

2022

Students' Perceptions and Insights towards Online Learning during Covid-19 Crises

Said Abbadi

Department of Microbiology, Faculty of Medicine, Suez University, saidabbadi@hotmail.com

Hosam Hefny

Department of Medical Education, Faculty of Medicine, Suez University

Hadeer Abd El-Shafy

Department of Physiology, Faculty of Medicine, Suez University

Follow this and additional works at: <https://hpe.researchcommons.org/journal>

Recommended Citation

Abbadi, Said; Hefny, Hosam; and El-Shafy, Hadeer Abd (2022) "Students' Perceptions and Insights towards Online Learning during Covid-19 Crises," *Health Professions Education: Vol. 8: Iss. 1, Article 5*. Available at: <https://hpe.researchcommons.org/journal/vol8/iss1/5>

This Original Research Reports is brought to you for free and open access by Health Professions Education. It has been accepted for inclusion in Health Professions Education by an authorized editor of Health Professions Education.

Students' Perceptions and Insights towards Online Learning during Covid-19 Crises

Cover Page Footnote

Authors' responses to the Proof and Queries Q1: It was checked. Q2: Funding No funding was received for this paper. Conflict of interest No conflict of interests is to be declared. Authors' contributions All authors participated well in the preparation of this paper and approved the final version for submission to the Journal for publication. Q3: Uncited references are added as follows: - On the other hand, it can be a good opportunity to reconsider alternative pathways to overcome such challenges for students, adjust our plans to adapt to this new learning environment (new reality of online learning) and to develop skills for active online learning [6,7]. Satisfaction and Engagement with online learning is a significant aspect of promoting successful educational processes [8,9]. Q4: It was checked.

Students' Perceptions and Insights Towards Online Learning During Covid-19 Crises

Said Abbadi ^{a,*}, Hosam Hefny ^b, Hadeer A. El-Shafy ^c

^a Department of Microbiology and Immunology, Faculty of Medicine, Suez University, Egypt

^b Department of Medical Education, Faculty of Medicine, Suez University, Egypt

^c Department of Physiology, Faculty of Medicine, Suez University, Egypt

Abstract

Purpose: To analyze and evaluate the perceptions and insights of undergraduate medical students at Suez University towards Online learning.

Methods: A cross-sectional study was conducted at Faculty of Medicine, Suez University where an online questionnaire was distributed to undergraduate medical students in 1st, 2nd and 3rd years. A self-administrated questionnaire was formulated based on a literature review. It was accessed online using Microsoft teams platform.

Results: A total of 182 students' responses were collected through the online questionnaire. The respondents' ages range from 18 to 20. The current study reveals the preferences of some medical students for online learning for many reasons as it provides them with the flexibility of space and time, the easy access of study materials, it saves time, effort and money needed by some students to travel to campus, and others. Some fruitful suggestions and recommendations were also pointed by those students to improve online learning in the future.

Discussion: Covid-19 pandemic has not only impacted human life but also impacted educational system as well. It has created an unprecedented challenge on education. With principles of social distancing, campuses are closed and the higher educational institutions (HEI) around the world suspended face to face learning and it has moved online to ensure the continuity of teaching-learning process and human safety simultaneously. However, it requires successful implementation and taking into consideration the students' suggestions.

Keywords: COVID-19, Higher education, Online learning, Students' perceptions

1. Introduction

The Covid-19 pandemic is considered as a global challenge that forced institutions across the world to shut down and to make a sudden and unexpected switch from formal face-to face learning to online learning [1, 2]. Unfortunately; the transition was sudden & unexpected to both faculty and students and we found ourselves facing staggering challenges with online Learning [3].

On the other hand, it can be a good opportunity to reconsider alternative pathways to overcome such

challenges for students, adjust our plans to adapt to this new learning environment (new reality of on-line learning) and to develop skills for active online learning [6, 7].

Fortunately, current technology enabled electronic learning (e-learning) to be one of the core methods of learning during the COVID-19 pandemic [4]. In an online learning setting, learners are given specific channels to interact independently and collaboratively between learners and instructors [5]. Thereby, supporting collaborative learning in a social context.

Received 9 March 2022; accepted 10 March 2022.
Available online 1 August 2022

* Corresponding author. Microbiology& Immunology, Faculty of Medicine, Suez University, Egypt.
E-mail addresses: saidabbadi@hotmail.com, dean@med.suezuni.edu.eg (S. Abbadi).

