International Journal of Multidisciplinary Education and Research
www.multidisciplinaryjournals.in
ISSN: 2455-4588
Received: 10-01-2024, Accepted: 25-01-2024, Published: 09-02-2024
Volume 9, Issue 1, 2024, Page No. 48-53

Exploring the perceptions of distance learning efficacy among undergraduate physical education students during the COVID-19 pandemic

Maria Giannousi
Department of Physical Education and Sports Science, Democritus University of Thrace, University Campus, Komotini, Greece

Abstract
The aim of this research was to explore how undergraduate students studying Physical Education (PE) at Democritus University of Thrace perceived the efficacy of distance learning instruction amid the COVID-19 pandemic. A total of 207 students took part in this study, having undergone the transition from traditional in-person classroom teaching to online learning due to the challenges presented by the COVID-19 crisis. The participants' ages ranged from 19 to 24 years, with 146 being male and 61 females. An online questionnaire, distributed via Google Forms, was used for data collection. The questionnaire was given to students in synchronous distance learning courses on Information and Communication Technologies (ICT) in PE during the last two lectures of the semester. A multiple regression analysis was employed to explore the perceptions of PE students regarding the effectiveness of distance learning instruction during the COVID-19 pandemic. Quantitative analysis of survey data revealed that students generally found distance learning instruction effective. Detailed data analysis uncovered a positive correlation between two key factors - experience with ICT and frequency of using distance learning systems - and students' perceptions of distance learning during the pandemic. Individuals with higher ICT proficiency held a more favorable view of the instruction compared to those with lower proficiency. Similarly, students engaging with distance learning systems more frequently tended to perceive the instruction during the pandemic as less effective than those with daily engagement. In conclusion, regular engagement with both synchronous and asynchronous platforms, coupled with ICT experience, emerges as crucial for fostering positive perceptions of distance education among undergraduate PE students.

Keywords: Perception, distance learning, ICT experience, system usage, physical education, COVID-19

Introduction

The onset of the COVID-19 outbreak thrust university faculty and students into a realm of unprecedented challenges, catching higher education institutions largely unprepared for the abrupt transition. This unforeseen shift disrupted the pursuit of learning goals for many students (Heng & Sol, 2021) [1]. The teaching faculty, faced with this sudden change, had to undergo substantial revisions to course schedules, assignments, and assessment tools. Simultaneously, they had to acquire new skills to effectively deliver online classes, irrespective of their prior experience in online teaching (Tan, 2021) [2].

The adaptive response required from educators was not only about technological adjustments but also entailed a paradigm shift in instructional methods. Faculty members found themselves navigating uncharted territories, transforming conventional teaching approaches into formats suitable for distance learning platforms. The challenges were multifaceted, ranging from the technical aspects of online delivery to the pedagogical nuances essential for engaging and effective distance learning experiences (Govindarajan & Srivastava, 2020; Tan, 2021) [3, 2].

In this transformative process, it became evident that the impact of the sudden shift to online education extended beyond the logistics of course delivery. Students, accustomed to the dynamics of typical face-to-face classes, found themselves grappling with a distinct mode of learning. This shift in perception can profoundly influence their educational experiences, with negative views potentially leading to reduced motivation and persistence (Kauffman, 2015) [4].

Surprisingly, while the challenges faced by teaching faculty in adapting to online education have been extensively explored in existing research, there is a notable gap in understanding the perceived challenges from the students' perspective. The literature tends to predominantly focus on barriers identified by instructors, leaving a limited body of work that comprehensively explores the unique challenges students face in the realm of distance learning.

Among the few studies examining this aspect, Muilenburg and Berge's (2005) [5] research identified four critical factors hindering students in online learning: social interaction, administrative/instructor issues, learner motivation, and time and support for studies. These factors are intertwined and collectively contribute to shaping students' success in the online learning environment. The lack of social interaction emerged as the most severe barrier, echoing the core principle of the Community of Inquiry (CoI) framework (Garrison, Anderson & Archer, 2000) [6], which emphasizes the pivotal role of social presence in distance learning success.

