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The Effect of Collaborative Learning Model Combined with Video Media on Senior High School Student's Critical Thinking Skill and Biology Learning Outcomes in Regional Coffee Plantation Schools in Jember City

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ABSTRACT

The characteristics of students who go to school in a coffee plantation environment tend to be less active in learning, resulting in student saturation and low cognitive learning outcomes. This study aims to analyze the effect of collaborative learning models combined with video media on critical thinking skills and biology learning outcomes of class X SMAN Jenggawah with a quasi-experimental research type using a pre-test post-test control group design. The learning design by forming the class into small groups to observe videos of arthropods found in the coffee plantation environment. Data collection was obtained from the implementation of observations, tests, and questionnaires. Data analysis was tested using the ANACOVA test for critical thinking skills and learning outcomes in the cognitive domain of students, and independent sample t-test for learning outcomes in the affective and psychomotor domains of students. The results showed a significance value of 0.000 <0.05 in critical thinking skills and a significance value of 0.001 <0.05 in learning outcomes in the cognitive domain, so the collaborative learning model had a significant effect on critical thinking skills and learning outcomes in the cognitive domain of class X high school students in coffee plantation area. Meanwhile, a significance value of 0.126 > 0.05 in the affective domain of learning outcomes, and a significance value of 0.213 > 0.05 in the psychomotor domain of learning outcomes, so the collaborative learning learning model has no significant effect on critical thinking skills and cognitive learning outcomes of class X students high school in a coffee plantation area.

Keywords: Collaborative Learning, Video Media, Critical Thinking Skills, Coffee Plantation Learning Outcome

Introduction

Coffee is a natural resource that has considerable economic value (Suratno et al., 2020). Indonesia is one of the third largest coffee producer countries after Brazil and Vietnam. Jember is famous as the largest coffee and tobacco plantation in East Java. Students tend to use the coffee plantation more often as a place to play, learn, and grow flowers until adulthood, which will affect students' education (Suratno et al., 2020). The characteristics of students who attend school in a coffee plantation environment tend to be less active in learning, resulting in student saturation and low cognitive learning outcomes of students (Safitri et al., 2018). Students who live in coffee plantation areas have low learning independence, so there is a need for guidance provided by educators to foster students' scientific attitudes (Faiqoh et al., 2019). The lack of students' self-confidence who go to school in coffee plantation areas requires encouragement from educators to foster self-confidence by being given freedom of opinion to determine what they want. A learning model that also needs to be supported in the 21st century to face global challenges in the future and is related to student learning success is collaboration.

Based on the observations result of conventional learning models used by educators in high schools in coffee plantation areas using discovery learning models. The discovery learning model used by educators is influenced by school regulations that require educators to use the discovery learning model. However, the characteristics of each student in the coffee plantation area are not in accordance with the discovery learning model. So the learning model used by educators and the lack of readiness of students causes student learning outcomes to be still low, especially in animal material, the arthropod sub-material. According to Suratno and Kurniati (2017) facilitating students to think critically is a must that must be improved. According to Putri et al., (2020), critical thinking is the ability used in an organized process to solve problems in activities which includes the ability to formulate problems, provide arguments, carry out deductions and inductions, carry out evaluations and be able to make decisions. Critical thinking skills are an important ability to improve the success of the learning process so students must continue to train it (Ramdani et al., 2020).

One way that educators can use in overcoming these problems is to apply a collaborative learning model. Collaborative learning according to Hanik (2020) is a learning model that is appropriate for improving cognitive skills and critical thinking skills in learning. In general, collaborative learning has been praised as a learning practice that can improve and develop the quality of learning in the classroom. Group activities in collaborative learning not only have the goal of developing their ability to communicate, but students can find different perspectives and thoughts between themselves and others. In this case, students can be influenced which results in having a broader and deeper mindset (Nurwidodo et al., 2021). Supported by the opinion of Utami et al., (2019) that collaborative learning based on interactional theory is one of student-centred learning, in which the theory discusses learning as a process used to build meaning through social interaction. One of the suitable collaborative learning models to be applied to students in the coffee plantation environment is the TAI (Team Assisted Individualization or Team Accelerated Instruction) learning model. This learning model pays attention to differences in the initial knowledge of each student to achieve learning achievement. The TAI learning model is student-centred learning by directing students to work on student Worksheets in groups of 4-5 heterogeneous students with shared responsibilities.

This learning model is suitable to be applied because it takes into account the characteristics possessed by students, therefore the TAI learning model is individual learning which is deemed necessary to be applied because students enter the class with different knowledge, abilities and motivations. Some students do not have the prerequisite knowledge to learn the material, of course, it can cause students who do not have the prerequisite knowledge to fail to achieve the learning objectives expected by the teacher. Each member in the group is given an equal task because in cooperative learning the success of the group is very important, therefore smart students are also responsible for helping their weak friends in their groups. Thus, smart students can develop their abilities and skills, while weak students will be assisted in understanding the problems solved in the group.

