

Student Perceptions on the Implementation of Practical Subjects Learning Models Post Pandemi Covid- 19



Melly Arfiani¹, Fatkurahman Arjuna²

^{1,2}Department of Sport Science, Yogyakarta State University, Yogyakarta Indonesia

ABSTRACT: This research is based on the outbreak of the Covid 19 pandemic, where for its prevention, it applies the rules of keeping a distance from each other or face-to-face lectures are not possible and must be carried out online or using (Zoom). In addition, this situation makes the lecturer laborious to know which students can practice the movements that are indicators of learning in practical courses. This quantitative research used a descriptive approach. It aimed to determine the perceptions of Sports and Health Education Study Program students of FKIP Universitas Jambi on the application of learning models in practical courses during the Covid-19 pandemic. The research benefits include: 1) for the lecturers, it can be a consideration to use learning models during the Covid-19 pandemic, 2) How the students need to train themselves to practice indicators of movement skills that must be mastered in these practical courses. It was because in practice, carrying out practical activities was impossible. In collecting the data, this research used a questionnaire with a Likert scale and validity and reliability tests. Afterward, the data collected were analyzed descriptively by calculating percentages. The results showed that students' perceptions of implementing learning models and practice during the Covid-19 pandemic, 64.2% stated 'agree' 31.3% 'strongly agree', and the remaining 4.5% were 'unsure'. It concluded the students 'agree' with the application of the learning model using Zoom application in practical courses during the Covid-19 pandemic.

KEYWORDS: perception, learning models, practical courses, covid- 19 pandemic

I. INTRODUCTION

After the discovery of the SARS-CoV-2 (Covid-19) virus resulted in a change in the pattern of whole activities in humans, including applied learning models at all education levels to prevent the spread of Covid-19. The SARS-CoV-2 or Covid-19 virus, which was initially found in cases in Wuhan City in central China at the end of 2019 and has now spread to all countries in the world and was declared a Covid-19 virus pandemic (Wenham et al., 2020), the Covid-19 virus was first detected in Indonesia at the beginning of March 2020. In Indonesia, the number of positive exposed cases of Covid-19 increased to 11,557, so a total of 869,600, 711,205 were cured, and 25,246 died. Meanwhile, the number of specimens studied today was 70,736, while 64,332 were observed. In Jambi, there were 3,858 positive Covid-19 cases, 2,862 recovered, and 64 people died.

After the emergence of the Covid-19 pandemic in various countries and to prevent further spread, the education system began to make changes in the teaching and learning process (Aisyah et al., 2020). The circular letter no.4 of 2020 from the Minister of Education and Culture suggested all activities in institutions of education must maintain distance, and all material delivery should be delivered online, (Mufid et al., 2020). Every educational institution is required to provide the latest innovations to form an effective and efficient learning process (Musriani & Mustamin, 2014). Based on the Minister's instructions, education experts concocted teaching and learning methods that were suitable for use during a pandemic, Universitas Jambi, as an educational institution in this case, has implemented the Minister of Education circular letter from the lectures at the initial of 2020/2021 until the lecturer at the end of 2020/2021 by making rules and lecture model programs using "e-learning, namely i-LMS UNJA, or media other based on video conferencing (Webex/Google Zoom/Cisco Team/U Meet Me Met/Microsoft) or Google Classroom, social media, (WhatsApp, Telegram) or email, or other models that are integrated and documented in Unja's Learning Management System (LMS) (Circular Letter Number 1/UN21/EP/2021).

Based on the above, the lecturers for Sports and Health Education Study Program of FKIP Universitas Jambi implemented a learning model using Zoom application for practical and theoretical courses. Courses that demand the achievement of indicators with theory are more flexible in explaining subject matter using the Zoom application. However, for courses that require the achievement of indicators in motor skills, it will be difficult to develop the subject matter because it must be accompanied by

Student Perceptions on the Implementation of Practical Subjects Learning Models Post Pandemi Covid- 19

exemplifying movements or motor skills that must be mastered by students. Thus, students must also practice and repeat these movements to achieve motor skills in the course.

Assessment for the mastery of motor skills is also laborious to know because it does not allow practical tests. However, the teacher still makes efforts by asking students to describe the movement techniques that must be carried out to achieve the course indicators but does not guarantee that students who can tell are also able to carry out the movements that must be mastered based on indicators of course achievement. If viewed from the level of attendance of students participating in lectures during the 2020/2021 pandemic with the lecture method using the Zoom application in courses that require mastery of movement skills to achieve the indicators is very high.

