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# The Effect of Active Knowledge Sharing Learning Strategy Assisted by Question Card on Concept Understanding of Excretory System Material and Student Communication Skills

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**ABSTRACT**

This research was motivated by the results of interviews with teachers, so far still using learning strategies that are unidirectional and not maximizing communication skills. The research method is quasi-experimental with the type of non equivalent control group design. This study aims to determine the effect of Active Knowledge Sharing learning strategy aided by question cards on concept understanding of excretory system material and communication skills. This research was conducted at SMA Muhammadiyah 1 Alternative Magelang City, using two classes. Based on the results of the study, with the application of Active Knowledge Sharing learning strategy aided by cards proved to have an effect. It can be proven in the results of hypothesis testing with Ancova which is sig. 0,000. Meanwhile, the use of Active Knowledge Sharing learning strategy with the help of question cards also affects students' communication skills. It can be proven in the results of hypothesis testing with Ancova which is sig. 0.000 where students have met the five indicators of communication skills. Both results show that the application of Active Knowledge Sharing learning strategy with question cards is better than the application of lecture learning method.



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## 1. INTRODUCTION

In teaching and learning activities at school, learning strategies are one of the many aspects of learning that play a role in the success of learning objectives. In the process of achieving this success, it requires the synergy of each component of the learning process. The components of teachers, students, subject matter, learning media, and financial administration factors (Siki, 2019).

Accuracy in choosing learning strategies carried out by teachers can arouse student motivation and interest and can increase student understanding of the material being studied (Dhamayanti, 2022). According to Handika (2012), the accuracy of choosing learning strategies in each teaching and learning process will determine the desired learning objectives. In addition, it can also improve students' academic and non-academic skills so that it will be followed by an increase in understanding of the given concept and student creativity in the lesson.

One of the things that needs to be considered in teaching and learning activities is communication skills. Communication skills are a skill in communication and language skills needed by each individual in conveying messages or information to others. So that the communication process can develop and the individuals involved reciprocate the information discussed (Hariko, 2017).

Thus, it is necessary to apply learning strategies that focus students to be more active during learning and communicate well with their friends. Because to achieve learning objectives, there needs to be good cooperation between students and teachers when learning takes place in class. One way to overcome this problem is the need for a learning strategy that is considered quite effective, one of the learning strategies is Active Knowledge Sharing (Yamin, 2018).

In addition to using learning strategies that can support the learning process and to overcome these problems, a learning media is needed that can add students' curiosity about a problem. Because with the learning media students can understand the lessons delivered by the teacher. The use of learning media in the learning

process can improve students' understanding of concepts, make students more interested in paying attention to explanations from teachers and also help students to receive information with their five senses (Muyaroah, 2017).

In terms of pedagogy, learning media is a very important instrument that determines the success of the teaching and learning process. determine the success of the teaching and learning process. Because of its existence can provide its own dynamics for students. The word learning media comes from the Latin "medias" which means middle, intermediary or introducer. Meanwhile, in Arabic it is referred to as an intermediary or messenger from the sender to the recipient of the message (Firmadani, 2020). Question card media is a visual media learning tool that contains questions to help teachers in learning activities. In this case, the cards given to students are cards that contain questions according to the subject. The selection of this question card is to avoid misunderstandings between one student and another. That way, this question card media can attract students' attention in learning so that students can easily capture the material by looking at the questions on the card. With the use of appropriate strategies and media, it is expected to optimize the education system with science that is growing from year to year (Alam & Mahardika, 2017).

Based on the description presented, the researcher intends to conduct research on "The Effect of Active Knowledge Sharing Learning Strategy Aided by Problem Cards on Understanding the Concept of Excretory System Material and Student Communication Skills".