Good learning can be combined with the right learning media. Learning media is used to help students understand the material provided by educators to improve better learning outcomes by implementing a fun, efficient and effective learning process (Susanti, 2021). One of the learning media that can be used is video media. The school facilities at SMAN Jenggawah have LCDs that can be borrowed when needed from the TU (Administration) office and each class has a stable electricity network to use LCDs in class. So that the Jenggawah SMAN school supports research that will be applied in experimental classes by providing collaborative learning models combined with video media. Video learning media is included in the audio-visual group, one of which is that students can use YouTube-based video media that can make it easier for students to access it at any time and can be downloaded at any time (Suminarsih, 2021). The YouTube-based video media used has been developed and designed based on the characteristic conditions of coffee plantation area students who have characteristics with a tendency to be less active in discussions, lack of independent learning, and low cognitive learning outcomes. So this media was developed to overcome these problems. Therefore, there is a need for learning that can overcome these difficulties, one of them is the collaborative learning model combined with video media.

This study is of utmost significance as it addresses the need for innovative educational strategies customized to regional contexts, aiming to enhance critical thinking abilities and academic achievements among high school students. The research holds a vital role in bridging the gap between traditional teaching methods and modern pedagogical approaches, emphasizing the integration of collaborative learning and video media to optimize biology education in senior high schools situated within coffee plantation communities in Jember City. By investigating the impact of the proposed collaborative learning model combined with video media, this study not only contributes to the advancement of effective teaching methodologies but also recognizes the unique challenges and opportunities faced by schools in agricultural regions, ultimately paving the way for informed educational reforms and improved student outcomes.

Based on the description above, it can be concluded that students who live in coffee plantation areas have low learning independence and the willingness to learn is still lacking, therefore a new learning method is needed in learning biology. This study aims to analyze the effect of collaborative learning models combined with video media on critical thinking skills and biology learning outcomes for high school students in coffee plantation areas.

Methods

This research is quasi-experimental research, namely by applying a collaborative model combined with video media in the experimental class and the discovery learning model in the control class as shown in Table 1,

Table 1. Research design two group pre-test and post-test group design

Group	Pre-test	Treatment	Post-test
Experiment	T_1	X_E	T_2
Control	T_1	X_K	T_2

Information:
T_1: Pre-test experimental and control classes before being given treatment
X_E : The collaborative learning model treatment is combined with the media videos
X_K: Treatment of the application of the discovery learning model
T_2 : Post-test of experimental and control classes after being given treatment

The research was conducted at Jenggawah High School, Tempurejo Wetan Gunung No. 76, RT.07/RW.02, Krajan, Wonojati, District Jenggawah, Jember Regency, East Java, which is one of the coffee plantation areas in Indonesia. The research was carried out in the even semester of the 2021/2022 school year from March to May 2022 consisting of 180 students with the topic Animals (Animalia), two classes were taken as samples, namely the experimental class and the control class. The experimental class used a collaborative learning model with the help of learning videos while the control class used discovery learning without using videos. Determination of the research sample was carried out using the normality test and homogeneity test and obtained a normal and homogeneous distribution of classes for the population of class X MIPA SMAN Jenggawah. The determination of the sample was carried out by random sampling with the class used, namely the experimental class and the control class consisting of 36 students. Classes were selected using random sampling since in this study the class used has been proven to have a homogeneous data distribution.

Teaching and learning activities in the experimental class using collaborative learning. The syntax used in the experimental class began with an introduction and delivering learning objectives, orienting students, forming groups, arranging learning tasks, facilitating student collaboration, providing grades, and evaluating collaborative learning. At the stage of preparing learning tasks, students are given a learning video in the form of an Arthropoda video. Furthermore, students are asked to do a practicum with arthropod classification material and write the results of observations into a worksheet. For the control class, discovery learning was used with the following syntax: delivering learning objectives, Providing stimuli, Identifying problems, collecting data, processing data, verifying, and concluding. The control class did not use videos in their learning. For assessment in experimental and control classes, critical thinking assessment and learning outcomes assessment were used.

Data collection techniques include students' critical thinking skills which are measured using a test including pre-test and post-test which refers to Ennis (1985) in Fadlina et al., (2021) which consists of 5 questions. Ennis (1985) in Fadlina et al., (2021) divide critical thinking skills into 5 indicators, namely providing simple explanations (elementary clarification), building basic skills (basic support), drawing conclusions

(inference), providing a further explanation (advanced clarification), set the strategy and tactics (strategies and tactics). Learning outcomes in the cognitive domain are measured using the pre-test and post-test which refers to Krathwohl (2011) there are 6 aspects of the revision of Bloom's cognitive learning level, namely: C1 (remember), C2 (understand), C3 (apply), C4 (analyze), C5 (evaluating) and C6 (creating). Meanwhile, the learning outcomes of the affective and psychomotor domains of students are assessed based on the observation sheet of student learning activities which are measured during the implementation of learning. The learning outcomes of the affective domain are measured, namely accepting differences of opinion, the activity of students asking questions and expressing opinions, the activity of students asking and conveying opinions, cooperating in groups, responsibility in doing assignments, and discipline during learning takes place. Meanwhile, the learning outcomes in the psychomotor domain that are measured are perception (preparing observation equipment), manipulation (making observations), precision (identifying observation results), articulation (recording observation results), and observation (analyzing data).