Based on the search results of the research, many students got good grades and felt satisfied. However, after tracing, many students did not match the grades obtained with the skills they had for the course, the discrepancy referred to in this case was that students were unable to practice the skills that are indicators of learning in these courses, but the grades are good. Based on the above, the problem formulation in this research is: How are the perceptions of Sports and Health Education Study Program students of FKIP Universitas Jambi on the application of learning methods using Zoom application in practical courses during the Covid-19 pandemic?

The learning model has four characteristics that other learning methods do not have. According to (Damschroder et al., 2009), the four special characteristics are 1) the theoretical rationale that is logically arranged by educators, 2) the learning objectives to achieve, 3) the teaching steps needed to make the learning model run well, 4) the expected learning environment to achieve learning objectives. The learning model is a learning plan used to design the learning process. The content contained in the learning model is a teaching strategy used to achieve learning objectives (Freeman et al., 2014). The learning model applied during the teaching and learning process should be adapted to the desired learning objectives because the learning model used greatly influences the level of achievement of these learning, (Erduran et al., 2015; Murga-Menoyo, 2015; Stockwell et al., 2015). The achievement of cognitive learning indicators using the online method with Zoom application is precise, but the achievement of psychomotor indicators, of course, is very difficult for teachers and students (Alexiou & Schippers, 2018; Young et al., 2014).

The Sports and Health Education is one of the study programs of FKIP Universitas Jambi, which has several theoretical and practical courses. There are 21 practical courses or 63 credits (Semester Credit Units) spread registered in semesters one to five (Curriculum Sports and Health Education Study Program 2021). It means that there are 21 courses or 63 credits in which the achievement of indicators requires cognitive and psychomotor aspects in the sense that students must be able to explain (know) and carry out (practice) properly and correctly what are the indicators that must be achieved from learning outcomes in these practical courses.

The achievement of cognitive indicators in both practical and non-practical courses with learning models carried out during the Covid-19 pandemic will not make lecturers experience difficulties in conducting teaching methods. However, in achieving indicators of movement skills, they will feel them in applying models. The achievement of practical learning indicators in movement skills must be carried out repeatedly (Harbourne & Stergiou, 2009; Moulton et al., 2006). Without training, movement skills cannot be carried out properly, and finding out the learning outcomes about the skills that must be mastered will be very difficult because it does not allow conducting skills tests (practice) on these students, (Criss, 2013). For this reason, in practical courses that should be required cognitively and psychometrically (motor skills) in the end only requires cognitive ones. As a result, many students get good grades but are not confident to practice their movement skills.

The learning model used by lecturers in carrying out the teaching and learning process has a paramount role in achieving learning indicators, (Doménech-Betoret et al., 2017; Pekrun et al., 2017). To achieve indicators of cognitive learning (knowledge), teachers should apply different learning models to achieve motor learning indicators (movement skills). Online learning models with Zoom application also make teachers laborious to know whether students have mastered and been able to practice the movement skills as indicators in the course. It is because the practice tests are not allowed to do face to face for assessments. Meanwhile, the learning outcomes obtained by students are generally very good (grades A, A-, B+, B, and B-). When viewed from the grade, the student should be able to practice the movement skills as indicators in the course.

METHODS

This research was quantitative research with a descriptive approach. This research aimed to determine the perceptions of sports and health education study program students of fkip universitas jambi on the application of learning models in practical courses during the covid-19 pandemic. The research was conducted at sports and health education study program of fkip universitas jambi, from june to august 2021. The research population was all the fifth-semester students from 4 (four) classes, a, b, c, and d, of the sports and health education study program of fkip universitas jambi. These students had contracted and passed various

Student Perceptions on the Implementation of Practical Subjects Learning Models Post Pandemi Covid- 19

subjects in practical courses during the covid-19 pandemic. The research sample was all fifth and fourth-semester students that consisted of 134 students. In addition, the instrument used to collect data on student perceptions of sports and health education study program of fkip universitas jambi on the application of practical course learning methods during the covid-19 pandemic was a questionnaire with a likert scale.

