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Analysis of 21st-century skills: Student collaboration through discovery learning in history subjects

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ABSTRACK

This research intends to describe the implementation of the discovery learning model and describe students' collaboration skills in history learning at MA Mambaul Ulum. The quantitative approach and descriptive approach were applied to this research. This research used a saturated sampling technique. A total of 28 students were used as samples in this study. Students' collaboration skills were obtained from observation sheets and supplemented with interview results. Data on students' collaboration skills were analyzed using descriptive statistical techniques. Based on the analysis results analysis results obtained from the observation sheet, it can be understood that the 28 students, there are 18 trained and high level, while the rest are in the category of medium and basic level. All indicators of collaboration skills have a high except the time management indicator, which is a very high category. This research concludes that the discovery learning model can hone students' collaboration skills.
Keywords: collaboration, history learning, discovery learning

INTRODUCTION

The rapid advancement of technology and data has brought changes in the order of social life, including in the field of education. One of the efforts to anticipate and respond to the changes that are and will occur in the future is to improve the quality of teaching (Muiz et al., 2016). The quality of teaching can be advanced by planning more imaginative learning frameworks and expanding the competencies of graduates with 21st-century skills (Zubaidah, 2018). Greenstein expresses this by saying Sugiyarti et al (2018) that students must have the knowledge and metacognitive skills, be able to think critically and creatively and be able to communicate or collaborate effectively. Thus, learning activities must be carried out by applying 21st-century skills, namely 4C skills consisting of critical thinking, communication, collaboration, and creative thinking.

The era of globalization had an impact on students' social life. Students tend to prefer interacting with others through the Internet. Interacting directly is only done in very urgent circumstances. This kind of social life will have an impact on students' mindset when they enter the community. Likewise, in the world of work, they will have difficulty interacting with others when cooperation must be completed quickly and goals can be achieved optimally (Moradian et al., 2020). Students are considered skilled in collaboration if they fulfill the four indicators, namely working productively, respecting each

other, compromising, and responsibility. Collaboration skills direct students on how to interact with peers while learning and discuss with each other to get optimal results. Collaboration skills contribute to improving students' thinking and problem-solving skills, giving positive energy to others, and being able to identify the abilities of others (Boholano, 2017; O'Leary et al., 2012).

The 21st century brings changes in various aspects of life. Everyone is required to have good thinking skills and social attitudes. Technological advancement demands collaboration as an absolute must-have to survive a better life in the era of globalization (Lay & Osman, 2018). Kemampuan kolaborasi merupakan kemampuan yang dapat memberikan bantuan dalam bekerja collaborate with other individuals. Students who have the ability to collaborate will be able to work together in several groups to solve problems and achieve common goals (Pramudiyanti et al., 2020). Collaboration skills enable students to prepare themselves for 21st-century society (Germaine et al., 2016). These skills are not only relevant for career success but also in the context of citizenship (Soulé & Warrick, 2015).

Collaboration skills are one of the skills that must be achieved. Conklin explains that collaboration is an effort that involves the cooperation of two or more people with similar goals to achieve a common target and have their own responsibilities and roles (Widodo & Wardani, 2020). Collaboration is one form of social interaction. Collaboration is a situation where people work together in a group to get the results they want to achieve (Nonthamand & Na-Songkhla, 2018). Collaboration is a social process in which performance is valued and rewarded in order to achieve a common goal (Fauzani, 2018).

The reality of history studies in schools is still often a problem because history subjects are less attractive to students and often create a negative stigma. History is often assumed to be a boring subject that provides little benefit. This is because history studies are often applied only in theory and discuss the past, which is considered to have no purpose in the future (Fadli et al., 2022). History learning is also often done by memorizing the names of figures, years, and events (Saputra & Widiadi, 2024). However, in reality, history studies in a broader context have educative historical values and are important in facing the future. Learning can be more effective if teachers have a strong understanding of the subject matter and choose the right learning models and media. Thus, it is expected to help students achieve optimal learning achievement. Sulfemi revealed that the use of suitable learning models and media can help teachers in achieving learning objectives (Sulfemi, 2016).

