



## The cooperative script base concrete media on biology higher order thinking and interpersonal communication skills



Nukhbatul Bidayati Haka <sup>\*</sup>, Intan Agustin, Bambang Sri Anggoro

Biology Education, Universitas Islam Negeri Raden Intan Lampung, Jl. Letkol H. Endro Suratmin, Sukarame, Bandar Lampung, (35131), Lampung, Indonesia

\* Corresponding author: [nukhbatulbidayatihaka@radenintan.ac.id](mailto:nukhbatulbidayatihaka@radenintan.ac.id)

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### ABSTRACT

The success of student achievement in the formation of HOTS and interpersonal communication skills is by applying an appropriate learning model, one of which is the cooperative script learning model. This research aims to determine how the influence of the cooperative script model aided by concrete media in studying plant tissue material on HOTS and interpersonal communication skills. Quasi-experimental design research methods. The population was all students of class XI SMA Negeri 15 Bandar Lampung, amounting to 162 students, the research sample contained two classes, namely the experimental class and the control class totaling 31 students each. The data analysis of the pretest and posttest using the MANOVA test analysis. The results showed that the application of the cooperative script model helped by concrete media affected HOTS and biology students interpersonal communication. Can be seen from the value significant was  $0.000 < 0.05$  then  $H_0$  is rejected and  $H_1$  is accepted. The results of Manova Test on HOTS and interpersonal communication shows the value significant was  $0.000 < 0.05$  so that  $H_0$  is rejected, it means learning activities using cooperative script learning models assisted by concrete media affect HOTS and biology students interpersonal communication skills.

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### INTRODUCTION

Today's 21st-century information knowledge and technology continue to evolve and provide a very pronounced influence on society. Both in the field of culture to the pattern of life of the community has now been influenced by electronic devices so that people are increasingly easy to get



info in the current digital era. In this 21st century, the community realizes how meaningful it is to prepare a new generation that is quick, creative, innovative, critical, and quick in making decisions, and able to solve cases. Therefore, schools are given hope so that they can create graduates who have the skills and are also experts in social skills, such as being able to discuss, be able to express ideas or views, be reliable in teams, both in working together individually or in groups (Sani, 2019).

An important role in the application of learning based on higher order thinking skills (HOTS) in the world of education will be able to bring students more easily involved in the world of work, creativity and tenacity obtained in the education bench make it easy for students to adapt to the evolving industrial environment. Interpersonal communication in learning biology is also very important, students can express opinions and discuss so that it can bring up discussions and interactions between students. However, the reality that occurs in the field of learning activities in schools generally can not prioritize the achievement of HOTS and student communication. This is addressed by data from observations and interviews conducted at the study site showing the average achievement of HOTS and students' interpersonal communication below 30%, which means that shows that HOTS and students' interpersonal communication is still lacking. Judging from the existing learning system HOTS students' ability is only developed in low order thinking skills, this is what underlies this research regarding the development of HOTS achievement and students' interpersonal communication. The lack of HOTS achievement and students' interpersonal communication was also evidenced by previous researchers including (Meilani & Sutarni, 2016; Syafrudin & Ridwan 2018; Widodo & Kadarwati, 2013). The same thing was also expressed by (Pratiwi & Fasha, 2015) and (Jannati, Sutoyo, & Sugiharto, 2016) who also explained that there was still a lack of HOTS and students' interpersonal communication skills in teaching and learning activities.

A teacher provides teaching to students so that they can interact in seeking or obtaining other references to learning so that good learning goal are achieved, which is the essence of learning (Triwikromo, 2012). Natural science is a science that is very related to the activities of the social life of students every day. Besides that, natural science also has an interest in solving cases. Science is broken up into three categories, namely biology, physics, and chemistry. Students must have skills in solving cases, collaborating, and thinking critically (Haka, Anggoro, & Hawani, 2019).

The great impact is felt from the industrial revolution 4.0, especially in the field of work, the community must be prudent and vigilant, the government must be alert to the current transition so the government needs to precisely make a list of strategies that can improve the competitiveness of local industries, while also improving the composition of education and preparing natural resources so that they can adjust to their environment. To be able to stay in the future, the education system must be revised. Lower order thinking-based learning must be abandoned immediately because of the many changes and competition that occur in industry 4.0, students must be aware of and prioritize HOTS learning. Individuals who have creativity can solve cases and create opportunities for themselves, while individuals who are not creative will have difficulty finding work.