## 2. RESEARCH METHOD

The type of research used in this study is experimental, which is research to determine the effect of a treatment (treatment) on another variable that is carried out in a controlled manner. This research uses a quasi-experimental method with a type of non-equivalent control group design. The reason for using a quasi experimental method with a type of non-equivalent control group design is to determine the difference in treatment given to the experimental class using the Active Knowledge Sharing learning strategy aided by question cards and the control class using the lecture learning method through a pretest before treatment and post-test after treatment, so that the comparison before and after treatment is known.

| | | |
|---|---|---|
| O1 | x | O2 |
| O3 | | O4 |

Description:
O1 = Pretest of experimental class
O2 = Post-test of experimental class
O3 = Pretest of control class
O4 = Post-test of control class
X = The treatment given, namely the Active Knowledge Sharing learning strategy aided by question cards

## 3. RESULT AND DISCUSSION

### Result of Data Analysis on Concept Understanding

Descriptive analysis of concept understanding was carried out after 50 multiple choice items were tested for validity, reliability, difficulty level, and differentiability. In multiple choice tests, good items must have an adequate level of difficulty, good differentiating power (Suwarto, 2016). The average value of control class pretest 57.57, control class post-test 70.61, experimental class pretest 64.17, experimental class post-test 80.35. This happened because of the effect of using the Active Knowledge Sharing learning strategy aided by question cards in the experimental class. The application of the Active Knowledge Sharing learning strategy can improve concept understanding. Active Knowledge Sharing learning strategy requires students to be active in learning activities. Through discussion activities students can share information so that the understanding of concepts that students have will last and students do not easily forget the material they have learned. The distribution of concept understanding scores is presented in Figure 1. and Figure 2.

