FACE-TO-FACE MODE VS. ONLINE MODE: A DISCREPANCY IN ANALOGY-BASED LEARNING DURING COVID-19 PANDEMIC

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ABSTRACT

Reasoning skill is crucial for students to translate the learning material provided by the teacher in online mode during the COVID-19 pandemic. Many teachers choose analogy-based learning to explain a concept by bringing the concept to facts that are close to students' daily lives. Analogy-based learning that was carried out face-to-face before the pandemic improved students' reasoning skills, and now its implementation is tested in online mode. The study aims to analyze differences in reasoning skills in each indicator area and their factors. A significant difference was obtained by involving 72 students and doing a t-test for two data groups in the two sample groups. Students' skills to identify problems and apply concepts have increased even though it is not as good as the increase in both aspects on face-to-face mode. The other two aspects (exploring the facts and concluding) are very unsatisfactory. There is a striking discrepancy between analogy-based learning during and before the pandemic with an unchanged syntax but different situations. The reduction in each reasoning indicator ranged from 10% to 25%. Signal constraints, a less supportive learning environment, and delayed communication between teachers and students are the main factors. This study provides an overview of discrepancies that can be addressed more wisely by strengthening the function of the media to optimize teacher and students communication and learning innovations that help students' learning difficulties during the pandemic.

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Keywords: analogy-based learning; COVID-19 pandemic; face-to-face learning; online learning; reasoning skill

INTRODUCTION

Indonesia is currently struggling with the COVID-19 outbreak and the spread of the virus. For that reason, the government implements social distancing. The implementation of this policy impacts society, one of which is in the field of education. Based on Circular Letter Number 4 of 2020 regarding the Implementation of Education activities in the COVID-19 Emergency Period, the Minister of Education and Culture urges to replace face-to-face learning in schools with online distance learning at home. This issue was following Adedoyin & Soykan's (2020) findings, which stated a need for instructional technology when researchers begin to look for short-term and long-term solutions to threats by COVID-19. The most suitable option is distance learning. It allows us to take advantage of the sudden increase in participants from online learning as an opportunity to provide innovations to meet the latest challenges of online learning.

Another challenge in conducting online learning is the absence of face-to-face interaction. Teachers' lack of technical skills and the inability to solve technology-related problems during online classes can impact students' access to learning materials. The sudden change in teaching methods pushes teachers to use various tools and platforms they are not ready to use. Hence, they do not know how to use technology and interact with students efficiently (Khlaif et al., 2021). In

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addition, online teaching requires good interaction and communication between teachers and students in emails, chatrooms, question and answer sessions in online classes, or feedback (Rahayu et al., 2021). It is essential to reflect on how exactly online education describes this crisis. Vlachopoulos (2020) revealed that many online education researchers and practitioners viewed the COVID-19 crisis as a unique opportunity to support students and schools by filling gaps left by conventional (face-to-face) education. Indeed, online education has some advantages. At least it allows educators and students to continue teaching and learning from any location without interruption.

Optimizing learning, however, require better knowledge of specific techniques and students' needs. Experimental studies that break down assignments into multiple tasks will enhance findings of the importance of course design (Clem & Junco, 2015). In science learning, the same challenges also occur. Students are trained to master concepts, practice, and solve problems related to concepts in everyday life. A strategy needed to achieve this goal is by dividing tasks in a structured manner and linking concepts to one another so that students can clearly understand the concept. The specific science learning purpose is to understand and know the relationship between a problem, solution, or other representation (Richland & Begolli, 2016). In understanding concepts and solving problems, students need good reasoning skills. Reasoning skills can affect problem-solving skills, so students need to have them (Robbins, 2011; Safaruddin et al., 2020).

