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DEVELOPMENT OF STUDENT ACTIVITY SHEET WITH CONNECTING, ORGANIZING, REFLECTING, EXTENDING LEARNING MODEL TO IMPROVE STUDENT LEARNING OUTCOMES ON SENIOR HIGH SCHOOL STUDENTS

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Abstract. This study aims to produce LKPD based on communication and collaboration with CORE learning model a decent to improve learning outcomes and Train Communication Skills on students in the subject matter of the Nervous System in Humans. This research have used 4D development model that has been tested on students in class XI IPA 4, XI IPA 5, and XI IPA 6 in SMAN 18 Surabaya with research design one group pretest and posttest design. Research data has been obtained through the method of validation, observation, test, and questionnaire. The results are analyzed descriptively quantitative and qualitative. The results showed that: (a) LKPD with CORE learning model and learning tools developed categorized as valid; (b) the implementation of learning activities is very good; (c) student learning outcomes on the knowledge aspect increases with high criteria; (d) the students provide very positive response to the learning that has been implemented. Based on the analysis and discussion, it is concluded that LKPD with CORE learning model is suitable to be used to improve student learning outcomes on high school students.

Keywords: Connecting, Organizing, Reflecting, Extending.

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INTRODUCTION

Education plays an important role in building and advancing a nation. This is because through education, knowledge, technology, and art (science and technology) can be more developed and advanced. Education is closely related to the process of learning activities which are basically a process of learning and teaching activities that cannot be separated from one another. Learning generally aims to guide and educate students to be better in accordance with the expected learning goals. Oemar (2005), explained that the purpose of learning is a description of behavior that is expected to be achieved by students after the learning process.

Based on the results of observations and interviews that have been conducted in one of the schools on the learning process of Biology, especially in class XI IPA students, shows that the average value of students' daily tests, especially in the material of the Nervous System in Humans is still low. This is because students find it difficult to understand the material which is abstract about the structure and work processes of the nervous system that occur in the body. In addition, one of the learning facilities used is the Student Activity Sheet (LKPD), but it has not been able to actively involve students. The LKPD also has not been able to help students to understand the subject matter optimally.

Based on these problems, an effort or solution is needed to deal with the problems that have been raised, it is necessary to develop a LKPD that can be used as teaching materials to help students understand the material of the Nervous System in Humans, so that student learning outcomes can improve.

In the development of LKPD, it is important to note that the various requirements of the preparation steps are in accordance with the characteristics of the LKPD that will be developed and the subject matter, so that the expected learning objectives can be achieved. Based on this, it requires a learning model that is appropriate and in accordance with the conditions of students who learn, then the Connecting, Organizing, Reflecting, and Extending (CORE) learning model was chosen as a reference in the development of LKPD in this study. Calfee, et al (2004), explained that the CORE learning model is a learning model that expects students to construct their own knowledge by connecting (connecting) and organizing (new knowledge) with old

knowledge then thinking about the concepts being studied (reflecting) and expected students can expand their knowledge as long as the learning process takes place (extending).

Based on the description of the problems that have been explained in this background, researchers are then interested in designing and conducting research entitled " Development of student activity sheet with connecting, organizing, reflecting, extending learning model to improve student learning outcomes on senior high school students ".

METHOD

This type of research is a development research that aims to produce a Student Activity Sheet (LKPD) model of Connecting, Organizing, Reflecting, Extending (CORE) to improve student learning outcomes in high school. Subjects in this study were students of class XI IPA 4, XI IPA 5, and XI IPA 6 in SMAN 18 Surabaya. In the development of LKPD, other learning tools were developed which were needed as a reference in the development of LKPD which consisted of syllabus, learning implementation plans (RPP), and test questions instruments.

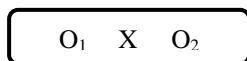
The procedure of this research consists of two stages, namely the development stage of the CORE model LKPD and the learning tools as well as the testing phase / implementation of the CORE model LKPD and learning tools.

1. CORE Model LKPD Development Stage and Learning Tools

The development of the CORE model LKPD and the thinking-flow learning tool Thiagarajan, Sivasailam, Dorothy, S. Semmel & Melvyn, I (1974) using the 4D (four D model) model which consists of four stages, namely defining, designing, developing and spread. In this study, the deployment phase was not carried out, because the results of the research in the form of the CORE model LKPD and the learning tools that have been developed have not been disseminated to other schools (other than research sites), so that this study was only carried out in three stages, namely defining, designing, and development.

2. The design of the CORE model LKPD trial and learning tools

The application of the CORE model LKPD and learning tools was carried out using the One Group Pretest and Posttest Design research design (Sugiyono, 2012). The trial starts with giving a pretest (O1), then students are given treatment with learning using the CORE model LKPD and learning tools (X), then after the learning process is given posttest (O2). The design of the trial in this study can be described as in the following figure.



Information:

- O1: pretest to know students' initial abilities before learning takes place.
- X: learning process using the CORE model LKPD and developed learning tools.
- O2: posttest to know students' abilities about the material learned after learning takes place.

