NOVATEUR PUBLICATIONS
JournalNX- A Multidisciplinary Peer Reviewed Journal
ISSN No: 2581 - 4230
VOLUME 7, ISSUE 3, Mar. -2021

APPLICATION OF SMART LEARNING MODELS TO IMPROVE ACTIVITY AND COMPLETE STUDENT CONCEPTS

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ABSTRACT:

The author's observations in class XI IPA 2 SMAN 2 Kota Gorontalo academic year 2020/2021 during the learning process students do not focus on the material provided by the teacher, generally tend to be passive, only accept what the teacher says without being able to issue opinions, ask questions, and answer question. This study aims to increase activity and complete students' mastery of concepts by using the SMART learning model on Cell material. This research is a classroom action research conducted in two cycles. The research subjects were students of class XI IPA 2 SMA Negeri 2 Gorontalo City. Data collection techniques using observation sheets and test sheets. Data analysis using quantitative descriptive analysis techniques. The results showed that the average student activity in the first cycle was 59,0% and the second cycle increased to 78,9%. The students' mastery of concepts in the first cycle was an average of 38,5% in the incomplete category. Cycle II students' mastery of concepts increased to 77,838 complete categories, with a KKM score of 70. The results of this study indicate that the SMART learning model can increase activity and complete the mastery of concepts for high school students.

Keyword: SMART Learning Model

INTRODUCTION:

The era of education in the 21st century, schools should be able to improve the quality of education to prepare human resources who have strong knowledge, skills and character. Regulation of the Minister of Education and Culture No. 22 (2016) states that the learning process is fully directed at the development of the three domains as a whole / holistically, meaning that the development of one domain cannot be separated from other domains so that it will give birth to people who are knowledgeable, skilled, and have strong character. Currently there are still many lessons in secondary schools that are memorizing facts, although many students are able to present a good level of memorization of the material they receive, but often do not understand deeply the substance of the material so that learning becomes meaningless.

Based on the author's observations in class XI IPA 2 SMA Negeri 2 Kota Gorontalo academic year 2020/2021 during the learning process students do not focus on the material provided by the teacher, in general students tend to be passive, only accept what the teacher says without being able to issue opinions, ask questions , as well as answering questions. If the teacher asks questions, only a few students dare to answer. These problems are probably caused by the inaccurate selection of learning models so that only a few students are active in the learning process. The inactivity of students who

are involved in the learning process can occur because the learning model used does not involve students directly. Learning in the classroom is dominated by teachers, students are only listeners, some even don't pay attention to the course of the learning process, experiencing boredom this will result in student motivation to learn and have an impact on students' mastery of concepts.

The teacher's task is to prepare learning tools that serve as guidance for teachers in carrying out learning both in the classroom, laboratory or outside the classroom. As stated by Zuhdan et al (2011, p16) that a learning device is a tool or equipment to carry out a process that allows educators and students to carry out learning activities. The learning tools are designed in the form of a Learning Implementation Plan (RPP), Student Activity Sheets (LKS), and Learning Outcomes Test (THB). In compiling learning tools, one thing that needs to be considered is the learning model that will be used. The learning model referred to in this paper is a conceptual framework that describes a systematic procedure for organizing learning experiences to achieve learning goals. One learning model that can activate students in the learning process is the SMART learning model. The SMART learning model is a model designed primarily to help students train their thinking skills and intellectual skills, and to master concepts with teacher guidance through scaffolding and analogies that are known to students.

The characteristics of the SMART learning model are developed based on several learning theories, namely constructivism theory, Piaget's theory, Vigotsky's theory, information processing theory, Ausubel's theory, and Bandura's theory. These theories are taken into consideration in compiling the stages / syntax of learning, these stages consist of 1) Present phenomena, Presenting phenomena that can attract students' attention. Phenomena in the learning process provide examples / modeling by presenting analogous concepts to be learned to explore students' initial knowledge, in addition to posing questions related to the material. Giving these questions aims to motivate students to explore information about the concepts being studied. 2) Asking, and formulating questions / problems, Students are guided by the teacher to ask questions from various activities carried out in the first step to collect information related to the formulation of questions / problems. Students are asked to explain about what, why, and how through discussion and put forward as many arguments as possible for the formulation of questions / problems related to the material. 3) Exploration (observation) activities, students seek as much information as possible to be able to answer questions / problems raised through various learning sources. 4) Report, preparation of reports, and formulation of conclusions, providing opportunities for students to formulate conclusions based on the data that has been analyzed. The activity undertaken is to analyze the relationship of some of the information obtained to support the evidence for a given solution so that a conclusion can be obtained. 5) Apply to new contexts, namely giving students the opportunity to apply the concepts they have acquired in various situations (Latjompoh, 2017, p. 58).