Problems in learning will continue to occur if teachers are less capable of arranging creative and innovative learning. Learning problems that continue to occur will lead to the degradation of students' academic knowledge and skills, which is called the lost generation. Lost generation refers to the decline in learners' potentials, including physical, psychological, thinking, and spiritual potentials. Character aspects have also decreased, such as interaction with family, tolerance, attitudes to help, dishonesty, and lack of shame (Suharno, 2022; Warsono et al., 2021). Symptoms of lost generation can be seen when students behave poorly in learning activities, such as lack of discipline, lack of responsibility, lack of activity, and low interest in learning (Prawitasari et al., 2022).

Based on pre-research activities conducted by researchers at MA Mambaul Ulum, students' collaboration skills are still low. This condition can be seen when learning activities are carried out in groups. Some students still do not have a sense of responsibility. They rely more on friends who are considered superior in completing the group task. Therefore, many students have a poor understanding of the learning material. Whereas it should be with the application of learning activities in groups, students can increase their sense of sensitivity to help each other in producing optimal results. This statement is in line with Sukasmo's opinion, which reveals that collaborative learning is a learning activity that emphasizes cooperation in a small team to achieve similar targets (Priandini et al., 2022).

Relevant opinions have also been expressed by several researchers, who believe that collaborative learning can improve student learning outcomes (Susanti et al., 2017; Utami et al., 2019).

The 2013 curriculum aims to develop and build student character, where teachers must be innovative in developing learning models, one of which is by applying the discovery learning model (Syarif et al., 2020). To achieve the best learning outcomes, appropriate guidance and active student involvement in the learning process are required. Teacher guidance and active student involvement are key to achieving optimal learning outcomes (Hunter & Elliott-Kingston, 2014).

The implementation of the discovery learning model has proven effective in improving problem-solving skills and scientific thinking skills, learning outcomes, enthusiasm for learning, and students' understanding of concepts and scientific attitudes (Prakasiwi & Ismanto, 2018; Suendarti, 2017; Wahjudi, 2015; Widiadnyana et al., 2014). In addition, the discovery learning model can be applied and relevant to various subjects, one of which is history learning. This is in line with research conducted Nurcahyo et al., 2018; Sulistyo et al., (2022) that shows that the discovery learning model can be applied to history learning. Based on the description described by the researcher above, the difference in this research is that the author analyses the collaboration skills of Madrasah Aliyah students when implementing the discovery learning model on the subject of history at MA Mambaul Ulum. This research aims to describe students' collaboration skills in the context of implementing the discovery learning model at MA Mambaul Ulum.

RESEARCH METHODS

This research applied a descriptive quantitative approach. The descriptive quantitative approach was applied to describe or describe students' collaboration skills when the Discovery Learning model was applied. Grade 12 became the population in this study, and the saturated sampling technique was used to involve all grade 12 students, totaling 28 students. This was done due to the relatively small sample size. Collaboration skills were measured through observation sheets and refined with the results of interviews with history subject teachers held in November 2023. The collaboration skills instrument was obtained from five indicators, namely contribution, time management, problem-solving, working with others, and investigation techniques, by applying a scale of 1 - 4 accompanied by categories on each scale. The collaboration skills research instrument is the result of an adaptation from the International Reading Association Read Write Think "Collaborative Work Skill Rubic," which has been adjusted to the conditions of Indonesian students Hermawan et al (2017). The data that had been obtained were analyzed using descriptive statistical techniques. Data analysis began with the calculation of the average student score, which was categorized based on Greenstein (2012) categorization. Table 1, the categorization of student collaboration skills scores.

Table 1. Student collaboration skills score category

Score	Category
1,0 – 2,7	Level 1: Basic Level
2,8 – 3,1	Level 2: Medium Level
3,2 – 3,5	Level 3: Trained Lev
3,6 – 4,0	Level 4: High Level

In addition to the calculation of the average student score, the score of each indicator is also calculated by giving a score of 1-4 on each indicator. Then the total score is calculated and converted into a scale range of 100. The collaboration skills scores obtained from the observations were then averaged and classified into several categories based on the categorization Djaali & Muljono (2008). Table 2 the criteria for interpreting the score.