The learning process carried out in the control class is with students paying attention to the pictures and questions given by the teacher as a form of stimulation. The teacher delivers material on arthropods and conducts questions and answers (Q&A session) to measure students' abilities. Students are divided into 6 small groups and work on worksheets with the group and identify the problem. Then they are instructed to read, and study materials from books, the internet and relevant sources that are often used in learning. Next, students make observations through practicum on animal identification material, then students write down the results of their observations into worksheets. Students make an arthropod animal observation video with their own group, and then upload it to YouTube. Some random groups read out their work in front of the class and other groups respond to the presentation. Students are encouraged to provide conclusions from the material they have studied.

Furthermore, the learning process was carried out in the experimental class, where students observed learning videos that contained pictures and videos of arthropods found in coffee plantations. Then the teacher delivers animal material, the arthropod sub-material, and then conducts questions and answers (QnA session) to measure students' abilities. Students are formed into small groups of 4 students to discuss. Each student is given an assignment in the form of a worksheet and students are allowed by the teacher to solve problems individually before studying with their group members. Students observe videos on YouTube that contain material about the classification of arthropods. Furthermore, students make observations through practicum on animal identification material, students mention the role of arthropods in people's lives and write down the results of their observations in the worksheets. Then students make videos of observing arthropod animals with 1 group, then upload them to YouTube. Each group is guided by the teacher in explaining problems that have not been understood. Random groups present the results of their work in front of the class and the teacher assesses and evaluates the students' learning outcomes.

Data analysis is used to test the hypothesis using descriptive and inferential statistics. Assessment of critical thinking skills and learning outcomes in the cognitive domain using inferential statistical analysis techniques (ANACOVA) to process the data obtained with pre-test and post-test values as data with a significance level of 5%. The learning outcomes of the affective and psychomotor domains are measured based on the observation sheets of student learning activities which are assessed from several indicators. Student affective and psychomotor learning outcomes were assessed using the Independent Sample t-test, with a significance level of 5%.

Results and Discussion

The research sample was taken at Jenggawah High School from March to June 2022. The research sample was taken in two classes, namely the application of a collaborative learning model combined with video media in the experimental class and the discovery learning model in the control class. Before taking the research sample, the samples were determined from class X MIPA 1, X MIPA 2, X MIPA 3, X MIPA 4, cand X MIPA 5 at SMAN Jenggawah by carrying out normality tests and homogeneity tests obtained from UAS (final semester exam) scores. The results of the normality test using the Kolmogorov Smirnov one sample test showed a significant value in class X MIPA at SMAN Jenggawah, including class X MIPA 1 (Sig. 0.056), class X MIPA 2 (Sig. 0.074), class X MIPA 3 (Sig. 0.056), class X MIPA 4 (Sig. 0.120), and class X MIPA 5 (Sig. 0.066). The results of the UAS scores obtained in all class X MIPA SMAN Jenggawah show significant values, therefore it can be stated that they are normally distributed. The X MIPA class UAS score data obtained is then continued with a homogeneity test using the Levene-Test with the results a significance of 0.069> 0.05, which can be stated that the UAS score data shows homogeneity. Based on the results, the values obtained stated that the data for grade X MIPA SMAN Jenggawah had a normal and homogeneous distribution. If the data is known to be normally distributed and homogeneous, then two classes can be selected by random sampling the experimental class and the control class in the study.

Critical Thinking Ability

The results of students' critical thinking skills data were assessed from a questionnaire consisting of 5 questions which included 5 indicators, giving simple explanations, building basic skills, drawing conclusions, providing further explanations, and setting strategies and tactics. The value of students' critical thinking skills is presented in Table 2 below,

Table 2. Assess critical thinking skills for each indicator

Indicators	Control class		Experiments class	
	Pre-test Average ± SD	*Post-test* Average ± SD	*Pre-test* Average ± SD	*Post-test* Average a ± SD
Give a simple explanation	27,78 ± 7,97	44,44 ± 22,45	34,72 ± 17,19	63,89 ± 24,23
Build basic skills	27,78 ± 15,56	67,36 ± 29,17	39,58 ± 20,16	71,53 ± 28,13
Draw conclusions	6,94 ± 11,36	31,25 ± 17,29	11,81 ± 12,66	41,67 ± 20,70
Provide further explanation	27,78 ± 22,18	35,42 ± 16,23	16,67 ± 15,81	53,47 ± 24,75
Set strategies and tactics	19,44 ± 12,12	30,56 ± 10,54	19,44 ± 18,04	43,75 ± 16,23
Average	21,94 ± 7,77	41,81± 11,90	24,44 ± 9,62	54,86 ± 16,67

Based on Table 2, shows that the average value of the experimental class is greater than the average value of the control class. The ANACOVA test results for critical thinking skills show a significance value of 0.000 or a significance value of <0.05, which means that H0 is rejected and H1 is accepted, so it can be concluded that the collaborative learning model combined with video media has a significant effect on students' critical

thinking abilities. The application of the collaborative learning model combined with video media to critical thinking skills is carried out by teaching animal material, especially arthropod material. The material presented in the video is related to learning material sourced from the coffee plantation environment at the coffee plantation school area. Providing material about arthropods is conducted to explore students' initial understanding so that it will foster students' curiosity in learning the material to improve their thinking skills. In accordance with the statement of Khusnul et al., (2018) that learning will be easier to understand if it is directly related to the environment, the coffee plantation environment, so that the material applied will be easier to understand and help students to foster their critical thinking skills.