<https://doi.org/10.55890/2452-3011.1017>

2452-3011/© 2022 Association of Medical Education in the Eastern Mediterranean Region (AMEEMR). This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>). Sponsored by King Saud bin Abdulaziz University for Health Sciences.

This paper aimed to analyze and evaluate the medical students' perceptions of online learning.

2. Methods

2.1. Overview

An online anonymous questionnaire was distributed to medical students at Suez University in the 1st, 2nd and 3rd years. The questionnaire was accessed online. It was generated using Microsoft forms online platform and through which it was disseminated.

2.2. Participants

A total of 182 students' responses were received. The participants' ages range from 18 to 20. Participated students were from the 1st, 2nd and 3rd academic years at faculty of medicine, Suez University. The ethics review committee at Suez University provided approval for this study.

2.3. Materials

An online questionnaire was made available to all undergraduate medical students in 1st, 2nd and 3rd academic years at faculty of medicine, Suez University (shown in [Appendix](#)).

This self-administrated questionnaire was formulated based on a literature review and was validated through piloting. It was tested on pilot basis through 10 students who were not included in the sample. It was conducted in English. The average time to complete the questionnaire was 19 min.

2.4. Procedure

The questionnaire was distributed through Microsoft forms and each student was allowed to

complete the questionnaire once. The questionnaire was divided into 3 partitions.

In the 1st part of the questionnaire, students were asked to enter their demographic details (Name, age, gender, Academic year).

In the 2nd part of questionnaire, respondents had to reflect their views and indicate their reactions by specifying their level of agreement to a statement typically in a scale ranged from (1 = Strongly disagree, 2 = Disagree, 3 = Neutral (neither agree nor disagree), 4 = Agree, 5 = Strongly agree) as regard 8 sections (1) The student and online learning; (2) Use of technology; (3) Technical support and instructions; (4) Teacher's role during online learning; (5) Collaboration and interaction during online learning; (6) Online study materials; (7) Courses during online learning; (8) Recommendations about online learning.

In 3rd part of questionnaire, students were asked to explain (1) aspects of online learning they particularly like; (2) aspects of Online Learning they particularly dislike; (3) to mention and specify their difficulties with online learning; (4) express their recommendations and suggestions for improvement of online learning.

2.5. Analysis

The obtained data was coded, entered and processed on a personal computer using statistical package of social science (SPSS). Descriptive statistics was applied in the form of tables and graphs as appropriate.

3. Results

In the first part of the questionnaire, a total of 182 students' responses (n = 182) were received. The participants' ages range from 18 to 20. Participated students were from 1st, 2nd and 3rd academic years at faculty of medicine, Suez University.

Table 1. The student and online learning.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
- Do you feel that online learning meets your demands and expectations?	9.30%	14.30%	25.80%	35.70%	14.80%
- Do you feel motivated with Online learning?	9.30%	23.10%	24.20%	33%	10.40%
- Do you find that Online learning enable the student to determine learning progress and current level of Learning?	9.90%	24.20%	19.80%	34.60%	11.50%
- Do find that Online learning helps the student to accommodate different types of learning styles?	8.80%	16.50%	23.10%	35.20%	16.50%
- Do find that Online learning provide the student with flexibility of time and space?	5.50%	5.50%	10.40%	34.60%	44%
- Does Online learning enable the student to reach educational materials easily and quickly?	9.90%	17%	17.60%	26.40%	29.10%

Table 2. Use of technology.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you find Microsoft teams a user-friendly interface during learning Online?	17.60%	46.70%	19.80%	11%	4.90%
Do you find that Online learning Provide availability access to the system at any time?	27.50%	44%	15.40%	8.20%	4.90%
Do you find Microsoft Teams Provide technical stability of system?	14.30%	40.70%	31.30%	8.20%	5.50%

The next tables (1–8) show that the average mean score of all the questions incorporated in second part of this study's questionnaire.

Majority of respondents (50.50%) agreed that online learning met their demands and expectations and 43.4% also agreed that they feel motivated with online learning.

It was found that 46.10% of the students' responses agreed that online learning enables them to determine learning progress and current level of learning and 51.70% of respondents found that online learning helps the student to accommodate different types of learning styles.

