

Developing a Mutually Cooperative Attitude and Science Process Skills Through Experiential Learning

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Abstract: Experiential learning is learning that applies learning through action, learning through activities, learning through experience, and learning through discovery and exploration. Science process skills are skills that students need to have because they are closely related to intellectual skills. *Gotong royong* is an activity that is done together. A group does it to complete a task or work considered useful for the common interest or welfare. This study aimed to determine the effect of the experiential learning model on science process skills and students' cooperation attitudes. The research design used was one group pretest-posttest, applied in one of the junior high schools in the Sumberrejo sub-district. Data collection techniques include tests and response questionnaires. Based on the average n-gain score of all indicators, the study results obtained a score of 0.72 with a high category. The highest increase in the indicator of making conclusions was an increase in the n-gain score of 0.75. The mutual cooperation questionnaire obtained an average percentage of all indicators of 88%. The helping indicator obtained the highest percentage, with a percentage of 90%. The analysis results of the *gotong royong* questionnaire show an increase in all indicators, with a high average value. Empathy and human values play an important role in improving helping attitudes. Based on the analysis of this research, it can be concluded that using an experiential learning model in learning can improve students' science process skills. The experiential learning model also effectively fosters an attitude of *gotong royong* in students.

Keywords: Experiential Learning; *Gotong Royong*; Science Process Skills

Introduction

Education is the most important aspect of human life. Education is also very influential in educating the nation's life and improving the quality of human resources [1]. Education has been considered a human right that all humans must freely own. Through quality education, students will get maximum learning [2]. The rapid development of science means that there will be much new knowledge that students must know. However, much knowledge and character will not be valuable without fundamental understanding [3]. For this reason, students need to be trained in knowledge so they can find concepts by developing their knowledge. During this time, students lack interaction with each other because they only listen to explanations from the teacher and take notes individually [4].

Science learning is closely related to everyday life, so science is learning closely related to real experience. The science learning process emphasizes the provision of direct experience to develop the competence of students to explore and understand the natural world scientifically through the use and development of process skills and scientific attitudes. Students are encouraged to discover and construct their knowledge in their minds through science process skills and scientific attitudes so that students are not just users or memorizers of knowledge but discoverers and owners of science [5]. Student involvement is needed to work directly in finding information so that students understand and can apply the knowledge they get [6]. Therefore, students must be actively involved in learning to construct their knowledge, thus making the knowledge more meaningful and not easily forgotten.

Character and cultural education are very strategic and can help the quality of a future nation [7]. The development involves good planning, appropriate approaches, and fun and effective learning methods—several national character and cultural education characters, including *gotong royong*. *Gotong royong* itself is an activity that is done together [8]. A group does it to complete a task or work considered useful for the common interest or welfare. In *gotong royong* activities, participants must work together in groups, put aside individualism, and be responsible for the group [9].

Using a learning model that can involve students actively in learning, cooperating with fellow students, and interacting with each other actively and effectively through a learning model improves teaching quality. It begins with revamping the learning model [10]. Learning models relate to the most effective and efficient way of teaching by providing the learning experiences necessary to achieve specific learning objectives [11].

Based on research results from Purwanti et al. in 2021 [10], teachers now, in delivering material, still use the lecture method, and giving assignments on student worksheets tend to use the same method in every lesson so that students are not active in receiving the information conveyed. Another symptom that arises is that teachers tend to pay attention to students as a whole in the class and do not pay attention to each student or group of students so that individual differences are not so noticed, even though students have the uniqueness that distinguishes one from another. Other problems that often arise in the learning process are boredom, lack of student enthusiasm, classroom disturbances, and low student attention due to sleepiness. The preliminary study results in one of the junior high

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schools in the Sumberrejo sub-district show that the learning process, especially in science subjects, is still teacher-centered, where students only receive information the teacher conveys.

The results of research conducted by Machin in 2014 [13] showed that one way to create meaningful learning is to apply a scientific approach. The scientific approach can invite students directly to infer existing problems from the environment, curiosity, and love of reading. Implementation: students will be able to conduct investigations develop, and present work. Through investigation, students will be stimulated to think analytically, behave honestly, and be disciplined, creatively, and independently. Science process skills are important for students because these skills will be used in everyday life. One of the factors that influences success in improving science process skills is the learning model used by teachers, such as the experiential learning model.

The experiential learning model is learning that applies learning through action, learning through activities, learning through experience, and learning through discovery and exploration. The experiential learning model has four stages that are carried out according to learning: concrete experience, reflective observation, abstract conceptualization, and active experimentation [14]. Experiential learning focuses more on the process of learning than the product of learning itself [15]. Therefore, educators must apply the experiential learning model to learning packaged using scientific activities that can involve students directly in the learning process so that students' science process skills and cooperation can be trained and developed.