Alghamdi and Alanizan's (2018) [7] study delving into students' motivation and barriers uncovered two primary obstacles: collaboration and interaction in online classes, as well as students' hesitance to learn and showcase their academic work. This aligns with De Metz and Bezuidenhout's (2018) findings, suggesting that insufficient interaction and collaboration could lead to a sense of isolation, impacting confidence levels and hindering the sense of belonging crucial for effective online learning engagement.

Moreover, the feeling of isolation can affect students' discipline and participation in distance learning, as

highlighted by further studies (Moore, 2005; binti Abd Aziz, bin Musa & binti Abd Aziz, 2020) [9, 10]. Confidence issues, identified by Moore (2005) [9] as a barrier, play a significant role in students' success in the online learning environment. Study by binti Abd Aziz *et al*. (2020) [10] underscored the persistent challenge of limited social interaction and collaboration with peers in online courses.

Beyond social interaction, various other barriers impede students' success in online learning. These include deficient technology skills (AlGhamdi & AlAnizan, 2018; binti Abd Aziz *et al*., 2020) [7, 10], time constraints, and inadequate support for studies (Muilenburg and Berge, 2005) [5]. Additionally, issues such as delays in feedback from instructors (van Rensburg, 2018) and a confusing course layout can contribute to challenges students face in the online learning environment.

In summary, the most pronounced barrier to distance learning, as perceived by students, is the deficiency in social interaction and collaboration. This barrier significantly influences learning effectiveness, online learning satisfaction, and the willingness to enroll in future online courses. Alongside this, deficient technology skills, time and support constraints, lack of confidence, delays in feedback, and the feeling of isolation emerge as serious barriers that hinder students from succeeding in the online learning landscape. Recognizing and addressing these challenges is crucial for enhancing the overall online learning experience and promoting student success in virtual educational settings.

The ongoing spread of the COVID-19 pandemic has created a prolonged state of uncertainty. With the transition from a short-term emergency to a long-term reality, higher education institutions find themselves on shaky ground. It is crucial to thoroughly reconsider, overhaul, and reshape our education system in light of this unprecedented situation (Martinez, 2020) [11]. There is an immediate need to assess whether online teaching can offer students comprehensive and successful learning experiences and whether the newly implemented approaches have been effectively executed. While existing literature suggests that well-planned online education can be comparable to face-to-face instruction in certain measures of learning outcomes (Horspool & Lange, 2012; Porter, Pitterle & Hayney, 2014; Ward, Peters & Shelley, 2010; Woldeab, Yawson & Osafo, 2020) [12, 14, 15], it is of critical practical importance to explore the perceived effectiveness of online instruction during the COVID-19 pandemic, considering the significant challenges faced by students, particularly those unprepared for or new to online learning. Therefore, the purpose of this study was to investigate the perceptions of undergraduate Physical Education (PE) students regarding the effectiveness of 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 distance learning instruction during the COVID-19 pandemic as an alternative to traditional face-to-face instruction?

a. Do students' perceptions of teaching effectiveness differ based on gender?
b. Do students' perceptions of teaching effectiveness differ based on their academic year?
c. Do students' perceptions of teaching effectiveness differ based on their Information & Communication Technology (ICT) experience?
d. Do students' perceptions of teaching effectiveness differ based on their use of the distance learning systems?

Methods

Participants

A total of two hundred seven students (N = 207) from the Department of Physical Education and Sport Science (DPESS) at Democritus University of Thrace (DUTh) participated in this study. These individuals experienced the shift from conventional face-to-face classroom instruction to online learning, prompted by the challenges posed by the COVID-19 pandemic. Their ages ranged from 19 to 24 years (M = 21.5, SD = 0.48). Among the participants, 146 (70.5%) were male, and 61 (29.5%) were female. Although students were invited to join the study as part of their ICT in Physical Education courses, they were also given the choice to opt out. The participants were selected through the method of random sampling. Prior to the experiment, students were informed about the research's objectives, and their responsibilities, ensuring voluntary participation without impacting their grades.