Most of respondents (78.60%) also agreed that online learning provides the student with flexibility of time and space and 55.50% of them were with that online learning enables the student to reach educational materials easily and quickly (Table 1).

Most of students' responses (64.30%) disagreed that Microsoft teams is a user-friendly interface during online learning and 71.50% were also against that online learning provides availability access to the system at any time.

Fifty five percent of respondents did not find that Microsoft Teams provides technical stability of system (Table 2).

Majority of respondents (53.30%) disagreed that they receive enough guidance when dealing with

online learning (technical and scientific) while 37.90% of them rated that online learning provides greater interaction between instructions as neutral (neither agree nor disagree) (Table 3).

It was found that 41.20% of students' responses were against that online learning provides the students with sufficient tutor's follow up and support with their learning, while 34.10% were with this assumption.

Also, 44.50% of responses also disagreed that online learning enables the teacher to use various online teaching approaches and 53.90% did not find that the tutor can make successful online learning.

Meanwhile; 48.90% of responses were also against that online learning provides a rapid responsiveness of staff to students' inquires, while 23.10% were with this assumption.

Most of respondents (53.30%) did not find that online learning enables the tutor to provide the student with quick feedback (Table 4).

Majority of students (52.20%) disagreed that online learning helps the student to achieve the course learning outcomes and 50.60% were against that online learning provides learning content in an organized and useful manner. Only 35.70% of them rated that the purpose of online learning is clearly stated as neutral.

Table 3. Technical support and instructions.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Do you receive enough guidance when dealing with Online learning? (technical and scientific)	18.70%	34.60%	26.90%	15.90%	3.80%
Does online learning provide greater interaction between instructions?	9.30%	24.20%	37.90%	19.80%	8.80%

Table 4. Teacher's role during online learning.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Does Online learning Provide the students with sufficient tutor's follow up and support with their learning?	12.10%	29.10%	24.70%	19.80%	14.30%
Does Online learning enable the teacher to use various online teaching approaches?	9.30%	35.20%	27.50%	18.70%	9.30%
Do you find that the tutor can make successful online learning?	17.60%	36.30%	24.70%	14.30%	7.10%
Do you find Online learning provide a rapid responsiveness of staff to students' inquires?	14.30%	34.60%	28%	17.60%	5.50%
Do you find that Online learning enable the tutor to provide the student with Quick feedback?	18.10%	35.20%	21.40%	18.10%	7.10%

Table 5. Courses during online learning.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Does Online learning help the student to achieve the course learning outcomes?	15.90%	36.30%	29.70%	13.20%	4.90%
Does online learning provide learning content in an organized and useful manner?	15.40%	35.20%	32.40%	11%	6%
Is the Purpose of Online learning clearly stated?	14.30%	31.90%	35.70%	11.50%	6.60%
Does Online learning offer a good balance between sufficient variety of different activities?	11.50%	35.70%	24.70%	22.50%	5.50%
Does Online learning include assessments based on clearly stated criteria of successful performance? (Does online learning enable the student to include assessments and submit assignments electronically?)	9.90%	40.70%	23.10%	20.90%	5.50%
-Can Online learning help the student to include the self-evaluations and reflections on what was learnt?	11%	36.30%	34.10%	14.80%	3.80%
Does Online learning provide evidence of various types of student learning?	18.10%	35.20%	24.70%	13.70%	8.20%

Table 6. Online study materials.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
- Do you find Online learning provide an easy access to study resources?	25.80%	50.50%	13.20%	7.70%	2.70%
- Do you find Online learning provide the student with Updated learning materials?	21.40%	45.60%	20.90%	9.30%	2.70%

It was found that 47.20% were against that online learning offers a good balance between sufficient variety of different activities and 50.60% did not find that online learning includes assessments based on clearly stated criteria of successful performance.

Most of responses (47.30%) also disagreed that online learning helps the student to include the self-evaluations and reflections on what was learnt, and 53.30% did not find that Online learning provides evidence of various types of student learning (Table 5).

Most of students' responses (76.30%) were against that online learning provides an easy access to study resources and 67% did not find that online learning provides the student with updated learning materials (Table 6).

It was found that 45.60% of respondents disagree that online learning provides good interactive

communication between the student and e-tutor, while 31.80% were with this assumption.

Most of students' responses (44.50%) were against that online learning provides good interaction and collaboration among the students to participate in online learning activities, while 33% were with this assumption (Table 7).

