



Comparing physical education students' perspectives on conventional and online examination during the COVID-19 pandemic

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Abstract

The purpose of this study was to compare undergraduate Physical Education (PE) students' perspectives on conventional and online examinations during the COVID-19 pandemic at the Democritus University of Thrace. A group of 207 students actively took part in this research, all of whom encountered the transition from conventional face-to-face classroom instruction to online learning in response to the challenges presented by the COVID-19 pandemic. The participants' ages ranged from 19 to 24 years, with 146 males and 61 females included in the sample. To collect data, an online questionnaire was utilized and distributed to students via Google Forms. This survey was specifically conducted during synchronous distance learning sessions focusing on Information and Communication Technologies (ICT) in Physical Education (PE). The distribution of the questionnaire took place during the final exams of the semester, allowing participants to provide feedback on their experiences with both conventional face-to-face and online exam formats. A paired samples t-test analysis was employed to assess the perceptions of undergraduate PE students concerning the final exams of typical face-to-face instruction compared to online learning instruction. Data analysis revealed that PE students generally held a significantly more favorable view towards online examinations compared to conventional face-to-face exams. This preference was particularly evident due to the feature of immediate feedback following the online examinations. However, it's crucial to note that online examinations also pose a heightened risk of cheating and fraudulent behavior. This indicates a complex trade-off between the benefits of prompt feedback and the challenges associated with maintaining academic integrity in the online examination environment. Such findings underscore the importance of implementing robust measures to mitigate the risks of cheating and fraud while harnessing the advantages offered by online assessment methods in the field of PE.

Keywords: Online examination, perception, physical education, COVID-19

Introduction

Once considered a delivery method that lacked interest from most students, distance learning rapidly evolved into a significant aspect of higher education institutions following the introduction of Learning Management Systems (LMS). These systems improved collaboration efforts and brought structure and organization to educational materials. Furthermore, the advent of Massive Open Online Courses (MOOCs) enabled individuals to acquire skills without enrolling in formal degree programs. Typically, free and open to the public, MOOCs provided accessible resources for learning. This period marked a transition in the definition of distance education to a broader term known as online education. With enhanced accessibility, usability, and convenience, geographical constraints no longer limited students' participation in online classes. Many began engaging in virtual learning even when their educational institution or workplace was located in close proximity to their residence. By 2019, online education had become a viable solution for over four billion people (Wadhvani, 2023) ^[1].

In March 2020, the global COVID-19 pandemic led to 84% of undergraduate students shifting to remote learning (National Center for Educational Statistics, 2021). Conventional classes were hastily adapted into emergency remote online courses, drastically altering students' academic experiences. Deprived of the interactive and engaging in-face-to-face settings they were accustomed to before the pandemic, students faced isolation. Instructors and educational designers rushed to replicate these

experiences online, often constrained by time and inadequate training opportunities. Over time, with the pandemic persisting, new technologies emerged and educators grew more confident (Marcus, 2022) ^[3]. Faculty members started transitioning their courses from emergency remote setups to more refined online formats. Nonetheless, it's imperative to prioritize quality assurance in evaluating these newly developed online courses.

Assessments of the effectiveness of online education have yielded inconclusive results, sparking a nuanced debate within educational research. The comparison between online education and conventional face-to-face instruction has been a subject of rigorous examination, with researchers employing diverse methodologies and measurement criteria to gauge effectiveness. This multifaceted approach has led to a spectrum of findings, resulting in a lack of consensus within the academic community.

On one hand, proponents of online education point to studies that highlight its potential to provide a dynamic and enriched learning experience. These studies emphasize factors such as flexibility, accessibility, and the integration of multimedia resources (Blau & Drennan, 2017; Manning-Ouellette & Black, 2017; Means, Toyama, Murphy & Bakia, 2013; Soffer & Nachmias, 2018) ^[4, 5, 6, 7]. They argue that the digital environment can cater to diverse learning styles and preferences, fostering engagement and participation among students.

Conversely, skeptics of online education raise valid concerns regarding its efficacy compared to conventional face-to-face instruction. Research has suggested challenges

such as technological barriers, limited social interaction, and difficulties in maintaining student motivation and engagement (Alpert, Couch & Harmon, 2016; Bettinger, Fox, Loeb & Taylor, 2017; Fish & Snodgrass, 2014; Fish & Snodgrass, 2015; Johnson & Palmer, 2015; Xu & Jaggars, 2014) [8, 9, 10, 11, 12, 13]. These studies underscore the importance of human interaction and face-to-face instruction in facilitating deep learning and knowledge retention.