The era of the industrial revolution 4.0 students are required to have high-level thinking skills to be able to compete in the future. Using the appropriate model can increase students' higher-order thinking skills as well as their interpersonal communication skills. The learning process in schools, educational programs is as formal education including some things that affect, namely: students, education staff, curriculum, costs, infrastructure, and environmental conditions. If some of these things can be fulfilled, it can be ascertained to facilitate learning activities in schools to increase learning achievement. Learning objectives in learning activities achieved to affect the creative thinking ability of students in solving problems (Anggoro, 2015).

The lack of variation in the learning model used by educators is one of the factors causing low HOTS and interpersonal communication skills. Efforts in overcoming the above problems are by applying the use of learning models by educators who are not monotonous also varying so HOTS and students' interpersonal communication skills are more optimal. Learning activities carried out in a teacher center, should be more optimally the implementation of student-centered. The learning model that is by the characteristics needed above is the cooperative script learning model supported by concrete media.

Cooperative script model is a model of student summary or resume analysis within the scope of small groups, the syntax of the cooperative script model is there are paired discussions and uses concrete media, the process of information received by students then analyzed the argumentation and explains the concepts to be concluded (Huda, 2014). These stages can improve HOTS supported by students' interpersonal communication skills.

This research differs from previous studies, where this research has several advantages, namely through the stages of cooperative script learning models in which there are small group discussion techniques assisted by concrete media where students can analyze arguments as well as define concepts to conclude with logical reasons in processing information. The stages of the cooperative script learning model can improve HOTS supported by students' interpersonal communication skills.

Based on the things that have been explained, it is expected that this cooperative script learning model supported by concrete media can improve simultaneously towards the achievement of HOTS-based learning as well as interpersonal communication skills. Based on the background that has been explained, a study was conducted on the effect of using cooperative script learning models assisted by concrete media on HOTS and interpersonal communication skills in biology.

## RESEARCH METHODS

### Research Design

This research is a quantitative study, with a research method that is quasi-experiment used to test hypotheses with a form of cause and effect through the treatment and test the changes caused by the treatment. The design of this research used The matching pretest posttest design, can be seen in the Table 1.

Table 1. Research design

Groups	Pretest	Treatment	Posttest
Experiment	$O_1$	X	$O_2$
Control	$O_1$	C	$O_2$

Note:

$O_1$  : Pretest in the experimental and control class.

$O_2$  : Posttest in the experimental and control classes.

X : Learning by using cooperative script learning models assisted by concrete media.

C : learning by using the discovery learning model

### Population and Samples

The population of this study was all students of SMAN 15 Bandar Lampung totaling 162 students from five classes. The sample of this study was the experimental class (XI MIPA 3) totaling 31 students and the control class (XI MIPA 4) totaling 31 students. The sampling technique uses a random class technique, by preparing a lottery paper as much as the population of class XI, then drawn 2 times by random sampling. The reason for using this sampling technique is because the sample is taken from the population without regard to strata (intelligence level).



### Instrument

The instruments used in this research: 1). HOTS test uses 20 items with multiple choice types, 2). The interpersonal communication questionnaire used 16 items of questions with closed answers, 3). Questionnaire responses of students using 12 question items, and 4). Field Notes. These instruments contain indicators that correspond to the instruments used. These instruments are feasible to use because they have been tested before use, and are by the calculations used. HOTS indicators are analysis, evaluation, and creation. Indicators of interpersonal communication skills are openness, empathy, supportive attitude, positive attitude, and equality. Based on the results of the HOTS instrument test results from 35 items obtained results, namely the validity test obtained 24 valid items, the reliability test got a value was 0.95 (high criterion) which means reliable, the difficulty level test found items with criteria (1 easy, 20 medium, 14 difficult), different power tests found items with criteria (5 bad, 9 enough, 17 good, 4 very good). Likewise with the results of the interpersonal communication instrument questionnaire test of 20 items obtained results, namely the validity test obtained 16 valid items and the reliability test got a value was 1.04 (high criteria) which means reliable.

### Procedures

The research data were obtained from the pretest and posttest of students taken before and after learning activities in the classroom in the odd semester with a total of 6 meetings from September 2, 2019, to September 16, 2019, on the learning material for plant network structure. The research data in the form of quantitative data from the results of the students' answer score scores from the HOTS rubric with multiple-choice tests.