Fitriani (2017), in her research, found that students who have high reasoning skills can solve various problems even though they have undergone modifications in various forms. Failure to understand a concept can cause students to be hampered by the following material. As in physics lessons, a branch of natural science is often difficult because students are more likely to memorize formulas than understand concepts. It is also revealed by Azizah et al. (2016) that in answering physics problems, students tend to only use mathematical equations without doing analysis, guessing formulas, or memorizing sample questions to solve other questions. It appears that students still have not optimized their reasoning skills. They only copy and paste problem-solving patterns without understanding the meaning of the problem-solving process and its underlying concepts. According to Demir et al. (2018), reasoning is described as the process of inferring from results, judgments, truths, or statements and confirming them. Based on this opinion and research findings, further efforts are needed to allow students to ensure the correctness of their answers in the context of the problem.

One learning method that can help students understand concepts is to use an analogy (Ugur et al., 2012). An analogy can explain some difficult concepts with conventional methods (Genc, 2013). Otherwise, based on Piaget's stages of cognitive development, tenth-grade high school students aged 15 years are included in the formal operational development stage (Ahmad et al., 2016). At this stage, students can use reasoning to solve a problem and combine various ideas or knowledge to understand something new (Lefa, 2014), making it suitable for applying analogy-based learning. An analogy is included in inductive reasoning. It is reasoning a phenomenon with other similar phenomena (Hajar & Budi, 2014). An analogy is also part of higher-order thinking, which involves prior knowledge to make conclusions and solve a problem (Richland & Simms, 2015). An analogy is a process of understanding and using the similarities between two events to conclude these similarities (Gentner & Smith, 2018). It can be concluded that analogy is suitable for learning physics because students will find it easier to understand a concept based on concepts that have been studied previously. Through a good understanding of concepts, it is hoped that students' reasoning skills can improve.

The implementation of analogy-based learning carried out face to face has been proven to train reasoning skills (Guerra-ramos, 2011; Genc, 2013) and improve students' conceptual understanding (Hasanah, 2012; Hajar & Budi, 2014). Analogy-based learning has a positive influence on improving students' learning outcomes. Analogy-based learning can be used as an alternative in learning physics, especially for students who have difficulty understanding new teaching materials but have a similar plot to the previous material (Hasanah, 2012). Desiana et al. (2019) also found that using analogy-based learning can improve students' skills in each stage of analogy in problem-solving. They explained further that the teacher could use reference concept mapping and target concept mapping to train students' analogy skills. The strategy will be optimal if the teacher can guide students with analogies following the concepts discussed.

The intensive interaction between teachers and students is one of the supporting factors for successful analogy-based learning implementation. However, what if it is done in an online mode during a pandemic? Will it still be effective, or will it show significant discrepancy? There is

a gap between online and face-to-face learning. Compared to regular face-to-face learning, online or distance learning is characterized by greater flexibility in scheduling, opportunities to individualize the learning process, the potential to improve self-study skills, and easy distribution of information (Pelikan et al., 2021). However, they explained the potential advantages and disadvantages of switching the system, especially for younger students. They are convinced that it is a big challenge because distance learning requires greater flexibility available. It places high demands on the students' skills to organize their learning and motivation, and thus it poses an increased risk of passive procrastination.

This assumption occurs since learning at home during the COVID-19 pandemic is fraught with problems. Limited access to learning, lack of guidance, and students' concentration while studying inhibit the optimal achievement of learning objectives. Similar data were also reported by Abdullah et al. (2021) that when online learning occurs, there are many reports of internet network errors experienced by students and teachers. Such conditions significantly affect learning outcomes. Moreover, the atmosphere of students studying at home is influenced by their home environment and psychological factors. This study aims to analyze the difference in the effect of the implementation of analogy-based physics learning through face-to-face and online learning on students' reasoning skills. This research is limited to the comparison of reasoning skills as a result of physics learning using analogies.

METHODS

A mixed-methods approach (Herodotou et al., 2020), consisting of measurements using a reasoning skills test and a response questionnaire, was used for the data collection with modification. The modification is used to eliminate qualitative measurements during the learning process because it was carried out online and by the school. The duration of online, face-to-face meetings is limited due to limited students' mobile data. Another distinguishing aspect is that at the analysis stage in mixed-method research, the analysis of achievement data compares analogy-based learning outcomes in face-to-face mode with the same learning model but in online mode.