The SMART learning model can explore students' initial knowledge, provide opportunities for students to ask questions, express opinions, formulate problems, collect information related to problems, work together to solve problems, formulate conclusions, and make decisions. During the learning process students not only hear what the teacher says, but students take an active role in the learning process.

So far, there is no information that explains the application of the SMART Model,

which is equipped with analogies in learning to increase activities and complete students' mastery of concepts. This research aims to determine the increase in activity and to complete the mastery of concepts for high school students using the SMART learning model. This research provides benefits for teachers, students and schools in terms of improving the learning process.

METHOD:

Types of Research:

This type of research used in this research is classroom action research (Classroom Action Research).

Time and Place of Research:

This research was conducted at SMA Negeri 2 Gorontalo City. held from July to September the odd semester of 2020.

Research Targets/Subjects:

The subjects in this study were 25 students of class XI IPA 2. The reason for choosing this class was according to the interview with the subject teacher, students were less active in the learning process compared to other classes.

Procedure:

This research is a classroom action research that uses direct observation data on the course of the learning process in the classroom. This action research consists of four components, namely the planning stage (planning), implementation of action (taking action), taking evidence through observation (collecting evidence), and reflection (reflecting) Martler (2009).

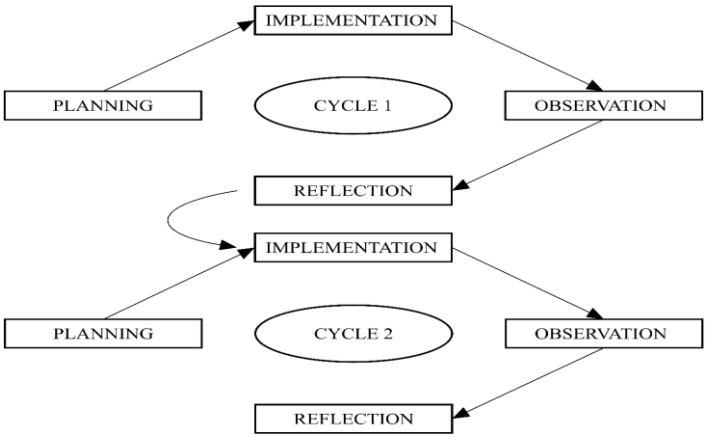

Figure 1. Classroom Action Research Cycle

Data, Instruments, and Data Collection Techniques:

The instruments used in this study were student activity observation sheets and test sheets to determine the students' mastery of concepts. The implementation of the action is the implementation or implementation of the planning that has been carried out and carried out in 2 cycles with each cycle of two meetings. This study involved observers from partner teachers and biology teachers at the school to monitor student activities using observation sheets. Each observer observed three students. Data were analyzed and discussed with the observer regarding the learning process carried out to obtain notes during the implementation of the learning process. The data on the mastery of concepts were collected through tests given before and after the learning process using the SMART learning model. Next do a reflection. From the results of the reflection, changes or solutions are needed to improve the implementation of the learning process in the next cycle.

Data Analysis Technique:

Analysis of the results of student activities during the learning process is processed descriptively by calculating:

The percentage of each aspect = $\frac{\text{number of aspects achieved}}{\text{the total number of all aspects}}$ x100%

(Purwanto, 2010)

The results are then adjusted to the success predicate categories in Table 1 as follows.

Table 1. Predicates of the Success of Student Activities

Numb	Interval	Predicate of Success
1	86-100%	Very Good
2	76-85%	Good
3	60-75%	Enough
4	55-59%	Less
5	< 54%	Very Less

The test value data were analyzed using the formula for the percentage of classical learning completeness. Classical completeness data analysis used the following formula:

$$KB = \frac{Ns}{N} \times 100$$

Information:
KB = The percentage of classical learning completeness
Ns = The number of students who completed
N = The total number of students
(Arikunto, 2010)

RESULTS AND DISCUSSION:

Results of Observation of Student Activities in Cycle 1:

Data from the observation of student activity during learning in cycle 1 is presented in Figure 1.