Moreover, a subset of research findings suggests that there may be no significant difference in effectiveness between online and conventional teaching modalities. These studies highlight the importance of instructional design and pedagogical approach rather than the delivery format itself (Alnabelsi, Al-Hussaini & Owens, 2015; Fonolahi, Khan & Jokhan, 2014; Porter, Pitterle & Hayney, 2014; Woldeab, Yawson & Osafo, 2020) [14, 15, 16, 17]. They emphasize the need for educators to adapt their teaching strategies to suit the online environment, leveraging technology as a tool to enhance rather than replace conventional instructional methods.

In light of these diverse perspectives, further investigation is warranted to unravel the complexities surrounding the comparative efficacy of online and conventional teaching methods.

An apparent complication that could arise is the widespread adoption of online assessment methods. Online exams provide students with added flexibility, such as the option to take exams from the comfort of their own homes. This might alleviate some of the anxiety associated with face-to-face exams held in examination halls and potentially reduce administrative costs for universities. Nevertheless, implementing assessment procedures presents numerous challenges in distance learning contexts. Summative assessments, including exams, serve as the basis for evaluating individual student performance and progress, while aggregated results can inform educational policies such as curriculum development and funding allocations (Shute & Kim, 2014) [18]. Hence, it is imperative that online summative assessments are conducted in a manner that ensures their fundamental reliability and validity are upheld. However, there is limited research specifically addressing the transition from conventional face-to-face exams to online exams in distance learning institutions (Aristeidou & Cross, 2021; Dominguez-Figaredo, Gil-Jaurena & Marentin-Encine, 2022) [19, 20]. Therefore, the purpose of this study was to compare undergraduate Physical Education (PE) students' perspectives on conventional and online examinations during the COVID-19 pandemic at the Democritus University of Thrace. The study was aimed to answer the following research question:

1. What are the perceptions of undergraduate PE students regarding the final exams of typical face-to-face instruction compared to online learning instruction during the COVID-19 pandemic?

Methods

Participants

This research engaged a total of 207 students (N = 207) affiliated with the Department of Physical Education and Sport Science (DPES) at Democritus University of Thrace (DUTH). These individuals were directly impacted by the transition from conventional face-to-face instruction to distance learning, a shift necessitated by the unprecedented

challenges posed by the COVID-19 pandemic. The age range of the participants spanned from 19 to 24 years (Mean = 21.5, Standard Deviation = 0.48). Among the participants, there were 146 males (70.5%) and 61 females (29.5%).

Participation in the study was entirely voluntary, and students were provided with the option to decline participation despite being invited as part of their Information and Communication Technologies (ICT) in Physical Education courses. The selection of participants was conducted through random sampling, ensuring that the sample represented the broader student population accurately. Prior to their involvement in the study, students received comprehensive information outlining the research objectives and their role in the process. It was explicitly communicated that participation was voluntary and would not affect their academic grades in any way. This approach was implemented to maintain ethical standards and guarantee the genuine willingness of participants to contribute to the study.

Distance Learning Platforms

Version 3.12 of the e-Class platform served as an alternative to conventional teaching methodologies, following a recommendation by the Academic Internet GUnet (2021) for tertiary education institutions in Greece. This robust platform facilitated seamless access to educational resources, enabled students to submit assignments, share documents, and engage in online discussions remotely. Additionally, for synchronous teaching sessions, Microsoft Teams for Education emerged as a pivotal tool. Integrated within the Microsoft 365 suite, this collaborative platform streamlined communication, collaboration, and organizational tasks for students, educators, and administrators alike.

Microsoft Teams for Education offered a myriad of features, including threaded conversations, virtual meetings, file sharing capabilities, and streamlined assignment creation, submission, and management processes. Moreover, its integration with OneNote facilitated the creation and utilization of digital notebooks, enhancing organization and accessibility for all stakeholders. Furthermore, Teams seamlessly integrated with various Microsoft 365 applications and third-party educational tools, fostering a dynamic and enriched learning environment.

Prioritizing security, compliance, and data analytics, Microsoft Teams for Education aimed to enhance both remote and hybrid learning experiences. By offering insights into student engagement and progress, educators could adapt their teaching strategies effectively, ensuring optimal learning outcomes in diverse instructional settings. Overall, the adoption of these innovative digital platforms signifies a commitment to leveraging technology to augment the educational experience and meet the evolving needs of modern learners.

