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Implementation of Numbered Heads Together (Nht) Learning Devices With Quiz Kahoot to Improve Student Learning Outcomes and Collaboration Skills In Reproduction System Materials

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Abstract

This study aims to analyze student learning outcomes and collaboration skills by applying the Numbered Heads Together (NHT) learning tool model with Quiz Kahoot on the reproductive system material. This type of research is the Pre-Experimental Design with the type of One-Shot Case Study. The sample used was 15 students from class XI MIPA 1 with purposive sampling technique. Students' cognitive learning outcomes were analyzed descriptively quantitatively with the N-gain test and t-test or the difference between the two means. The results of the N-gain test for 15 students of class XI MIPA 1 were 0.4 with moderate criteria. The results of the t-test analysis or the difference between the two mean values obtained sig. 0.002 <0.05, then Ha is accepted and Ho is rejected, so there is a significant difference between pretest and posttest. In addition, there is also an increase in student collaboration obtained from the data from the observation and trial stages. This is supported by the results of student responses related to the application of the Numbered Heads Together (NHT) learning tool model with Quiz Kahoot, which obtained an average student score of 84.17 with very good criteria. Based on the results of the study, it can be concluded that the Numbered Heads Together (NHT) learning device with Quiz Kahoot to improve student learning outcomes and collaboration skills is good for use in SMA PGRI 02 Kayen Pati.

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INTRODUCTION

Learning in the 21st century undergoes changes marked by the rapid development of times and technology.Learning that was initially centered on the teacher (teacher center) became centered on students (student center).In the 21st century, learning emphasizes 4 skills, namely communication, collaboration, critical thinking, and creativity.Before the learning process takes place the teacher is required to make learning tools that are suitable for teaching students in accordance with the provisions of 21st Century learning.In addition to learning tools that are feasible to use, currently schools do not only emphasize the knowledge of subject matter, but what is prioritized is the ability of students to acquire their own knowledge (Hidayah et al., 2017).The ability to acquire one's own knowledge and emphasize these 4 skills can be developed through learning science, one of which is biology learning.

Biology learning is learning that links physiological processes with symptoms in everyday life.One of the biological materials related to this is the reproductive system material in humans.Reproductive system material is needed for students because of the transition from adolescence to adulthood and is associated with promiscuity which is very appropriate for their age.With the development of the times and the current era of globalization, juvenile delinquency is increasing, one of which is promiscuity which can lead to free sex.At this time many teenagers are engaging in casual sex regardless of their mental and psychological readiness.In addition, many impacts will be obtained, one of which is the infectious disease HIV / AIDS.With free sex and its impact, students can study the Reproductive System material in Biology Subjects.

Based on an interview with the Biology Teacher at SMA PGRI 02 Kayen Pati. The result was that the teacher had difficulty explaining the reproductive system material because in certain sub-chapters it could make children crowded so that they were not conditioned and it was difficult to explain in simple language which could make students better understand. The results of the daily test scores of the reproductive system material obtained by students were lower than the other materials. In the Reproductive System material, the students' incomplete score reached 52% compared to the Respiratory System material which was only 9%, the Excretion System 13%, the Coordination System 14%, and the Immune System 12%. In addition to the test results achieved by students, questions made on the discussion sheet did not make students think critically because the questions used were usually taken from Student Worksheets and were of less quality. When learning takes place students play an active role, but there are obstacles faced by the teacher, namely focusing on students when other groups present in front of the class and the lack of collaboration between students during discussions.

Numbered Heads Together (NHT) is a cooperative learning model using numbers placed on the back and chest, where students are given the opportunity to share ideas and consider the right answers (Effendi, 2017).The advantages of the *Numbered Heads Together* (NHT) learning model include students being able to discuss seriously, helping each other if there are friends who do not understand the material they are discussing, all students are ready when appointed by the teacher to deliver the results of the discussion and there are no studentswhich dominates in the group.In addition, *Numbered Heads Together* (NHT) can be used to increase cooperation between students, so that students have equal knowledge with each other (Kurniati&Sahyar, 2017).