The first indicator of critical thinking ability is to provide a simple explanation, showing that the average value obtained in the experimental class which was initially 34.72 increased to 59.72, while in the control class which was initially 27.78 increased to 44.44. The problems given are in accordance with the learning material, in which students work on assignments in groups so that learning is more student-centred to share experiences and explore student understanding earlier to hone skills in asking questions or answering questions that are in accordance with existing goals. In line with the statement of Ariyatun and Octavianelis (2020) the learning model, in which initially the teacher was always the main centre, changed to become student-centred, as well as individual learning to collaborative learning which functions to emphasize students' creativity and problem-solving.

Video media originating from coffee plantations that are shown to students as well as dialogue and questions and answers from teacher to students, aims to channel concrete or real evidence to students about animals in coffee plantations so that they can stimulate their thinking skills. Supported by the statement of Handoko et al., (2019) that indicators of asking and answering questions can be improved by conducting dialogue or debriefing in accordance with the material to be discussed, the aim is to provide an overview related to students' knowledge or experience.

The second indicator of critical thinking skills is building basic skills, which shows that the average obtained in the experimental class which was initially 39.58 increased to 68.06, while in the control class which was initially 27.78 increased to 67.36. This is because collaborative learning increases students' enthusiasm for learning so students will become more active in-class learning. Students are directed to find information on their own based on trusted learning sources and brainstorm the ideas they have. Therefore, with the given worksheet, students become more accustomed to finding information from trusted sources. Supported by the research of Dewi et al., (2020) that the increase in basic skill indicators was influenced by students' enthusiasm for learning in answering the questions given by including logical reasons sourced from trusted sources which are a series of critical thinking skills. This is in accordance with the explanation of Sukmasari and Murniawaty (2019) that in groups students are given the opportunity to exchange ideas in solving a problem and respect each other.

The third indicator of critical thinking skills, the conclusion, shows that the average obtained in the experimental class which was initially 11.81 increased to 38.89, while in the control class which was initially 6.94 increased to 31.25. The indicator for concluding critical thinking skills gets the lowest average score of the five indicators for critical thinking skills. This is according to Wayudi et al., (2020) the low critical thinking skills of students in the inference indicator are caused because students are not careful enough in identifying the problems that have been given. According to Utami et al., (2022), the weakness of the conclusion-drawing indicator is caused by the
way of finding a point of view because the interpretation that students have is still lacking or not perfect.

The fourth indicator of critical thinking ability is to provide further explanation, showing that the average obtained in the experimental class which was initially 16.67 increased to 50.69, while in the control class which was initially 27.78 increased to 35.42. The indicator of providing further explanation is an ability to define terms and define ideas according to their understanding to provide a further explanation (Miatun and Khusna, 2020). Providing further explanation is an attempt to analyze arguments and provide an explanation of the material for arthropods so that students can explain what differences these arthropods have. In line with the research by Agustiana and Miterianifa (2019), indicators provide further explanation used to measure students' abilities in describing further explanations of the problem being analyzed. The last indicator of critical thinking skills, namely setting strategies and tactics, shows that the average results obtained in the experimental class, which was initially 19.44, increased to 40.97, while in the control class, which was initially 19.44, it increased to 30.56. Indicators governing strategies and tactics are methods used to solve problems and find alternative solutions to problems that occur (Miatun and Khusna, 2020).

Based on the average score obtained in all aspects of the pre-test results, it shows that the ability to think critically and students' awareness to understand is still low, therefore a new learning model is needed that can improve students' critical thinking abilities. Asri (2022) states that the activities carried out in collaborative learning affect increasing students' critical thinking skills through discussions between small groups, classifying thoughts, evaluating other people's thoughts, solving problems, and being able to form new thoughts by collaborating with others. In line with the statement of Candrarini et al., (2018) collaborative learning becomes very meaningful learning because in learning students are formed into several small groups by being given a problem and then solving the problem with a sense of responsibility for each student and socially. In line with the statement of Aminah et al., (2017) video media can improve students' critical thinking skills in science learning. Based on the results of students' critical thinking skills that have been described above, it can be concluded that the use of collaborative learning models combined with video media sourced from the coffee plantation environment is effective for use in learning.

Cognitive Learning Outcomes

The learning outcomes in the cognitive domain of students are taken from the results of the pre-test and post-test assessments carried out in the control class and the experimental class to find out the learning outcomes in the cognitive domain of students, the value of learning outcomes in the cognitive domain is presented in table 3 below,

Table 3. The value of learning outcomes in the cognitive domain

Kelas	**Number of students**	***Pre-test***	***Post-test***	**Sig.**
		Average ± SD	**Average ± SD**	**0,001**
Control	36	32,25 ± 14,11	56,58 ± 13,23	
Experiment	36	29,11 ± 10,29	67,58 ± 13,07	

Based on Table 3, shows that the average difference in pre-test scores and post-test scores in the experimental class is greater, with the number 38.47, compared to the control class, which is 24.33. The results of the ANACOVA test obtained a significance value of 0.001 <0.05, which means that H0 is rejected and H1 is accepted, so it can be concluded that the model using collaborative learning models combined with video media has a significant effect on learning outcomes in the cognitive domain of students. In line with the theory of Mahendra et al., (2018) collaborative learning can encourage

students to have a high sense of responsibility for achieving goals in groups and encourage self-confidence in students by making them aware of their role in the group. This can foster a confident character in students by giving them freedom of opinion to determine what they want.