RESULTS

1. The Data Description of Sports and Health Education Study Program Students' Perception of the Application of Learning Models during the Covid-19 Pandemic

Based on the results of the analysis, the average perception of Covid-19 students was 59.82 out of 134 students, the median value was 60, the highest perception score based on the sample was 60, the standard deviation was 5.715 which showed the sample score was quite far from the average, the value indicating the difference between the highest and lowest total perception scores was 28 (range=28). The lowest overall score was 46, the highest overall score was 74, and the total score was 8016 out of 134 samples. The distribution of the data above also showed the distribution of the frequency of research results at intervals of 39-50 was six students (4.5%), at intervals of 51-62 was 86 students (64.2%), at intervals 63-75 was 42 students (31.3%) while in class intervals 15 -26 and 27 - 38 there were no students in it.

2. The Data Description of the Participation of Sports and Health Education Study Program Students in Lectures

Based on the results of data analysis, the average student participation in attending lectures was 11.81 out of 134 students, the median value of the sample was 12, and the student participation score that appeared the most was 12, the standard deviation was 1.638 which showed the sample score used close enough to the mean, the value indicating the difference between the highest and lowest total student enrollment scores was 15 and 5 (range=10), and the total score was 1582 out of 134 samples. The distribution of the data above is also in the distribution of the frequency distribution of research results 4 – 6 as one student (0.7%), at intervals 7 – 9 as many as five students (3.7%), at intervals 10 – 12 as many as 88 students (65.7%), in the interval 13-15 there were 40 (29.9%) while in 1-3, there were no students in it.

3. The Data Description of Sports and Health Education Study Program Students' Attention on Lecturing

Based on the results of data analysis, the average student attention to learning material in the application of practical learning models during the Covid-19 pandemic was 15.83 out of 134 students, the median value of the sample was 16, the student participation score appeared the most was 16, the standard deviation was 2.19 which showed that the sample score was quite close to the average, the value indicating the difference between the highest and lowest total student participation scores was 20 and 10 (range = 10), and the total score was 2121 out of 134 samples. The distribution of the data above was in the distribution of the frequency of research results in class intervals 10-12 with ten students (7.5%), in intervals 13-16 with 74 (55.2%), in 17-20 with 50 (37.3%) while in class intervals 4-6 and in class intervals 7-9 there were no students in it.

4. The Data Description of Sports and Health Education Study Program Students on the Values Obtained

Based on the results of data analysis, the average student perception of the value obtained in the application of practical learning models during the Covid 19 pandemic was 8.15 out of 134 students, the median value was 8, the student participation score appeared the most was 8, Standard deviation was 1.34 which showed that the sample score was quite close to the average, the value indicating the difference between the highest and lowest total student enrollment scores was 10 and 4 (range=6), and the total score was 1092 out of 134 samples. The distribution of the data above was also in the frequency distribution. The research results obtained values in class 3-4 interval range of 1 student (0.7%), in the 5-6 interval of 17 students (12.7%), in intervals 7-8 was 62 students (46.3%), in 9-10 was 54 students (40.3%) in class intervals 1-2 there were no students in it.

5. The Data Description of Sports and Health Education Study Program Students on Skills Mastery in the Courses They Have Followed

Based on the results of data analysis on student perceptions of the application of learning models in practical courses during the Covid 19 pandemic, the mastery of skills in the indicators of the subjects studied was an average of 24.04 out of 134 students, the median value of the sample was 25, the participation score of the most appeared was 25, the standard deviation was 3.6 which showed that the sample score was quite far from the average, the highest value indicating the difference between the total score of students' perceptions of skills mastery was 30, and the lowest was 15, (range=15) and the total score was 3221 out of 134 samples. The distribution of the data above was also in the distribution of the frequency distribution of the research results, which was in the 11-15 class range of 2 students (1.5%), 22 students (16.4%) in 16-20 intervals, 21-25 intervals as many as 64 students (47.8%), 26 – 30 intervals was 46 (34.3%), while in interval class 6 – 10, there were no students in it.

DISCUSSION

1. Perceptions of Sports and Health Education Study Program Students on the Application of Practical Courses Learning Models During the Covid-19 Pandemic

Based on the results of the research and calculations, the student's perceptions of the application of the practical courses learning model during the Covid-19 pandemic were 64.2% or 86 out of 134 students stated 'agree' with the application of the learning model using Zoom. Meanwhile, those who chose "strongly agree" were 31.3% or 42 students, and the remaining 4.5% were 'unsure' about implementing the practical learning model using Zoom application during the Covid-19 pandemic.