The weakness of the *Numbered Heads Together* (NHT) learning model is the possibility that the number that has been called will be called again by the teacher, and not all students are called by the teacher to deliver the results of the discussion (Karyadi et al., 2012).In addition, the teacher does not yet know that students whose numbers are not called understand whether or not the material has been explained.To find out whether students understand what has not been about the material that has been explained, the teacher can use *Kahoot Quiz* to evaluate students at the end of each lesson.

There are three website features that can be used for learning evaluation, namely *Quizizz*, *Socrative&Kahoot*.The *Kahoot Quiz* has advantages, among others, the questions displayed have a limited time allocation, so students can be trained to think quickly in answering these questions.With the development of technology, learning can be accessed via the internet, be it discussions or online quizzes, one of which is *Kahoot*.According to Ilmiyah&Sumbawati research (2019) *Kahoot* is an online application used for interactive and fun online quiz-based learning media.With this *Kahoot Quiz*, it can be used to evaluate the learning process and at the same time to find out the level of student understanding of the reproductive system material.

Learning outcomes are changes in the form of physical, mental and intellectual skills from the process of learning activities both at the formal and non-formal education levels (Ariyanto, 2016).The learning outcomes obtained by students can increase or decrease depending on the students themselves.To get learning outcomes, of course, there is a process that is carried out when the learning takes place.The student learning process can be done individually or in groups.

There are several obstacles in teaching this material, namely the students' lack of understanding, especially on hormones related to the reproductive system, and the lack of collaboration between groups.Most students at school, when there is a group assignment, only ride to get grades, but do not contribute to the group.Especially when there was Covid-19 which allowed learning to be carried out online and remotely, effective learning methods and tools were needed.With this, researchers can develop the Numbered Heads Together (NHT) learning tool model with Quiz Kahoot to improve student learning outcomes and collaboration skills on the Reproductive System material.

RESEARCH METHOD

The research was conducted at SMA PGRI 02 Kayen Pati, Pati Regency, Central Java.The research was conducted in the odd semester of the 2020/2021 school year.The study population was the students of class XI SMA PGRI 02 Kayen Pati for the academic year 2020/2021 which consisted of 6 classes.Sampling using purposive sampling technique, namely the sampling technique using certain considerations.In this study, based on the opinion of the biology teacher concerned, after consulting with the biology teacher, the research sample was finally obtained, namely 15 students of Class XI MIPA 1. The type of research used was Pre-Experimental Design with the type of One-Shot Case Study, namely research in which a group was given treatment., then observed the results (Sugiyono, 2017: 74).

RESULTS AND DISCUSSION

The pretest and posttest questions were done by 15 students with 20 multiple choice questions. Determination of the value obtained by each student is calculated by adding up the scores obtained divided by the maximum score, then multiplying by one hundred.The minimum completeness criteria (KKM) determined in research schools in biology subjects are 67. The following is a table of student cognitive learning outcomes.

Table 1. Student cognitive learning outcomes

Information	Pretest Score	Posttest Score
Lowest score	25	55
Highest score	80	85
Total class score	**790**	**1095**
Class average score	**52.7**	**73**

In addition to the results of the pretest and posttest scores, a recapitulation of students' cognitive learning outcomes was also obtained through the pretest and posttest.The following is a recapitulation of

students' cognitive learning outcomes through the pretest and posttest material on the human reproductive system.