### Data Analysis

Data analysis techniques in this study were the instrument test (validity test, reliability test, difficulty level test, and different power test), prerequisite test (normality test and homogeneity test), and hypothesis testing namely MANOVA. The use of MANOVA analysis in research is easier because it uses the SPSS 17.0 data program to see the interpretation of the results of the Multivariate Test and Tests of Between-Subjects Effects in the analysis of the data that is expected to influence the variables studied can be known.

## RESULTS

Based on analysis results the pretest-posttest results normality test and homogeneity test of HOTS are obtained which can be shown in Table 2 and Table 3. The analysis results the pretest-posttest results normality test and homogeneity test of interpersonal communication are obtained which can see Table 4 and Table 5.

**Table 2.** HOTS normality test

Type of Test	L-count	L-table	Conclusion
Pretest Class experiments	0.108	0.156	Normal distribution
Posttest Class experiment	0.154	0.156	Normal distribution
Pretest Control Class	0.084	0.156	Normal distribution
Posttest Control Class	0.132	0.156	Normal distribution

**Table 3.** HOTS homogeneity test

Type of Test	F-count	F-table	Conclusion
Experiment class pretest and control class pretest	1.097	1.840	Homogeneous
Experiment class posttest and control class posttest	1.069	1.840	Homogeneous



Based on the results of the data obtained the normality test can meet the criteria if  $L\text{-count} < L\text{-table}$  makes  $H_0$  accepted, this means the data is normally distributed. The results of the calculation of normality test data on HOTS and interpersonal communication show data  $L\text{-count} < L\text{-table}$  means normal distribution.

**Table 4.** Interpersonal communication normality test

Type of Test	L-count	L-table	Conclusion
Pretest class experiments	0.138	0.156	Normal distribution
Posttest class experiment	0.106	0.156	Normal distribution
Pretest control class	0.134	0.156	Normal distribution
Posttest control class	0.082	0.156	Normal distribution

**Table 5.** Interpersonal communication homogeneity test

Type of Test	F-count	F-table	Conclusion
Experiment class pretest and control class pretest	0.287	1.840	Homogeneous
Experiment class posttest and control class posttest	1.214	1.840	Homogeneous

Likewise with the homogeneity test that has met the criteria accepted  $F\text{-count} < F\text{-table}$  so that  $H_0$  can be accepted, this means that the sample data is received from the same contribution (homogeneous). Homogeneity test data calculation results on HOTS and interpersonal communication show data  $F\text{-count} < F\text{-table}$  means homogeneous.

Teaching and learning activities in the experimental class use the cooperative script model assisted by concrete media, while in the control class uses the discovery learning model. The following is the recapitulation of HOTS values in [Table 6](#) and [Table 7](#).

**Table 6.** The average HOTS value of control class

No.	Average Value	Score
1	Pretest	57.09
2	Posttest	69.67
3	N-Gain	0.26

**Table 7.** The average HOTS value of the experimental class

No.	Average Value	Score
1	Pretest	50.16
2	Posttest	79.19
3	N-Gain	0.60

The questions used by researchers consisted of 20 questions in the form of multiple choice. The average value of HOTS pretest both in the control class and the experimental class showed that the value of the data was still lacking while the posttest got a pretty good rating ([Table 8](#)).

**Table 8.** Manova Test on *HOTS*

Source	Dependent Variable	Type III Sum of Square	df	Mean Square	F	Sig.
Class	HOTS	1403.629	1	1403.629	14.771	.000
	IC	460.661	1	460.661	7.851	.007

The hypothesis is accepted or rejected if the probability (Sig.HOTS) < 0.05 then H0 is rejected, and vice versa. The calculation results above are known that if the probability (Sig.) < 0.05 is 0.000 < 0.05 so that H0 is rejected, it means that learning by using Cooperative Script learning models assisted by concrete media affects students' higher order thinking skills (HOTS). The following Table 9 and Table 10 are the recapitulation results of students' interpersonal communication.

**Table 9.** The Average value of interpersonal communication class of control

No.	Average Value	Score
1	Pretest	59.57
2	Posttest	66.29
3	N-Gain	0.16

**Table 10.** The average value of interpersonal communication class of experiment

No.	Average Value	Score
1	Pretest	59.96
2	Posttest	71.74
3	N-Gain	0.31

The questionnaire used by researchers consisted of 16 questions, consisting of 8 negative questions and 8 positive questions each. The mean value of pretest interpersonal communication in the control class and the experimental class shows that the value of the data is still lacking, while the posttest gets a pretty good rating.