Most of the students' responses (50.60%) did not recommend using blended learning in the future while Only 43.40% agreed to use Only Online learning and 41.20% agreed to use only face to face learning in the future (Table 8).

In the third part of the Questionnaire, Among the responses of the students to item question "What aspects of online learning do you particularly like?" were (1) It provides them with more flexibility of time and space; (2) Easy & quickly access of required study materials and availability of lectures

Table 7. Collaboration and interaction during online learning.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
- Do you find that Online learning provide good interactive communication between the student and e-tutor?	16.50%	29.10%	22.50%	21.40%	10.40%
- Do you find that Online learning provide good interaction and collaboration among the students to participate in online learning activities?	14.80%	29.70%	22.50%	22%	11%

Table 8. Recommendations about online learning.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you recommend learning using Only Online learning in the future?	23.10%	17.60%	15.90%	21.40%	22%
Do you recommend learning using Only Face to face traditional learning in the future?	20.30%	17%	21.40%	31.90%	9.30%
Do you recommend learning using Blended learning in the future?	18.70%	31.90%	36.80%	7.70%	4.90%

and sections with their records permanently on Microsoft Teams and the student can return to it and repeat it anytime; (3) Ability to submit assignments electronically; (4) Some students liked online PBL & TBL activities (5); It saves time, effort and money needed by some students to travel to campus; (6) Some students answered that they liked the way of communication with the tutors and easily contact with them; (7) Other students liked arrangement of data in online class into lectures, sections, General & e-Portfolio Partitions, so Online learning provides them with learning content in an organized manner; (8) Easy reach to any information they need at any time by browsing & getting it at once; (9) Some students find that Online learning is fast & comfortable (10); There are different sources of learning the student can browse and get various information; (11) Some students find that Online Exams reduces stress; (12) Communication with classmates easily; (13) The ability to study the lectures more than once at any time they want; (14) Reduction of direct contact with other to prevent infection; (15) Quick response and quick understanding in complete silence; (16) Live meeting & Live discussion; (17) The videos, the audios, Recordings are so helpful; (18) Submitting e-Portfolio activities; (19) The ability to ask tutors on their chats privately; (20) Assignments became easy to be handed over; (21) Students don't have to commit to a certain schedule and are able to study whatever & whenever they want; (22) Self-Learning and feeling of responsibility for their own learning.

Among the responses of the students to item question "What aspects of online learning do you particularly dislike?" were (1) Some students disliked online TBL activity with the attendance of all students simultaneously; (2) Others disliked dealing with Microsoft teams and found it difficult platform; (3) Some students found that some online meeting were not well-organized, and mess might occur in some online lectures; (4) Among the responds were that they disliked the lack of clinical training and

practical application with online learning and that some skills are better to be taught in the skill lab and the morgue; (5) The poor network connection and the interruption of online meeting; (6) Looking to the phone too much and loss of ability to maintain focused; (7) less interaction between the teacher and student than face to face learning; (8) getting bored while listening to long videos; (9) deadlines and instructions are not clear and it's easy to lose track; (10) The lectures took time until its published so they get accumulated; (11) Some tutors did not record the lecture after giving it online so students couldn't access it again; (12) Technical issues and cut electricity; (13) Sitting in front of the computer for long hours to study and to listen to online classes; (14) Some tutors uploaded PDF lectures without video explanation; (15) Some of tutors spoke with low voice and students couldn't hear some lectures well; (16) Absence of continuous evaluation with online learning; (17) Delay in upload of some lectures and Not all the lectures were uploaded at its time according to the schedule; (18) Follow up by tutors wasn't sufficient; (19) It opens ways of procrastinations that made students delay studying the lectures as it is available and they can get it any time; (20) online meeting were not enough and mostly recorded videos; (21) The issue of giving quizzes and exams online because of not being sure whether student did it by him/herself or it was done by another person; (22) Inability to imagine some steps of experiments well as they weren't seen directly; (23) some online lectures might have a limited discussion; (24) Taking attendance online; (25) Inability to do essential skills like meeting patients in the field training; (26) inability to regulate time were among the aspects that the students dislike about Online learning.