The research results above were based on discussions with students of the Sports and Health Education Study Program of FKIP Universitas Jambi, who have attended practical lectures and have passed practical courses. They said it was easier and more practical to attend lectures, but the problem was when using Zoom application because sometimes the signal was not good. This obstacle was generally felt by students who lived outside the city because, during the Covid-19 pandemic, almost all students were back to their villages. (Al-Rahmi et al., 2021), The results of a survey conducted among university students to evaluate the challenges they face in studying online during the COVID-19 pandemic, including signal constraints and the impact on out-of-town students. (Samaka et al., 2022), revealed that the problem of unstable internet connection or poor signal is the main obstacle for students who live outside the city. One of the factors found is the quality of the internet connection, which can be an obstacle for students studying from remote locations, (Jalilifar et al., 2021).

2. Perceptions of Sports and Health Education Study Program Students on the Application of Practical Courses Learning Models during the Covid-19 Pandemic from Participation in Lectures

Based on the results of research on the application of the learning model using Zoom application in practical courses during the Covid-19 pandemic, 88 out of 134 students, or 65.7% stated "agree", 40 students, or 29.9% "strongly agree", remaining five students or 3.7% were "unsure" and only one or 0.7% of students had a perception that they disagreed with the application of the practical learning model using Zoom application during the Covid-19 pandemic.

The research results above were supported by the discussions with students of the Sports and Health Education Study Program of FKIP Universitas Jambi, who attended lectures in practical courses. They said it was easier to attend lectures because wherever they were, they could participate. Some even were while driving cars, riding motorbikes, in the garden, in shops or stalls, can join or participate. It was observed when many students were driving vehicles among the palm trees while shopping at the stalls around their homes when lecturing. (Naji et al., 2020), Through online lectures, students have greater access to courses. They do not need to face transportation constraints or travel costs to get to campus, thus helping to increase student participation and attendance. (Wasilik et al., 2020), Students can save on transportation and accommodation costs that are usually required for physical presence on campus. Thus, they have the opportunity to allocate those resources to other things that support the learning process, such as acquiring textbooks or additional learning resources. (Nguyen et al., 2020), The flexibility of online courses allows students to participate in other activities while attending lectures, such as shopping at stalls around the house. This can help maximize time and efficiency, and reduce the monotony of attending lectures continuously.

3. Perceptions of Sports and Health Education Study Program Students on the Application of Practical Courses Learning Models during the Covid-19 Pandemic from Student Attention to Learning Materials.

Based on the results of research on student perceptions of the application of practical learning models seen from students' attention to lecture material, there were 10 out of 134 students, or 7.5% said they were unsure, 74 students, or 55.2%, said "agree", and 50 students or 37.3% who answered "strongly agree" with the implementation of the learning model using Zoom application in practical courses during the Covid-19 pandemic.

The results of the research above show that more than half, or 55% students pay attention to lecture material when attending lectures using the Zoom application. The results of this research were under the observations of lecturers who taught during the teaching and learning process using Zoom application where many students did not turn on their laptop or cellphone cameras while attending lectures because they did not want to be seen when they were doing other things that cause their attention not to be focused on the material lectures. However, some students attended lectures that had laptops or cellphone cameras on, but when monitored by lecturers those who did other things, such as watching television (TV), moving their bodies to show they were listening to music, and some were playing with his sister. Research by (Parker, 2021), explained that Zoom fatigue can reduce the focus and productivity of online meeting participants, due to visual distractions such as students not turning on the camera and doing other activities during lectures. (A. Ahmed & A. Bogdanovych, 2020), The study showed that when participants did not turn on the camera during online lectures, they tended to have lower engagement levels and found it more difficult to maintain focus on the lecture material. (Straumsheim, 2021), suggests that students who do not turn on their cameras during online lectures may affect their social interaction and engagement in the teaching and learning process.

Student Perceptions on the Implementation of Practical Subjects Learning Models Post Pandemi Covid- 19

4. Perceptions of Sports and Health Education Students on the Application of Practical Courses Learning Models during the Covid-19 Pandemic from the Grades Obtained

Based on the results of research on student perceptions of the application of practical learning models from the grades obtained by students after attending lectures, there were 1 out of 134 or 0.7% of students said "disagree", 17 or 12.7% of students said "unsure", 62 or 46.3% of students said "agree" and 54 or 40.3% of students said "strongly agree" with the application of the learning model using Zoom.

