Research Article

THE EFFECT OF THE STATION ROTATION MODEL ON THE COLLABORATIVE SKILLS OF EIGHTH-GRADE JUNIOR HIGH SCHOOL STUDENTS

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Abstract

This study aims to investigate the effect of the Station Rotation Model on the collaborative skills of eighth-grade junior high school students. In light of Industry 4.0 and the digital revolution, the integration of technology into education is crucial. The station rotation model, as a blended learning approach, presents a viable solution for enhancing students' collaborative skills. The study uses a quasi-experimental design with 120 participants from two schools and collects data through pre-tests, post-test, and observations. The results indicated that students taught with Station Rotation Model 1 achieved higher average scores than those taught with Station Rotation Model 2, demonstrating a positive influence on collaborative skills. The analysis further confirmed the significant impact of the station rotation model on students' collaborative abilities. This research emphasizes the importance of innovative learning models like the station rotation model for fostering collaborative skills in the era of Industry 4.0. Nonetheless, additional research is required to ascertain the generalizability of the findings across different contexts and age groups. Moreover, the quasi-experimental design of the study imposes limitations on establishing causal relationships definitively. Future studies may consider implementing a randomized controlled trial design to further explore the effects of the Station Rotation Model on collaborative skills.

Keywords: Station rotation model, Collaborative skills, Junior high school.

INTRODUCTION

Industry 4.0, which was introduced in Germany in 2011, is a digital revolution that aims to change the manufacturing industry by replacing manual processes with digitization and technology. In Indonesia, transformation into the digital world as part of the industrial revolution 4.0 has become the main focus to welcome these changes (Suwardana, 2018). Digitalization is an important part of the Industrial Revolution 4.0, which connects technology and humans in various aspects of life, including education (Maksum & Fitria, 2021). Education faces challenges in integrating technology into the learning process, especially in the era of the industrial revolution 4.0. Digitalization has opened opportunities for the development of online learning through smart computers, which contain learning activities related to subjects that will be delivered by educators (McCarthy, 2007). Online learning is a means for optimizing self-regulated learning, collaborative skills, and students critical thinking abilities by using appropriate learning models (Assidiqi & Sumarni, 2020). An alternative learning model that is a solution to improving students' collaborative skills is the station rotation model. The station rotation model is a learning model that combines blended learning models into one learning series. The station rotation model has a variety of learning activities where students can rotate through several learning systems by selecting at least one online-based learning system. The advantage of the station rotation model is that teachers are allowed more flexibility in working with their students. The choice to provide different types of learning opportunities for students multiplies student learning opportunities (Gil & García, 2011). The station rotation model is a blended learning approach in which students rotate between several class

stations, at least one of which is a technology-based station (Larsari *et al.,* 2023). The station rotation model has three parts of learning activities: opening, rotating, and closing. The opening activity contains motivation for students and provides learning guides for them. Rotation activities involve three learning systems: small groups, educators, and online learning. The closing activity is the final learning activity, in which each learning system gives assignments to students that must be completed thoroughly. The station rotation model is applied to improve students' collaborative skills in solving learning problems. In the 21st century, collaborative skills are very important because they require someone to be able to work together with others. Collaborative skills are skills that students use when working with other people to produce or create something or achieve a common goal (Wolkowicz, 2023). Education is one way to practice collaborative skills (Istiyono *et al.,* 2014). Education must be student-oriented so that students have good collaborative skills (Andayani, 2018). Increasing collaborative abilities can be done by providing challenging problems in real life. This process must be carried out continuously so that students are trained and accustomed to improving collaborative skills (Trinova, 2013). To improve students' collaborative skills, collaborative learning is important and has domains such as contribution, time management, problem-solving, working with others, and investigative techniques (Mustaji, 2017). Indicators of Collaborative Skills, namely playing an active role in discussing in groups and contributing to providing ideas according to the topic when discussing. Complete assignments on time. Turn in assignments on time. Trying to find answers to problems Provide solutions from their ideas to solve problems. Listen to and respect the opinions of others. Helping others facilitate group work Look for various sources of information for problem-solving. Using various sources of information for problem-solving (Mustaji, 2017). For collaborative skills to be more optimal, students must choose a

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learning model that demands active, communicative, and independent involvement so that collaborative skills can be optimized properly (Teladaningsih *et al.,* 2019). Collaborative skills can be maximized by applying a learning model that follows Industrial Revolution 4.0. The station rotation model is used in this study to prove whether or not there is an effect on improving students' collaborative skills. Collaborative skills are an important educational outcome and are not only used as a medium for developing or assessing knowledge learned through engagement and practice(Child & Shaw, 2016). Greenstein also emphasized that collaborative skills are more than just cooperation because they involve planning and working together, considering other people's perspectives, and contributing to discussions on certain topics(Greenstein, 2012). In the station rotation model, there are collaborative activities and stations. In applying the Station Rotation model, students will be invited and encouraged to carry out collaborative learning activities. Therefore, in-depth research was carried out to prove that the application of the station rotation model (SRM) would improve students' collaborative skills.

