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Distance Learning Experience: Unleashing the Power of Peardeck for Post-Pandemic Education

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Abstract: Pear Deck is one of the tools for presenting web-based online slides. This research was implemented on 26 preservice science teachers who have heterogeneous thinking skills. This research examined the improvement of preservice science teachers' learning outcomes through interactive online learning using Pear Deck after the pandemic era. The instruments used were written tests that were given twice before and after learning. This research was a pre-experimental design including pre-test and post-test design. Data earned was then analysed using an N-gain score and paired t-test but normality and homogeneity test was conducted before it. Data is said to be normally distributed if the Lcount < Ltab, and is said to be homogeneous if the Fcount < Ftab. There was a significant difference between learning outcomes before and after treatment if tcount < ttab. with $\alpha = 0.05$. Learning with Pear Deck increases the average preservice science teacher's score. the data were normally distributed, and then a homogeneity test was conducted with the result Fcount = 1.204 and Ftable = 1.955. Which means that Fcount < Ftable. The data were stated as homogenous. Pear Deck has a significant effect on the improvement of preservice science teacher's learning outcomes. This is proven by the majority of students having high N-gain scores through their improvement on their test before (pretest) and after (posttest) learning. 77.78% of preservice science teacher also belonged to moderate-high increases in their scores. Results of the T-test concluded that tcount=23.10>ttable=2.06 means that H0 was rejected. So, the use of Pear Deck in distance learning had a significant effect on improving preservice science teacher's learning outcomes.

Keywords: Distance learning; Interactive Learning; Peardeck; Post-pandemic.

Introduction

Acute respiratory syndrome caused by SARSCoV-2 is a coronavirus that attacks humans, It was discovered in Wuhan, Hubei province, China, in January 2020 [1]. In essence, SARSCov-2 is a virus made of single-stranded RNA. The spikes protein, which is mushroom-shaped and protrudes from the surface of the spherical SARS-CoV-2 virus particles, gives them a crown-like look. that the virus can enter human cells because the spikes bind to them [2]. This virus impacts many global sectors. The World Health Organization defines coronavirus illness (COVID-19) as an infectious disease caused by a recently identified coronavirus. As stated by the WHO, the COVID-19 virus produces a mild to severe respiratory infection that can be treated without special help. The chance of developing a serious illness and passing away is increased among older persons and those with underlying medical conditions such as diabetes, cardiovascular disease, chronic lung disease, and cancer [3].

SARCov-2 which caused Covid-19 has had many impacts in some sectors such as health, tourism, economy, social life, education, etc since the lockdown policy was implemented by almost all countries [4]. This situation also led to school closure [5], [6]. The education system was forced to look for alternative teaching and learning processes by the Covid-19 [7]. School, colleges and universities closed their campuses and shifted to online courses. These online courses made several countries face many gaps and obstacles[8]. This also has many impacts on their psychological and behavioural changes [9]–[11]. Two problems exist with online learning. First, there is virtually little research on the outcomes and effectiveness of online learning itself and second, depending on the many different learning objectives that direct instructional and educational priorities, the ability to properly teach digitally is likely to vary [12]. In Addition, monotonous learning methods and media make students less interested in online learning. Another significant issue with online learning is the lack of appropriate teacher and student interaction. Students in Pakistan, students stated that online learning made them less motivated to learn due to minimal interaction with teachers which made learning ineffective[13]. The findings of this study also suggested that educational institutions needed to update their curriculum and create relevant online lecture content. Student involvement by focusing on the online courses that university students were enrolled in. The findings indicate that taking more online classes has less participation in learning activities [14].

The success of online learning may be influenced by a variety of elements, including technological characteristics, user-friendly online platforms, class activities, and examinations [15]. Some strategies have been discovered to fill the gaps above. One of them is by implementing interactive online learning. Using a group, holding debates, and giving students distinct roles in

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conversations are a few tools and tactics to promote interactive online learning and student engagement. One program that functions well on some devices, including smartphones, tablets, laptops, and PCs, is Pear-Deck. Pear-Deck is an add-on that enables you to import Google Presentations and Microsoft PowerPoint slides to generate fresh instructional content in slides. Pear-Deck gives users the ability to design captivating questions that centre on the fascinating facts that are the subject of studies [16].