According to research by Anggreni et al., (2019) states that the collaborative learning model is proven to have an effective influence in inducing the development of student cognitive learning outcomes because when carrying out learning activities in collaborative learning situations students will have a positive sense of dependence to achieve success which is desired. Therefore, the collaborative learning model is very effective to use because it guides students in learning optimally so that it can significantly improve student learning achievement. Collaborative learning models combined with local wisdom video media related to the coffee plantation environment can improve cognitive learning outcomes. In line with the statement of Atika et al., (2018) that videos about local wisdom provide interest for students to be actively involved in the learning process in class so that videos can improve learning outcomes in the cognitive domain.

This is also supported by Asmara's (2021) statement that the use of instructional video media is effectively used to increase student learning outcomes because video media makes it easy for students to understand learning concepts many use other names that are rarely known, so it will affect student learning.

Affective Learning Outcomes

The learning outcomes of the affective domain in this study were taken from the results of observation sheets of learning activities carried out in the control class and the experimental class which aimed to determine the learning outcomes of the affective domain in students which included several student characters, including accepting differences of opinion, activeness, cooperation, responsibility and discipline. The value of affective domain learning outcomes is presented in Table 4 below,

Table 4. The value of learning outcomes in the affective domain

Affective Domain Learning Outcomes Indicators	Control Class Values	Categories	Experimental Class Values	Categories
Accept differences of opinion	78,82	Good	81,08	Very good
Liveliness	57,12	Enough	60,42	Good
Cooperation	73,61	Good	80,38	Good
Responsibility	94,97	Very good	91,49	Very good
Discipline	74,83	Good	79,69	Good
Average	75,87 ± 13,52	Good	78,61 ± 11,26	Good

Based on Table 4, it shows that the average value in the experimental class is greater than in the control class. The results of the average value obtained are then analyzed using the Independent Sample t-test to obtain a significance value of 0.126 > 0.05 or H0 is accepted and H1 is rejected. This means that there is no significant difference in the learning outcomes of the affective domain of students in the control class and the experimental class. Therefore, the average results obtained show that the control class and the experimental class have good value categories and the results of the average scores of the two do not have much difference, indicating that there is no significant difference in student learning outcomes in the affective domain. The control class uses

the discovery learning model with experimental class students who use the collaborative learning model combined with video media.

Indicators of activeness and cooperation are ways students can practice their social skills, can appreciate the differences that exist, and are able to manage themselves in their study groups. According to Noorhapizah et al., (2019) state that collaboration can be trained, one of which is by forming small groups with two students in one group to complete tasks discuss with each other and share opinions in one group to achieve goals. This can train cooperation between students and is useful for getting students used to not only relying on the knowledge provided by the teacher.

The third indicator is responsibility. Learning in the control class, one of the responsibilities of the assignments given is done in groups with 1 assignment done in one group. Whereas in the experimental class, the teacher gave assignments to each individual but worked with groups and groups were only used as a learning tool with social interaction from group members to solve problems given by the teacher and build knowledge. According to Febriani and Ghozali (2020) it is stated that an increase in indicators of responsibility can be measured by the way students can complete assignments given by the teacher according to the time limit given, Students help each other and work together in their groups to complete their assignments, and students are able to organize groups.

The fourth indicator is discipline. According to Febrianti and Rachmawati (2018), discipline is divided into 2 indicators, namely time discipline and action discipline. One way that can be done to improve student discipline is by getting students used to not procrastinating work and eliminating students' lazy attitudes. The last affective domain learning outcome indicator is accepting differences of opinion. This indicator requires teachers to form study groups by choosing different learning styles, so students can respect each other's opinions from their group mates. Therefore, students will get used to recognizing and respecting the diversity between them. In line with Nuzalifa's (2021) statement that in studying, students do not only receive knowledge that comes from the teacher, but can also be influenced by interaction and learning together with their friends. The application of the collaborative learning model combined with video media on learning outcomes in the affective domain has a positive influence because the application of this learning model can have a good influence on biology learning outcomes in animal material, sub-submaterial of arthropods in class X MIPA SMAN Jenggawah.

Psychomotor Learning Outcomes

The psychomotor domain learning outcomes in this study were taken from the results of observation sheets of student learning activities in the control class and the experimental class with the measured indicators namely perception, manipulating, precision, articulation, and observation. The value of learning outcomes in the psychomotor domain is in Table 5 below,

Table 5. The value of learning outcomes in the psychomotor domain

Class	Number of students	Student's psychomotor scores		Sig.
		Rerata ± SD	Categories	
Control	36	81,25 ± 3,80	Proficient	213
Experiment	36	83,75 ± 3,95	Proficient	

Based on Table 5, the results of the average values obtained were analyzed using the Independent Sample T-Test with the results obtained that were a significance value of 0.213 > 0.05 or H0 was accepted and H1 was rejected. This can be interpreted that there is no significant difference in the learning outcomes of the psychomotor domain of students in the control class and the experimental class. Therefore the results obtained show that the two classes have no significant difference in the psychomotor domain learning outcomes of the control class students by applying the discovery learning model with the experimental class students who apply the collaborative learning model combined with video media. The source of students' psychomotor assessment came from carrying out practical learning activities in biology subjects with sub-arthropod animal material, students were very enthusiastic to follow well and many students had skills in skills, and students were eager to understand every part and function of arthropods. The application of collaborative learning models combined with video media has a positive effect on student psychomotor learning outcomes. This learning has a good influence on psychomotor learning outcomes because according to Aristo (2018), the collaborative learning model can build meaning for each student. After all, it can shape student abilities through social interaction between students.