**Table II.** Manova test on interpersonal communication (IC)

Source	Dependent Variable	Type III Sum of Square	df	Mean Square	F	Sig.
Class	HOTS	1403.629	1	1403.629	14.771	.000
	IC	460.661	1	460.661	7.851	.007

The hypothesis is accepted or rejected if the probability (Sig. IC) < 0.05 then H0 is rejected, and vice versa. The calculation results above are known that if the probability (Sig.) < 0.05 is 0.007 < 0.05 so that H0 is rejected, it means that learning using the cooperative script learning model assisted by concrete media affects the students' interpersonal communication skills (Table II).

**Table 12.** Manova tests on HOTS and interpersonal communication

	Effect	Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's trace	.993	4213.670 <sup>b</sup>	2.000	59.000	.000
	Wilks'lambda	.007	4213.670 <sup>b</sup>	2.000	59.000	.000
	Hortelling's trace	142.836	4213.670 <sup>b</sup>	2.000	59.000	.000
	Roy's largest root	142.836	4213.670 <sup>b</sup>	2.000	59.000	.000
Class	Pillai's trace	.272	11.026 <sup>b</sup>	2.000	59.000	.000
	Wilks'lambda	.728	11.026 <sup>b</sup>	2.000	59.000	.000
	Hortelling's trace	.374	11.026 <sup>b</sup>	2.000	59.000	.000
	Roy's largest root	.374	11.026 <sup>b</sup>	2.000	59.000	.000

The next hypothesis test uses the MANOVA test on HOTS and interpersonal communication (Table 12). This test is used to see whether there is an effect of concrete media-assisted Cooperative Script models on HOTS and students' interpersonal communication skills on plant tissue material. The following is the data of the calculation results of the MANOVA test can see Table 12.

The above calculation results obtained are the Sig. ie  $0,000 < 0,05$  so that  $H_0$  is rejected means learning activities using cooperative script learning models assisted by concrete media affect HOTS and interpersonal communication skills in biology of students. Response questionnaire was given to the experimental class at the end of the teaching and learning activities in class. The questionnaire totaling 12 items with a choice of 'yes or no'. Three main aspects, namely: 1). know students' responses about the cooperative script model assisted by concrete media, 2). know students' responses about the cooperative script model assisted by concrete media to HOTS, and 3). know the responses of students about using cooperative script models assisted by concrete media to interpersonal communication skills.

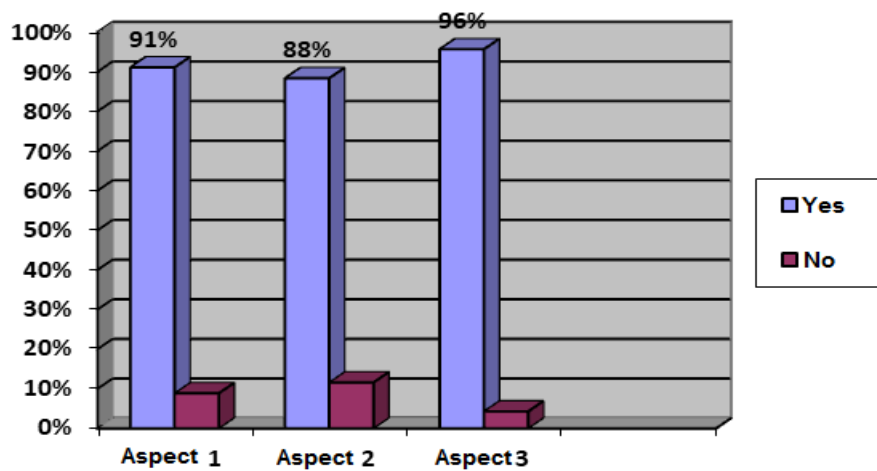


Figure I. The results diagram of the questionnaire response

Based on the Figure I, it can be seen that the average score is very, very good for those who answer 'yes' by 91.12%. While those who answered 'no' only amounted to 8.88% of the average response of students.

