



Examining undergraduate physical education students' perceptions on conventional and distance learning instruction during the COVID-19 pandemic: A comparative study

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Abstract

The purpose of this study was to evaluate the perceptions of undergraduate Physical Education (PE) students regarding the effectiveness of conventional face-to-face instruction versus distance learning instruction during the COVID-19 pandemic at the Democritus University of Thrace. A cohort of 207 students actively participated in this study, all of whom experienced the shift from typical face-to-face classroom instruction to online learning in response to the challenges posed by the COVID-19 crisis. The participants' ages varied between 19 and 24 years, with a distribution of 146 males and 61 females within the sample. For data collection, an online questionnaire was employed, distributed to students via Google Forms. This questionnaire was specifically administered during synchronous distance learning courses focusing on Information and Communication Technologies (ICT) in PE. The distribution of the questionnaire occurred during the final two lectures of the semester, allowing participants to provide feedback on their experiences with both traditional in-person classroom teaching and online learning formats. A paired samples t-test analysis was employed to assess the perceptions of undergraduate PE students concerning the efficacy of typical face-to-face instruction compared to distance learning instruction. The analysis of student survey data showed that, in general, PE students found distance learning during the COVID-19 pandemic to be effective. However, when compared to conventional face-to-face teaching, most students considered distance learning less effective and expressed less comfort with the online environment, resulting in lower satisfaction scores with their distance learning experiences. These results underscore the challenges associated with the sudden transition to online learning and highlight the importance of further research to understand the factors influencing student perceptions and experiences in different instructional modalities.

Keywords: Conventional instruction, distance learning, perception, physical education, COVID-19

Introduction

The emergence and rapid spread of the novel coronavirus (COVID-19) brought about profound shifts in societal norms and organizational structures, and the realm of education was not spared from its impacts. The imperative of maintaining social distance prompted an abrupt and largely unprepared closure of numerous traditional brick-and-mortar higher education institutions. In place of conventional face-to-face teaching, emergency measures were implemented, necessitating a swift transition to remote instruction, predominantly delivered online. This sudden shift sparked considerable debate among academics regarding the readiness of higher education for such a digital transformation (Veletsianos & Houlden, 2020) [1]. Esteemed scholars have publicly lamented the lack of preparedness in this emergency adaptation, highlighting the absence of adequate training, preparation, and support for effective online teaching (Jones & Sharma, 2020; Tobin, 2020) [2, 3].

Consequently, stakeholders across the educational landscape—academic leaders, faculty, students, and parents—voiced concerns regarding the efficacy of this rapid transition from traditional classroom settings to online platforms (Mseleku, 2020) [4]. Unlike the structured framework of conventional online education, which is built upon established theoretical and practical foundations (Bozkurt *et al.*, 2020) [5], the online instruction necessitated by the COVID-19 crisis emerged as a temporary solution, aimed primarily at ensuring continued educational access during an unprecedented global emergency (Hodges, Moore, Locke, Trust & Bond, 2020) [6].

Subsequent research has yielded varied insights into the effectiveness of online instruction during the pandemic. While some studies highlighted positive outcomes, such as increased academic performance and student satisfaction (Aristovnik, Keržič, Ravšelj, Tomaževič & Umek, 2020; Iglesias-Pradas, Hernández-García, Chaparro-Peláez & Prieto, 2021; Khalil *et al.*, 2020) [7, 8, 9], others revealed challenges and shortcomings. Negative conclusions were drawn regarding assessment methods, teaching approaches, and overall effectiveness compared to traditional methods (Tartavulea, Albu, Albu, Dieaconescu & Petre, 2020; Nambiar, 2020; Adnan & Anwar, 2020) [10, 11, 12]. Means and Neisler's (2021) [13] survey underscored declining satisfaction levels and motivational struggles among students following the transition to online learning. Similarly, findings by Grether, Macdonald & Higgins (2020) [14] and Aguilera-Hermida (2020) [15] indicated a preference for face-to-face instruction and diminished engagement and motivation in online settings.