Distance Learning Platforms

The e-Class platform version 3.12 was utilized to provide an alternative method of presenting information compared to the face-to-face approach. This platform, recommended by the Academic Internet GUnet for supporting and enhancing asynchronous distance education services in tertiary education in Greece. This specific platform allowed the course administrator to organize their educational material and present it in various formats through the internet. On their part, students could have remote access to digital material, upload assignments and shared documents, and participate in discussions and conversations (GUnet Asynchronous Distance Education Group, 2021).

For the implementation of synchronous online teaching and learning process, the Microsoft Teams for Education platform was used. Microsoft Teams for Education is a collaborative platform within the Microsoft 365 suite, designed for educational institutions. It serves as a centralized hub for communication, collaboration, and organization among students, teachers, and administrators. The platform enables threaded conversations, virtual meetings, and file sharing, fostering communication and facilitating online classes. Teachers can create, distribute, and manage assignments, while students can submit work digitally and receive feedback. OneNote integration allows the creation of digital notebooks, providing a space for collaborative note-taking and resource access. Teams integrates with various Microsoft 365 applications and third-party educational apps, creating a comprehensive digital learning environment. It prioritizes security, compliance, and provides analytics for monitoring student engagement and progress. In essence, Microsoft Teams for Education aims to enhance remote and hybrid learning experiences by offering a versatile and collaborative platform tailored to the specific needs of educators and students.

Questionnaire

The first part of the instrument comprised a demographic questionnaire aimed at collecting comprehensive background information from the participants. This included inquiries pertaining to their gender, age, academic year, experience with ICT, and utilization of the distance learning systems.

The second part of the instrument utilized the Online Learning Quality Index based on Teachers' and Learners' Perceptions (OLQ-TLP Index), developed by Gómez-Rey, Barbera & Fernández-Navarro (2016) [17]. The OLQ-TLP Index measures the quality of online learning programs through the assessment of teacher and student satisfaction. Expanding on the Online Learning Consortium's scorecard, Gómez-Rey *et al*. (2016) integrated key educational variables into the OLQ-TLP Index, encompassing 39 quality indicators across 11 categories. These categories included learning support, social presence, instruction, learning platform, instructor interaction, learner interaction, learning content, course design, learner satisfaction, knowledge acquisition, and ability to transfer. Measurement involved a 5-point Likert-type scale, with scores ranging from 1 (Totally Disagree) to 5 (Totally Agree). Adding the scores for all 39 quality indicators provided the overall measure of perception regarding the effectiveness of distance learning instruction during the COVID-19. Notably, the OLQ-TLP Index addressed limitations by incorporating the perceptions of faculty and students, the primary stakeholders, and evaluating variables based on their actual implementation in courses. Additionally, it considered the dual cognitive-social nature of learning, aligning with the learner-centered learning paradigm. Reliability coefficients, assessed through Cronbach's alpha, yielded results of .930 for faculty surveys and .910 for student surveys (Gómez-Rey *et al*., 2016).

Procedure

Utilizing an online questionnaire emerged as the optimal approach for distributing surveys among Physical Education students and consolidating the collected data. Google Forms was specifically chosen for this task due to its attributes as a free, open survey application relying on a scalable MySQL database. Participants were already well-acquainted with this tool, having previously tested its functionality.

The questionnaire was administered to students enrolled in synchronous distance learning courses related to ICT in Physical Education. The completion of the questionnaires occurred during the final two lectures of the semester, concluding the respective courses.

Participants were instructed to choose the course that necessitated a mandatory transition from face-to-face to some degree of online learning amid the COVID-19 pandemic. They were then required to fill out the questionnaire based on the selected course. Data gathered from the survey was treated confidentially, with an average completion time of approximately 10-15 minutes. Following survey completion, the instructor expressed gratitude to the participants for their time and effort. All responses were promptly stored in real-time within Google's online database.