The research results indicated that the scores obtained by students were under their abilities where students stated "agree" with the scores they got and the second, most stated "strongly agree". Based on monitoring results with students, when asked about the grades they got, they said they had been based on their hopes. There were also no students who protested or asked the truth about the lecturer's way gave them grades. (Aristovnik et al., 2020), the results showed a negative impact of the COVID-19 pandemic on students' grades and academic performance. 94% responden dalam penelitian (Adnan & Anwar, 2020), mengatakan kesulitan dalam menyelesaikan tugas dan penelitian akademis mereka pada masa pandemi covid-19. (Dwivedi et al., 2020), The results revealed that the grades obtained by students during the COVID-19 pandemic were consistently below their abilities.

5. Perceptions of Sports and Health Education Study Program Students on the Application of Practical Courses Learning Models during the Covid-19 pandemic from Skills Mastery of Followed Course Indicators

Based on the results of research on student perceptions of the application of practical learning models from skill mastery of followed course indicators that have been attended, there were 2 out of 134 or 1.5% of students who said they did not agree, 22 or 16.4% of students said doubtful, and 64 or 47.8% of students said "agree", while 46 or 34.3% of students stated, "strongly agree".

The results of the research above showed that students master the skills from the indicators of the courses they have followed. It can be seen from the number of students who said "agree" with the application of the practical learning model using the Zoom application was 64 out of 134, or 47.8%, and 46, or 34.3% of students stated, "strongly agree". It cannot be proven true because the test results to be converted to final grades were only taken from the written exam results or only looking at the cognitive aspects.

Based on the search results, students who passed the practical course (swimming), were asked whether their swimming scores were good, the student said good, then continued with the question whether they could swim the person in question gave an unconvincing answer because he only said little, so did other practical courses. (Buccola & Caviglione, 2021), Learning during the covid-19 pandemic is conducted online, which has limited accessibility and interaction between teachers and students. This can hinder optimal learning and reduce pure results. (Wang et al., 2020), The absence of direct teacher supervision in online learning can make students less likely to focus and be tempted by distractions around them. This can reduce the effectiveness of learning and affect the results obtained. (Maican et al., 2021), Online learning during the covid-19 pandemic requires electronic devices and a stable internet connection. Not all students have equal access to adequate devices and connections, hindering their ability to obtain genuine learning outcomes. (Doridot & Delhom, 2021), Online learning during the covid-19 pandemic also requires rapid adaptation from teachers and students. Many teachers are not used to teaching online and need to learn to use online learning platforms effectively. This can affect the quality of material delivery and learning outcomes.

6. Research benefits

The difficulties of modifying practical courses for the post-pandemic environment. This piece also emphasizes how crucial it is to comprehend how students view these changes. The students' perspectives, opinions, and experiences are presented in this study, and they offer important insights into how they cope with these changes and react to the post-pandemic learning paradigm that has been introduced. This article may introduce different learning models that are applied in practical courses, like modern technology or virtual simulations. This method allows students to obtain real-world experience in various educational settings. This essay examines these problems to understand better and construct post-COVID-19 pandemic realistic learning models that are applicable in a shifting educational environment.

CONCLUSIONS

Based on the results of the research and discussion, the perceptions of Sports and Health Education Study Program students of FKIP Universitas Jambi on the application of practical learning models during the Covid-19 pandemic, most students agreed with the application of the learning model using Zoom application, it was from 64.2% of students said "agree", 31,3% o students said "strongly agree", the remaining or 4.5% of students said "unsure". Student perceptions of the application of the learning model

Student Perceptions on the Implementation of Practical Subjects Learning Models Post Pandemi Covid- 19

were from participation in learning, where 65.7% said "agree", 29.9% said "strongly agree", the remaining 3.7% said "unsure", and only 0.7% said, "disagree". Student perceptions were seen from students' attention to lecture material, where 55.2% said "agree", and 37.3% said "strongly agreed, the remaining 7.5% said they were "unsure". Student perceptions were from the grades obtained, 46.3% said "agree" and 40.3% said "strongly agree", while 12.7% said "unsure", and the remaining 0.7% said "disagree". Student perceptions were from the mastery of the skills from indicators of courses that had been followed where 47.8% said "agree" and 34.3% said "strongly agree", 16.4% said "unsure" and the remaining 1.5% said, "disagreed".