Data analysis technique

Data analysis techniques in this study are as follows.

1. Analysis of the validity of LKPD CORE models and learning tools

Data from the validity of the CORE model LKPD and learning tools are obtained through the validation sheet and based on the assessment of three validators and then the average value is calculated. Data validity analysis techniques are described in descriptive quantitative and qualitative. The CORE model LKPD assessment categories and learning devices are determined based on the average value of the validator and then adjusted to the assessment criteria of learning devices based on Ratumanan and Laurens (2011).

2. Analysis of learning effectiveness

Data analysis techniques for learning implementation are described in descriptive quantitative and qualitative ways. The score for the implementation of learning scores is given by two observers when observing the learning process which is then categorized based on the assessment criteria by Ratumanan and Laurens (2011).

3. Analysis of student learning outcomes in aspects of knowledge

Data on student learning outcomes in aspects of knowledge were obtained from the results of the pretest and posttest analyzed quantitatively descriptively. Analysis of student learning outcomes tests was analyzed to determine the understanding and completeness of the value of student learning

outcomes on the material being studied. The test of student learning outcomes is analyzed individually, classical, and the value of N-Gain. Calculation of N-Gain scores (<g>) to determine the increase in student learning outcomes obtained after students after learning activities. The N-Gain test is performed using the following formula.

$$N\text{-gain} = \frac{\text{posttest score} - \text{pretest score}}{\text{maximum score} - \text{pretest score}}$$

(Herlanti, 2006)

4. Analysis of student activities

Student activity data aims to provide a description of student activities during the learning process taking place using the CORE model LKPD and learning tools obtained from the instrument observation sheets of student activities that were analyzed quantitatively and qualitatively. Data from observations of student activities during learning activities were analyzed using the following formula.

$$P = \frac{\sum R}{\sum N} \times 100\%$$

(Arifin, 2010)

Information:

- P = Percentage of student activity
- $\sum R$ = mber of average frequency of observation category
- $\sum N$ = Total number of total observation categories.

5. Analysis of student responses

Student response data was obtained from the questionnaire responses of students to the learning activities process which were analyzed descriptively quantitative and qualitative with percentages. Student response data is used to follow up the learning activities with the use of the CORE model LKPD and developed learning tools. The results of student response analysis are then calculated using the following formula.

$$P = \frac{\sum K}{\sum N} \times 100\%$$

(Riduwan, 2015)

Information:

- P = Percentage of student response scores
- $\sum K$ = Number of students who choose the answer Yes or No
- $\sum N$ = The total number of students who filled out the questionnaire.

RESULT AND DISCUSSION

A. LKPD Development Validity Results and Learning Tools

LKPD CORE model and learning tools consist of syllabus, learning implementation plans (RPP), and test questions instruments, before being tested in the learning process first validated by three validators.

The results of LKPD validation and learning tools can be seen in Table 1 below.

Table 1. CORE Model LKPD Validity Results and Learning Tools

No	Validation Assessment Results	\bar{x} Validation Value Per Aspect	\bar{x} R (%) Per Aspect
1.	Syllabus	3,3 – 4	86 – 100
2.	RPP	3,7 – 3,9	89,5 – 98,4
3.	LKPD	3,75 – 3,95	93 – 98
4.	Test questions	3,7 – 3,8	89,5 - 93

Information: R (%) = Percentage of agreement; \bar{x} = Average value.

Based on Table 1 shows that the results of the CORE model LKPD validation and overall learning tools scored 3 to 4 with valid categories, while the overall percentage of agreement obtained from the CORE model LKPD and the developed learning tools scored 86% to 100% with reliable category.

B. Test Results of LKPD Development and Learning Tools

1. Practical Use of LKPD and Learning Tools Learning Implementation

The implementation of learning activities using the CORE model LKPD and other learning tools used to improve student learning outcomes was assessed based on observations of the implementation of learning activities carried out by two observers / observers using observation sheets for the implementation of learning activities. Observations on the implementation of learning activities were carried out for students of class XI IPA 4, XI IPA 5, and XI IPA 6 for three meetings as an implementation of the RPP that had been developed. The results of observing the implementation of learning activities can be seen in Table 2 below.

Table 2. Learning Outcomes

No	Assessment Results Per Stage of Learning Activities	\bar{x} Assessment Per Activity Stage	\bar{x} R (%) Per Activity Stage
1.	Preliminary Activity Stage	3,96 – 4	97 – 100
2.	Core Activity stage	3,91 – 3,96	97
3.	Closing Activity Stage	4	100

Information: R (%) = Percentage of agreement; \bar{x} = Average value.

Based on Table 2 shows that the results of the implementation of learning that has been done to get an overall average score of 3.91 to 4 in the good category, while the percentage of agreement obtained in its entirety towards the learning process that has been done gets a score of 97% to 100% by category reliable.