A total of 72 students were involved in this study. This research is a tiered study, with 36 students who received face-to-face analogy-based learning before the pandemic and 36 receiving the same learning during the pandemic. This research was conducted in the same school and

by the same teacher. The material presented is not much different, only packaged more densely regarding the lesson hours from the school. However, additional activities are provided to meet the lesson hours students can access after online learning. The factors that differentiate between the two groups of research subjects are the face-to-face duration and assessment methods. During a pandemic, schools provide opportunities for teachers to do virtual face-to-face learning for 45-60 minutes. Students are given assignments to fulfil the total lesson hours. The second distinguishing factor is the assessment aspect. Before the pandemic, the teacher could carry out a cognitive assessment using a written test. Because of the pandemic, the teacher used the Google Form to test students' reasoning skills. The research design is presented in Table 1.

Table 1. Research Design

O1	X1	O2
Control Class pretest	Treatment (Face-to-Face Analogy-Based Physics Learning)	Control Class posttest
O3	**X2**	**O4**
Experiment Class pretest	Treatment (Online Analogy-Based Physics Learning)	Experiment Class posttest

The measurement of reasoning skills can be used to understand logical thinking skills and encourage teachers to modify the structure and instructional design strategies to improve or enhance their problem-solving skills (Kenneth & Andrew, 2019). This concept is applied in this research by using rectilinear motion material as the basis for measuring reasoning skills. It means that the focus of measurement is on students' initial reasoning indicators before the intervention is carried out. Rectilinear motion material is the basis for identifying and using it to carry out logical thinking in solving problems.

Racharak et al. (2019) stated that analogical reasoning is a complex process based on comparisons between two pairs of concepts or states (i.e., source and target) that share some common features. This comparison is the basis of a particular type of inference and can be described as the similarity between two cases. These cases could be two different cases 'concept' or 'state.' In this research, the concept used as the subject in this study is circular motion material chosen because it has a similar concept to rectilinear motion. So, to deliver the concept of circular motion, a rectilinear motion analogy can be used. The analogy-based learning syntax adapts the syntax proposed

by Cansiz et al. (2020) and is applied during face-to-face and online learning, which does not differ except for duration. This syntax includes the stages of introducing the target concept, reminding students of analog concepts, identifying relevant analog features and goals, objectives, identifying similarities between analogies and the target, showing where the analogy breaks, and concluding goals that were modified as in Table 2.

Table 2. Analogy-Based Learning Syntax

Syntax	Activities
Introduce the target concept	The target concept is a concept that will be achieved in analogy-based learning. Students are introduced to the concept of physical quantities in a circular motion with constant velocity and constant acceleration. It can help students in exploring the facts that are known in the questions
Review the concept of sources	The source concept has been previously studied and is used as a basis for learning the target concept. In this case, the source concept used is rectilinear motion because it is like circular motion. For example, when determining the angular position in a circular motion ($\theta = \omega t$), students can review when looking for distances in rectilinear motion ($s = vt$).
Look for things that are relevant between the source concept and the target concept	Students identify things that are relevant between rectilinear motion and circular motion. It can train students' reasoning skills because students need to identify both.
Determine the similarity of the source concept and target concept	The concepts to find relevant things. For example, determining the velocity in a circular motion is the same as finding the velocity in a rectilinear motion ($v = s/t$). However, the distance traveled in a circular motion is in the circle circumference because the path is circular. So, the mathematical equation is $v = 2\pi r/T = \omega.r$.
Draw conclusions about target concepts	After students find relevant things between circular and rectilinear motion, students can determine the similarities between the two concepts. For example, the similarity between acceleration (a) in rectilinear motion and angular acceleration (α) in a circular motion is that it is affected by an angle in a circular motion, while in rectilinear motion, it is not.

The reasoning indicators measured were the skills to explore facts, the skills to identify problems, the skills to apply concepts, and the skills to conclude. The instrument used has been tested for reliability. In this study, the reliability test was carried out with the help of SPSS 21, using the Cronbach Alpha method. If the alpha value is getting closer to one, then the level of reliability of the questions will be higher, as shown in Table 3.