The first indicator of learning outcomes in the psychomotor domain is perception. Based on the results obtained, it can be seen that the average value of the experimental class is greater than that of the control class. According to Mafudiansyah et al. (2020), indicators of perception or imitation are skills that students have in assembling experimental tools. Students are very active when participating in practicum learning, the teacher gives directions in advance about what students must prepare. Students make the directions given by the teacher as a pattern to be able to prepare observation equipment so that students follow the activities that have been demonstrated by the previous teacher and try again according to what was directed by the teacher until they achieve a good and correct response.

The second psychomotor domain learning outcome indicator is manipulating. Based on the results of the average value obtained, it show that the value of the experimental class is greater than the control class. According to Maryam (2022) manipulation is learning that directs students to practice by believing in the examples given at the beginning and their ability to practice material. Each student tries and understand each of the parts or characteristics possessed by arthropods. The third indicator of learning outcomes in the psychomotor domain is precision. Based on the results obtained in both classes, it show that the average value obtained in the experimental class is greater than the average value of the control class. According to Rahman et al. (2020), precision is a skill that is acquired with the ability to identify again with good and correct accuracy. This indicator identifies each group by paying attention to the various types of arthropods by observing their characteristics, the differences possessed by arthropods, and the functions of each part of the body of arthropods correctly and precisely.

The fourth indicator is articulation. Based on the results obtained, it show that the control class and the experimental class do not have a significant difference in this indicator, but the average value obtained in the experimental class is greater than the control class. According to Achmad et al. (2022), articulation is a skill that is carried out simply by students correctly so that it will produce perfect work results. This indicator students record the results of observations of arthropods that have been identified previously with the characteristics and functions of each body part possessed by arthropods, then record the results obtained onto student worksheets prepared by the teacher beforehand. The last indicator of psychomotor learning outcomes is observation.

Based on the results of the average value obtained, it shows that the two classes have the same value category, namely The category is quite good with the results of the average value obtained not having a large enough difference, but the average value obtained by the

experimental class is greater than the results of the average value in the control class. This indicator students observe the results of the data obtained when making observations in the material biology practicum of arthropods which then arranges it in the form of determination according to the results that have been obtained previously, about the kinship of arthropod animals, how the shape and characteristics of the bodies of arthropod animals, the functions that are each part of the body of an arthropod animal has, then the results obtained become a reference in working out the key to determination. Based on this, with the application of collaborative learning models combined with video media on student psychomotor learning outcomes, states that applying this learning model can have a positive influence on psychomotor learning outcomes by understanding real biology learning of arthropod animal material in class X MIPA Janggawah High School.

Conclusion

The application of the collaborative learning model combined with video media has an effect on critical thinking skills and learning outcomes in the cognitive domain of high school students in coffee plantation regional schools. The application of collaborative learning models combined with video media does not affect learning outcomes in the affective and psychomotor domains of high school students in coffee plantation regional schools. This learning is very effective learning to develop the social, psychological, and academic skills of students at various levels with a pleasant atmosphere in learning so that students can think critically and cognitive learning outcomes with a variety of views in the group because students will be able to affect which results in having a broader and deeper mindset. The advantages and disadvantages of carrying out research that should be carried out by direct observation of animals in the coffee plantation environment to grow real knowledge and understanding of students, but due to time limitations and permits, must be appropriate. Further research is needed to apply the collaborative learning model combined with video media to effectively influence other learning materials and to redevelop research on student learning outcomes in the classroom as the results have been obtained.

References

Achmad, G. H., Ratnasari, D., Amin, A., Yuliani, E., & Liandara, N. (2022). Authentic Assessment in the Independent Learning Curriculum in Learning Islamic Religious Education in Elementary Schools. *Educative: Journal of Educational Sciences, 4*(4), 5685-5699. https://doi.org/10.31004/edukatif.v4i4.3280.

Agustiana, J. (2019). Analysis of students' critical thinking skills on colloid material. SPECTRA: *Journal of Science Education Studies*, *5*(1), 91-98. http://dx.doi.org/10.32699/spektra.v5i1.80.

Aminah, S., Susiani, T. S., & Suryandari, K. C. (2017). Improving Critical Thinking Skills Through Guided Inquiry Learning Models With Multimedia In Learning Natural Sciences About Energy. *Scholar's Word*, *5*(3), 261-265.

Anggreni, I. D. A. Y. D., Margunayasa, I. G., & Kusmariyatni, N. N. (2019). The Influence of the Collaborative Learning Model in terms of Achievement Motivation on Science Learning Outcomes. *Indonesian Journal Of Educational Research and Review*, *2*(2), 125-136. https://doi.org/10.23887/ijerr.v2i2.17333.