Moreover, Google Forms provided additional insights into the recorded answers, including the time taken to complete the questionnaire, date and time stamps, and computer IP addresses, among other details.

Statistical analysis

The study utilized Jamovi open statistical software version 2.4.11 to perform a multiple regression analysis, aiming to explore the perceptions of undergraduate Physical Education (PE) students regarding the effectiveness of distance learning instruction during the COVID-19 pandemic. Multiple regression extends bivariate regression by enabling the examination of the relationship between a dependent variable and multiple independent variables (Green & Salkind, 2017) [18]. As highlighted by Green & Salkind (2017) [18], regression techniques are particularly valuable in survey research, especially when there is manipulation of correlated variables in the study's nature, as regression can be applied when the independent variables exhibit correlation. The dependent variable in the analysis focused on student perceptions regarding the effectiveness of distance learning instruction. The independent variables included gender, categorized into two levels (male, female); academic year, stratified into four levels (first, second, third, fourth); experience with ICT, classified into three levels (low, moderate, high); and the frequency of utilizing distance learning systems, segmented into three levels (daily, when needed, rarely).

Several statistical techniques were employed to validate the assumptions of the analysis. Specifically, normal Q-Q Plots were used to evaluate the normality of residuals. The Durbin–Watson values for the regression model was 1.78, signifying an absence of autocorrelation issues. The multicollinearity test demonstrated a low level of intercorrelation among independent variables (VIF range from 1.03 to 1.07; tolerance range from 0.937 to 0.975). VIF values below 5 are generally considered acceptable for multicollinearity (Hair, Babin, Anderson & Black, 2019) [19]. Moreover, bivariate correlation analysis results indicated correlation coefficients between independent variables below 0.70, suggesting weak correlations among variables (Green & Salkind, 2017) [18]. The significance level for measurements was set at ($p < 0.05$).

Results

A standard multiple linear regression analysis was conducted to investigate potential differences in students' perceptions regarding the effectiveness of distance learning instruction during the COVID-19 pandemic. The analysis considered gender, academic year, experience with ICT, and the frequency of utilizing distance learning systems as predictors.

All categorical independent variables were dummy coded, with male as the reference group for gender, first year as the reference group for academic year, low for students' experience with ICT, and daily for the frequency of utilizing distance learning systems. The mean student survey total score was 141.57 (SD = 27.987), surpassing the average score of 117, which corresponds to the scenario where participants chose "undecided" for all 39 survey questions. This suggests that PE students, on the whole, perceived distance learning instruction during the COVID-19 pandemic as effective.

The outcomes of the multiple linear regression analysis revealed that the overall model was statistically significant, with $F(8, 198) = 7.8$, $p < .001$. This significance implies that a certain proportion of the total variation in student perceptions regarding the effectiveness of distance learning instruction during the COVID-19 pandemic could be

predicted by the combination of the four independent variables.

The multiple R-squared (R^2) value was .24, indicating that approximately 24% of the variation in students' perceptions regarding the effectiveness of distance learning instruction was accounted for by the combination of the independent variables. Table 1 presents the Model Summary, providing an overview of the key statistics related to the regression analysis. Additionally, Table 2 presents the Regression Coefficients, offering detailed insights into the coefficients associated with each independent variable in the model.

Table 1: Model summary

R	R^2	Adjusted R^2	AIC	F	df1	df2	P	Durbin-Watson
0.489	0.240	0.209	895	7.80	8	198	< .001	1.78

