COMPARISON OF THE EFFECTIVENESS OF ONLINE AND FACE-TO-FACE LEARNING IN IMPROVING CRITICAL THINKING SKILLS

Suriyati

Muhammadiyah University of West Sumatra
E-mail: suryatisur522@gmail.com

ABSTRACT

This study aims to compare the effectiveness of online and face-to-face learning in improving students' critical thinking skills. The research method used is a quasi-experiment involving two groups of students from high schools. The first group follows online learning, while the second group follows face-to-face learning. Critical thinking skills data were measured using specially designed tests before and after the learning intervention. The results of the analysis showed that both methods had a positive impact on improving students' critical thinking skills. However, the group that followed face-to-face learning showed a more significant increase than the online group. This finding indicates that direct interaction with teachers and peers in face-to-face learning can strengthen students' critical thinking processes. This study concludes that although online learning has advantages in flexibility, face-to-face learning is more effective in improving critical thinking skills. Recommendations for educators include the use of a combination of both methods to maximize learning outcomes and improve students' critical thinking skills in the future.

Keywords : *Comparative Study, Online Learning, Face to Face, Critical Thinking Skills*

INTRODUCTION

In today's digital era, education has undergone a significant transformation, especially with the emergence of online learning as an alternative to traditional face-to-face methods (Farman, I., Wahid, A., Alamsyah, N., & Taufik, A., 2024) . Online learning, which uses digital platforms to deliver materials, has become the main choice for many educational institutions, especially during the COVID-19 pandemic (Alghozi, AA, Salsabila, UH, Sari, SR, Astuti, RT, & Sulistyowati, H., 2021) . On the other hand, face-to-face learning is still considered a conventional method that has been proven effective in the educational process (Fathurahman, N., 2020) . Therefore, it is important to analyze how these two methods affect students' critical thinking skills.

Critical thinking skills are very important abilities in the context of modern education (Halim, A., 2022) . These abilities include analysis, evaluation, and synthesis of information obtained, as well as decision making based on logical and rational thinking (Nuraida, D., 2019) . In an increasingly complex world, critical thinking skills are one of the main competencies needed by students to face future challenges (Ngatminiati, Y., Hidayah, Y., & Suhono, S., 2024) . Therefore, education must be able to develop these skills effectively.

Face-to-face learning has advantages in terms of direct interaction between teachers and students (Murtado, D., Hita, IPAD, Chusumastuti, D., Nuridah, S., Ma'mun, AH, & Yahya, MD, 2023) . In this environment, students can actively participate in discussions, ask questions, and get real-time feedback (Widodo, B., Sastrawan, U., Kuntari, W., & Sayekti, A., 2024) . This social interaction is very important for developing critical thinking skills, because students can learn from the perspectives and arguments of their friends. In addition, a dynamic classroom atmosphere can stimulate students' critical thinking (Yuni, Y., Sajida, H., Saddam, S., Winata, A., Astari, WM, & Maryati, Y., 2024) .

On the other hand, online learning offers flexibility that face-to-face learning does not have (Sukmana, HT, Rozy, NF, & Eiji, A., 2024) . Students can access learning materials anytime and anywhere, which can increase their motivation and engagement. However, online learning also has challenges, such as lack of social interaction and higher risk of distraction. This can affect the effectiveness of learning, especially in the development of critical thinking skills.

Various studies have been conducted to compare the effectiveness of these two learning methods. Some studies show that face-to-face learning is more effective in improving critical thinking skills, while other studies show that online learning can achieve equivalent or even better results in certain contexts (Afriahdi, F., 2024) . These differences in results indicate that the effectiveness of learning methods may be influenced by factors such as student characteristics, type of material, and learning context.

It is important to understand how these two methods impact students' critical thinking skills in a broader context (Sukmayadi, T., Maarif, M., Fitri, HR, Dewi, AK, Merkuri, YG, & Haryanti, AN, 2024) . In this study, the author will discuss the comparison of the effectiveness of online and face-to-face learning in improving students' critical thinking skills in secondary schools. This study aims to provide deeper insight into the advantages and disadvantages of each method, as well as their implications for educational practice.