Questionnaire

In this study, researchers employed the Conventional and Online Examination Questionnaire, a tool developed by Hanafy, Jumaa & Arafa in 2021 [22], to assess the quality of both conventional and online examination formats by measuring students' satisfaction levels. This comprehensive survey encompasses 5 quality indicators, which address various aspects of both online and conventional exams. These indicators include fundamental questions such as:

- a. **Ease of access:** Assessing whether participants perceive conventional or online exams to be easily accessible.
- b. **Immediate feedback:** Evaluating whether participants feel that conventional or online exams provide prompt feedback.
- c. **Adequate time limit:** Determining participants' opinions regarding the sufficiency of time allocated for completing conventional or online exams.
- d. **Efficient time utilization:** Gauging participants' agreement with the notion that time is effectively utilized once the exam begins, as it must be completed within a specified timeframe.
- e. **Risk of cheating and fraud:** Investigating participants' perceptions regarding the likelihood of cheating and fraudulent behavior in conventional versus online exams.

To assess perceptions, the researchers utilized a 5-point Likert-type scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Cumulative scores from all 5 quality indicators provided an overall measure of perception regarding the final examination formats of distance learning instruction during the COVID-19 pandemic.

Reliability analysis, conducted through Cronbach's alpha, demonstrated adequate internal consistency, with coefficients of .76 for the student survey (Hanafy, Jumaa & Arafa, 2021) ^[22]. This indicates good reliability and consistency in the measurement of perceptions regarding online and conventional examination formats among students, thereby enhancing the credibility of the survey as a valid tool for assessing perceptions in this context.

Procedure

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

The conventional instructional approach followed a direct teaching method, incorporating lectures, interactive activities, and discussions with the instructor present. Each session began with a brief 5-minute overview of the main learning objectives, followed by a 40-minute lecture on the subject matter. Subsequently, a 45-minute session was dedicated to constructive activities. The teaching session concluded with a concise 5-minute recapitulation of the key learning points. Participants were given the flexibility to work independently or in pairs, with verbal feedback encouraged during the activity segment.

In contrast, the distance learning method mirrored 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 using 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 via Google

Forms as the final assessment measure. This questionnaire was distributed during the final exams of the semester, marking the conclusion of the respective courses.

Participants were instructed to choose a course that had undergone a mandatory transition from face-to-face to some level of online learning due to the COVID-19 pandemic. They were then asked to complete 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 5 to 10 minutes. Upon survey completion, 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 utilized a post-test design, with rigorous screening of the data to identify and address any potential violations of statistical assumptions, all of which were found to be absent (Green & Salkind, 2017) ^[23]. A paired samples t-test analysis was employed to examine the perceptions of undergraduate PE students regarding the final exams conducted in conventional face-to-face instruction versus online learning instruction during the COVID-19 pandemic. The dependent variables analyzed focused on students' perceptions of the final exams under both conventional and distance learning methods. The significance of mean differences between the formats of final exams (online versus conventional) was assessed at the 0.05 alpha level. Additionally, effect size was determined using the Cohen statistic (*d*) to ascertain practical significance, adhering to Cohen's guidelines: where 0.2 denotes a small effect size, 0.5 indicates a medium effect size, and 0.8 suggests a large effect size (Cohen, 1988) ^[24].

The hypothesis of the study was formulated as follows:

H01: There will be no statistically significant difference in the mean scores of PE students' perceptions regarding the final exams of conventional face-to-face instruction compared to online learning instruction.

Results

The Shapiro-Wilk test was conducted to assess the normality of the sample, revealing no evidence of non-normality ($W = 0.97$, $p\text{-value} = 0.15$). Additionally, upon visual examination of the histogram and the QQ plot, no substantial departures from normality were observed. Consequently, based on these findings, we proceeded to utilize a parametric test for further analysis. Therefore, a paired samples t-test was applied to examine the H01 hypothesis, which posited that there would be no statistically significant difference in the mean scores of PE students' perceptions regarding the final exams of conventional face-to-face instruction compared to online learning instruction.

The analysis unveiled that both the online and conventional examination formats significantly impacted the perceptions of PE students, $t(206) = 6.02$, $p < .001$, $d = .42$. Specifically, the mean perception score for the online examination format was $M = 18.1$ ($SD = 2.3$), indicating that, on average, students held a more favorable view of online examination format. In contrast, for the conventional face-to-face examination format, the mean perception score was slightly lower at $M = 17.2$ ($SD = 3.36$). This suggests that, overall, PE students tended to perceive the online examination

format as more effective compared to the conventional face-to-face examination format. Detailed information regarding the mean value (M), standard deviation (SD), and the t-

value with the corresponding level of significance are presented in Table 1.