Two individual predictors showed significance: Experience with ICT (Moderate, B = 0.752, t = 2.115, p = 0.036; High, B = 1.411, t = 3.671, p < 0.001) and Frequency of utilizing distance learning systems (When needed, B = -1.517, t = -4.496, p < 0.001; Rarely, B = -2.33, t = -4.351, p < 0.001). In comparison to the Lower experience with ICT group, students in the higher experience with ICT groups perceived distance learning instruction during the COVID-19 pandemic as more effective, with an approximate increase of 0.752 and 1.411 for the Moderate and High experience with ICT groups, respectively. Similarly, compared to the Daily frequency of utilizing distance learning system group, students in the higher frequency of utilizing distance learning system groups perceived distance learning instruction during the COVID-19 pandemic as less effective, with an approximate decrease of -1.517 and -2.33 for the When needed and Rarely frequency of utilizing distance learning system groups, respectively. All other individual predictors, including Gender (B = 0.273, t = 0.102, p = 0.918), and Academic year (Second, B = -0.513, t = -1.3, p = 0.195; Third, B = -1.465, t = -1.674, p = 0.096; Fourth, B = -0.755, t = -2.191, p = 0.03), were not significant. However, compared to students in the First year of study, students in the Fourth academic year perceived distance learning instruction during the COVID-19 pandemic as more effective, with an increase of approximately -0.755. Based on standardized Beta coefficients, Experience with ICT (Moderate, β = 0.327; High, β = 0.613) and Frequency of utilizing distance learning systems (When needed, β = -0.659; Rarely, β = -1.012) were stronger predictors of student perceptions regarding the effectiveness of distance learning instruction during the COVID-19 pandemic.

Table 2: Regression Coefficients

Predictor	B	SE	β	t	p
Intercept	19.157	0.442		43.302	< .001
Gender	-0.262	0.328	-0.114	-0.799	0.425
Academic year:					
Second	-0.513	0.395	-0.223	-1.300	0.195
Third	-1.465	0.875	-0.637	-1.674	0.096
Fourth	-0.755	0.344	-0.328	-2.191	0.030
Experience with ICT:					
Moderate	0.752	0.356	0.327	2.115	0.036
High	1.411	0.384	0.613	3.671	< .001
Frequency of utilizing distance learning systems:					
When needed	-1.517	0.337	-0.659	-4.496	< .001
Rarely	-2.330	0.535	-1.012	-4.351	< .001

Discussion

As a result of the COVID-19 pandemic, Greece witnessed a significant shift in the education landscape, with entire student populations transitioning to virtual classrooms. The move to distance learning instruction posed considerable challenges, not only in terms of adapting to a new mode of teaching but also in the time and support required for educators to effectively navigate the digital realm. Consequently, it is probable that the distance learning experiences delivered by instructors may not have been comprehensive, and the adoption of innovative teaching methodologies might not have been fully optimized. The unique circumstances brought about by the pandemic demanded rapid adjustments, and this transitional period likely impacted the seamless integration of advanced teaching techniques into the virtual learning environment. As educational institutions grappled with the unforeseen challenges, the need for ongoing support and professional development for faculty became evident, aiming to enhance their proficiency in distance learning instruction and ultimately improve the overall quality of the educational experience for students. Therefore, the purpose of this study was to examine the perceptions of undergraduate PE students regarding the effectiveness of distance learning instruction during the COVID-19 pandemic at the Democritus University of Thrace. In order to attain this objective, specific inquiries were formulated, meticulously examined, and the research outcomes related to this fundamental query are outlined in the following sections. The quantitative analysis of survey data indicated that PE students generally viewed distance learning instruction during the COVID-19 pandemic as effective. This effectiveness suggests that a specific portion of the overall variability in student perceptions regarding distance learning could be anticipated by considering the four independent variables investigated in this research.

In particular, the detailed data analysis brought to light a positive correlation between two key factors, namely Experience with ICT and Frequency of utilizing distance learning systems, and students' perceptions concerning distance learning instruction during the COVID-19 pandemic. Notably, individuals with higher levels of experience with ICT exhibited a more favorable perception of distance learning instruction compared to their counterparts with lower ICT proficiency. Likewise, students who reported higher frequencies of utilizing distance

learning systems tended to perceive the instruction during the pandemic as less effective in comparison to those with a daily frequency of engagement with these systems. These correlations underscore the influential role that students' prior experience with ICT and the frequency of their interaction with distance learning systems played in shaping their overall perspectives on the effectiveness of distance learning instruction during the unprecedented circumstances of the COVID-19 pandemic.