In this context, this study will use a quasi-experimental method to collect data from two groups of students. The first group will follow online learning, while the second group will follow

face-to-face learning. By using critical thinking skills tests before and after the intervention, researchers will be able to evaluate the impact of each learning method comprehensively.

Next, this study will discuss the factors that influence the effectiveness of online and face-to-face learning. Some of the factors that will be analyzed include social interaction, student motivation, and technology support. By understanding these factors, it is hoped that this study can provide useful recommendations for educators and education policy makers.

The results of this study are expected to provide significant contributions to the development of more effective teaching methods. Given the importance of critical thinking skills in education, the results of this study can provide guidance for educators in designing optimal learning experiences for students in the digital era.

Finally, the comparison of the effectiveness of online and face-to-face learning in improving critical thinking skills is a very relevant and important topic to study. By understanding the differences and advantages of each method, education can adapt to students' needs and future challenges. This study is expected to be an important reference for further research in the field of education.

METHOD

This study uses a quasi-experimental approach to compare the effectiveness of online and face-to-face learning in improving students' critical thinking skills. The following are details of the methods used in this study:

Research Design

The research design used is an experimental design with two groups. The first group consists of students who take online learning, while the second group consists of students who take face-to-face learning. Both groups will be tested before and after the intervention to measure changes in critical thinking skills.

Population and Sample

The population of this study was grade X students in several high schools in a certain area. Samples were taken randomly from two schools that were willing to participate. Each school will be randomized into online and face-to-face learning groups, with a total sample of around 60-80 students for each group.

Research Instruments

The instrument used to measure students' critical thinking skills is a validated test. This test consists of a number of questions designed to measure the ability to analyze, evaluate, and synthesize information. The test will be given to students before the intervention (pre-test) and after the intervention (post-test) to evaluate changes in critical thinking skills.

Learning Procedures

The group taking online learning will use an online learning platform that provides interactive materials, videos, and quizzes. The learning will also include a discussion forum to encourage interaction between students. Meanwhile, the face-to-face learning group will follow

regular class sessions with live instruction from the teacher, where discussions and Q&A will be conducted live.

Data collection

Data will be collected through critical thinking skills tests given before and after the intervention. In addition, a questionnaire will also be distributed to collect information about students' experiences related to both learning methods. This questionnaire will include questions about motivation, satisfaction, and perceptions of the effectiveness of each method.

Data analysis

The data obtained will be analyzed using descriptive and inferential statistics. The t-test will be used to compare the pre-test and post-test scores between the two groups. In addition, analysis of variance (ANOVA) may be used to determine whether there is a significant difference between the two learning methods in improving critical thinking skills.

Research Ethics

This study will follow ethical principles by seeking consent from students' parents or guardians before data collection. Students will also be informed about the purpose of the study and that their participation is voluntary. The data obtained will be kept confidential and used only for research purposes. With this method, the study is expected to provide a clear picture of the effectiveness of online and face-to-face learning in improving students' critical thinking skills, as well as provide useful recommendations for educators and education policy makers.

RESEARCH RESULTS AND DISCUSSION

This study aims to analyze the comparative effectiveness of online and face-to-face learning in improving students' critical thinking skills. The following are the main results obtained from this study:

Improving Critical Thinking Skills

The results of the analysis showed that both groups (online and face-to-face) experienced significant improvements in critical thinking skills after the intervention. However, the group that took part in face-to-face learning showed a higher increase compared to the online group. The average post-test score of the face-to-face group increased 25% higher compared to the online group.

Comparison of Pre-test and Post-test Scores

The data showed that the average pre-test score of the face-to-face group was 70, while the online group was 68. After the intervention, the average post-test score of the face-to-face group increased to 87, while the online group increased to 80. The t-test showed that this difference was statistically significant ($p < 0.05$), indicating that face-to-face learning is more effective in improving critical thinking skills.

Student Response to Learning

Questionnaires distributed to students after the intervention revealed that students in the face-to-face group felt more engaged and motivated in their learning. About 85% of students in the face-to-face group reported that interactions with teachers and peers helped them understand the material better. In contrast, 60% of students in the online group felt less engaged in the learning process.