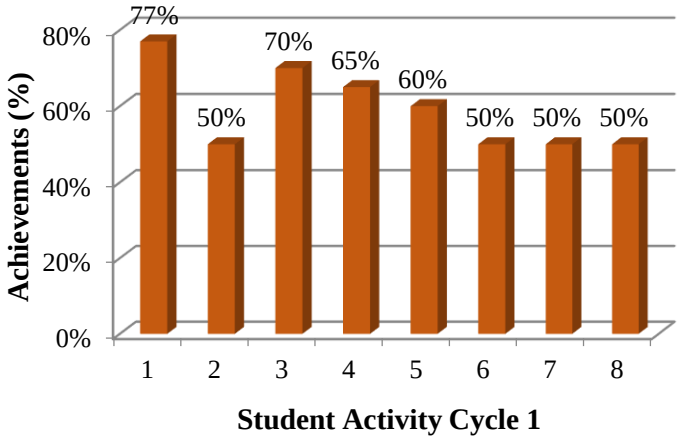

Figure 2.Graph of the percentage of achievement of each aspect of student activity in cycle 1

Information:

Activity 1 : actively paying attention to the presentation of phenomena
Activity 2 : actively formulating questions
Activity 3 : actively working on worksheets in groups, reading books and other sources
Activity 4 : discussion / question and answer between students
Activity 5 : discuss / question and answer between the teacher and students
Activity 6 : actively formulating conclusions
Activity 7 : actively responding to other groups' presentations
Activity 8 : show behavior that is not relevant to learning activities

Based on Figure 2, it can be seen that the average student activity in the first cycle was in the sufficient category. Based on the percentage of achievements of each category, it can be seen that there are several aspects that are classified as low, including the activity of formulating questions, discussing questions and answers between students, discussing questions and answers between teachers and students, formulating conclusions and responding to presentations of other groups and showing behavior that is not relevant to learning activities. These aspects were fixed in cycle II.

Reflection on Cycle Action 1:

Based on the data from the results obtained, including student activity and test results after applying the SMART learning model in the learning process, student activity and student test results have not reached the expected performance indicators. Student activities that have not been carried out properly during the learning process in cycle I and improvement solutions can be seen in Table 2.

Table 2. Reflections on Student Activities in the Learning Process

Aspects that need to be improved	Deficiency	Repair Solution
Formulate / pose questions	There are only a few students who are able to formulate questions after they pay attention to the presentation of the phenomenon, this is because students are not used to it or are embarrassed because they are afraid of being wrong.	Familiarize students with asking questions by providing assistance in stages and being guided by the teacher so that students get used to asking questions.
Discuss questions and answers between students	Students work individually without having a discussion. There are students who do LKPD alone, other friends only tell stories, and others just keep quiet.	The teacher always motivates students to be active in discussions by giving assignments to each student in their group.
Discuss questions and answers between teachers and students	There were only 3 students who often discussed with the teacher, perhaps because they were reluctant to ask and answer questions with the student teacher.	Motivating students to be active, if students can ask or answer the teacher should provide additional points for students who are actively discussing.
Formulate conclusions	Only certain students are active in formulating conclusions. this is due to the lack of understanding of students towards the material and the students are not serious in discussing it.	Before carrying out the group transition activities, the teacher must ensure that all groups have finished working on the LKPD. In addition, the teacher must guide students when exchanging information with other groups.
Respond to other groups' presentations	Students accept the results of presentations from other groups without giving a response.	Motivate students to dare to respond to the results of presentations from other groups in the form of suggestions or additional answers by providing additional points for students who actively express their opinions even though the answers are not quite right.
Shows irrelevant behavior during the learning process	Some students do other activities during the learning process, for example telling stories.	Gives understanding to students to really focus on what is being done.

The results of the students mastery of concepts in cycle 1:

Students mastery of concepts in cycle 1 was measured by an 8-item essay test. Data on students mastery of concepts can be seen in Figure 3.

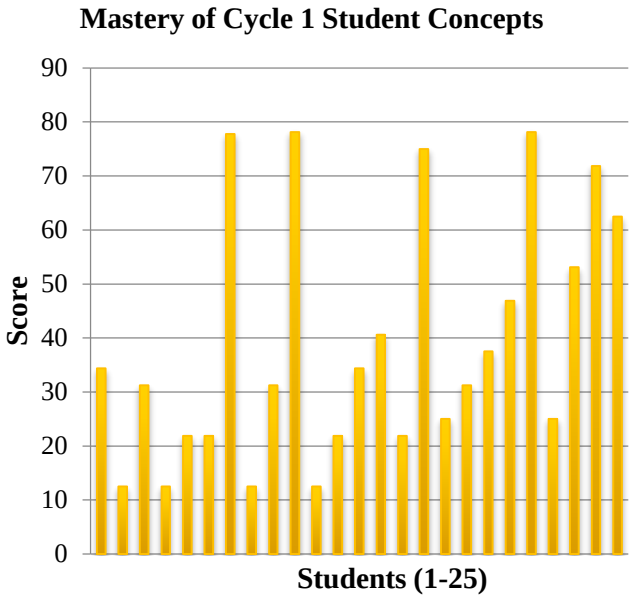

Figure 3.Graph of Cycle 1 Students' Concept Mastery

The individual and classical completeness of students in cycle 1 can be seen in Table 3