From the above results, it appears that engaging with both synchronous and asynchronous platforms on a daily basis, along with experience with ICT, is crucial for shaping students' positive perceptions of distance education. Regular interaction, combined with familiarity with ICT, enhances adaptability to distance educational tools, allowing students to control the flow and content of lesson-related information. This experience with ICT, coupled with daily platform usage, facilitates effective communication with educators, encouraging dynamic exchanges of ideas and knowledge.

In addition, the familiarity gained through daily engagement and experience with ICT enables students to tailor knowledge acquisition to individual preferences and needs, fostering a sense of comfort in active participation in the educational journey. This familiarity also aids in navigating the quantity and quality of educational material, leading to a deeper understanding of the lesson content.

Furthermore, seamless integration into the platform environment, achieved through daily use and experience with ICT, ensures that students allocate their time more efficiently in the distance educational process. Conversely, sporadic or limited platform usage, coupled with restricted experience with ICT, may pose a challenge for students to adapt to the controls of the learning process, hindering their ability to fully comprehend and leverage the benefits of distance education.

Ultimately, the frequency of platform uses and experience with ICT emerge as key factors influencing students' perceptions, with consistent engagement and usage experience reinforcing a natural and positive connection between the online platforms and the educational experience.

The research findings regarding students' engagement with ICT and the frequency of utilizing distance learning systems align with previous studies exploring the connection between student characteristics and their views on distance learning instruction. Notably, Martin and Bolliger (2018) [20] found that students with greater online course experience perceived online learning as more effective compared to those with less experience. Fish and Snodgrass (2015) examined student perceptions of online versus face-to-face courses, revealing that perceptions of online learning improved with increased online experience. Additionally, Aparicio, Bacao & Oliveira (2017) [21] and Cidreal, Oliveira, Di Felice & Aparicio (2018) [22] established the importance of system use preceding satisfaction, as usage serves as a predictor of success and satisfaction. They also suggested that satisfaction could lead to continuous usage behavior. In the context of e-learning, frequent system uses by students to fulfill tasks may result in satisfaction and, consequently, an intention to continue using the e-learning system. The current study's results affirm and supplement existing research findings. Nevertheless, further exploration is necessary to understand how factors such as interaction, learning tools and environment, type of institution, and class setup influence students' perceptions of the effectiveness of distance learning.

Conclusions

In conclusion, the in-depth quantitative analysis of survey data has not only confirmed the overall efficacy of distance learning instruction but has also unraveled essential factors influencing students' perceptions. The recognition of distance education's effectiveness speaks to its adaptability during unprecedented times, such as the COVID-19 pandemic. However, delving deeper into the nuances of these findings reveals that the positive reception is intricately linked to two key components: regular engagement with both synchronous and asynchronous platforms, and a notable proficiency in ICT.

The significance of consistent involvement in both synchronous and asynchronous learning environments underscores the importance of a varied and dynamic educational approach. Students who actively participated in real-time interactions, as well as those who engaged with self-paced learning modalities, tended to perceive distance learning as more effective. This observation emphasizes the need for educational institutions to provide a diverse set of tools and resources, accommodating different learning preferences and ensuring a comprehensive and engaging virtual learning experience.

Furthermore, the pivotal role played by ICT experience in shaping positive perceptions highlights the growing importance of digital literacy in contemporary education. Students with higher levels of ICT experience demonstrated a more favorable outlook on distance learning, showcasing the critical role technology plays in facilitating effective remote instruction. This insight calls for continued efforts in integrating and enhancing digital literacy skills within educational curricula, equipping students with the necessary tools to navigate and thrive in an increasingly digital educational landscape.

In essence, this study not only affirms the success of distance learning during challenging circumstances but also provides valuable insights for educators, institutions, and policymakers. As we navigate the evolving landscape of education, a nuanced understanding of the factors influencing student perceptions will be instrumental in refining and optimizing distance learning strategies for the benefit of all stakeholders involved.