Pear Deck is an add-on for Google Slides that allows teachers to collaborate with students to create interactive presentations. It enables teachers to keep track of student involvement and learning advancement throughout the class. Pear Deck's remote learning capabilities can be used with Google Meet and Zoom. Pear Deck (www.peardeck.com) is a platform that helps instructors grade students at any point during in-person lessons and while they work at their own pace. With the Pear Deck add-on feature, teachers may import their existing Powerpoint slides into Google Slides. They can also insert questions into the slides, use the custom questions in the templates, or have students work in small groups to explore potential answers. Slides for the start, middle, and finish of lessons are available in library templates. Additionally, it includes several slides for a few areas like social studies, science, and mathematics. Using the Pear Deck add-on, the teacher can incorporate audio instructions, descriptions, or examples so that students can hear them as they read the prompts and respond to interactive questions. The study reveals that active learning pedagogy techniques are significant support for students to maintain engagement, as evidenced by the sharp increase in enrolment in online courses following the implementation of Pear Deck [15].

The pandemic has changed the view of the learning process in education. Full online learning emerged when the pandemic happened, which replaced face-to-face learning at that time. Even though the pandemic has ended people are still using online learning as an alternative if face-to-face learning cannot be carried out in the post-pandemic era. Therefore, innovative online learning continues to be needed so that online learning can be interesting and maximal for students[17].

The purpose of this research is to describe the improvement of preservice science teacher learning outcomes through interactive online learning using Pear Deck after the pandemic era.

Research Methods

The type of this research was a pre-experimental design including one group pre-test and post-test design. The sampling technique of this research is purposive sampling. This research was implemented on 26 preservice science teachers who have heterogeneous thinking skills. The instrument used was written tests before and after learning called pre and post tests to evaluate the improvement of student's learning outcomes.

Students were given the test before learning with this method to determine their initial understanding of the respiration topic. Then students were explained about respiration topic using interactive slides with the Peardeck add-on. After that, a test to determine their final understanding was conducted. The improvement also was calculated.

Data collection methods were through written tests through online web-based software, namely Google Forms. The question type is multiple choice. Data earned was then analysed using the N-gain score and paired t-test, however normalized test was conducted before it. Data is said to be normally distributed if the Lcount < Ltab, and is said to be homogeneous if the Fcount < Ftab. An individual preservice science teacher's understanding is stated to be improved if their score of N-gain is more than 70. Criteria of N-gain Score as seen in Table 1 [18]. Then, there was a significant difference between learning outcomes before and after treatment if tcount < ttab.with $\alpha = 0.05$.

Table 1. N-gain Criteria

Score	Gain Point
High	$g > 0.7$
Moderate	$0.3 \leq g \leq 0.7$
Low	$g \leq 0.3$

[18]

Results and Discussion

The effect of the Pear Deck implementation was analyzed based on the pretest and posttest scores of 26 students. Then N-gain scores were earned from both of them. As can be seen in Table 2. The highest score of the pretest was 80 and the lowest score was 40. However, the highest score on the post-test was 70 while the highest score was 100.

Table 2. Pretest and Posttest Score

Score	Pretest	Posttest
Minimum	40	70
Maximum	80	100
Average	71.1	80.4

In this research, online learning uses Pear Deck interactive slides on breathing material. This material was chosen because respiratory material is quite a complex material [19]. Pear Deck is suitable for use as an interactive medium for material related to mechanisms such as the body's defence system [20].

Interactive presentation of material can help students understand the material presented. Interactive learning is very necessary to make students understand the material more deeply[21]. Interactive presentations as learning media can improve student's learning outcomes [22]. N-gain score was earned from both pretest and posttest scores with three categories, which were high, moderate and low. 13 persons belonged to high scores, 8 persons belonged to moderate scores and 4 persons belonged to low scores. This means that 77.78% of preservice science teacher had high increases in their scores (Figure 1).