Aristo, A. (2018). Application of Collaborative Learning Using the Discussion Method Using Picture Media on Biology Learning Outcomes of Class XI IPA Students of SMAN 1

Batang Cenaku Academic Year 2015/2016. *Journal of Tambusai Education, 2*(3), 1370-1383. https://doi.org/10.31004/jptam.v2i3.123.

Ariyatun and D. F. Octavianelis. (2020). The Effect of the STEM Integrated Problem Based Learning Model on Students' Critical Thinking Ability. *Journal of Educational Chemistry*, *2*(1), 33-39. https://doi.org/10.21580/jec.2020.2.1.5434.

Asmara, A., & Sari, D. J. (2021). Pengembangan soal aritmetika sosial berbasis literasi matematis siswa SMP. Jurnal Cendekia: *Jurnal Pendidikan Matematika*, *5*(3), 2950-2961. https://doi.org/10.31004/cendekia.v5i3.982.

Asri, N.A. (2022). The Effect of Lesson Study-Based Collaborative Learning on Students' Critical Thinking Ability. *Proceedings of the National Seminar on Biology*, *2*(1), 455-462. https://doi.org/10.24036/prosemnasbio/vol2/410.

Atika, D., Nuswowati, M., & Nurhayati, S. (2018). The effect of the video-assisted discovery learning method on high school students' chemistry learning outcomes. *Journal of Chemical Education Innovation*, *12*(2). https://doi.org/10.15294/jipk.v12i2.15474.

Candrarini, K. P., & Nugroho, J. A. (2018). Penerapan Model Pembelajaran Kolaboratif Dengan Strategi Quantum Teaching Untuk Meningkatkan Kemampuan Berpikir Siswa Pada Mata Pelajaran Marketing Kelas X-6 Kompetensi Keahlian Bisnis Daring dan Pemasaran SMK Negeri 1 Karanaganyar Tahun Pelajaran 2017/20. *Jurnal Pendidikan Bisnis dan Ekonomi*, *4*(1).

Dewi, C., Utami, L., & Octarya, Z. (2020). The Influence of Guided Inquiry Learning Model Integration of Peer Instruction on Critical Thinking Ability of High School Students on Reaction Rate Material. *Journal of Natural Science and Integration*, *3*(2), 196-204. http://dx.doi.org/10.24014/jnsi.v3i2.9100.

Fadlina, F., Artika, W., Khairil, K., Nurmaliah, C., & Abdullah, A. (2021). Application of the STEM-based discovery learning model to motion system material to improve critical thinking skills. *Indonesian Journal of Science Education*, *9*(1), 99-107.

Faiqoh, E.N., Suratno, and Asyiah, I. N. (2019). Pattern of interaction problem based learning with self regulated learning on coffee plant area. *Journal of Physics: Conference Series. 1211*(1), 1-9. https://doi.org/10.1088/1742-6596/1211/1/012095.

Febriani, F., & Ghozali, M. A. (2020). Increasing the attitude of responsibility and learning achievement through the 7E cycle type collaborative learning model. Premiere Educandum. *Journal of Basic Education and Learning, 10*(2), 175-186. http://doi.org/10.25273/pe.v10i2.6335.

Febrianti, L., & Rachmawati, L. (2018). The Effect of Emotional Intelligence and Learning Discipline on Student Learning Outcomes at SMA Negeri 3 Nganjuk. *JUPE*, *6*(2), 69-75. https://doi.org/10.26740/jupe.v6n2.p%25p.

Handoko, A., Supriadi, N., & Ningrum, S. (2019). The Effect of Thinking Ability Improvement Learning Strategies (SPPKB) on Students' Critical Thinking Ability. *Biosphere: Tadris Journal of Biology*, *10*(2), 189-200. http://dx.doi.org/10.24042/biosfer.v10i2.5406.

Hanik, N. R., & Harsono, S. (2020). Implementation of Comparative Learning Models that are Integrated with Collaborative Approaches in terms of Student's Analysis Ability. *Journal of Educational Communication*, *4*(2), 114-122. https://doi.org/10.32585/jkp.v4i2.681.

Khusnul, K., Suratno, and Yushardi. (2018). The Patterns Of Skills Of Science Process In Discovery Learning: A Case Study Of Science Learning In Coffee Plantation School. *Journal of Physics: Conference Series*, *121*(1), 1-10. https://doi.org/10.1088/1742-6596/1211/1/012105.

Krathwohl, D. R. (2011). *A Taxonomy for Learning Teaching and Assessing*. United States: Addison Wesley Longman.

Mafudiansyah., Sari, S. S., and Arsyad, M. (2020). Analysis of Physics Learning Outcomes at SMA Negeri 3 Makassar. *Journal of Science and Physics Education*, *16*(1), 8-19. http://localhost:8080/xmlui/handle/123456789/8254.

Mahendra, I. W. E., Jayantika, I. G. A. N., & Mintarti, N. G. P. (2018). The effect of collaborative learning models on mathematics learning outcomes by controlling students' numerical talents. *Journal of Songke Math*, *1*(1), 26-36. http://ejournal.stkipsantupaulus.ac.id/index.php/jsm.