References

1. Heng K, Sol K. Online learning during COVID-19: Key challenges and suggestions to enhance effectiveness. Cambodian Journal of Educational Research,2021:1(1):3-16.
2. Tan C. The impact of COVID-19 pandemic on student learning performance from the perspectives of community of inquiry. Corporate Governance: The International Journal of Business in Society,2021:21(6):1215-1228. https://doi.org/10.1108/cg-09-2020-0419
3. Govindarajan V, Srivastava A. What the shift to virtual learning could mean for the future of higher ed. Harvard Business Review,2020:31(1):3-8.
4. Kauffman H. A review of predictive factors of student success in and satisfaction with online learning.

Research in Learning Technology, 2015, 23. https://doi.org/10.3402/rlt.v23.26507
5. Muilenburg LY, Berge ZL. Student barriers to online learning: A factor analytic study. Distance Education,2005:26(1):29-48. https://doi.org/10.1080/01587910500081269
6. 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. https://doi.org/10.1016/s1096-7516(00)00016-6
7. Alghamdi M, Alanizan S. Performance indicators, motivations and barriers in online distance courses: A case study at Arab open university. International Journal of Teaching & Education,2018:VI(2):46-60. https://doi.org/10.20472/te.2018.6.2.003
8. De Metz N, Bezuidenhout A. An importance-competence analysis of the roles and competencies of e-tutors at an open distance learning institution. Australasian Journal of Educational Technology, 2018, 34(5). https://doi.org/10.14742/ajet.3364
9. Moore MG. Blended learning. The American Journal of Distance Education,2005:19(3):129-132. https://doi.org/10.1207/s15389286ajde1903_1
10. Binti Abd Aziz NA, Bin Musa MH, Binti Abd Aziz NN. A study on barriers contributing to an effective online learning among undergraduate students. Open Journal of Science and Technology,2020:3(1):17-23. https://doi.org/10.31580/ojst.v3i1.1359
11. Martinez J. Take this pandemic moment to improve education. EdSource, 2020. https://edsource.org/2020/take-this-pandemic-moment-to-improveeducation/633500
12. Horspool A, Lange C. Applying the scholarship of teaching and learning: student perceptions, behaviors and success online and face-to-face. Assessment & Evaluation in Higher Education,2012:37(1):73-88. https://doi.org/10.1080/02602938.2010.496532
13. Porter AL, Pitterle ME, Hayney MS. Comparison of online versus classroom delivery of an immunization elective course. American Journal of Pharmaceutical Education,2014:78(5):96. https://doi.org/10.5688/ajpe78596
14. Ward ME, Peters G, Shelley K. Student and faculty perceptions of the quality of online learning experiences. International Review of Research in Open and Distributed Learning,2010:11(3):57-77. https://doi.org/10.19173/irrodl.v11i3.867
15. Woldeab D, Yawson RM, Osafo E. A systematic meta-analytic review of thinking beyond the comparison of online versus traditional learning. e-Journal of Business Education & Scholarship of Teaching,2020:14(1):1-24.
16. GUnet Asynchronous Distance Education Group. Platform Description (Open eClass 3.12), 2021. Accessed January 21, 2024.
17. 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.openeclass.org/en/3.12/detail_description
18. Green SB, Salkind NJ. Using SPSS for Windows and Macintosh: Analyzing and understanding data (8th ed.). Upper Saddle River, NJ: Pearson, 2017.
19. Hair JF, Babin BJ, Anderson RE, Black WC. Multivariate Data Analysis (8th ed.). England: Pearson Prentice, 2019.
20. Martin F, Bolliger DU. Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. Online Learning,2018:22(1):205-222. https://doi.org/10.24059/olj.v22i1.1092
21. Aparicio M, Bacao F, Oliveira T. Grit in the path to e-learning success. Computers in Human Behavior,2017:66:388-399. https://doi.org/10.1016/j.chb.2016.10.009
22. Cidral WA, Oliveira T, Di Felice M, Aparicio M. E-learning success determinants: Brazilian empirical study. Computers & Education,2018:122:273-290. https://doi.org/10.1016/j.compedu.2017.12.001