Table 1: Mean scores and standard deviations of PE students' perceptions for the conventional and the online examination format

Variable	Conventional face-to-face examination (n=207)		OnLine examination (n=207)		t	p
	M	S.D.	M	S.D.		
PE students' perceptions	17.2	3.36	18.1	2.3	6.02	< .001

Based on the obtained results, the null hypothesis (H01) asserting that there would be no statistically significant difference in the mean scores of PE students' perceptions regarding the final exams of conventional face-to-face instruction compared to online learning instruction is

rejected. The findings indicate that, overall, PE students tend to perceive the online examination format as more favorable when compared to the conventional face-to-face examination format (Figure 1).

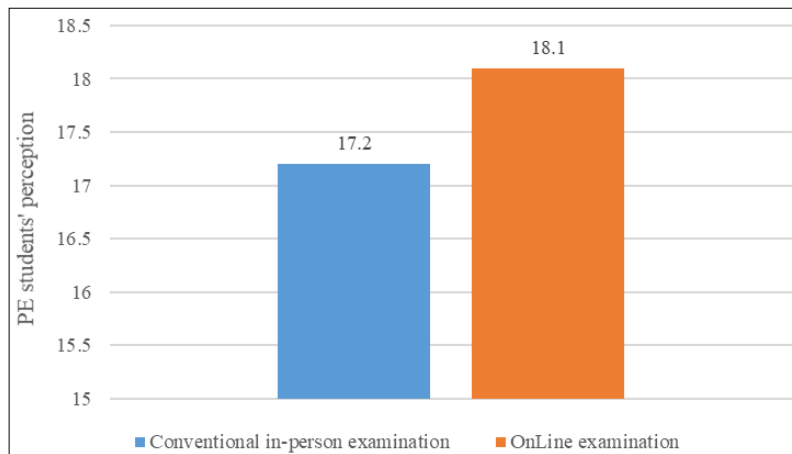


Fig 1: Mean scores of PE students' perceptions for the conventional and the online examination format

Discussion

Amidst the backdrop of the COVID-19 global pandemic, the landscape of higher education has undergone significant transformations, both in terms of the undergraduate student body and the structure of course offerings. As institutions navigate the shift from emergency remote learning to establishing quality online educational experiences, it becomes imperative for them and their educational staff to respond with careful attention and empirical approaches.

A notable change that emerges from this transition is the potential widespread adoption of online assessment methods. Online exams, for instance, present students with enhanced flexibility, allowing them to take exams from the comfort of their own homes. This not only provides convenience but also has the potential to alleviate some of the anxiety associated with face-to-face exams held in conventional exam halls. Additionally, there's a possibility of reduced administrative costs for universities. However, it's worth noting that there's a lack of extensive research specifically focusing on the transition from face-to-face to online exams in the context of distance learning universities. Exploring this transition further, research conducted by Aristeidou & Cross (2021) [19] and Dominguez-Figaredo, Gil-Jaurena & Marentin-Encine (2022) [20] sheds light on the challenges and opportunities inherent in this process. These studies provide valuable insights into the nuances of implementing online assessment methods within the framework of distance learning. However, given the evolving nature of higher education in response to the pandemic, there remains a need for further research to comprehensively understand the implications and best practices associated with this transition. Therefore, the

purpose of this study was to delve into the perceptions and experiences of undergraduate PE students regarding conventional and online examination formats during the challenging circumstances brought about by the COVID-19 pandemic. Specifically, the research sought to comprehensively understand how students in the Department of Physical Education and Sport Sciences at Democritus University of Thrace, navigate and perceive the transition from conventional face-to-face exams to online examination modalities.

An examination of the quantitative data from student surveys indicated that, on the whole, the students involved perceived both conventional and online exams amidst the COVID-19 pandemic to be adequate. However, upon comparing the experiences of conventional and online exams, the majority of students rated conventional exams as less satisfactory and expressed a lower level of comfort with the conventional assessment setting. This discrepancy was reflected in their overall satisfaction scores, which were notably lower for conventional exam experiences.

Moreover, students tended to express a greater degree of satisfaction and comfort with online exams compared to their conventional counterparts. The data underscored a clear preference among students for the online assessment environment, highlighting its perceived effectiveness and suitability, particularly in the context of the challenges posed by the COVID-19 pandemic.