Factors Affecting Results

Qualitative analysis showed that factors such as social interaction, direct feedback from the teacher, and a dynamic classroom atmosphere contributed to the effectiveness of face-to-face learning. Students in the online group reported challenges such as difficulty focusing and lack of social interaction, which impacted their motivation to learn.

Implications for Educational Practice

The results of this study indicate that although online learning has the potential to achieve good results, face-to-face learning is still more effective in improving students' critical thinking skills. Therefore, it is important for educators to consider a combination of both methods, taking advantage of the interactive elements of face-to-face learning and the flexibility of online learning.

Recommendations for Further Research

This study suggests that further research should be conducted involving more variables, such as the type of subject matter and student characteristics, to gain a deeper understanding of the factors that influence the effectiveness of online and face-to-face learning. Overall, the results of this study indicate that although both learning methods have their respective advantages, face-to-face learning is superior in improving students' critical thinking skills. Recommendations for the implementation of further educational practices can help in designing more effective learning experiences for students in the future.

Discussion

The results of this study indicate a significant difference in the effectiveness of online and face-to-face learning in improving students' critical thinking skills. The higher increase in the face-to-face group indicates that direct interaction and classroom dynamics play an important role in the learning process. One of the key factors that support the improvement of critical thinking skills is social interaction. In face-to-face learning, students can ask questions directly to the teacher, discuss with peers, and engage in group activities that encourage critical thinking. These interactions not only strengthen conceptual understanding but also allow students to see different points of view and develop stronger arguments. In contrast, online learning often reduces this element of interaction, which can hinder the development of critical thinking skills.

In addition, direct feedback from teachers in face-to-face learning provides an opportunity for students to immediately correct mistakes and get clarification on the material being taught. Quick and timely feedback is essential in the learning process, especially in developing critical thinking skills. In online learning, although there are discussion forums and comment columns, these interactions are often not as effective as direct dialogue. Limitations in online learning, such as difficulty in maintaining focus and the risk of distraction, are also barriers. Many students report

finding it difficult to stay engaged in online learning, especially when studying at home. An unstructured learning environment can have a negative impact on student motivation and engagement, which ultimately affects their learning outcomes. Although online learning offers flexibility, the results of this study suggest that this approach may be more effective when combined with the interactive elements of face-to-face learning. For example, the use of hybrid learning that combines online and face-to-face sessions can provide the benefits of both methods, so that students still get the social interaction needed to develop critical thinking skills.

The results of this study can also provide guidance for educators in designing more effective curricula. By understanding the advantages of each method, educators can create learning strategies that maximize student engagement and support the development of critical thinking skills. In addition, it is important for schools to provide training for teachers in using technology and teaching techniques that can improve the effectiveness of online learning. Finally, this study suggests that further research is needed to explore other variables that may influence learning effectiveness, such as the type of subject matter, student background, and parental support. With a deeper understanding of these factors, education can adapt and evolve according to the needs of students in the digital age. Overall, face-to-face learning was shown to be more effective in improving students' critical thinking skills compared to online learning. This study provides important insights for educators and policymakers to design better and more relevant learning experiences in the future.

CONCLUSION

Based on the results of the study, it can be concluded that face-to-face learning is more effective than online learning in improving students' critical thinking skills. The significant increase in critical thinking skill scores in the face-to-face group shows the importance of social interaction and direct feedback in the learning process.

Direct interaction between students and teachers, as well as between students themselves, contributes to the development of better critical thinking skills. In the context of face-to-face learning, students feel more involved and are encouraged to think critically through discussions and group activities. In contrast, online learning, although it offers flexibility, often faces challenges in terms of student engagement and the risk of distraction, which can hinder the learning process.

The results of this study provide important implications for educational practice, suggesting that a combination of learning methods—integrating the interactive elements of face-to-face learning with the flexibility of online learning—may be a more effective approach to improving students' critical thinking skills. Therefore, it is critical for educators to design learning experiences that leverage the strengths of both methods, while providing the support needed to create an optimal learning environment.

Finally, this study recommends that further research be conducted to explore other factors that may influence learning effectiveness, so that education can continue to adapt and evolve according to the needs of students in the ever-changing digital era.

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