Peardeck can improve students learning outcomes as seen from the result that shows a mean of the pretest is 71,12 and the mean of the posttest is 80,42. Then, the N-gain score above also shows that most of the students get high scores of N-gain which means most of the students get high improvement in their outcomes. Student with low scores of N-gain means that the improvement is not as high as others. Because their initial score was already high. Learning to use

Pear Deck has been proven to have a significant effect on student learning outcomes, in this case, prospective science teachers. as a result of the t-test between the pretest and posttest as seen in Table 4. However, before carrying out the t-test, a normality test using Liliefors was carried out with the results in Table 3.

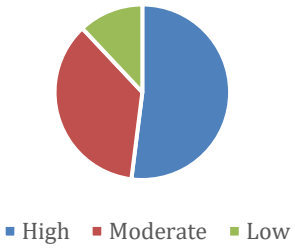

Figure 1. N-gain Criteria of Student's Score

Table 3. Test of Normality

	Sample	
	Pretest	Posttest
n	26	26
Label	0.1699	0.1699
Account	0.113909	0.13634
Conclusion	Normally distributed	Normally distributed

After knowing that the data were normally distributed, then homogeneity test was conducted with the result Fcount = 1,204 and Ftable = 1,955. Which means that Fcount < Ftable. So, the data were stated as homogenous. The hypothesis was tested by using t t-test paired two samples as seen in Table 4.

Table 4. Hypothesis Test using t-Test

No.	Sample	Mean	Varian	n	table	count	Conclusion
1.	Pretest	71.12	85.87	26	2.06	23.10	H0 rejected
2.	Posttest	80.42	103.45	26			

The conclusion of t test that was conducted is H0 rejected which means there is a significant effect of interactive distance learning using Peardeck towards students' learning outcomes. Peardeck can have a positive influence on student learning outcomes [23]. Since Peardeck is one of the interactive media, that can be used for online learning in this era, especially in the new civilization everything is connected by technology. It will help students learning outcome[26]. This is also in line with the research results of [16], 80% of students agreed that Peardeck could make them understand the material presented better. Similar research produced learning with interactive slides such as peardecks that had a significant effect on student learning achievement[24]. Interactive learning using Peardeck can be implemented effectively in the Advanced Abstract Algebra subject with 84% of students getting a score above the specified minimum standard [25]. These are also supported by research stating that to achieve the best possible outcomes for students' learning outcomes, teachers actively participate in online learning through creativity and innovation. Interactive media for online learning can improve student learning outcomes[27].

Implementing online learning using Peardeck stimulates student participation and creates interactive learning. As explained, there are several characteristics of interactive learning, namely that students' thinking processes are driven by induction or can be involved in the discussion process and activate their skills, students remain active for quite a long period (throughout the class), note down other class members' answers, enjoy great freedom in thinking, assuming, engaging in learning from emotionally charged class activities; students continue to interact with each other[21]. Since Peardeck is a popular application that combines interactive elements with presentations called Pear Deck [28]. Pear Deck functions as an interactive classroom response system and online platform for presentations. With the help of the real-time response mechanism on this platform, teachers can see students' responses in real time and provide fast feedback to them [28]. So Peardeck can be said to be an interactive distance learning medium. Another research also concluded that the Pear Deck is an engaging and dynamic tool for students to practice reading comprehension. It gives teachers a platform to design a classroom where students are the centre of attention and can engage in practical activities. It provided students more control over their reading comprehension and decreased the teacher's involvement in the learning process[15]. Another finding indicates that students view the usage of interactive digital presentations in technology classes as positive and beneficial, and they perceive it as a successful alternative for promoting logical reasoning and critical thinking. Then among other things, students in the experimental class who underwent the intervention learnt more than those in the control class who had learned through conventional methods. Additionally, it was evident in how the students interacted with the material during the learning process and on the post-test, where the overall success of this class was noticeably better than that of the control group[29].

Conclusion

This study examined the improvement of preservice science teacher's learning outcomes after the pandemic era using Pear Deck. Pear Deck has a significant effect on the improvement of student's learning outcomes. This is proven by the majority of students having high N-gain scores through their improvement on their test before (pre test) and after (post test) learning. 77,78% preservice science teacher also belonged to moderate-high increases of their scores. Then, it is strengthened by the results of the T test concluded that tcount>ttable means that H0 rejected. So, the use of Pear Deck in distance learning had a significant effect on improving preservice science teacher's learning outcomes.

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