Maryam, S. (2022). Improving Students' Skills on Plant Tissue Structure Material Through the Use of Microcam Media. *Journal of Teacher Scientific Work Innovation*, *2*(2), 136-148. https://doi.org/10.51878/teacher.v2i2.1334.

Miatun, A. and Khusna, H. (2020). Mathematical Critical Thinking Ability Based on Mathematical Disposition. *Journal of Mathematics Education Study Program*, *9*(2), 269-278. https://doi.org/10.24127/ajpm.v9i2.2703.

Noorhapizah, N., Nur'alim, N. A., Agusta, A. R., & Fauzi, Z. A. (2019). Improving Critical Thinking Skills Through Reading Comprehension Skills in Finding Important Information With a Combination of Directed Inquiry Activity (DIA), Think Pair Share (TPS) and Scramble Models for Class V Students at SDN Pemurus in 7 Banjarmasin. *Proceedings of the National Seminar*, *5*(2), 95-108. https://repo-dosen.ulm.ac.id//handle/123456789/31377.

Nurwidodo, N., Romdaniyah, S. W., Sudarmanto, S., Rosanti, D., Kurniawati, K., & Abidin, Z. (2021). Analysis of Profiles of Critical Thinking, Creative, Collaborative Skills, and Environmental Literacy of Grade 8 Muhammadiyah Middle School Students as Impacts of Modern Learning. *Bioscientist: Scientific Journal of Biology*, *9*(2), 605-619. https://doi.org/10.33394/bioscientist.v9i2.4642.

Nuzalifa, Y. U. (2021). Application of the Lesson Study Based Think-Pair-Share (TPS) Learning Model as an Effort to Improve Student Collaboration Skills. *Journal of Science Education and Learning*, *4*(1), 48-57. https://doi.org/10.23887/jppsi.v4i1.31774.

Putri, N. S. Y., Rosidin, U., & District, I. W. (2020). The Effect of Implementing Performance Assessment Using the Pjbl Model on the Critical and Creative Thinking Skills of High School Students. *Journal of Physics Education*, *8*(1), 58-69.

Rahman, M. H., Iriani, T., and Widiasanti, I. (2020). Psychological Domain Analysis Basic Competency of Soil Measurement Techniques Construction and Property Engineering Vocational High School Curriculum. *Journal of Technology and Vocational Education*, *17*(1), 53-63. https://doi.org/10.18502/kss.v4i14.7872.

Ramdani, A., Jufri, A. W., Jamaluddin, J., & Setiadi, D. (2020). Students' critical thinking skills and mastery of basic science concepts. *Science Education Research Journal*, *6*(1), 119-124. https://doi.org/10.29303/jppipa.v6i1.388.

Safitri, A. N., Subiki, S., & Wahyuni, S. (2018). Development of a science module based on coffee local wisdom on the subject of business and energy in junior high schools. *Journal of Learning Physics*, *7*(1), 22-29. https://doi.org/10.19184/jpf.v7i1.7221.

Sukmasari, D., & Murniawaty, I. (2019). Peningkatan Kemampuan Berpikir Kritis Siswa Melalui Model Pembelajaran Group Investigation Berbasis Lesson Study. *Economic Education Analysis Journal*, *8*(3), 1097-1114. https://doi.org/10.15294/eeaj.v8i3.35713

Suminarsih. (2021). *Fantastic Student Fun Learning Videos*. Central Java: Indonesian Gumun Foundation (YLGI).

Suratno, S., & Kurniati, D. (2017). Implementation of a performance assessment-based math-science learning model to improve students' critical thinking skills in the Jember coffee plantation area. *Journal of Educational Research and Evaluation*, *21*(1), 1-10. https://doi.org/10.21831/pep.v21i1.11799.

Suratno, Wahono, B., Chang, C. Y., Retnowati, A., and Yushardi. (2020). Exploring a Direct Relationship between Students' Problem Solving Abilities and Academic Achievement: A STEM Education at a Coffee Plantation Area. *Journal of Turkish Science Education, 17*(2), 221-224. https://files.eric.ed.gov/fulltext/EJ1264688.pdf.

Suratno, Komaria., N., Hobri, Husniah, F., Novenda, I. L., and Fahroyin, M. (2020). Biotechnology Concept: Questioning Of Analysis With Lesson Study For Learning Community (LSLC) For Higher Ordered Thinking Skills On Coffee Area Plantation. *Journal of Physics: Conference Series*, *1563*(1), 1-10. https://doi.org/10.1088/1742-6596/1563/1/012040.

Susanti, A. I. (2021). *Information and Communication Technology (ICT) Based Learning Media. Print 1*. Bojong Pekalongan: PT. Nasya Expanding Management.

Utamayasa, I. G. D. (2019). *Physical Education Learning Models*. Surabaya: Jakad Media Publishing.

Utami, F. W., Prasetya, S.P,. Segara, N.B,. and Setyawan, K. G. (2022). The Effect of Applying Global Issues in Problem-Based IPS Learning to Improve Critical Thinking Skills. *Dialectics of Social Studies Education*, *2*(2), 217-228.

Wayudi, M., Suwatno, and Santoso, B. (2020). Analysis of Critical Thinking Skills of High School Students. *Journal of Office Management Education*, *5*(1), 67-82. https://doi.org/10.17509/jpm.v4i2.18008.