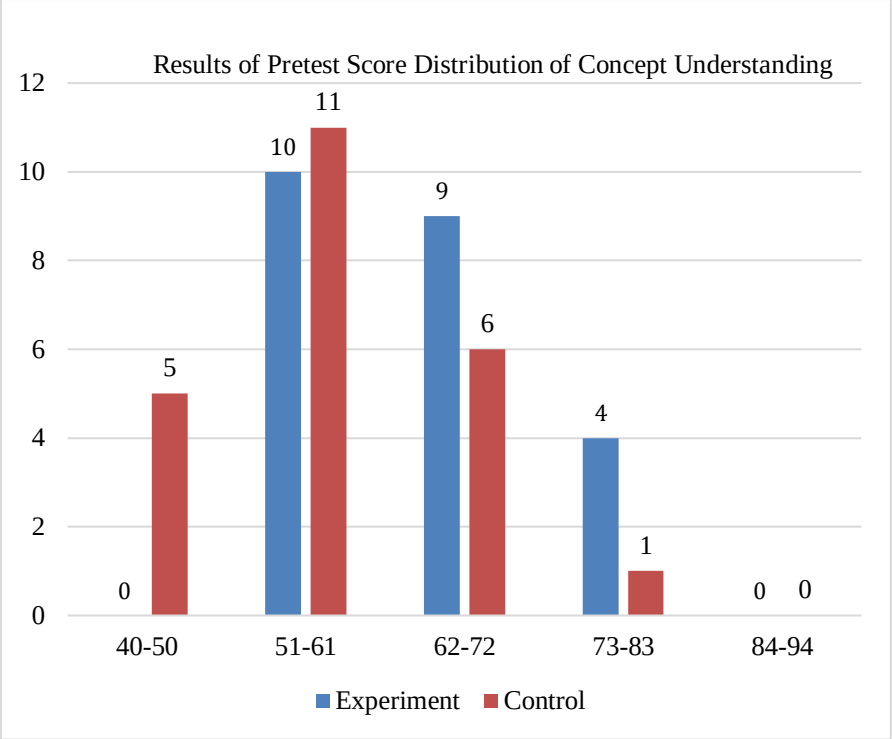


Figure 1. Results of Pretest Score Distribution of Concept Understanding

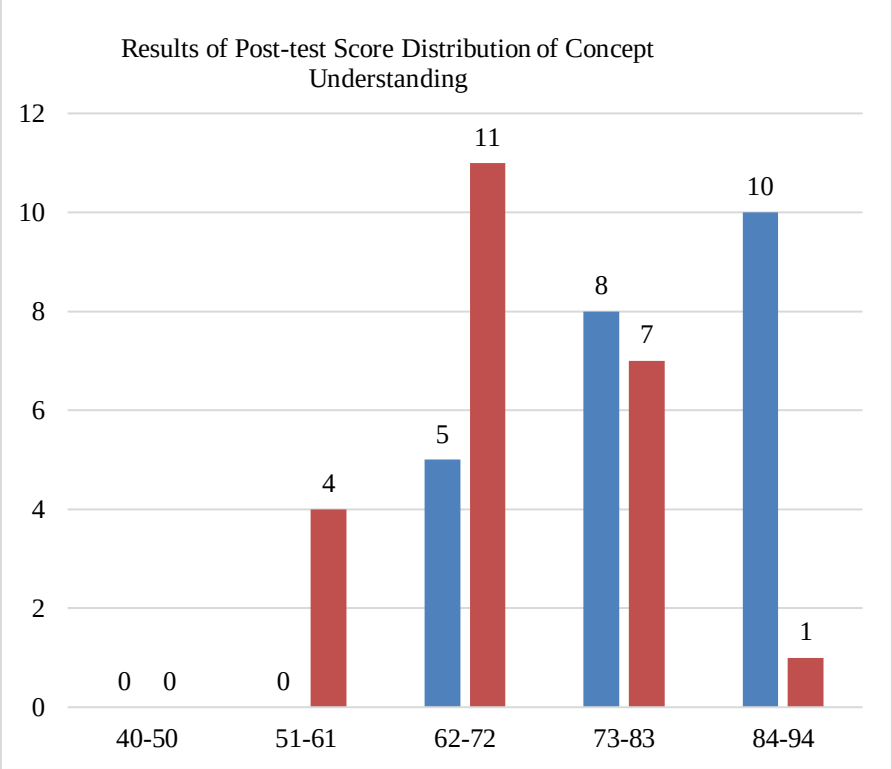


Figure 2. Distribution Results of Post-test Values of Concept Understanding

The normality test was conducted to determine the distribution or distribution of data scores from the concept understanding instrument using the Active Knowledge Sharing learning strategy aided by question cards. Normality test using the Shapiro Wilk test with testing criteria if the significance> 0.05 then the data is normally distributed, whereas if the significance <0.05 then the data is not normally distributed.

The homogeneity test is used to determine the overall data variation. The homogeneity test was carried out using the Levene test (test of homogeneity of variance) with the test criteria if the significance value> 0.05 then the data is homogeneous, whereas if the significance < 0.05 then the data is not homogeneous. Based on the results

of the homogeneity test, the probability value of significance> levene of significant (0.05) is obtained in the Pretest of 0.356 and Post-test of 0.347 in accordance with the decision that if the significance> 0.05 then the data is homogeneous. Linearity test is done after normality and homogeneity test. Based on the results of the Linearity test, the significance value> (0.05) is obtained, namely at 0.638 in accordance with the decision that if the significance> 0.05 then the data is homogeneous.

Hypothesis testing was carried out to determine the effect of the Active Knowledge Sharing learning strategy aided by question cards using the Ancova hypothesis test. The significance level used in Ancova test is <0.05. Based on the table of Ancova test results, the significance of the final result is 0.000 which means <0.05 then $H_0$ is rejected, and $H_1$ is accepted, namely there is an effect of Active Knowledge Sharing learning strategy aided by question cards on concept understanding.

**Discussion of Data Analysis on Concept Understanding**

Based on the results of the research that has been done, the use of Active Knowledge Sharing learning strategies aided by question cards shows an influence on students' concept understanding. This can be proven by the hypothesis results obtained using Ancova, namely Sig. 0.000 in the experimental class. With these results, the experimental class can be said to have a better influence than the control class using the lecture research method. In line with research conducted by Mayasari, Amin, & Rofiqoh (2019), it is stated that there are differences in the results of students' concept understanding using the Active Knowledge Sharing learning strategy.