Table 3. Data on Individual and Classical Completeness of Cycle I Students

Cycle	Total students	Completeness			Category
		Individual		Classical Percent	
		Completed	Not complete		
I	25	5 students	20 students	20%	Incomplete

Based on Table 3, it can be explained that the mastery of the concept in cycle I, 5 students who completed and did not complete were 20 out of 25 students. and the class average score of 38,85 has not reached the completeness standard set by the school and will be continued in cycle II.

Results of Observation of Cycle 2 Student Activities:

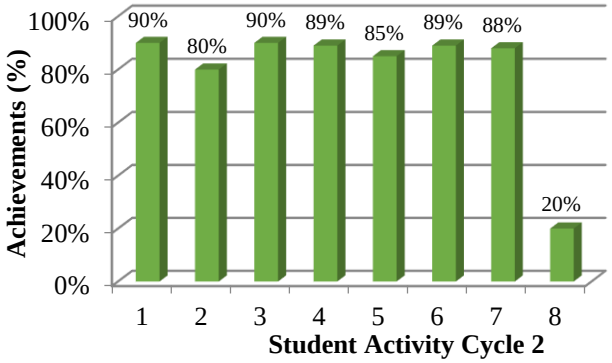

Figure 4.Cycle 2 Student Activity Data

Based on Figure 4, it can be seen that every aspect of student activity has increased from cycle 1, except for the 8th aspect, which shows behavior that is not relevant to learning activities, meaning that most students are active in the learning process. The average student activity is in the very good category.

Results of the Student's Concept Mastery in Cycle 2:

Students mastery of concepts in cycle 2 has increased. Data on the mastery of concepts from cycle 2 students can be seen in Figure 5.

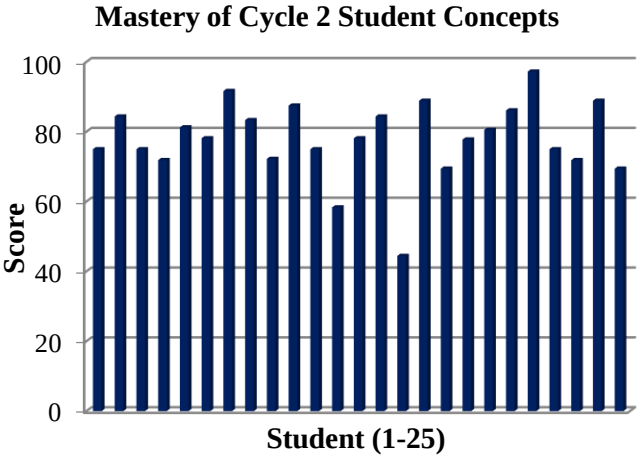

Figure 5.Graph of Cycle 2 Students Concept Mastery

Individual and classical completeness of cycle 2 students can be seen in Table 4.

Table 4.Data of individual and classical completeness of students in cycle 2

Cycle	Total students	Completeness			Category
		Individual		Classical Percent	
		Completed	Not complete		
II	25	21 Students	4 Students	84%	Complete

Based on Table 4, it can be explained that the mastery of the concept in cycle 2, there were 21 students who completed and 4 out of 25 students who did not complete. and the class average score is 77,83. Based on the predetermined KKM of 70, then the students' mastery of concepts is categorized as complete.

RESULTS AND DISCUSSION:

This section discusses and discusses the results of research on the application of the SMART learning model to increase activities and complete students' mastery of concepts. Discussion of research results in the form of student activities and mastery of concepts.

One important factor in the learning process is student activity. The active role of students in the learning process is needed so that learning becomes more effective. An effective learning atmosphere according to Government Regulation Number 19 of 2005 concerning National Education Standards states that the learning atmosphere in the classroom must be interactive, inspirational, fun, challenging, innovative and self-discovering. Nurhasnawati (2008) argues that the active involvement of children in teaching and learning activities is needed so that learning can be effective and can achieve the desired results. The same thing was stated by (Hamalik, 2010) that students can gain more experience by means of active and personal involvement, compared to if they only see material or concepts. Thus, effective learning has characteristics where students see, listen, demonstrate, work together, discover, and build their own concepts. The effectiveness of learning depends a lot on the readiness and method of learning carried out by the students themselves, both independently and in groups.