This finding suggests that while both exam modalities were deemed acceptable, online exams emerged as the preferred choice among students due to factors such as convenience, flexibility, and perhaps a perceived reduction in anxiety associated with the conventional exam setting.

Such insights are valuable for educators and institutions seeking to optimize assessment practices and cater to the evolving needs and preferences of students in the face of unprecedented circumstances.

These findings are consistent with previous research in the field. For example, a systematic review by Topuz and Kinshuk (2021) ^[25] examined 61 papers published between 2002 and 2019 to explore students' perspectives on remote assessment. The review revealed positive attitudes towards online exams, indicating that they do not necessarily heighten anxiety among students. Additionally, many students expressed a desire to continue using online assessment formats in the future. However, concerns were raised regarding technical issues that could arise during online exams, representing a significant negative aspect.

Regarding cheating and plagiarism, divergent views were observed among students. Some believed that remote exams facilitated cheating due to the perceived ease of accessing external resources, while others disagreed with this notion. In terms of learning efficacy, students generally reported that online assessment positively contributes to the learning process.

Furthermore, other studies have highlighted specific factors that contribute to increased pressure during online exams. Issues such as insufficient exam time, strict time limits, and the inability to revisit questions have been identified as significant stressors (Bayar & Alimcan, 2021; Novick *et al.*, 2022) ^[26, 27]. Moreover, the design and format of online exams also influence students' stress levels, with features such as visible clocks and oral formats exacerbating anxiety (Novick *et al.*, 2022) ^[27].

In contrast to the common belief that online examinations induce heightened intensity and student nervousness (Choi, Song & Zaman, 2020) ^[28], this study revealed a favorable reception of online examinations. However, this finding could potentially be attributed to the fact that the participants in this study had not yet encountered online unsupervised exams, thus lacking entrenched opinions on relevant processes.

Another plausible explanation for the positive reception of online examinations could be the disparity from students' previous experiences with invigilation in face-to-face exams – their conventional examination model prior to the pandemic. The acceptance of online examinations by students carries significant implications for the design of online exam systems.

This acceptance could pave the way for innovative approaches in distance learning, particularly in terms of teaching and learning methodologies. As students become increasingly accustomed to online assessments resembling the online exam format utilized in this study, their familiarity with exam technology and proficiency in responding to specific question types may grow.

Hence, educational designs that leverage assessment methods to bolster students' confidence in their exam performance should be encouraged. Such initiatives have the potential to enhance students' preparedness for online examinations and contribute to their overall success in the academic realm.

The significance of the findings from this study extends beyond the immediate context of online examination acceptance among students during the COVID-19 pandemic. These results have broader implications for educational institutions, curriculum design, and the

evolution of assessment practices in higher education. The positive reception of online examinations suggests a willingness among students to adapt to new modes of assessment, underscoring the importance of pedagogical flexibility and the need for educators to be responsive to changing learning environments. Institutions may need to invest in professional development opportunities for faculty to enhance their online teaching and assessment skills.

Furthermore, online examinations can potentially promote equity and access by removing geographical barriers and offering flexibility to students with diverse needs. The acceptance of online examinations highlights the importance of ensuring equitable access to technology and resources for all students, especially those from underprivileged backgrounds.

Moreover, the acceptance of online examinations opens avenues for innovation in assessment practices. Educators can explore diverse assessment formats, such as open-book exams, multimedia-based assessments, and simulations, to more authentically assess students' knowledge and skills. This encourages a shift away from conventional, rote memorization-based assessments towards more authentic and meaningful evaluation methods.

The positive perception of online examinations contributes to overall student satisfaction and engagement with the learning process. Institutions can leverage this insight to enhance student support services, provide tailored resources for online exam preparation, and create a conducive learning environment that fosters academic success.

As the educational landscape continues to evolve, students' familiarity with online assessment methods positions them well for future academic and professional challenges. The skills developed through online examinations, such as time management, digital literacy, and critical thinking, are highly transferable and valuable in a rapidly changing global economy.

Additionally, these findings stimulate further research and development in the field of educational technology and assessment. Researchers may explore factors influencing students' acceptance of online examinations, investigate best practices in online exam design and implementation, and evaluate the long-term impact of online assessment on student learning outcomes.

In conclusion, the acceptance of online examinations among students represents a significant paradigm shift in higher education. By embracing this change and leveraging the opportunities it presents, institutions can enhance the quality, accessibility, and relevance of education in the digital age.

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