REFERENCES

- 1) A. Ahmed, & A. Bogdanovych. (2020). Investigating the Impact of Camera Usage in Virtual Classroom on Students' Engagement and Cognitive Load. *IEEE Global Communications Conference (GLOBECOM Workshops)*, 21(1), 1–9. <https://doi.org/10.1109/GLOCOMW.2020.9343597>
- 2) Adnan, M., & Anwar, K. (2020). Online Learning amid the COVID-19 Pandemic: Students' Perspectives. *Journal of Pedagogical Societies and Education*, 21(1), 1–9.
- 3) Aisyah, D. N., Mayadewi, C. A., Diva, H., Kozlakidis, Z., Siswanto, & Adisasmito, W. (2020). A spatial-temporal description of the SARSCoV-2 infections in Indonesia during the first six months of outbreak. *PLoS ONE*, 15(12 December), 1–14. <https://doi.org/10.1371/journal.pone.0243703>
- 4) Al-Rahmi, A., Zeki, A. M., & Aldraiweesh, A. (2021). Challenges of Online Learning During the COVID-19 Pandemic: A Survey of University Students. *International Journal of Information and Education Technology*, 14(1), 1–13.
- 5) Alexiou, A., & Schippers, M. C. (2018). Digital game elements, user experience and learning: A conceptual framework. *Education and Information Technologies*, 23(6), 2545–2567. <https://doi.org/10.1007/s10639-018-9730-6>
- 6) Aristovnik, A., Keržič, D., Ravšelj, D., Tomaževič, N., & Umek, L. (2020). ticle Impacts of the COVID-19 Pandemic on Life of Higher Education Students: *Sustainability (Switzerland)*, 12(20), 1–34.
- 7) Buccola, V. B., & Caviglione, L. (2021). COVID-19 Pervasive Impact on Education: Challenges and Solutions for Distance Learning. *International Journal of Information and Learning Technology*, 14(1), 1–13.
- 8) Criss, M. J. (2013). School-based Telerehabilitation In Occupational Therapy: Using Telerehabilitation Technologies to Promote Improvements in Student Performance. *International Journal of Telerehabilitation*, 5(1), 39–46. <https://doi.org/10.5195/ijt.2013.6115>
- 9) Damschroder, L. J., Aron, D. C., Keith, R. E., Kirsh, S. R., Alexander, J. A., & Lowery, J. C. (2009). Fostering implementation of health services research findings into practice: A consolidated framework for advancing implementation science. *Implementation Science*, 4(1), 1–15. <https://doi.org/10.1186/1748-5908-4-50>
- 10) Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-efficacy, satisfaction, and academic achievement: The mediator role of students' expectancy-value beliefs. *Frontiers in Psychology*, 8(JUL), 1–12. <https://doi.org/10.3389/fpsyg.2017.01193>
- 11) Doridot, F., & Delhom, I. (2021). Online Learning during the COVID-19 Pandemic: Lessons for the Future. *In Frontiers of Education*, 14(1), 1–13.
- 12) Dwivedi, Y. K., Hughes, L., Coombs, C., Constantiou, I., Duan, Y., Edwards, J. S., & Upadhyay, N. (2020). Impact of COVID-19 pandemic on information management research and practice: Transforming education, work and life. *File:///C:/Users/VERA/Downloads/ASKEP_AGREGAT_ANAK_and_REMAJA_PRINT.Docx*, 21(1), 1–9.
- 13) Erduran, S., Ozdem, Y., & Park, J. Y. (2015). Research trends on argumentation in science education: a journal content analysis from 1998–2014. *International Journal of STEM Education*, 2(1), 1–12. <https://doi.org/10.1186/s40594-015-0020-1>
- 14) Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences of the United States of America*, 111(23), 8410–8415. <https://doi.org/10.1073/pnas.1319030111>
- 15) Harbourne, R. T., & Stergiou, N. (2009). Movement variability and the use of nonlinear tools: Principles to guide physical therapist practice. *Physical Therapy*, 89(3), 267–282. <https://doi.org/10.2522/ptj.20080130>
- 16) Jalilifar, A., Moghaddam, M. A., & Zarei, A. A. (2021). Factors Influencing Student Satisfaction and Performance in Online Learning Environments: A Structural Equation Modeling Approach. *Education and Information Technologies*, 14(1), 1–13.
- 17) Maican, M. I., Cocorada, E., Cornea, C. P., & Zamfir, A. M. (2021). From Traditional Teaching Methods to Online Learning Platforms: A Relevant Challenge Posed by the COVID-19 Pandemic. *International Journal of Information and Communication Technologies in Education*, 14(1), 1–13.

