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of SAVI Direct Instructions based learning model at each meeting can be seen in Figure 1.

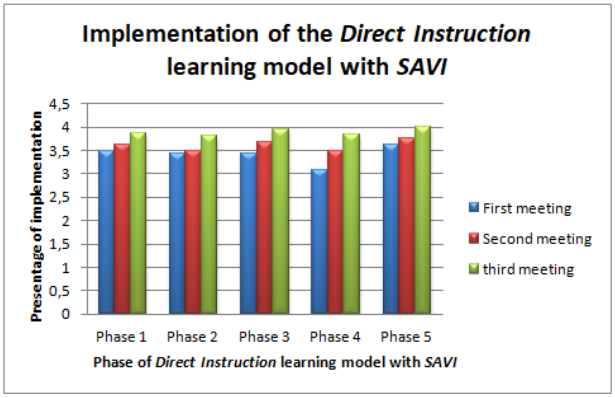

Figure 1 Results of Implementation of SAVI Direct Instructions Based Learning Model Syntax

Based on Figure 1, phase 1 goals and establish clarify sets have increased in each meeting. Phase 1 begins with the teacher opening lessons and doing apersepsi, motivation and convey the purpose of learning. Further learning activities are core activities where there are phases 2, phase 3 and phase 4 in core activities. Fase 2 is demonstrate knowledge or skill have increased in each meeting. At the first meeting, the teacher demonstrated the stage of making extracts from purple cabbage and hibiscus flowers and then tested the solution stage. At the second meeting, demonstrating the test phase of the solution using litmus paper. The third meeting, the teacher demonstrating the test phase of the solution, further estimates the pH value of the solution. In accordance with Bandura, the process of observing and imitating the behavior and attitudes of others as a model is a learning act. Students will conduct practical stages according to what the teacher does when the teacher conducts a demonstration [14].

Phase 3 is provide guided practice have increased in each meeting. In this phase there *SAVI* activity where the activity is somatic is doing practicum and after that visual and auditory activity that is by listening and watching the video. At the first meeting, the students performed visual somatic auditory activities on natural indicators, the second meeting doing a practicum on artificial indicators using litmus paper and a third meeting on pH value estimation. Then auditory and visual activities listen and observe the video according to the material taught at each meeting. This activity is carried out to obtain data and information that the next data is used to work on student worksheet.

Phase 4 is check for understanding and provide feedback have increased in each meeting. This phase there is SAVI activity where intellectual activity is working on the problem of student worksheet. In addition, according to Felder that learning style can affect student learning, therefore it is recommended varying teaching methods with learning styles [9]. SAVI integrates these four elements in such a way that students and teachers can come together to bring the classroom atmosphere together. The last phase is provide extended practice and transfer. This activity is a closing activity where at each meeting students conclude the material that has been studied with teacher guidance. Teacher closed the lesson with a greeting and prayer.

Based on Figure 1, it is known the results of syntax execution at the first meeting received very good criteria, then at the second and third meetings increased very well in all phases and obtained the percentage of implementation $\geq$ 2.1. This shows that the management of teachers in learning activities is very good.

Student Activity

Student activity is an activity that students do during the learning process takes place. Student activity observed is student activity on learning using SAVI and Direct Instructions learning model. Student activity observers were conducted by five observers from UNESA chemistry students who were observed every 3 minutes during the learning process and recorded the dominant activity at that time. Student activity data obtained in the form of data of student activity expressed by activity time percentage (%).

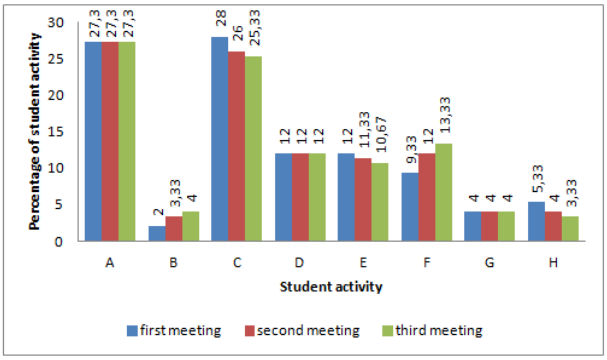

Figure 2 Activity percentage of Student Activity on SAVI Direct Instructions Learning

Information :

G = Group

A = Listen to teacher's explanation

B = Bring your opinion

C = Doing practicum (somatic)