While there are studies presenting positive perspectives on online learning during the pandemic (Murphy, Eduljee & Croteau, 2020) [16], the majority of literature, particularly in the United States, highlights negative impacts on student satisfaction and academic performance. This discrepancy underscores the need for further exploration and comprehensive analysis. Given the predominantly single-institution focus of existing studies, a broader examination encompassing diverse courses and programs across multiple institutions is imperative to discern not only the

effectiveness but also the underlying reasons behind varying outcomes.

Looking ahead, it is crucial to develop flexible, robust long-term strategies to mitigate the impacts of crises like COVID-19 on higher education. This necessitates comprehensive data collection and analysis, encompassing diverse perspectives from both faculty and students across a wide spectrum of online courses. Insights gleaned from such endeavors will not only inform institutional responses to global emergencies but also pave the way for enhancing the quality and meaningfulness of online learning experiences in the future. Therefore, the purpose of this study was to evaluate the perceptions of undergraduate Physical Education (PE) students regarding the effectiveness of conventional face-to-face instruction versus distance learning instruction during the COVID-19 pandemic at the Democritus University of Thrace. The study was aimed to answer the following research questions:

1. What are the perceptions of undergraduate PE students regarding the effectiveness of conventional face-to-face instruction versus distance learning instruction during the COVID-19 pandemic?

Methods

Participants

This study enlisted a total of 207 students ($N = 207$) affiliated with the Department of Physical Education and Sport Science (DPESS) at Democritus University of Thrace (DUTH). These students were directly affected by the transition from conventional face-to-face instruction to distance learning, necessitated by the challenges presented by the COVID-19 pandemic. The age range of the participants fell between 19 and 24 years ($M = 21.5$, $SD = 0.48$). Among the participants, there were 146 males (70.5%) and 61 females (29.5%).

Participation in the study was voluntary, and students were given the option to opt out despite being invited as part of their ICT in Physical Education courses. The selection of participants was carried out via random sampling, ensuring a representative sample. Prior to their involvement in the study, students received comprehensive information regarding the research objectives and their role in the process. Importantly, it was emphasized that participation was entirely voluntary and would not impact their academic grades. This approach was implemented to uphold ethical standards and ensure the genuine willingness of participants.

Distance Learning Platforms

Version 3.12 of the e-Class platform was employed as an alternative to traditional teaching methods, recommended by the Academic Internet GUnet (2021) ^[17] for tertiary education in Greece. This platform facilitated remote access to educational materials, assignment submissions, document sharing, and online discussions. For synchronous teaching, Microsoft Teams for Education was utilized. This collaborative platform, part of Microsoft 365, centralizes communication, collaboration, and organization for students, teachers, and administrators. It enables threaded conversations, virtual meetings, file sharing, assignment creation, submission, and management, as well as OneNote integration for digital notebooks. Teams integrates with various Microsoft 365 and third-party educational apps, prioritizes security, compliance, and offers analytics for

monitoring student engagement and progress, aiming to enhance remote and hybrid learning experiences.

Questionnaire

In this study, the researchers utilized the Online Learning Quality Index based on Teachers' and Learners' Perceptions (OLQ-TLP Index), a tool developed by Gómez-Rey, Barbera & Fernández-Navarro in 2016 ^[18], to evaluate the quality of online learning programs by gauging the satisfaction levels of both instructors and students. This comprehensive index integrates 39 quality indicators across 11 categories, covering various aspects of online education. These categories encompass essential factors such as learning support, social presence, instruction, learning platform, interaction between instructors and learners, as well as among learners themselves, content quality, course design, learner satisfaction, knowledge acquisition, and the ability to apply acquired knowledge.

To assess perceptions, the researchers employed a 5-point Likert-type scale, ranging from 1 (Totally Disagree) to 5 (Totally Agree). The cumulative scores from all 39 quality indicators provided an overall measure of perception regarding the effectiveness of distance learning instruction during the COVID-19 pandemic.

Reliability analysis conducted through Cronbach's alpha demonstrated high internal consistency, with coefficients of .930 for faculty surveys and .910 for student surveys (Gómez-Rey *et al.*, 2016) ^[18]. This indicates strong reliability and consistency in the measurement of perceptions regarding online learning quality from both instructors and students, enhancing the credibility of the index as a valid tool for assessing the effectiveness of distance learning programs.