Based on the results of data analysis, the presentation of student activities actively paying attention to the presentation of phenomena is one of the dominant activities in the range of 77% to 90%, and actively working on worksheets in groups, reading books and other sources ranging from 70% to 90%. The dominance of student activities in actively paying attention to the presentation of phenomena and actively working on worksheets is in accordance with constructivist theory. Based on the social constructivist view, students build their knowledge through social interaction with teachers or other students so as to provide opportunities for students to participate in creating shared understanding (Ormrod, 2009). Furthermore (Ormrod, 2009) said that the strategy of developing student skills to build teamwork, among others, is by telling students to help them become good listeners.

The lowest student activity is in activities showing behavior that is not relevant to learning activities. This process indicates that the learning that occurs is able to make students active. This can be seen in the activities of students discussing, doing assignments and paying attention to the teacher's explanation that runs effectively. According to the constructivist view, student-centered learning can arouse student activeness in learning. Teachers not only provide knowledge to students, but also give students the opportunity to find and apply their own ideas, so that students build their own knowledge in their minds (Slavin, 2009).

High student activity reflects that the "SMART" learning model has been carried out well. It was concluded that the SMART learning model was effective in increasing student activity in learning biology.

Based on the results of the data analysis of the concept mastery test, the learning process through the SMART model which is equipped with scaffolding and analogies in biology learning can complete the classical mastery of students' concepts. This is in accordance with research conducted by (Treagust in Harrison and Cool 2013: 26) that analogy is able to encourage students and teachers to develop explanations and conceptual mastery.

However, seen from the individual completeness there are still some students who do not complete based on the KKM score. The dominant students who did not complete were the questions related to their application in everyday life. This is probably because students are accustomed to rote questions. Therefore, the teacher needs to make a plan by providing guidance in stages to students through the use of scaffolding so that students are familiar with application questions. Other factors that influence incompleteness are internal factors such as learning methods, willingness to learn and external factors in the form of learning facilities, interactions between students and other students or with teachers. In addition, another factor that influences insolence is the self-handicapping strategy, in which a number of individuals deliberately inhibit themselves by not making efforts, playing games, not studying before exams so that their performance is at a low level (Urdan & Midgley, 2001). Internal student factors such as how to learn, willingness to learn, self-motivation and external factors in the form of learning arrangements at school both learning facilities, discussions with other fellow students and interactions between teachers and students are always carried out. The factors that support learning outcomes whether met or not met will have an impact on student learning outcomes.

The solution made by the teacher provides assistance / guidance and direction by providing material explanations (enrichment), asking questions, giving additional assignments in the form of questions that are done by students at home and encouraging students to have positive beliefs about their abilities, and creating a learning environment that is according to his learning style. As stated by Caroll, quoted by (Joyce and Calhoun, 2011) that learning outcomes are not solely determined by previous students' academic abilities but are also influenced by other factors, namely individual ability (initial ability), available time, quality of learning, talent individual, and environmental factors. This is also stated by Brophy in Santrock (2011) that students need to be consistently convinced that they can reach the goals and challenges that have been set and teachers provide the assistance and support needed by students to succeed. Furthermore, Dunn & Dunn (2003) said that each individual basically has different advantages from one another and to foster these advantages it is necessary to create an environment and learning approach that is in accordance with their learning style.

CONCLUSIONS AND SUGGESTIONS:

Conclusions:

The SMART learning model equipped with scaffolding and analogy can increase student activity by 78.9% and complete students' mastery of classical concepts by 77.83%.

Suggestions:

Learning must be oriented towards student activities that involve the active role of students so that learning becomes meaningful and students become independent.

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PROFIL SINGKAT:

Masra latjompoh lahir di Gorontalo pada tanggal 12 Februari 1967. Pada tahun 1991 memperoleh gelar Sarjana Pendidikan di bidang Pendidikan Biologi FKIP Unsrat Manado di Gorontalo yang sekarang menjadi Universitas Negeri Gorontalo. Tahun 2000 memperoleh gelar Magister Pendidikan (M.Pd) dalam bidang Pendidikan Sains di Universitas negeri Surabaya, Tahun 2016 memperoleh gelar doktor Pendidikan di bidang Pendidikan Sains Universitas Negeri Surabaya. Sejak tahun 1992 sampai saat ini bekerja di Universitas Negeri Gorontalo sebagai dosen di Jurusan Biologi Fakultas Matematika dan IPA.