In the implementation of the research, the 4 stages of implementing learning by using the Active Knowledge Sharing learning strategy assisted by question cards have been implemented properly. According to Melvin (2014) in stage 1, the teacher provides a list of questions related to the subject matter to be taught. In this stage the teacher compiles questions that can trigger students to actively discuss. So that students will be more interested in listening to the material to be learned and be more careful to answer questions (Fitria & Zulfan, 2020). In line with Oktaviana & Hidayati's (2016) statement that teacher questions in learning have a function to determine students' thinking processes, develop students' ways of learning, increase student participation, and focus students on the problems discussed.

The teacher instructs students to answer the questions which is the 2nd stage of the Active Knowledge Sharing learning strategy. Furthermore, students answer the questions and are allowed to spread out in the room to find answers to the questions given by the teacher. This is the 3rd stage of Active Knowledge Sharing learning strategy. In this stage students are actively involved in the learning process. So that it makes it easier for students to remember the material of the excretory system, which later the memory will be stored permanently. Because students are actively involved in learning, students can have a good understanding of concepts and students will be able to solve problems in problem cards (Hamruni, 2014).

Students' curiosity at stage 3 can arise and then trigger questioning activities between students or teachers in the learning process. Student activeness in this stage is in line with the theory of constructivism, this theory states how students adapt and increase knowledge. Students can construct their knowledge based on interaction with the environment (Bada & Olusegun, 2015). In line with research by Yunita & Santoso (2019), the application of the Active Knowledge Sharing learning strategy allows students to explore basic knowledge or concepts more freely. Students are not only listeners during the learning process, but students become more active and share knowledge with classmates who are less able to solve questions given by the teacher.

Students present the results of the discussion and the teacher confirms the students' answers, which is the final stage of the Active Knowledge Sharing learning strategy. At this stage, if there are unanswered questions, the teacher can use the information to introduce important topics in the subject being studied. Purba, Silahi & Lubis (2022), stated that the activities at stage 4 are very necessary so that the cognitive conceptions constructed in learning activities can be convinced and strengthened by oral and written feedback. Through various sources, so that there is a high desire to learn and have a meaningful learning experience. Sukmawati (2022), states that at this stage students will record the results of discussions from other students and record the results of explanations from the teacher as a reminder of the material being studied.

Excretory system material is one of the materials whose concepts are difficult to understand because there is a lot of memorizations, the terms and physiological mechanisms are abstract. Physiological processes related to the excretion process cannot be seen directly, so students' understanding is often not in accordance with scientific concepts (Amini, et al., 2018). In the learning process carried out using the Active Knowledge Sharing learning strategy, giving question cards can be solved by conducting discussions with groups or with friends in different groups.

The application of this Active Knowledge Sharing learning strategy is assisted by question card media. Problem card media is a tool to carry out learning activities. In this case the teacher helps students to be able to construct knowledge and know various ways of solving problems in the use of problem cards. In accordance with Edgar Dale's cone of experience theory which states that visual stimulus produces better learning results for tasks such as remembering, recognizing, and reconnecting facts and concepts In Edgar Dale's cone of experience, the higher the peak of the cone, the more abstract the media conveying the message. However, the learning process

and teaching interactions do not have to be from direct experience but start with the type of experience that best suits the needs and abilities of the group of students faced by considering the learning situation (Maruf & Hustim, 2018).

Based on this explanation, the application of the Active Knowledge Sharing learning strategy aided by question cards can affect students' concept understanding. This is in accordance with the words of Sukmawati (2022), which states that the Active Knowledge Sharing learning strategy aided by question cards can facilitate students in exchanging knowledge with their friends. With the card-assisted Active Knowledge Sharing learning strategy helps teachers in delivering material. As the teacher gives time in advance to students to discuss with fellow group friends so that the teacher will later convey important material and provide reinforcement to the results of student discussions.

In implementing the Active Knowledge Sharing learning strategy, students will exchange information and opinions in discussion activities. The purpose of this is to stimulate students' creative thinking (Silberman, 2013). In line with Vygotsky's theory, students can acquire a set of knowledge if they are conditioned in a learning process that involves social interaction between students and groups or teachers in an environment. This theory states that students can understand the material they learn together with other students or with the teacher. In other words, this theory states that knowledge is acquired through social interaction (Danoebroto, 2015).