Procedure

Over a period of 13 consecutive weeks, this study encompassed a series of teaching sessions, practice activities, and assessments. Participants engaged in thirteen 95-minute instructional sessions.

The conventional instructional approach followed a direct teaching method, comprising lectures, interactive activities, and discussions with the instructor present. Each session commenced with a concise overview of the main learning objectives lasting 5 minutes, followed by a 40-minute lecture on the subject matter, and subsequently, a 45-minute session dedicated to constructive activities. The teaching session concluded with a brief 5-minute recapitulation of the key learning points. Participants were afforded the flexibility to work individually or in pairs, with verbal feedback permitted during the activity segment.

In contrast, the distance learning method replicated the educational process of conventional instruction. Participants received a similar introductory overview lasting 5 minutes, followed by a 40-minute lecture and a subsequent 45-minute period for constructive activities. However, these sessions were conducted utilizing the Microsoft Teams for Education synchronous distance learning platform. Like the conventional method, participants had the option to collaborate individually or in pairs. Upon completing the instructional phase, participants were administered an online perception questionnaire (OLQ-TLP Index) via Google Forms as the final assessment measure. This questionnaire was administered during the final two lectures of the semester, concluding the respective courses.

Participants were instructed to select a course that underwent a mandatory transition from face-to-face to some level of online learning due to the COVID-19 pandemic. Subsequently, they were tasked with completing the questionnaire twice, once for each teaching method (conventional and remote). The data collected from these surveys were treated confidentially, with an average completion time ranging from 20 to 30 minutes. Upon completion of the surveys, participants received expressions of gratitude from the instructor for their time and contributions. All responses were promptly stored in real-time within Google's online database.

Statistical analysis

The study adopted a post-test design, where the data underwent thorough screening to identify any potential violations of statistical assumptions, and none were found (Green & Salkind, 2017) [19]. A paired samples t-test analysis was employed to assess the perceptions of undergraduate PE students concerning the efficacy of typical face-to-face instruction compared to distance learning instruction. The dependent variables scrutinized in the analysis centered on students' perceptions regarding the effectiveness of both conventional and distance learning methods. The significance of mean differences between teaching method approaches was evaluated at the 0.05 alpha level. Effect size was calculated using the Cohen statistic (d) to determine practical significance, in accordance with Cohen's guidelines: where 0.2 indicates a small effect size, 0.5 suggests a medium effect size, and 0.8 indicates a large effect size (Cohen, 1988) [20].

The hypothesis of this study was as follow:

H01: There will be no statistically significant difference in the mean scores of PE students' perceptions regarding the effectiveness of conventional face-to-face instruction versus distance learning instruction.

Results

The Shapiro-Wilk test was conducted to assess the normality of the sample, revealing no evidence of non-normality ($W = 0.99$, $p\text{-value} = 0.17$). Additionally, upon visual examination of the histogram and the QQ plot, no substantial departures from normality were observed. Consequently, considering these findings, we opted to utilize a parametric test for further analysis. Therefore, a paired samples t-test was applied to examine the H01 hypothesis that there will be no statistically significant difference in the mean scores of PE students' perceptions regarding the effectiveness of conventional face-to-face instruction versus distance learning instruction. The analysis revealed that the teaching method approaches (conventional and distance learning) has a significant impact on the PE students' perceptions, $t(206) = 9.93$, $p < .001$, $d = .69$. The mean perception score for conventional face-to-face instruction was $M = 145$ ($SD = 16.2$), indicating that, on average, students viewed conventional face-to-face instruction more positively. In contrast, for distance learning instruction, the mean perception score was slightly lower at $M = 141$ ($SD = 17.7$). This suggests that, overall, PE students tended to perceive conventional teaching approach as more effective compared to distance learning approach. In Table 1, the mean value (M), standard deviation (SD), and the t-value with the corresponding level of significance are presented in detail.

Table 1: Mean scores and standard deviations of PE students' perceptions for the conventional and distance learning approaches.