Table 2. Criteria for score interpretation

Interpretation	Score
Very High	86% ≤ N < 100%
High	72% ≤ N < 85%
Medium	58% ≤ N < 71%
Low	43% ≤ N < 57%
Very Low	N ≤ 43%

RESULTS AND DISCUSSION

Based on the results of the calculation of student collaboration skills data through the observation sheet, the data on collaboration skills through the discovery learning model is interpreted into the following pie chart.

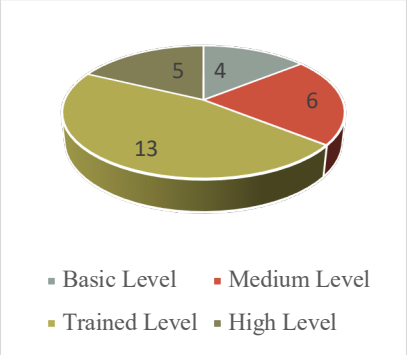

Figure 1. Student collaboration skills

The results of the calculation of the observation sheet of students' collaboration skills interpreted into the pie chart above provide an understanding that out of 28 students, 18 students have trained and high-level collaboration skills, while the rest are in the basic level category. The data gives an understanding that when the discovery learning model is applied in the classroom, students can improve their collaboration skills from the aspects of contribution, time management, problem-solving, working with others, and investigation techniques. Students in the medium and low categories may be influenced by several other factors that are not the focus of discussion in this study. The results of the assessment of students' collaboration skills are good because each indicator achieves a good value as well. The following is the value of each indicator of student collaboration skills. Table 3 displays the indicators, percentages, and categories of collaboration skills.

Table 3. Acquisition of collaboration skills percentage

Indicator	Percentage	Category
Contribution	76%	High
Time management	86%	Very High
Problem solving	78%	High
Working with others	76%	High
Inquiry techniques	79%	High

The calculation results on each student collaboration skill show that each indicator gets a good category. The time management aspect received a very high category with a percentage of 86%. This indicates that students can manage time well so that they can complete the task according to the time frame given by the teacher. It can be seen during the learning process that each group divides the functions to each member in order to complete the task on time. The other indicators are categorized as high, with a score range between 72% and 85%. The lowest score is in the contribution indicator and working with others. The score gives an understanding that there are some students who prefer to learn independently, so they put more effort into managing their time well.

The results of the assessment of student collaboration obtained by researchers were obtained when applying the discovery learning model. Hosnan argues that discovery learning is active learning that involves student activeness in discovering and investigating material independently, which makes the acquisition of the results last long in memory (Hosnan, 2014). The implementation of Discovery Learning can be a learning guide where students are given the opportunity to be more dynamic in overseeing their learning strategies when discovering concepts, and educators guide and coordinate student learning activities in accordance with learning objectives (Wigati, 2019). This research uses the syntax of discovery learning by Joyce, Weil, & Showers, namely stimulation, problem statement, data collection, data processing, verification, and generalization (Zahara et al., 2020).

Stimulation

Stimulation is the first step in a learning activity. In this step, students are given stimulation related to the material to be studied in the form of observing a video about the struggle of Indonesian unifying figures. From the appearance of the video, students can be stimulated to think and find out more about the material being studied. In addition to the appearance of the video, the teacher also needs to ask questions so that students' curiosity is even higher (Ramadhan et al., 2019). A question posed will make students feel interested and curious to find the answer so that it will motivate students to start learning. Collaboration skills are seen when students discuss with their groups to find answers to the stimuli given by the teacher. The application of the discovery learning model in the stimulation syntax can instill collaboration skills, namely problem-solving. Solving indicators are trained when students get a stimulus from the teacher in the form of questions where students can think systematically to be able to answer questions given by the teacher.