**Results of Data Analysis on Communication Skills**

In communication skills, research data was obtained from the results of filling out questionnaires by students. The data was then converted into numbers and calculated from each indicator measured. The average student communication skills Pretest Control Class 66.80, Post-test Control Class 78.40, Pretest Experimental Class 71.00, Post-test Experimental Class 86.60. Meanwhile, the distribution of indicator scores is presented in Figure 3. and Figure 4.

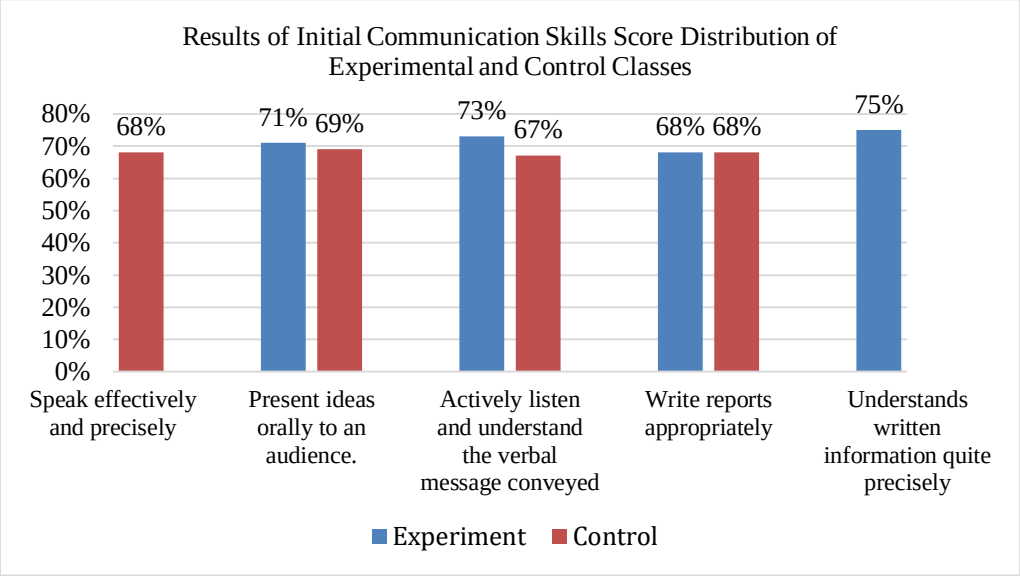


Figure 3. Distribution Results of Initial Communication Skills Values of Experimental and Control Classes.

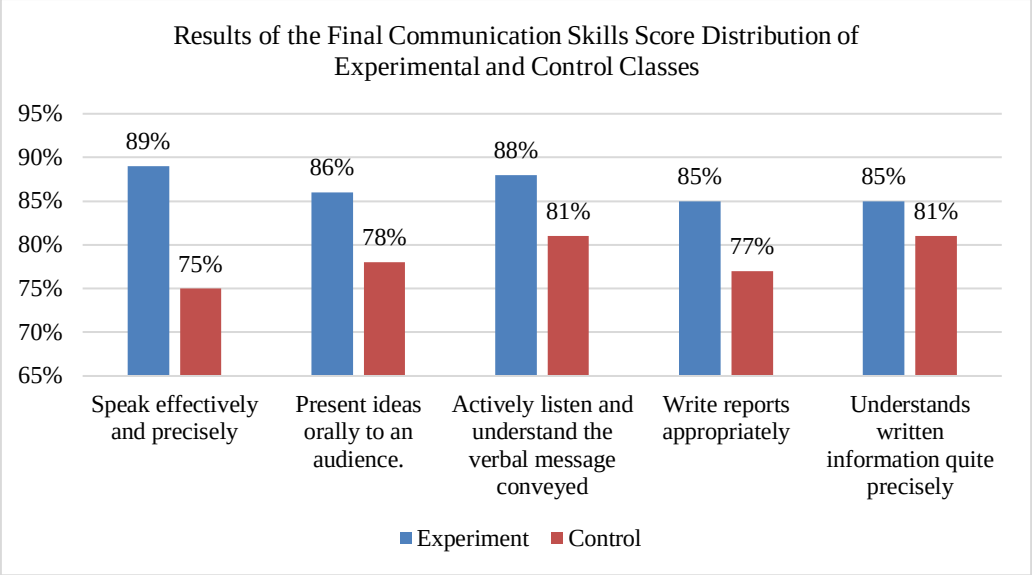


Figure 4. Results of the Final Communication Skills Score Distribution of Experimental and Control Classes