The advantages of the experiential learning model are that it helps students realize their abilities, assists in developing group work projects, decides how information and communication technology can assist the learning process, and provides an effective connection between theory and practice. Students are invited to look critically at events in everyday life and then conduct research (experiment). In the final stage, students draw conclusions that are used as one of the understandings achieved by students. This research aims to develop students' science process skills and cooperation attitudes through an experiential learning model. Science process skills and a cooperative attitude are important for students. These skills and attitudes become students' provision in everyday life.

Research Methods

This study used a one-group pretest-posttest design. The sampling design uses purposive sampling, where the researcher takes samples based on the purpose and needs of the sample [16]. The participants involved in this study were in one of the junior high schools in the Sumberrejo sub-district in the 2022–2023 academic year. The instruments used in this study were test questions and questionnaire sheets. The test questions were used to determine the improvement of science process skills after applying the experiential learning model. The science process skills test consists of four questions and is done offline using paper. The test was done for 40 minutes with the type of description questions. The following indicators of science process skills tests can be seen in Table 1.

The student response questionnaire was used to determine the cooperation attitude of students after using experiential learning. The questionnaire was used to

determine the students' attitudes toward cooperation. The questionnaire instrument used consists of 10 statements. The response questionnaire indicators used can be seen in Table 2.

Table 1. Indicators of Science Process Skills Questions

No	Indicator Science Process Skills	Question Number
1	Formulate a problem	1
2	Formulate a hypothesis	2
3	Identifying variables	3
4	Conclusion	4

Table 2. Indicator *Gotong Royong* Questionnaire.

No	Indicator <i>Gotong Royong</i>	Questionnaire Number
1	Cooperation	1,2,3
2	Discuss	4,5
3	Helping hands	6,7
4	Mutual respect	8,9,10

Data collection techniques, namely tests and surveys on paper and pencil, were used. The written test method was given before and after applying the experiential learning model to assess students' science process skills. The questionnaire survey of cooperation was carried out directly and closed. The science process skills test students have completed is then analyzed by looking at the increase using normalized gain (n-gain). The following criteria are used in n-gain as Hake's in 1998. [17].

Table 3. Score Criteria N-gain

Score	Criteria
$<g> > 0.70$	High
$0.30 \geq <g> \leq 0.70$	Medium
$<g> \leq 0.30$	Low

The *gotong royong* questionnaire used in the instrument uses a Likert scale. The results of the *gotong royong* questionnaire were then analyzed using the percentage of each indicator used to determine the criteria. After calculating the index value of each indicator, proceed to compare the results with Table 4.

Table 4. Criteria Percentage of *Gotong Royong* Questionnaire

Percentage (%)	Criteria
1-20	Very bad
21-40	Bad
41-60	Simply
61-80	Good
81-100	Very good

Results and Discussion

The research data are the science process skills ability test and the students' cooperation questionnaire. The results after applying experiential learning models to students' science process skills can be measured by research instruments, namely, pretest and posttest science process skills questionnaires in the form of filling. The pretest and posttest questions that students do have four indicators of science process skills, namely, formulating problems, making hypotheses, identifying variables, and making

conclusions. The results of students' science process skills test through pretests and posttests were then analyzed with n-gain to determine whether there were differences before and after the application of learning using experiential learning models. The results of the n-gain analysis can be seen in Table 5.

Table 5. Science Process Skills N-gain Results

Indicator	Pretest	Posttest	N-Gain	Category
Formulate a problem	38.1	82.5	0.72	High
Formulate a hypothesis	38.1	83.8	0.74	High
Identifying variables	29.4	78.8	0.70	High
Conclusion	40.0	85.0	0.75	High

Based on Table 5, it can be seen that all indicators have increased. The average n-gain score of all indicators is 0.72, with a high category. Making conclusions is the highest n-gain score of all indicators of science process skills. This can happen because, when learning, students have practiced concluding. Slavin stated in 2018 that students, when learning in all subjects, often practice making conclusions without realizing it [18].

The indicator of identifying variables obtained the lowest score compared to other indicators. By Yunita and Nurita's research in 2021 [19], variable identification obtained the lowest score. This is because students sometimes still struggle to distinguish between manipulation, control, and response variables. In addition, according to Akinbobola & Afolabi in 2010 [20], integrated skills are rarely taught, so it is difficult to improve.

Students gradually build small facts together to understand the concept [21]. Students also need the ability to test old and new ideas using science process skills to build meaningful connections between facts. The experiential learning model accommodates students' science process skills through their experiences [22]. The use of experiential learning models in learning places students in a position to deeply understand the material taught through the search process carried out by students. The concept that students get will be stronger and not just rote [23]. In the experiential learning model, students conduct experiments and discuss with groups to complete tasks. The learning does emphasize that students directly experience it themselves in obtaining concepts and developing scientific attitudes.