Variable	Conventional face-to-face instruction (n=207)		Distance learning instruction (n=207)		t	p
	M	S.D.	M	S.D.		
PE students' perceptions	145	16.2	141	17.7	9.93	<.001

Based on the results obtained, the null hypothesis (H01) proposing that there would be no statistically significant difference in the mean scores of PE students' perceptions regarding the effectiveness of conventional face-to-face instruction versus distance learning instruction is rejected. The evidence suggests that, overall, PE students tend to perceive the conventional teaching approach as more effective when compared to the distance learning approach (Figure 1).

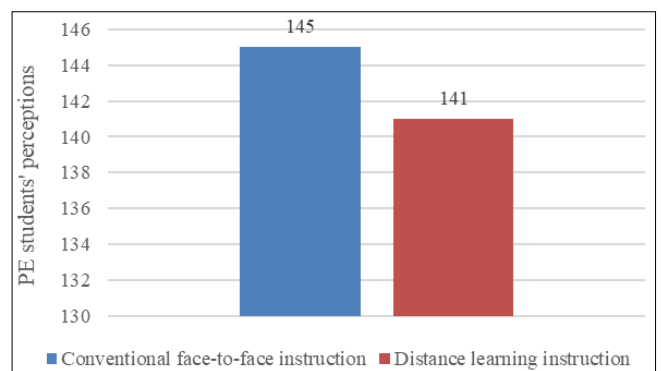


Fig 1: Mean scores of PE students' perceptions for the conventional and distance learning approaches

Discussion

The outbreak of the COVID-19 pandemic triggered a rapid and widespread transition of higher education institutions in Greece from face-to-face classes to distance learning, necessitating the adoption of online class delivery. This shift presented numerous challenges compared to typical classroom teaching and established online education methods. Both instructors and students, many of whom lacked prior experience with online learning, faced significant pressure to adapt to this new mode of instruction amidst the uncertainty surrounding the pandemic.

What began as a short-term emergency response soon evolved into a prolonged state of upheaval, leaving higher education institutions navigating uncertain terrain. As this new normal persisted, it became increasingly vital to assess whether online teaching adequately met students' educational needs and whether these new approaches were effectively implemented. Additionally, the ongoing crisis underscored the urgency of reimagining and overhauling the education system to better prepare for future disruptions in higher education.

In light of these challenges, it is imperative to evaluate the efficacy of online teaching methods and explore ways to enhance the online learning experience for students. This may involve rethinking conventional pedagogical approaches, leveraging technology more effectively, and providing comprehensive support and resources for both instructors and students. By embracing innovation and

actively addressing the shortcomings exposed by the COVID-19 pandemic, higher education institutions can better equip themselves to meet the evolving needs of students and navigate future disruptions with resilience and adaptability. Therefore, the aim of this study was to assess the perceptions of undergraduate PE students concerning the effectiveness of conventional face-to-face instruction versus distance learning instruction during the COVID-19 pandemic at the Democritus University of Thrace.

The quantitative analysis of student survey data revealed that, overall, student participants perceived distance learning instruction during the COVID-19 pandemic as effective. However, when compared to conventional face-to-face classroom teaching, most students rated distance learning as less effective and conveyed a lesser degree of comfort with the distance learning environment, expressing lower scores of satisfactions with their distance learning experiences.

These results align with findings from previous studies. For instance, some authors observed that a significant number of students opted not to participate in an online electrocardiogram course but instead continued attending face-to-face classes, despite the content being identical in both formats (Keis, Grab, Schneider & Öchsner, 2017) ^[21]. Conversely, Pei and Wu (2019) ^[22] examined the effectiveness of online and offline courses by comparing pre-test and post-test results, as well as retention test outcomes across 16 articles published between 2000 and 2017. They noted that seven articles did not report significant differences between the two teaching strategies, while nine articles indicated a significant improvement in the online study groups. These findings underscore the variability in student preferences and outcomes associated with different modes of instruction, highlighting the need for further research to understand the factors influencing such preferences and performance outcomes.