Problem Identification

The second syntax is problem identification. Students are asked to identify relevant problems related to the material studied. Collaboration skills are seen when students formulate questions and identify as many problems as possible together. This indicates that in the syntax of problem identification, indicators of actively contributing and inquiry techniques appear. Problem identification activities can train students' cooperation skills in solving problems and train social skills (Khofiyah & Santoso, 2019; Kusuma et al., 2019). Indicators of contribution and inquiry techniques are trained when students organize strategies together to identify a problem from the material being studied.

Data Collection

The third syntax is data collection. This step asks students to answer the question or problem. Students are allowed to obtain relevant information through reading and observation. When students

seek information independently, they can understand the material better than just memorizing concepts or topics. The data collection step can help students to solve their problems. Students are not only answering questions but also looking for as much new information as possible, which can improve cooperation skills for the success of group tasks (Tarim & Akdeniz, 2008). Collaboration skills in this syntax are seen when each member works together to find references to answer questions/problems. This shows that in the data collection syntax, the indicators of contribution and working with others appear. Indicators of contribution and working with others are trained when students convey the information obtained and collect the information as data, which is then processed to become accurate data.

Data Processing

Data processing is the fourth syntax of discovery learning. In this syntax, students are given the opportunity to analyze the data they have obtained before drawing a conclusion. The teacher asks each group to assess, select, and categorize the data or information obtained. The teacher also emphasizes to the students that not all information or data collected should be included; only those that are relevant and fit the purpose should be considered. Each group member can also share their arguments in analyzing the data. Collaboration skills are involved in this syntax. Students can work together to analyze data to conclude. The students also share tasks and plan time carefully so that the work can be completed according to the set timeline. The indicators of collaboration skills involved are time management and working with others.

Verification

Verification is the stage after data processing. The data that has been analyzed is then proven with alternative findings. At this stage, the teacher asks learners in each group to check carefully whether their hypotheses match the findings of the information and data they have collected previously. The skill indicators that appear in this step are contribution and working with others. Both indicators are trained when students work together to verify the data obtained to get the expected results.

Generalization

After collecting, processing, and verifying data, the last step of discovery learning is a generalization. Students are given the opportunity to conclude the results of the data that has been obtained from each group. The teacher leads the generalization activity and is followed by students so that there is a collaboration between students and teachers. The submission of conclusions is not only delivered by one student but can also be complemented by expressions from other students. This step can hone confidence and motivation and improve social skills (Trilling & Fadel, 2009). From this, it can be seen that the indicator involved is the contribution indicator.

The results of interviews conducted by researchers with history teachers are that the discovery learning model is proven to provide good effectiveness in shaping students' collaboration skills, one of which is in history learning. This is due to the fact that learning often gets a boring impression on students. Therefore, the discovery learning model makes students more active in learning and not feel bored. However, the history teacher revealed that there are shortcomings related to the application of the discovery learning model where the teacher must control and guide students well according to the syntax of the discovery learning model used. If not, students will underestimate their learning, which results in learning not being carried out optimally.

The description of the data above gives an understanding that discovery learning contributes to creating students' collaboration skills. The findings of this study are in line with the results of several previous studies that discovery learning contributes to improving critical thinking, creativity, collaboration, and communication skills (Chusni et al., 2021; Ekaputra, 2023; Putra et al., 2020; Syolendra & Laksono, 2019). Großmann & Wilde (2019) also stated that students who were treated with the Discovery Learning model had higher conceptual and procedural knowledge compared to students who were treated with the conventional model.

CONCLUSION

The results and discussion of the research above can be concluded that out of 28 students, 18 students have trained and high-level collaboration skills, while the rest are in the basic and low-level categories. The analysis of each indicator showed that the highest percentage was in the time management indicator, and the rest were categorized as high. Each indicator is also visible when discovery learning is applied, both from contribution, time management, problem-solving, working with others, and investigation techniques. The explanation indicates that the application of discovery learning can hone students' collaboration skills in history learning. This study has shortcomings in sampling techniques that result in limited data obtained due to a small population. Thus, there are several ideas that need to be considered, especially for future researchers who want to study students' collaboration skills through Discovery Learning. Future researchers are expected to conduct research in other places to get adequate population and samples. In addition, future researchers are expected to use different types of research data analysis techniques with this research.

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