Table 3. Reliability Test for Pretest and Posttest Instruments

Instruments	Cronbach Alpha	Criteria
Pre-test	0.84	Reliable
Post-test	0.83	Reliable

The data analysis technique used a simple linear regression, N-gain, and paired sample t-test, preceded by normality and linearity tests. After the data was collected, a normality test was carried out. It aims to determine the distribution of the variables with a normal curve or not. If it is normally distributed, then the parametric statistical analysis technique can be used. The normality test used in this study was the Kolmogorov-Smirnov test for one sample and was calculated using the SPSS 21 program. The normality test was carried out by assessing 2-tailed significance with a significance level of 5%. The decision of distribution is said to be normal from the level of significance or probability p. The data is normal if the Asymp value. Sig. (2-tailed) is greater than 0.05 (Ghozali, 2016). The linearity test serves to determine the relationship between the independent variable and the dependent variable. After conducting the prerequisite analysis test, hypothesis testing was carried out using the paired sample t-test to determine differences in students' reasoning skills before and after treatment. The results of the N-gain analysis (Hake, 1998) can show the effectiveness of applying analogy-based physics learning to improve students' reasoning skills. Analysis of the achievement of each indicator of reasoning skills in analogy-based learning with face-to-face mode compared to online mode will provide an overview of discrepancies.

RESULTS AND DISCUSSION

Based on the data generated from the One-Sample Kolmogorov-Smirnov test using SPSS 21, it can be concluded that the pretest and posttest data on face-to-face and online learning are normally distributed. The result is shown in the Asymp. Sig (2-tailed) value of both data is more than 0.05, as seen in Table 4.

Table 4. Normality Test of Face-to-face and Online Learning Mode

Data	Kolmogorov-Smirnov Scores		Summary
	Face-to-face Class	Online Class	
Pre-test	0.119	0.482	Normal
Post-test	0.059	0.226	Normal

The paired sample t-test as a linearity test analysis for the experimental class showed a Sig. 2-tailed value of 0.000 where this value is smaller than 0.05, which means a difference between students' reasoning skills before and after analogy-based learning is applied as shown in Table 5.

Table 5. Paired Difference Pretest Posttest of Experimental Class

	Mean	Std. Devia-tion	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 Pretest-Posttest	-17.278	9.933	1.655	-20.639	-13.917	-10.437	35	0.000

From the different tests, paired sample t-test in the experimental class has a smaller t-test value (-10.473) than the t-test value of the control class (-19.531) as can be seen in the Table 6. This data explains that the analogy-based learning model increases reasoning skills in the control class than in the experimental class.

Table 6. Paired Difference Pretest Posttest of Control Class

	Mean	Std. Devia-tion	Std. Error Mean	95% Confidence Interval of the Difference		t	df	Sig. (2-tailed)
				Lower	Upper			
Pair 1 Pretest-Posttest	--48.349	14.853	2.475	-53.374	-43.323	-19.531	35	0.000

In general, the implementation of analogy-based learning can improve students' reasoning skills because of the relationship between analogy and reasoning. Since analogy is part of the reasoning, the teacher automatically trains students' reasoning skills when applying analogy in learning. In addition, reasoning skills can also improve learning outcomes in physics (Markawi, 2013). It concludes that if reasoning skills increase, the students' skills to solve problems will also increase, improving students' learning outcomes. The statement is under the results obtained in this study, where the average value of the posttest results was higher than the students' pretest results.