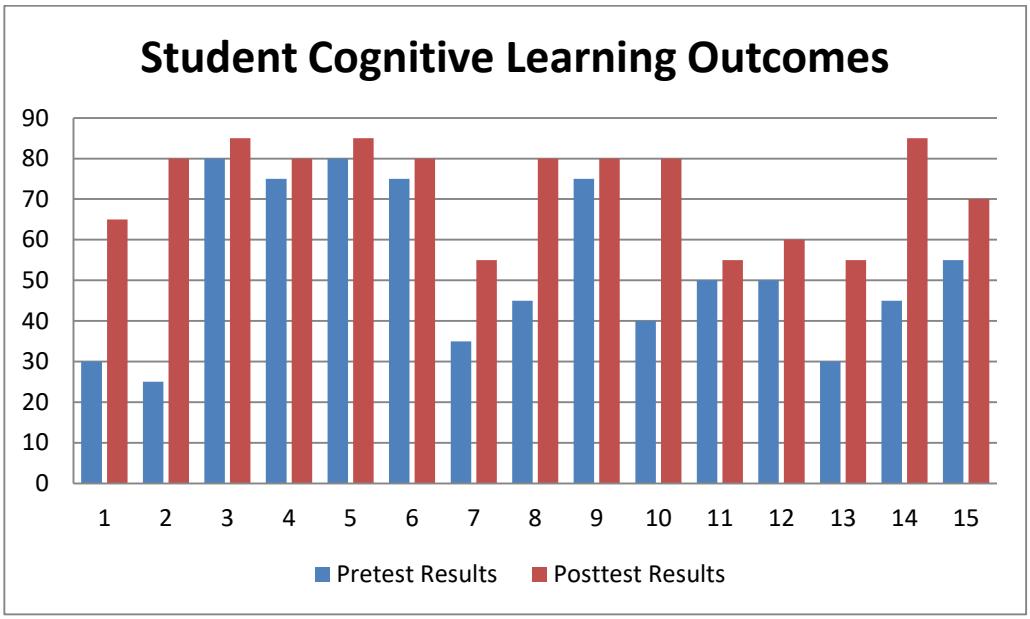

Figure 1. Recapitulation of Student Cognitive Learning Outcomes

In addition to analyzing student cognitive learning outcomes, it also analyzes the average difference test and the increase in student learning outcomes.The mean difference test was used to determine whether or not there was a significant difference in the pretest and posttest scores.Based on the results of the t-test with SPSS, there are significant differences in the pretest and posttest scores.The following is the result of the analysis of the difference between the two means.

Table 2. Results of the Two-Mean Difference Test Analysis

Score	N	T	Sig.	Information
Pretest *Posttest*	10	-3.441	0,002	Sig. <0.05, there is a significant difference

The increase in learning outcomes is obtained from the difference between the pretest and posttest scores then divided by the maximum score minus the pretest score.Based on the learning outcomes of the 15 students, it was obtained an average N-gain value of 0.4 with moderate criteria and a percentage of 47%.The following is a picture of the student's N-gain results.

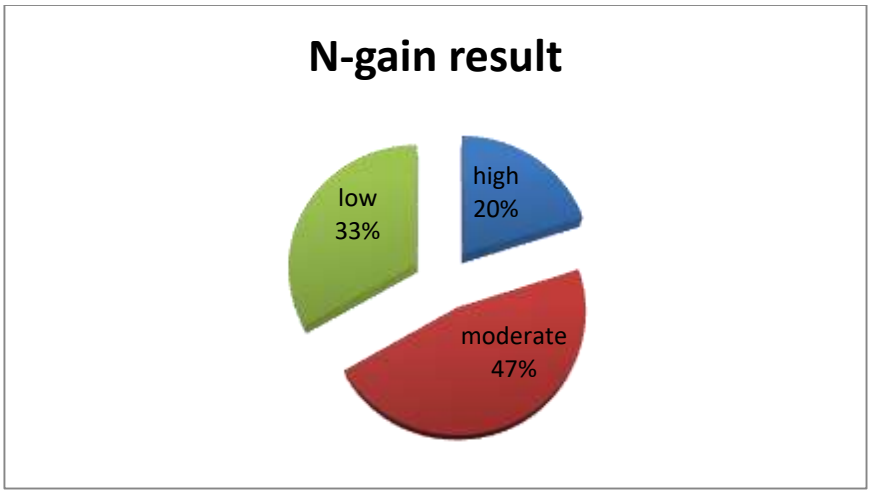

Figure 2. Diagram of Improving Learning Outcomes (N-gain)