## DISCUSSION

In the experimental class, the posttest score was 79.19 with N-Gain 0.60 in the medium category, in the control class the posttest score was 69.67 with the N-Gain 0.26 in the low category. This means that the value obtained by the experimental class HOTS is higher than the control class. The effect of cooperative script learning models assisted by concrete media makes the HOTS value of the experimental class increase. Cooperative script models can affect learner's HOTS students' (Boleng, 2014) because there is the syntax in this model that supports HOTS programs and interpersonal communication such as analyzing, collaborating, thinking critically, sharing information, discussing, arguing, listening and being able to solve problems.

The cooperative script model is model capable of influencing achievement (Widiyanto, 2017). Teaching and learning activities are assisted by media that function as intermediaries to maximize the delivery of material. Original concrete learning media can create real illusions by students. The reference used aims to find out the results of learning to use questions. The number

of items is an indicator of HOTS. The questions are as training how much the level of students' ability to develop their thinking ability. The cooperative script model has gradually increased, as increased activity, application and improvement have taken place in learning activities (Damayanti, Tarmed, & Jupri, 2018).

The control class N-Gain mean value was 0.26 with low category, while the value of N-Gain in percentage categorization was 25.80% with low category, and 74.19% with medium category. That could be because educators convey the material is still not optimal. The use of an appropriate model is a treatment by educators of students. Good treatment by educators by applying appropriate models can increase the achievement of success in learning activities. Learning activities using conventional learning models are still widely applied by educators in the classroom. Using teaching materials such as textbooks, LKPD, and so on in the learning process, these activities should be able to improve the performance of thinking, working, having a scientific opinion, and giving students a hands-on experience of learning knowledge directly (Jatmiko, 2017).

Changes occur due to the treatment in the experimental class and the control class viewed from the results of the pretest and posttest, the average value of the experimental class pretest gets a very small difference than the control class, the average value of the experimental class posttest is much higher. Research (Suheryani, Indriani, & Murni, 2018) on the application of instructional media in the form of concrete media can help teaching and learning activities because the use of such media can help educators when delivering messages material provides learning activities, especially interactions that occur between educators and students so that the learning process is more effective and efficient. The ability of learners in (Wulandari, Napitupulu, & Panjaitan, 2009) is the most important attitude of educators in reflecting the character of students based on their interpersonal communication skills so that appropriate learning model are needed to create attractive learning and be able to achieve better learning outcomes.

Communication skills are skills that must be mastered by students. Learning activities in the classroom there is communication in telling messages directly from the message source using a certain media. (Putra, Widyawati, Asyhari, & Putra, 2018). The HOTS pretest and posttest scores and the Interpersonal Communication Skills of students on plant tissue material in Table 6, Table 7, Table 9, and Table 10 show a significant increase in value. Based on the results of the MANOVA hypothesis (Table 12), the result of sig 0.000 is in the class row, then sig 0.000 < 0.05, which means  $H_0$  is rejected, the conclusion is that the use of cooperative script learning models assisted by concrete media has a significant influence on hots and communication skills interpersonal biology.

The creativity is someone's skill in assembling theories of innovation, experience, and creativity in teaching and learning activities and is driven by the environment. The right environment can significantly influence a person's intellectual development so that he is intelligent. So on this basis attention to the composition of education in schools must be applied. Students are required to have a creative attitude, innovative, willing to learn, and a high sense of social sensitivity. (Mehrabi & Goodarzi, 2018)

According to (Ramdiah, Royani, Malang, & Kleij, 2019) learning that can be said to be successful is learning that is reflected by a set of knowledge, attitudes, and skills. In the education process, HOTS has a very important role because every idea can affect the ability, responsiveness, and effectiveness of learning. The positive impact will be felt by students who are continuously trained for HOTS ability in the development of their education. HOTS is needed both for school agencies. Other opinions, according to (Thomas, 2018), interpersonal communication skills are needed in interacting with individuals. In the delivery of interpersonal communication between two individuals, not found among them experiencing fatigue, and depression. This can relieve fatigue in discussions.

## CONCLUSION

Based on the research hypothesis test and the results of data processing the significance value of the effect is  $0.000 < 0.05$ , which means  $H_0$  is rejected, it can be concluded that the cooperative script model assisted by concrete media influences students HOTS and interpersonal communication skills on plant network material. So, this model is recommended to be used in teaching and learning activities in the classroom, because it has the potential to empower the improvement of students HOTS and interpersonal communication skills.

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