METHODS

This study uses a quasi-experimental design involving eighth-grade students from two schools in Bojonegoro, East Java, Indonesia. The total number of participants was 120, divided equally between the experimental and control groups. The selection criteria for participants included enrollment in the blended learning program, class sizes of around 30 to 32 students, comparable learning facilities, A or at least B accreditation of the schools, and teachers holding a Bachelor of Science degree. Data collection involved tests and observations. The station rotation model was implemented in two variations: Station Rotation Model 1 (SRM 1) and Station Rotation Model 2 (SRM 2). Both models consisted of three learning activities: opening, rotating, and closing. SRM 1 involved assigning tasks through Google Classroom or personalized online instructions, group discussions using Google Drive or Independent and Collaborative Practice resources, and providing explanations through Google Meet or Teacher-Led (Group) Instruction. SRM 2 included providing explanations through Google Meet or Teacher-Led (Group) Instruction, assigning tasks through Google Classroom or personalized online instructions, and group discussions using Google Drive or Independent and Collaborative Practice resources. Data collection began with a pre-test to assess collaborative skills.

Table 1. Indicators of Collaborative Skills

Number	Domains	Indicators
1	Contribution	• Playing an active role in discussing in groups • Contributing to providing ideas according to the topic when discussing
2	Time management	• Complete assignments on time • Turn in assignments on time
3	Problem-solving	• Trying to find answers to problems • Provide solutions from their ideas to solve problems
4	Working with others	• Listen to and respect the opinions of others • Helping others facilitate group work
5	Investigative techniques	• Look for various sources of information for problem-solving • Using various sources of information for problem-solving

Then, the learning process was conducted based on a validated implementation plan for both the experimental and control groups. A post-test was administered to evaluate students' skill levels and measure the impact of the station rotation model. The experimental group received the same treatment as the control group. The collaborative skills instrument underwent content validity testing by an expert in Educational Technology. The results confirmed its suitability for use. Additionally, the instrument underwent construct validity testing and a reliability test.

RESULTS AND DISCUSSION

Based on calculations in Table 2, the average value of students' collaborative skills taught by station rotation model 1 in the experimental group is 36.649. The mean score for students' collaborative skills taught by station rotation model 2 in the control group is 34.644. The mean score for collaborative skills of students who are taught with station rotation model 1 is higher than that of students who are taught with station rotation model 2.

Table 2.The Average Value of the Station Rotation Model on Students' Collaborative Skills

Dependent Variable	Sta Rot Model	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Collaborative Skills	SRM 1	36.649	.422	35.813	37.485
	SRM 2	34.644	.477	33.699	35.589

The effect of the station rotation model on collaborative skills, based on the analysis of the test of between-subject effects, obtained a significance of 0.000 <0.050. It can be concluded that there is a significant influence of the station rotation model on students' collaborative skills. The Station Rotation Model incorporates both collaborative activities and stations, providing a framework for students to engage in collaborative learning. The aim is to enhance the collaborative skills of students with lower proficiency while allowing those with already proficient skills to further develop and refine their abilities in the context of learning activities. The findings of this study offer valuable insights into the effect of the Station Rotation Model on the collaborative skills of eighth-grade junior high school students in Bojonegoro. In the context of Industry 4.0, integrating technology into education has become increasingly important, and the Station Rotation Model, as a blended learning approach, shows promise in enhancing students' collaborative skills. The application of the Station Rotation Model aligns with the demands of the Industrial Revolution 4.0, where digitalization and technology play crucial roles. By incorporating online-based learning systems and technology-based stations, the Station Rotation Model promotes active, communicative, and independent student involvement. This engagement contributes to the development and optimization of collaborative skills, which are highly valued in the 21st-century workforce. Collaborative skills are essential for effective teamwork and problem-solving, making their cultivation through education of utmost importance. The Station Rotation Model offers a learning environment that fosters collaboration, providing opportunities for students to work together, contribute ideas, solve problems, and respect others' opinions. These activities align with the indicators of collaborative skills, including active participation in group discussions, timely completion of assignments, problem-solving abilities, and the ability to seek and use diverse sources

of information. The findings of this study support the notion that innovative learning models, such as the Station Rotation Model, have the potential to enhance students' collaborative skills. The incorporation of collaborative activities and stations in the model provides a structured framework for students to practice and develop their collaborative abilities. By actively involving students in the learning process and promoting collaboration, educators can better prepare students for the challenges of the digital era and the requirements of Industry 4.0. However, it is important to note that this study focused specifically on eighth-grade junior high school students in Bojonegoro. Further research is needed to explore the generalizability of the findings to different contexts and age groups. Additionally, the study's quasi-experimental design implies limitations in definitively establishing causal relationships. Future research could consider employing a randomized controlled trial design to further investigate the impact of the Station Rotation Model on collaborative skills.

Conclusion

In conclusion, this study provides valuable insights into the impact of the Station Rotation Model on the collaborative skills of eighth-grade junior high school students in Bojonegoro. The integration of technology into education, particularly in the era of Industry 4.0, is crucial, and the Station Rotation Model serves as a promising approach to enhancing students' collaborative skills. The findings demonstrate that students taught with the Station Rotation Model achieved higher average scores and displayed improved collaborative abilities compared to those taught with a different model. This research highlights the significance of innovative learning models, like the Station Rotation Model, in fostering collaboration, active participation, and problem-solving skills, which are highly valued in the 21st-century workforce. However, it is important to note that the study's scope was limited to eighth-grade students in Bojonegoro, and further research is necessary to explore the generalizability of the findings to different contexts and age groups. Additionally, the study's quasi-experimental design introduces limitations in establishing definitive causal relationships. Future studies could consider employing a randomized controlled trial design to further investigate the impact of the Station Rotation Model on collaborative skills. By continuously exploring and refining instructional approaches, teachers can better prepare students to meet the challenges of the digital era and the demands of Industry 4.0.

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