2. Student Activity

Observation of student activities is carried out in students of class XI IPA 4, XI IPA 5, and XI IPA 6 during the learning process. Observation of student activities was carried out by two observers using observation sheets of student activities. The results of the analysis of observations of student activities in students of class XI IPA 4, XI IPA 5, and XI IPA 6 can be seen in Figure diagram 1 below.

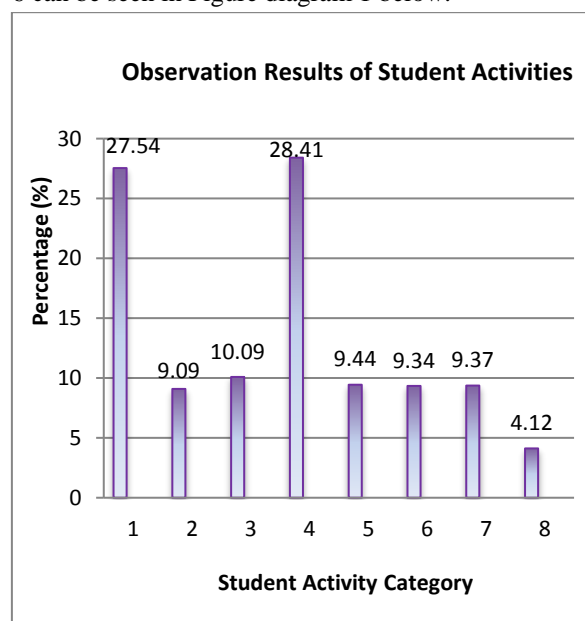


Figure 1. Results of Observation of Student Activity

Caption:

Percentage (%): The average percentage of the number of activities carried out.

Student activity categories:

- 1: Activity listening and paying attention to the explanation of the teacher.
- 2: Question and answer activities between the teacher and students or between students and students.
- 3: Activity reading LKPD.
- 4: Activities working on tasks contained in LKPD in groups
- 5: Activities presenting the results of group discussions.

- 6: Activities provide criticism, suggestions, as well as opinions / ideas towards the group that is presenting.
- 7: Activity concludes lesson material.
- 8: Activity actions that are not relevant.

C. Effectiveness of Using LKPD and Learning Tools

1. Student Learning Outcomes

Student learning outcomes are obtained from the results of the pretest and posttest by using the instrument test questions. The results of the analysis of student learning outcomes test scores carried out on students of class XI IPA 4, XI IPA 5, and XI IPA 6. The learning outcomes of students' knowledge at pretest and posttest can be presented in the form of diagrams in Figure diagram 2 below.

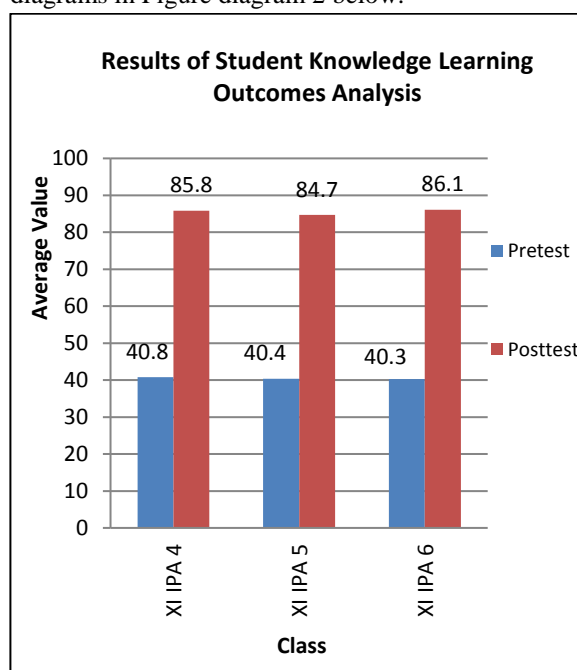


Figure 2. Results of Analysis of Student Learning Outcomes Tests.

Based on student learning outcomes that have been done all students get complete grades with values above 75, while the overall score is 85.8 to 86.1.

2. Student Response

Student response data on the learning process activities using the CORE model LKPD and other learning tools were obtained by using the student response questionnaire given to each student after participating in all the learning process activities. Student response data observed were students of class XI IPA 4, XI IPA 5, and XI IPA 6. The results of the analysis of student response data on the learning process using the CORE model LKPD and

the developed learning tools can be seen in Table 3 below.

Table 3. Student response results

No	Assessment Aspect	Percentage of Assessment
1.	Respondents were interested in the process of learning activities using the CORE model LKPD	91,1% - 100%
2.	Respondents easily understand, use, and follow the components contained in the CORE model LKPD	88,2% - 100%
3.	Respondents agreed with the learning process that has been carried out at this time by using the CORE model LKPD to be applied to the next learning activity	97,1 - 100%

Based on data analysis of student responses to the learning process using the CORE model LKPD it is known that students give a positive response with an average score of 88.2% to 100%.

CONCLUSION

Based on the results of the research that has been done it can be concluded that the LKPD CORE model is feasible (valid, practical, and effective) to improve student learning outcomes in the material of the Nervous System in Humans.

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