In this study, in carrying out analogy-based learning, the concept of rectilinear motion was used as the source and circular motion as the target concept. Comparing the source concept and the target concept shows that using metaphorical interpretation can minimize the analogy process. Using analogy-based learning makes it easier for students to use the source concept to understand the target concept. It also refers to the opinion of Fischer (2017) that philosophically influential introspective conceptions of the mind can be derived from conceptual metaphors through analogies. However, let us look at the opinion of Salta et al. (2021) that the interaction gap upon adoption of an online (distance) learning scheme, teachers should undertake action to maintain their communication, collaboration, and personal interaction with their students. It seems that this is the main cause of discrepancies in students' learning achievement. Figure 1 shows the percentage increase in results from pretest to posttest in face-to-face and online learning.
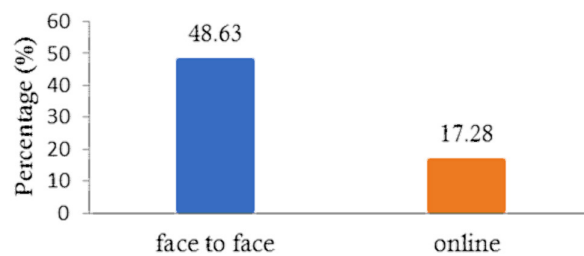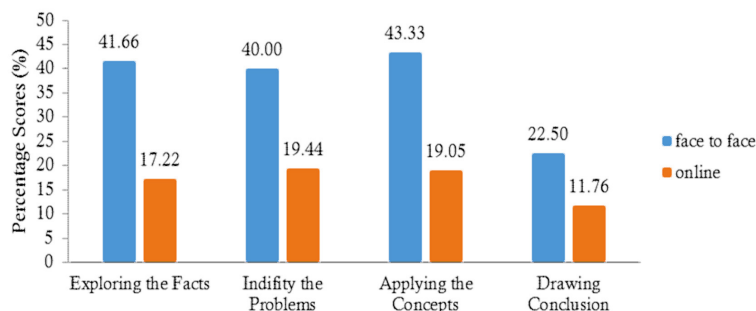
Figure 1. Improvement of Face-to-face and Online Learning Outcomes

The students' pretest and posttest results in face-to-face learning are higher than in online learning, with 31.16% differences. An N-gain analysis was carried out to investigate the significance of this difference in achievement. This analysis is intended to examine the effectiveness of analogy-based physics learning in improving students' reasoning skills. The N-gain value in face-to-face learning is 0.83, which is included in the high criteria. Meanwhile, the N-gain value in online learning is 0.60, which is included in the moderate criteria. It appears that there is an increase in skills in both groups, which can be seen from the increase in pretest and posttest scores. However, the calculation results show that the average N-gain value for face-to-face learning is 0.23 higher than the N-gain value for online learning. It can be inferred that the face-to-face implementation of analogy-based physics learning is more effective in improving students' reasoning skills than online learning.

Findings from previous research suggest that non-propositional instructions presented by analogy may be less cognitively demanding than explicitly presented instructions. Processing analogous instructions presented as visual representations primarily contain a visuospatial working memory rather than a phonological component (Tse et al., 2016). It has implications for communication barriers between teachers and students when carrying out online learning with an analogy-based approach when there is a pause in understanding between teachers and students. It is emphasized by Yeo (2014) that new technologies allow a shift in the level of delivery of old, literate pedagogies, and old technologies are augmented but not completely replaced. It means that effective communication of analogy-based learning during face-to-face cannot be completely replaced in online learning. It can be seen in the achievements of each indicator of reasoning skills in the pretest and posttest to find out more about the discrepancy that occurs in analogy-based learning with these two modes. Figure 2 is the summary of the improvement in each indicator of students' reasoning skills.

Figure 2. Improvement of Reasoning Skills in Face-to-face vs. Online Mode

The skills to explore the facts are trained through analogy learning syntax when introducing the target concept. The results showed that students were generally not satisfied with online learning. They were explicitly dissatisfied with the way of communication and question-and-answer activities during the learning process. Effective communication is one of the most important elements of successful online learning (Tang et al., 2020). They emphasize that learning is a social activity reinforced when a teacher carefully facilitates instruction. When the teacher explains the circular motion material, students can explore physical quantities in a circular motion (i.e., period, frequency, angular position, angular velocity, and others) through simulation. This strategy makes students feel familiar when they find these quantities in the problem and write them down

mathematically to help them explore what is known. However, students experience confusion when the variable is not stated explicitly but with a phenomenon that describes the variable. Understanding context and relating it to the related variables is still an obstacle. Although it happens in face-to-face classes, it is not as severe as in online classes. The same aspect is explained by Alant (2004) that in a cognitive perspective, familiarity in problem-solving assumes that students use a particular set of heuristics as a memory problem. It is rare to be seen as a factor in students' conceptual understanding of the subject.