Based on the data obtained in Tables 1 & 2, and figures 1 & 2, there is an increase in the value between the pretest and posttest scores obtained by students.Students' posttest scores have an average higher than the pretest scores.This is evidenced by the presence of students' scores at the pretest, the lowest score obtained was 25 and the highest score was 80, while at the posttest the lowest score obtained by the students was 55 and the highest score was 85. In addition, the average difference test was also obtained with significant results.0.002, which means that there is a significant difference between pretest-posttest, because the results are sig. <0.05, so that Ho is rejected.Student cognitive learning outcomes can also be seen in improving learning outcomes.Learning outcomes are said to be optimal if students get an increase in pretest and posttest scores with moderate to high criteria.

Based on the data above, it is obtained a percentage of 20% with high criteria, a percentage of 47% with moderate criteria and a percentage of 33% with low criteria. With this, it can be said that the N-gain value of the 15 students of class XI MIPA 1 is in moderate criteria. An increase in student learning outcomes shows that the application of the Numbered Heads Together (NHT) learning tool with Quiz Kahoot can understand students about the reproductive system material. In addition to being able to understand students, it can also improve student collaboration skills, this is supported by the presence of data before the research from the Biology Teacher at SMA PGRI 02 Kayen Pati stated that there was a lack of student collaboration during the discussion. After the research was conducted using the Numbered Heads Together (NHT) model, the students actively participated in participating in the discussion. This research is supported by Permana's (2016) research that the Numbered Heads Together (NHT) model can improve student achievement, deepen student understanding, develop student positive attitudes, develop student self-confidence and a sense of belonging. In addition, it is also supported by research by Wardana&Sagoro (2019) that Quiz Kahoot can increase learning activities, learning motivation and student learning outcomes.

In this study, besides improving learning outcomes, it also improves student collaboration skills.Student collaboration is obtained through self-assessment at the observation and trial stages.The following is data on student collaboration skills at the observation stage.

Table 3. Results of the Analysis of Student Collaboration Skills at the Observation Stage

No	Percentage Range (%)	Criteria	Total Students	Percentage

1	76 – 100%	Very good	5	33%
2	51 – 75%	Good	10	67%
3	26 – 50%	Less good	-	-
4	0 – 25%	Not good	-	-

From the results of the analysis of student collaboration skills at the observation stage, the percentage with very good criteria was 33% with a total of 5 students and a good criterion of 67% with a total of 10 students.The following is a diagram of the percentage of student collaboration skills at the observation stage.