Student Perceptions on the Implementation of Practical Subjects Learning Models Post Pandemi Covid- 19

- 18) Moulton, C.-A. E., Dubrowski, A., MacRae, H., Graham, B., Grober, E., & Reznick, R. (2006). Teaching Surgical Skills: What Kind of Practice Makes Perfect?: A Randomized, Controlled Trial. *Annals of Surgery*, 244(3).
- 19) Mufid, M. R., Basofi, A., Mawaddah, S., Khotimah, K., & Fuad, N. (2020). Risk diagnosis and mitigation system of covid-19 using expert system and web scraping. *IES 2020 - International Electronics Symposium: The Role of Autonomous and Intelligent Systems for Human Life and Comfort*, 577–583. <https://doi.org/10.1109/IES50839.2020.9231619>
- 20) Murga-Menoyo, M. A. (2015). Las Capacidades , Actitudes Y Valores Meta. *Foro de Educaciòn*, 13, 55–83. <https://doi.org/http://dx.doi.org/10.14516/fde.2015.013.019.004>
- 21) Musriani, A., & Mustamin, M. (2014). Improving the Learning Result of the Integer Number Operation Using Card Model. *Journal of Education and Learning (EduLearn)*, 8(1), 23–28. <https://doi.org/10.11591/edulearn.v8i1.202>
- 22) Naji, S., Abdulwahed, M., & Tawfik, A. (2020). Distance education during COVID-19: A case study of online teaching in a Saudi university. *International Journal of Educational Technology in Higher Education*, 21(1), 1–9. <https://doi.org/10.1186/s41239-020-00235-2>
- 23) Nguyen, T., Pham, L., & Nguyen, D. (2020). Barriers to online learning in higher education: A literature review. *The Journal of Continuing Higher Education*, 21(1), 1–9. <https://doi.org/10.1080/07377363.2020.1735147>
- 24) Parker, L. (2021). Zoom Fatigue: The Reason Zoom Meetings Drain Your Energy. *The Guardian*.
- 25) Pekrun, R., Lichtenfeld, S., Marsh, H. W., Murayama, K., & Goetz, T. (2017). Achievement Emotions and Academic Performance: Longitudinal Models of Reciprocal Effects. *Child Development*, 88(5), 1653–1670. <https://doi.org/10.1111/cdev.12704>
- 26) Samaka, S., Helmy, Y., & Khalil, S. (2022). The Impact of COVID-19 on Higher Education: Students' Perspectives on Remote Learning. *European Journal of Education Studies*, 33(1), 1–12.
- 27) Stockwell, B. R., Stockwell, M. S., Cennamo, M., & Jiang, E. (2015). Blended Learning Improves Science Education. *Cell*, 162(5), 933–936. <https://doi.org/10.1016/j.cell.2015.08.009>
- 28) Straumsheim, C. (2021). Zoom Fatigue or Future: Is It Time to Return to Campus? *Inside Higher Ed Yang*, 14(1), 1–13.
- 29) Wang, C., Chen, X., & Ackerman, R. (2020). Challenges and Opportunities for Online Learning during the COVID-19 Pandemic. *SAGE Open*, 21(1), 1–9. <https://doi.org/https://doi.org/10.1177/2158244020948481>
- 30) Wasilik, K., Wicaksana, I. G. A., & Iskandar, A. (2020). COVID-19 as an enabler of open education: A case study of online learning in response to a pandemic. *Association for Computing Machinery*, 21(1), 1–9. <https://doi.org/10.1145/3410344.3410365>
- 31) Wenham, C., Smith, J., & Morgan, R. (2020). COVID-19: the gendered impacts of the outbreak. *The Lancet*, 395(10227), 846–848. [https://doi.org/10.1016/S0140-6736\(20\)30526-2](https://doi.org/10.1016/S0140-6736(20)30526-2)
- 32) Young, J. Q., Van Merriënboer, J., Durning, S., & Ten Cate, O. (2014). Cognitive Load Theory: Implications for medical education: AMEE Guide No. 86. *Medical Teacher*, 36(5), 371–384. <https://doi.org/10.3109/0142159X.2014.889290>



There is an Open Access article, distributed under the term of the Creative Commons Attribution – Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.