It was concluded that in the initial and final activities students' communication skills changed. This happened because of the influence of the Active Knowledge Sharing learning strategy aided by question cards. Because in the stages of the Active Knowledge Sharing learning strategy, indicators in communication skills can be fulfilled. In line with Sukmawati's research (2022), that the Active Knowledge Sharing learning strategy helps students to play a more active role in learning activities, so that there is good communication between students.

Normality test is used to determine whether the sample used is normally distributed or not. In this normality test using a parametric test, namely the Shapiro Wilk test. The results of the values obtained from the normality test on communication skills are normally distributed because the sig value results <0.05.

Homogeneity test is used to determine whether the data used is homogeneous or not. Based on the results of the homogeneity test of communication skills, a significant value> 0.05 is obtained. So it can be concluded that the data has the same variance or homogeneous. Linearity test is conducted to determine whether the data used is linear or not between two variables significantly. Based on the results of the linearity test, it can be concluded that the data is linear. This is because the significance shows 0.140 which means> 0.05.

Hypothesis testing of communication skills using Ancova, the results of this hypothesis test will determine whether there is a significant influence between the experimental class using the Active Knowledge Sharing learning strategy formed by question cards (XI MIPA 1) and the control class using the lecture learning method (XI MIPA2). Based on the table of communication skills hypothesis test results, the significance of the final result Sig 0.000 is obtained which means <0.05. With that, then $H_0$ is rejected, and $H_1$ is accepted, meaning that there is an effect of Active Knowledege Sharing learning strategy assisted by question cards on communication skills of Muhammadiyah 1 Alternative High School students in Magelang City.

**Discussion of Data Analysis on Communication Skills**

The problem that teachers often face in learning activities is the low communication skills of students in learning (Yamin, 2018). In learning, teachers are more active than students. This is related to the learning process which still uses the lecture method. So that learning becomes less interesting and the lack of willingness to know, find, and solve their own problems. After testing the data, it is known that by applying the Active Knowledge Sharing learning strategy aided by question cards, it is proven to improve students' communication skills. This can be proven from the results of hypothesis testing using Ancova has Sig. 0,000. Therefore, it can be said that the application of the Active Knowledge Sharing learning strategy has an influence on student communication skills.

Students' communication skills in the learning process are stimulated through discussion activities contained in stages 2, 3 and 4 of the Active Knowledge Sharing learning strategy assisted by question cards. At these 3 stages, students are asked to cooperate and exchange knowledge with each other, so that there will be good communication between students. Then at stage 4 students will present the results of the discussion, so that other students get new knowledge from different questions in the question cards (Sukmawati, 2022). Based on this, students' communication skills can be trained and improved by grouping, in line with Erlangga's (2017) statement.

The effect of the application of the Active Knowledge Sharing learning strategy on students' communication skills means that students are able to fulfil the 5 indicators of communication skills according to

Rachmawati (2019). The 1st indicator is to have effective and precise speaking skills. Presented in question items number 1 to 5, in this 1st indicator there is an influence on students' communication skills by using the Active Knowledge Sharing strategy assisted by question cards. This means that students can convey an idea well, so that other students can understand the ideas conveyed. In the 1st indicator, students can speak politely and politely and students actively ask questions on things that have not been understood. Thus, the learning activities went well in accordance with the statements of Fahrunnisa (2021) and Padmawati (2019). This indicator is in line with the theory of constructivism, where through the Active Knowledge Sharing learning strategy students can interpret information into their minds and teachers can help construct their understanding (Bada & Olusegun, 2015).