In the last part of the questionnaire, the responders gave some suggestions for improvement of online learning as (1) Using an easier Platform instead. Of Microsoft teams; (2) Use more live meetings than recorded videos; (3) Live lectures

with fixed timetable and to be committed to the schedule (Uploading the lectures should be controlled according to the schedule with no delay); (4) Adding electronic assignment after the lectures as application exercises to guarantee that the topic is clear; (5) Improve the quality of internet services; (6) Online Exams weekly for follow up and to measure our learning progress; (7) Provide live sessions for sections and skill lab; (8) Usage of video conference technology with Opening all cameras during sessions to establish interaction and see the tutor's facial expression and body language; (9) Keep uploaded videos short and easy to understand it; (10) Students at campus hostile should be given Wi-Fi for studies; (11) Online lectures have to be recorded to reach them any time; (12) Tutors have to use a digital board to explain complicated issues; (13) Train all tutors and help them to get better with online learning; (14) All tutors have to revise their records to assure that the voice is clear; (15) Keep Face to face learning for practical activities as field training, skill lab and some practical sections; (16) Train students on how to use the Microsoft teams well and receive an IT course to every student; (17) An online session has to be held after each recorded lecture to receive questions from students and respond to them.

4. Discussion

Satisfaction and Engagement with online learning is a significant aspect of promoting successful educational processes [8, 9]. The current study investigated and analyzed the perceptions of medical students at Suez University towards Online learning as regard their satisfaction and engagement with online classes compared to face-to face ones.

The study reveals the preferences of some students for online learning for many aspects as it provides them with the flexibility of space and time, the easy access of study materials, it saves time, effort and money needed by some students to travel to campus, and others.

On the other hand, there were many aspects mentioned by students they dislike about online learning as the poor Network connection, sometimes loss of ability to maintain focused, less interaction between the teacher and student than face to face learning, deadlines and instructions are not clear and it's easy to lose track, The lecture takes time until its published so it accumulate, some tutors do not record the lecture after giving it online so

we cannot access it again, technical issues and cut electricity, and others.

Suggestions were also given by students in this article for improving online learning.

Research examining student overall satisfaction and engagement in online learning is extensive.

Recent studies conducted by *Elshami et al., (2021)* addressing online learning and medical students' satisfaction argued that both Students and faculty are dissatisfied with online learning compared to face-to- face instruction and student participation in online discussions are lower than face-to-face [11].

Based on the findings of their study that revealed that most of the students reported technical difficulties and support, staying on-screen for a long time, Time zone differences, accessibility & availability of the instructor and the long duration of study courses as main challenges they faced in online learning. In addition, most students study in a completely different environment that was not prepared for education. *Similarly*, the faculty reported a higher workload and time devoted to online teaching compared to face-to-face, technical difficulties, and difficulty motivating students in an online environment, and taking longer to prepare for an online course as main challenges facing them [11].

Indeed, this point is also put forward by *Ortega et al., (2017)* who affirmed the argument that Students' satisfaction and engagement is higher with face-to-face courses than on-line courses and they suggest improving teaching methodologies for enhancing on-line program's quality [12].

According to the results of their research, they found that the on-line students reported problems and difficulties to keep up with courses work and to attend to live streaming lessons or to watch the full video about each session. In addition, the on-line students could not understand some group dynamics that took place in the face-to-face session [12].

A different perspective on this is suggested by *Butts et al., (2013)* who argued that there is no difference in students' engagement and satisfaction with online courses and face to face ones [10].

Their results were based on finding of analysis of likert-scaled questions that there were no significant differences in all factors (variables) used to assess student engagement in an online versus face-to-face undergraduate physical education teacher preparation. Besides, they found that there was no significant difference between the knowledge gained in online courses and face-to-face courses. Mixed results were found pertaining to the value of learning communities as some students found a positive online

community, while others perceived the online community as unsupportive in their coursework [10].

Consequently, we should adopt the necessary measures, and adjust our plans to improve the quality of online learning to help increase student engagement and satisfaction in online learning to help with better learning of students during Covid-19 pandemic.

Ethical approval

Ethical approval has been granted from Suez University Review board for research involving human subjects (14 October 2020, Suez University IRB).

Funding

No funding was received for this paper.

Authors' contributions

All authors participated well in the preparation of this paper and approved the final version for submission to the Journal for publication.

Conflict of interest

No conflict of interests is to be declared.

Other disclosure

None.