The above sentiments were largely attributed to several key factors aligning with the core elements of the CoI framework (Garrison, Anderson & Archer, 2000) ^[23]: teaching presence, social presence, and cognitive presence. Specifically, many students expressed a perception of a lack of supportive learning community in the online environment, making it challenging to establish meaningful relationships with peers and instructors. The absence of communication and social interaction hindered their ability to make cognitive progress, as these interactions are essential for building and sustaining a sense of group commitment and facilitating critical thinking processes. Previous research has also highlighted the role of social presence in supporting cognitive presence, indirectly aiding in critical thinking processes among learners.

Faculty members' clear guidance, accessibility, prompt feedback, and commitment to maintaining course quality and expectations were also identified as crucial by students, reflecting the importance of teaching presence. According to Garrison *et al.* (2000) ^[23], the absence of teaching presence undermines the support and enhancement of social and cognitive presence, hindering the realization of educational outcomes.

These findings resonate with extensive research on student perceptions of online learning during the COVID-19 pandemic, as evidenced by studies conducted by Adnan and Anwar (2020) ^[12], Grether *et al.* (2020) ^[14], Means and Neisler (2021) ^[13], Nambiar (2020) ^[11], and Tartavulea *et al.* (2020) ^[10]. The findings from the current study not only

confirm but also complement the existing body of evidence. Further research is warranted to explore how other factors such as gender, type of institution, class setup, and socioeconomic background influence student perceptions of online learning effectiveness, as suggested by Wang *et al.* (2022) ^[24]. Moreover, investigating the role of technological literacy, motivation, and self-regulated learning strategies, as emphasized by Sui, Yen & Chang (2021), could provide additional insights into enhancing distance learning experiences and mitigating the challenges faced by students in virtual learning environments.

Conclusions

Based on the findings outlined above, it is evident that undergraduate Physical Education (PE) students at the Democritus University of Thrace perceive conventional face-to-face instruction more favorably compared to distance learning instruction during the COVID-19 pandemic. Despite the overall effectiveness of distance learning, students consistently rated traditional classroom teaching as more effective and expressed greater satisfaction with in-person instruction.

These results underscore the challenges associated with the sudden transition to remote learning and highlight the importance of further research to understand the factors influencing student perceptions and experiences in different instructional modalities. Additionally, the findings emphasize the need for educational institutions to carefully consider the design and implementation of online learning environments to ensure they meet the diverse needs and preferences of students.

Moving forward, it is imperative for policymakers, educators, and administrators to address the shortcomings identified in this study and implement strategies to enhance the quality and effectiveness of distance learning instruction. This may involve providing additional support and resources for instructors and students, promoting interactive and engaging online learning experiences, and fostering a sense of community and collaboration in virtual classrooms.

By addressing these challenges and leveraging the insights gained from this research, educational institutions can better prepare for future disruptions and ensure the delivery of high-quality education that meets the evolving needs of students in an increasingly digital world.

References

1. Veletsianos G, Houlden S. Radical flexibility and relationality as responses to education in times of crisis. *Postdigital Science and Education*, 2020;2(3):849–862. <https://doi.org/10.1007/s42438-020-00196-3>
2. Jones K, Sharma R. On reimagining a future for online learning in the post-COVID era. *SSRN Electronic Journal*, 2020. <https://doi.org/10.2139/ssrn.3578310>
3. Tobin TJ. Now is not the time to assess online learning. *Chronicle of Higher Education Review*, 2020. <https://www.chronicle.com/article/now-is-not-the-time-to-assess-online-learning>
4. Mseleku Z. A literature review of e-learning and e-teaching in the era of COVID-19 pandemic. *International Journal of Innovative Science and Research Technology*, 2020;5(10):588-597. <https://ijisrt.com/assets/upload/files/IJISRT20OCT430.pdf>