Second, the skills to identify problems are seen when encountering a problem that cannot be worked on immediately. As revealed by Bronkhorst et al. (2020), good reasoning skills will assist students in selecting and interpreting information from a particular context, making connections, verifying and drawing conclusions based on the information provided, and interpreting and relating rules and processes. For example, students must convert the units first or calculate another physical quantity to find a particular physical quantity as determined in the question. This skill is trained through analogy learning syntax when looking for relevant things between the source and target concepts. Students can identify relevant things between rectilinear motion and circular motion, which is done by identifying their meaning, physical quantities, and existing mathematical equations. From the answers, students cannot complete calculations and tend to memorize equations without understanding their meaning. It is resonant with the findings of Heppen et al. (2016), who reveal the importance of providing some critical warnings about providing online learning for at-risk, generally low-achieving students, especially relatively rigorous courses content and, in terms of a bit of opportunity to improve if students have learning difficulties.

Third, the skills to apply physics concepts increases because, in the analogy-based learning process, one stage invites students to review the reference concept from the previous chapter, the rectilinear motion material. The source concept is the basis used as an analogy to understand the target concept. It is strengthened by Barbot et al. (2019) that reasoning by analogy plays a vital role in human thinking in exploring parallels between situations. It allows us to explain by comparing, drawing reasonable conclusions, or creating new devices or concepts by changing old ones in new contexts. Therefore, the teacher needs to review the source concept to find out students' prerequisite knowledge so that misconceptions can be revealed and not carried over to the next concept. If the source concept is well understood, students can also make an analogy to the concept of the target.

Through analogy learning, students are trained to determine the relationship between a concept and other concepts. For example, finding velocity in rectilinear motion is the distance traveled at any time or $v = s/t$. It is the same as when looking for velocity in a circular motion, but the path where there is a circular motion is circular, then the distance traveled is as considerable as the circumference of the circle or $2\pi r$ so that it can be written $v = 2\pi r/T$. So, analogy-based learning can help students understand newly learned concepts through previously learned concepts. This point of view follows Maharaj & Sharma's (2015) findings that selected analogies used for a particular topic may not produce the same learning experience for all students because of prior knowledge, social background, or cultural context.

Fourth, an increase in the skills to conclude is supported by an analogy-based learning syntax, looking for linkages and mapping the similarities between the source concept and the target concept. It can train students to conclude the similarity of a material they have learned to apply to newly learned material, such as using rectilinear motion topics as an analogy to understand circular motion material. Learning and making inferences based on relations is central to intelligence, underlying the distinctively human skills to reason by analogy across different situations. The increase in the skills to conclude through face-to-face learning is more remarkable than through online learning. Based on these findings, displaying the circular motion phenomenon and showing the analogy process of rectilinear motion seems to be a more suitable medium to show its similarity. All findings reinforce Nemetz et al. (2017) that students' involvement in learning is an essential part of a learning process. They emphasized that a teacher has a vital role in breaking down material into manageable parts and creating activities that match its delivery. It means that teacher management skills to manage the classroom become crucial for students' learning success. This statement is in line with the opinion of Kennedy & Archambault (2012) that online education at the secondary school level is not presented as something that will completely replace traditional face-to-face learning, but an education system that can incorporate mixed and hybrid learning models, incorporating face-to-face activities into online learning.