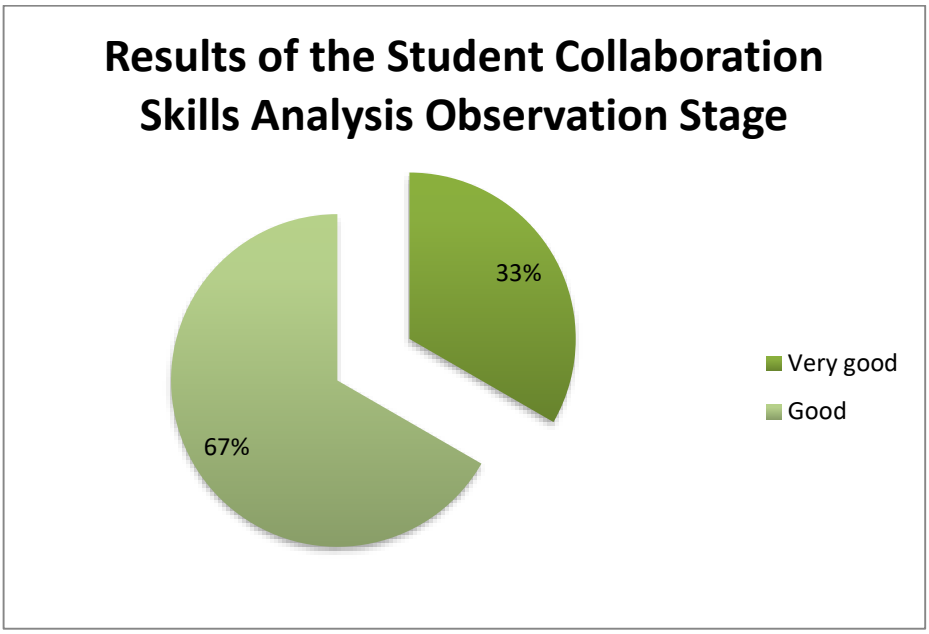

Figure 3. Diagram of Student Collaboration Results in Observation Stage

Student collaboration skills questionnaires were also given to students at the trial stage to find out whether there was an increase in student collaboration after implementing the Numbered Heads Together (NHT) learning model with Quiz Kahoot.The following is the data from the analysis of student collaboration skills at the trial stage.

Table 4.Results of Student Collaboration Skills Analysis at the Trial Stage

No	**Percentage Range (%)**	**Criteria**	**Total Students**	**Percentage**
1	76 – 100%	Very good	6	40%
2	51 – 75%	Good	9	60%
3	26 – 50%	Lessgood	-	-
4	0 – 25%	Not good	-	-

From the results of the analysis of student collaboration skills at the trial stage, a percentage of very good criteria was obtained by 40% with a total of 6 students and a good criterion of 60% with a total of 9 students.The following is a diagram of the percentage of student collaboration skills at the trial stage.

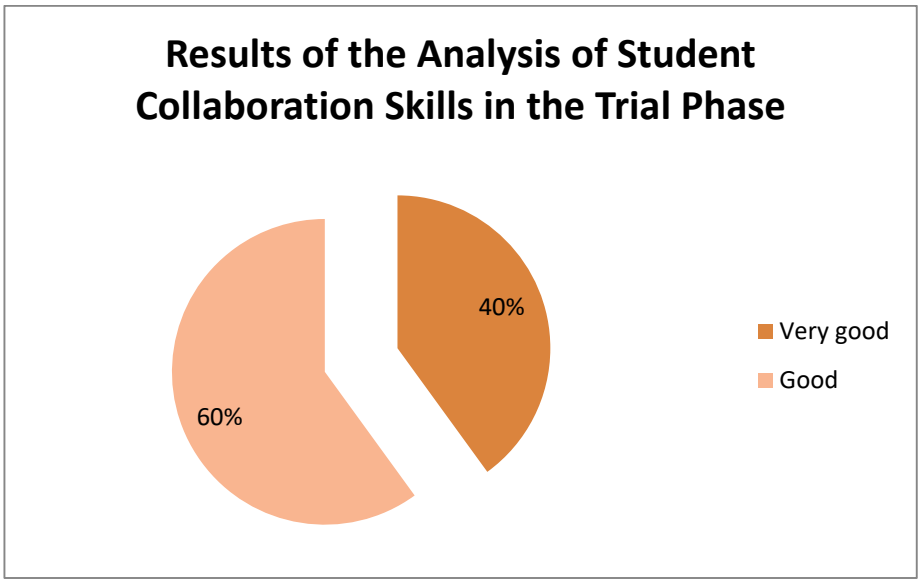

Figure 4. Diagram of Student Collaboration Results in Trial Phase

From the data from the analysis of student collaboration skills at the observation and trial stage, the results of the recapitulation of student collaboration improvement were obtained.The following is a recapitulation of increasing student collaboration skills at the observation and testing stage.