The *gotong royong* questionnaire data is then analyzed using percentages by looking at each indicator. The cooperation questionnaire students completed contained four indicators of cooperation: cooperation, discussion, helping, and mutual respect. The results of the cooperation questionnaire were then analyzed to see whether using the experiential learning model can develop cooperation attitudes. The results of the cooperation questionnaire analysis through self-assessment and between friends can be seen in Table 6.

Based on Table 6, it can be seen that all indicators of the cooperation questionnaire have very good criteria. The average percentage of all indicators in the cooperation questionnaire is 88%. The helping behavior indicator has the highest percentage. This can happen because students have a fairly high empathy value. The cooperation indicator

obtained a low percentage of results from all indicators. This agrees with the results of Sholihah's research in 2016 [24] that alarming conditions also occur among students who show low cooperation skills among students, so to prepare a better generation and character, those who have cooperation skills must be prepared through education.

Table 6. Student Mutual Cooperation Questionnaire

No	Indicator	Percentage (%)	Criteria
1	Cooperation	86	Very good
2	Discuss	88	Very good
3	Helping hands	90	Very good
4	Mutual respect	88	Very good

One of the factors affecting the results of each indicator of *gotong royong* is the negative impact of globalization. In addition to causing generations to lose their identity easily, it also affects the mindset about *gotong royong*. The culture of *gotong royong* is gradually eroded due to the understanding of modernity and globalization, which has an impact that results in a very complicated way of life [25], [26]. However, with the experiential learning model, students' cooperation attitudes can be developed, as evidenced by all indicators obtaining a good interpretation.

Empathy is the ability to understand and feel the feelings and perspectives of others, which is an important factor in helping. Individuals with a high level of emotional intelligence tend to be more sensitive to the needs and suffering of others. They can relate to others, feel their emotions, and respond by providing the necessary assistance. In addition, human values also play a role in helping. Humans naturally tend to help others and feel good when they can assist. When these human values are emphasized and reinforced through education and the social environment, helping attitudes can grow and develop to a high level.

The results of the *gotong royong* questionnaire indicate that the cooperation indicator has the lowest percentage among other indicators. Differences influence low cooperation in personality or learning style. Each student has a different personality and learning style. If these differences are not understood or respected, it can cause tension or difficulty working together. For example, some students prefer to work independently, while others prefer to work in groups. It is important to be aware of these factors and address the issue of low cooperation by developing social skills, building trust, and creating an environment that supports cooperation in an educational context. However, overall, the indicators obtained very good results.

The attitude of cooperation encourages students to work together to achieve a common goal. In an educational context, it provides opportunities for students to learn collaboratively, supporting each other and complementing their expertise [27]. By working together, students can develop cooperation, communication, and leadership skills that are important in everyday life.

Through *gotong royong*, students learn to interact with others, appreciate differences, and respect the views and contributions of others [28]. This helps them develop essential social skills such as empathy, cooperation, compromise, and tolerance. These social skills are useful in a school setting and their future personal and professional

lives. Students who engage in gotong royong activities feel responsible for their work and the neighborhood. They learn to care for and maintain the school environment, and they feel responsible for the well-being and success of the community. This helps to increase their sense of belonging to their school and builds a strong attitude of responsibility towards their duties and obligations [29].

Students often face challenges or problems they must solve together in a mutual aid situation. This enriches their learning experience by providing opportunities to develop problem-solving skills. Students learn to think critically, find creative solutions, and adapt to change. These skills are invaluable in facing the challenges of everyday life and the future. Overall, the attitude of *gotong royong* has far-reaching benefits for students, both in social, emotional, and academic aspects. It helps shape caring, collaborative, and responsible individuals ready to face challenges and positively contribute to society. This follows the research of Jannah & Shofiyah in 2023 [30], who also concluded that experiential learning can develop science process skills and student cooperation attitudes. It is hoped that this research can be continued by conducting large-scale tests.

Conclusion

Based on the analysis of this research, it can be concluded that using an experiential learning model in learning can improve students' science process skills. This model allows students to acquire concepts deeply through direct experience and build scientific attitudes. The experiential learning model is also effective in fostering an attitude of cooperation in students. The results of the cooperation questionnaire analysis showed an increase in all indicators, with a high average value. Empathy and human values play an important role in improving the helping attitude.

However, there are differences in students' level of cooperation, which is influenced by differences in personality and learning style. Educators need to understand and address the issue of low cooperation by developing students' social skills. A cooperative attitude benefits students, including developing social skills, problem-solving, a sense of belonging to the school, and responsibility for duties and obligations. It also helps shape caring, collaborative, and responsible individuals ready to face challenges and contribute positively to society.

Using an experiential learning model and cultivating a *gotong royong* attitude positively impacts student's development in various aspects, including academic, social, and emotional skills.

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