Indicators that experience influence by using the Active Knowledge Sharing learning strategy are indicator 2. This 2nd indicator can be influential because in the 3rd stage of the Active Knowledge Sharing learning strategy, namely answering questions from relevant sources, then students compile the points to be presented. Then in stage 4 students will present and the teacher will confirm the results of the presentation from the students (Melvin, 2014). This means that with these stages students can present their ideas well in accordance with Yamin's statement (2018). Listening actively and understanding the verbal message presented in question items 12 to 17 is the 3rd indicator of the Active Knowledge Sharing learning strategy. In the 3rd indicator of the experimental class there was a significant effect, where listening activities and understanding verbal messages are mental activities to receive information from a source. This activity makes students think actively because it involves mental activity, this is in accordance with the exposure of Marx (2017). In addition, the Active Knowledge Sharing learning strategy can trigger students to be active in discussions, so that material that has not been obtained will be presented and recorded by students (Marlina & Sangadji, 2022).

Writing reports appropriately, presented in question items number 18 to 22 is the 4th indicator of communication skills. In the 4th indicator, the activity of writing reports involves logic and reasoning. This can be seen from the content and composition of writing, as well as other linguistic aspects such as the use of words, sentences, and writing systematics (Karwati & Damayanti, 2016). In the Active Knowledge Sharing learning strategy, students at each meeting answer the questions on the cards. By differentiating the questions of each group, so that students can compile a report concisely and clearly. The results of the discussion are then presented, the purpose of this is so that other students can understand the material being studied (Marlina & Sangadji, 2022).

Understanding written information quite precisely is presented in question items number 23 to 25, this is the last indicator of communication skills. In this indicator, the experimental class experienced a significant effect with the application of the Active Knowledge Sharing learning strategy. This happens because in the experimental class students will record the results of discussions from other students. Then students will also take notes to remember the teacher's explanation, this is in line with Sukmawati's research (2022).

The benefit of communication skills for students in learning is to help students understand the information or messages given by the teacher in the form of subject matter (Fahrunnisa, 2021). One of the materials in biology subjects that are considered difficult by students is excretory system material. In this case, learning by using the Active Knowledge Sharing learning strategy focuses on discussion activities that trigger students to share their knowledge. So that communication skills can be influential in learning excretory system material. In line with the research of Sugilar et al. (2019) that in the Active Knowledge Sharing learning strategy students can share the knowledge they have with other students to develop communication.

Student communication skills in learning activities need to be developed because they are closely related to learning activities to achieve learning goals (Satriawati, 2018). With the application of the Active Knowledge Sharing learning strategy aided by question cards, it makes it easier for students to discuss and makes it easier for students to exchange knowledge with their friends. The use of question card learning media is used as a tool to carry out learning activities, students will answer the questions contained in the question card by discussing (Sugilar 2019). So that it will trigger good cooperation and make students skilled in communication.

Based on this explanation, it can be concluded that the application of the Active Knowledge Sharing learning strategy aided by question cards can affect communication skills. This can be proven in the data analysis that has been done. In line with the research of Sukmawati (2022), Satriawati (2018), and Yamin (2018) which states that the application of the Active Knowledge Sharing learning strategy can affect student communication skills. The Active Knowledge Sharing learning strategy can attract students' attention in learning activities. Because the learning process in class becomes more interesting and can eliminate boredom in the learning environment. So that students are more interested and eager to learn. This is also supported by Vygotsky's theory, where in learning activities the socio-cultural environment plays an important role in the formation of knowledge and the learning process so that it is more efficient and effective if students learn in groups (Danoebroto, 2015).

## 4. CONCLUSION

Based on the results of research and discussion in this study, it can be concluded that. Active Knowledge Sharing learning strategy aided by question cards affects students' concept understanding on the material of the excretory system as evidenced by the results of the Ancova test obtained a significance of 0.000 then in accordance with the decision if the significance number <0.05 then $H_0$ is rejected and $H_1$ is accepted. Active Knowledge

Sharing learning strategy assisted by question cards affects students' communication skills on the excretory system material as evidenced by the Ancova test results obtained a significance of 0.000 then in accordance with the decision if the significance number <0.05 then then $H_0$ is rejected and $H_1$ is accepted.

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