Further review of students' perspectives on their experience in the learning process was done by questionnaire. The questionnaire aims to find out the students' responses to analogy-based physics learning. Figure 3 provides data of the students' responses recapitulation percentage from questionnaires. This study explores four aspects: attitudes, interests, attractiveness of media presentations, ease of understanding topic presentations with analogy learning.
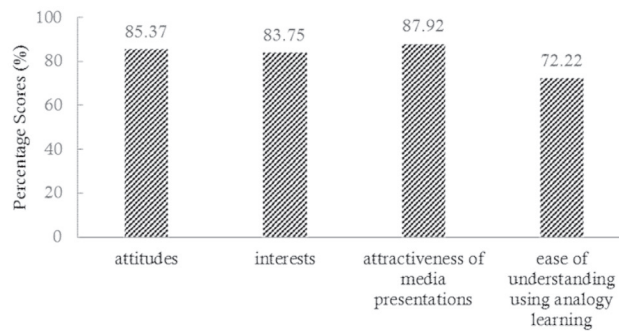
Figure 3. Students' Interest in Analogy-Based Learning

The percentage of students' responses to the first aspect is shown from one of the indicators, students' activeness during learning. Students seem very enthusiastic in answering questions. In addition, positive responses were also shown during discussion activities regarding sources and target concepts in analogy-based learning. In the second aspect, students' interest in studying physics increases with analogy-based learning. Students feel motivated to understand a concept through the analogy they learn. The interest and motivation that arises in students significantly contribute to students' learning outcomes, as seen in the increase in students' posttest results. The third aspect is the highest percentage. It means that students find it easier to understand the concept of circular motion through the concept of rectilinear motion. With the implementation of analogy-based physics learning, students' reasoning skills increase to find it easier to understand a concept. It is shown in the results of the students' posttest, which showed an increase in the third indicator of students' reasoning skills, the skills to apply physics concepts. The percentage of the fourth shows that students feel capable of applying analogies in learning physics. According to students, the similarity between rectilinear and circular motion material makes it easier to apply analogy. This convenience can be felt because of the close similarity between the source concept and the target concept. The closer the similarities are, the easier it is for students to understand. It is undeniable that even though teachers feel optimal in conveying concepts in learning, it takes time to adjust to the drastically changing situation during the pandemic.

Ssenkusu et al. (2021) stated that CO-VID-19 exposed the weaknesses of the traditional education system, which is anchored in a linear input-output model. Educational challenges and sometimes failure institutions, teachers, parents, and students to continue the learning process during the COVID-19 pandemic. COVID-19 practically disrupts the school system while presenting a serious challenge to traditional education systems and has ushered in new

hope for holistic teaching and learning. According to Grover et al. (2017), efforts that can be made are acknowledging shortcomings as educators, letting students admit their own shortcomings flaws, and willingly asking for ideas to solve them. These practices will help build on their community, inform teaching, and increase shared knowledge of effective online teaching methods and practice.

CONCLUSION

The implementation of analogy-based physics learning offline is more effective than online. It is indicated by the N-gain value in face-to-face learning, 0.83 (high criteria), while the N-gain value in online learning is 0.60 (moderate criteria). There are differences in the implementation of analogy-based physics learning through face-to-face and online to increase reasoning skills. Analogy-based learning implemented in this study has limitations because not all materials can be analogous. Therefore, the teacher needs to explain the extent to which the analogy can be used in a lesson, as in some events occur in circular motion but not in rectilinear motion. Not all material in a circular motion can be explained using the kinematics analogy of straight motion. For example, the wheel-wheels relationship only occurs in a circular motion; centripetal acceleration occurs at constant angular velocity or in a regular circular motion, unlike the acceleration in rectilinear motion, which occurs due to a change in velocity or non-rectilinear motion. The direction of linear velocity in a circular motion is constantly changing. It is perpendicular to the radius or in the direction of the tangent to the circle, unlike linear velocity in rectilinear motion, where the direction is permanently fixed. The analogy-based learning model is evidence of the discrepancy in the application of the learning model during the pandemic. The interaction of teachers and students in the analogy-based learning model

that occurs intensely in the face-to-face mode still cannot be represented by communication technology in the online mode. Constraints on students' facilities and opportunities to explore their skills are the responsibility of all stakeholders involved to provide innovations and online learning strategies that are more student-friendly in the new normal era.

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