5. Bozkurt A, Jung I, Xiao J, Vladimirschi V, Schuwer R, Egorov G, & Paskevicius M. A global outlook to the interruption of education due to COVID-19 pandemic: Navigating in a time of uncertainty and crisis. *Asian Journal of Distance Education*,2020:15(1):1-126. <http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/462>
6. Hodges C, Moore S, Lockee B, Trust T, Bond A. The difference between emergency remote teaching and online learning. *Education Review*, 2020, 27. <https://er.educause.edu/articles/2020/3/the-difference-between-emergencyremote-teaching-and-online-learning#fn1>
7. Aristovnik A, Keržič D, Ravšelj D, Tomažević N, Umek L. Impacts of the COVID-19 pandemic on life of higher education students: A global perspective. *Sustainability*,2020:12(20):8438. <https://doi.org/10.3390/su12208438>
8. Iglesias Pradas S, Hernández García Á, Chaparro Peláez J, Prieto JL. Emergency remote teaching and students' academic performance in higher education during the COVID-19 pandemic: A case study. *Computers in Human Behavior*, 2021, 119106713. <https://doi.org/10.1016/j.chb.2021.106713>
9. Khalil R, Mansour AE, Fadda WA, Almisnid K, Aldamegh M, Al Nafeesah A, *et al.* The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students' perspectives. *BMC Medical Education*,2020:20(1):1-10. <https://doi.org/10.1186/s12909-020-02208-z>
10. Tartavulea CV, Albu CN, Albu N, Dieaconescu RI, Petre S. Online teaching practices and the effectiveness of the educational process in the wake of the COVID-19 pandemic. *Amfiteatru Economic*,2020:22(55):920-936. <https://doi.org/10.24818/ea/2020/55/920>
11. Nambiar D. The impact of online learning during COVID-19: Students' and teachers' perspective. *The International Journal of Indian Psychology*,2020:8(2):783-793. <https://doi.org/10.25215/0802.094>
12. Adnan M, Anwar K. Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*,2020:2(1):45-51. <https://doi.org/10.33902/jpsp.2020261309>
13. Means B, Neisler J. Teaching and learning in the time of COVID: The student perspective. *Online Learning*,2021:25(1):8-27. <https://doi.org/10.24059/olj.v25i1.2496>
14. Grether ST, Macdonald H, Higgins K. Students' perceptions and experiences of learning during the coronavirus pandemic. *Virginia Social Science Journal*,2020:54:84-93.
15. Aguilera Hermida AP. College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*,2020:1:100011. <https://doi.org/10.1016/j.ijedro.2020.100011>
16. Murphy L, Eduljee NB, Croteau K. College student transition to synchronous virtual classes during the covid-19 pandemic in northeastern United States. *Pedagogical Research*,2020:5(4):em0078. <https://doi.org/10.29333/pr/8485>
17. GUnet Asynchronous Distance Education Group. Platform Description (Open eClass 3.12), 2021. Accessed January 21, 2024.
18. Gómez Rey P, Barbera E, Fernández Navarro F. Measuring teachers and learners' perceptions of the quality of their online learning experience. *Distance Education*,2016:37(2):146-163. <https://doi.org/10.1080/01587919.2016.1184396> https://docs.openeeclass.org/en/3.12/detail_description
19. Green SB, Salkind NJ. *Using SPSS for Windows and Macintosh: Analyzing and understanding data* (8th ed.). Upper Saddle River, NJ: Pearson, 2017.
20. Cohen J. *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum, 1988.
21. Keis O, Grab C, Schneider A, Öchsner W. Online or face-to-face instruction? A qualitative study on the electrocardiogram course at the University of Ulm to examine why students choose a particular format. *BMC Medical Education*,2017:17:194.
22. Pei L, Wu H. Does online learning work better than offline learning in undergraduate medical education? A systematic review and meta-analysis. *Medical Education Online*,2019:24:1666538.
23. Garrison DR, Anderson T, Archer W. Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*,2000:2(2-3):87-105.
24. Wang DX, Lian DP, Xing YZ, Dong SY, Sun XY, Yu J. Analysis and prediction of influencing factors of college student achievement based on machine learning. *Frontiers in Psychology*,2022:13:11. <https://doi.org/10.3389/fpsyg.2022.881859>
25. Sui CJ, Yen MH, Chang CY. Investigating effects of perceived technology-enhanced environment on self-regulated learning. *Education and Information Technologies*,2024:29:161-183. <https://doi.org/10.1007/s10639-023-12270-x>