D = Listening and watching video (auditory and visual)

E = Working on LKS (intellectual)

F = Presenting the results of working on LKS

G = Summing up the learning outcomes

H = Irrelevant activity

Based on Figure 2 it is known that the time spent on somatic activity at the first meeting gained 28%, the second meeting gained 26% and the third meeting was 25.33% of overall time in each meeting. According to Pashler that the kinesthetic learners will learn more effectively if they could involve the movement of the body in the learning process [15]. There is a decrease in the percentage of somatic activity because the time spent at each meeting is more timely and focused when practicing. The time spent on auditory and visual activities at first to third meeting amounted to 12% of overall time in each meeting. This is because almost all students are enthusiastic during video play so that all students watch video play from beginning to end. The time spent on intellectual activity at first meeting was 12%, second meeting was 11.33% and third meeting was 10.67% of overall time in each meeting. There is a decrease in percentage because students better understand how to analyze to work on student worksheet so that the time used more directed. This indicates that the students have activity and study the acid-base material well by using the overall time on certain activities according to the learning style.

Learning outcomes

Students Student learning outcomes on acid-base matter can be seen from the pretest and posttest values. Students have completed the study when it meets the minimum completeness criteria that is ≥75 (KKM school) of the scale assessment 0-100 [14] while the completeness of student learning outcomes in classical if at least 75% of students have achieved the value of ≥75 (KKM school).

Figure 3 Completeness of student learning outcomes

Based on Figure 3 it can be seen that in the pretest activity 100% of students XI MIPA-7 has not reached completeness. While at the posttest value as much as 94% of students have achieved mastery learning on acid-base material. There are 6% of students have not reached the completeness found in students with intellectual learning style. This is because less than the maximum in analyzing activity and the format in the LKS is too general and less detailed, so some students are less biased linking the results of the analysis to be used as knowledge they should absorb. Collaboration between Direct Instruction learning model and SAVI approach can make it easier for students to achieve mastery of learning outcomes.

Data on student learning outcomes in pretest and posttest activities obtained then analyzed by using Gain Score (score increase). Percentage of Gain Score can be seen in figure 4.

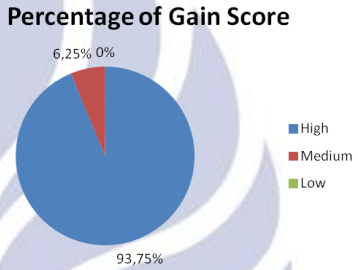

Figure 4 Percentage of Gain Score students

Based on Figure 4 it is known that as many as 93.75% of students obtain categories of high learning outcomes and 6.25% of students obtain the category of increase in learning outcomes are. In accordance with the basic SAVI approach that expects students with the diversity of learning styles can absorb and understand the learning materials delivered by teachers with learning styles (somatis, audio, visual and intellectual) in maximum [16]. This shows that Direct Instruction learning with SAVI approach can improve student learning outcomes in acid-base solution materials.

CLOSURE

Conclusion

Based on the formulation of problems and the results of discussion above, it can be concluded that:

1. The implementation of the Direct Instruction instructional model with the SAVI approach on the acid-base material as a whole for the whole meeting received a larger score of 2.1 with an average first practice quality of 3.44 (very good), the second meeting of 3.6 (very good), and the third meeting amounted to

3.89 (very good). This indicates that the teacher has carried out the learning process and gave the teaching of acid-base material well.

2. The time spent on somatic activity amounted to 28% of the total time at the first meeting, at 26% of the total time at the second meeting, and 25.3% of the total time at the third meeting. Auditory and visual activities amounted to 12% of the total time at the all meetings. Intellectual activity amounted to 12% of the total time at first meeting, at 11.33% of the total time at the second meeting, and 10.67% of the total time at the third meeting. This indicated that the students have activity and study the acid-base material well.
3. Learning results obtained by 94% achieve classical mastery. Gain score of 93.75% of students obtain the category of high learning outcomes and 6.25% of students obtain the category of increase in learning outcomes are. This shows that Direct Instruction learning with SAVI approach can improve student learning outcomes in acid-base solution materials.

Suggestion

Based on the research that has been done and the results that have been obtained after implementing Direct Instruction learning with SAVI, the implementation of Direct Instruction learning model with SAVI takes a lot of time to practice, so it should be considered the use of time allocation and good class management. Teachers must be good at directing student activities so that time is not wasted or time consuming for other activities

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