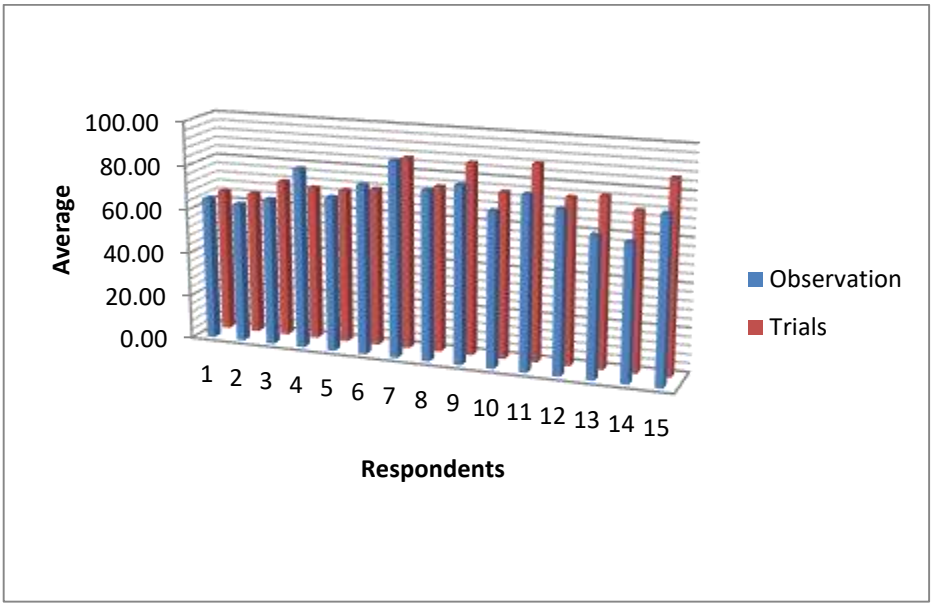

Figure 5. Recapitulation of Student Collaboration Skills

Based on the data above, at the observation stage, the percentage with very good criteria was 33% with a total of 5 students and a good criterion of 67% with a total of 10 students.Whereas at the trial stage, the percentage with very good criteria was obtained by 40% with a total of 6 students and a good criterion of 60% with a total of 9 students. According to Muiz, A. et al. (2016) stated that collaboration skills are important to develop so that students can work together in a group in the era of 21st Century globalization. With this, it can be interpreted that there is an increase in student collaboration skills from the observation stage to the trial stage based on the self-awareness of each student.This student response is supported by research by Maielfi & Wahyuni (2020) which states that collaboration skills are competencies that exist in students to work together, respect and have an obligation to do something individually.

In this study, in addition to the analysis of student collaboration skills, the results of the analysis of student responses to the Numbered Heads Together (NHT) learning device model with Quiz Kahoot were also obtained.Response questionnaires are given to students at the end of the lesson.The following is the data from the analysis of student responses to the Numbered Heads Together (NHT) Learning Tool Model with Quiz Kahoot in the following table.

Table 5. Results of Analysis of Student Responses to Learning Tools Model Numbered Heads Together (NHT) with Quiz Kahoot.

No	Percentage Range (%)	Criteria	Total Students	Percentage
1	76 – 100%	Very good	4	26.66%
2	51 – 75%	Good	11	73.33%
3	26 – 50%	Lessgood	-	-
4	0 – 25%	Not good	-	-

From the results of the analysis of student responses with very good criteria obtained a percentage of 26.66% with a total of 4 students and with good criteria obtained a percentage of 73.33% with a total of 11 students. With the student's response, the application of the Numbered Heads Together (NHT) learning device model with Quiz Kahoot was declared effective and attractive for students in the learning process both at school and at home, this was supported by the existence of an average number of student scores obtained of 84.17 with criteria very good. Based on this, it can be said that students are very interested in learning using the Numbered Heads Together (NHT) model and working on reproductive system problems using Quiz Kahoot. According to Daryanes&Ririen (2020), through Kahoot when learning can make students move psychologically so that it can encourage student interest in learning to achieve these learning goals. Besides being able to encourage interest in learning, students can also evaluate themselves whether the learning outcomes they get are satisfactory or not.

CONCLUSION

Based on the results of the research that has been done, it can be concluded that the Numbered Heads Together (NHT) learning device with Quiz Kahoot to improve student learning outcomes and collaboration skills is good for use in SMA PGRI 02 Kayen Pati.This is evidenced by an increase in the pretest and posttest values, as well as the significant difference test of 0.002, which means that there is a significant difference

between the pretest-posttest, because the results are sig. <0.05 so that Ho is rejected.In addition, there is also an increase in student collaboration, as well as student responses to the Numbered Heads Together (NHT) learning tool with Quiz Kahoot being in good criteria.

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