Appendix

Online Questionnaire: Students' Perceptions with Online Learning

(To be filled by the Students)

Section 1 : Demographic data

Name of the student:

Academic Year:

Age:

Gender:

Section 2:

Please consider the following statements and decide which mostly reflects your view

(1) The Student and Online Learning

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you feel that online learning meets your demands and expectations?					
Do you feel motivated with Online learning?					
Do you find that Online learning enable the student to determine learning progress and current level of Learning?					
Do find that Online learning help the student to accommodate different types of learning styles?					
Do find that Online learning provide the student with flexibility of time and space?					
Does Online learning enable the student to reach educational materials easily and quickly?					

(2) Use of Technology

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you find Microsoft teams a user-friendly interface during learning Online?					
Do you find that Online learning Provide availability access to the system at any time?					
Do you find Microsoft Teams Provide technical stability of system?					

(3) Technical Support and Instructions

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you receive enough guidance when dealing with Online learning? (technical and scientific)					
Does online learning provide greater interaction between instructions?					

(4) Teacher's Role during Online Learning

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Does Online learning Provide the students with sufficient tutor's follow up and support with their learning?					
Does Online learning enable the teacher to use various online teaching approaches?					
Do you find that the tutor can make successful online learning?					
Do you find Online learning provide a rapid responsiveness of staff to students' inquires?					
Do you find that Online learning enable the tutor to provide the student with Quick feedback?					

(5) Courses during Online Learning

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Does Online learning help the student to achieve the course learning outcomes?					
Does online learning provide learning content in an organized and useful manner?					
Is the Purpose of Online learning clearly stated?					
Does Online learning offer a good balance between sufficient variety of different activities?					
Does Online learning include assessments based on clearly stated criteria of successful performance? (Does online learning enables the student to include assessments and submit assignments electronically?)					
Can Online learning help the student to include the self-evaluations and reflections on what was learnt?					
Does Online learning provide evidence of various types of student learning?					

(6) Online Study materials

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you find Online learning provide an easy access to study resources?					
Do you find Online learning provide the student with Updated learning materials?					

(7) Collaboration and Interaction during Online Learning

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you find that Online learning provide good interactive communication between the student and e-tutor?					
Do you find that Online learning provide good interaction and collaboration among the students to participate in online learning activities?					

(8) Recommendations and Suggestions about Online Learning

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Do you recommend learning using Only Online learning in the future?					
Do you recommend learning using Only Face to face traditional learning in the future?					
Do you recommend learning using Blended learning in the future?					

Section 3: Answer the following questions reflecting your point of view.

- What aspects of Online learning do you particularly like?
- What aspects of Online Learning do you particularly dislike?
- What are your suggestions on how to improve Online Learning?
- Your Overall rating to Online Learning

References

- [1] Adedoyin OB, Soykan E. Covid-19 pandemic and online learning: the challenges and opportunities. *Interact Learn Environ* 2020;1–13. 0(0). <https://doi.org/10.1080/10494820.2020.1813180>.
- [2] Almusharraf NM, Khahro SH. Students' satisfaction with online learning experiences during the COVID-19 pandemic. *Int J Emerg Technol Learn* 2020;15(21):246–67. <https://doi.org/10.3991/ijet.v15i21.15647>.
- [3] Toquero CM. Challenges and opportunities for higher education amid the COVID-19 pandemic: the philippine context. *Pedag Res* 2020;5(4):em0063. <https://doi.org/10.29333/pr/7947>.
- [4] Bączek M, Zagańczyk-Bączek M, Szpringer M, Jaroszyński A, Woźakowska-Kapłon B. Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students vols. 2020:1–14. <https://doi.org/10.21203/rs.3.rs-41178/v1>.
- [5] Khan MA, Vivek, Nabi MK, Khojah M, Tahir M. Students' perception towards e-learning during covid-19 pandemic in India: an empirical study. *Sustainability* 2021;13(1):1–14. <https://doi.org/10.3390/su13010057>.
- [6] Madeshia PK, Verma S. Review on higher education in India. *J Crit Rev* 2020;7(10):1161–4. <https://doi.org/10.31838/jcr.07.10.228>.
- [7] Agarwal S, Kaushik JS. Student's perception of online learning during COVID pandemic. *Indian J Pediatr* 2020; 87(7):554. <https://doi.org/10.1007/s12098-020-03327-7>.
- [8] Bali S, Liu MC. Students' perceptions toward online learning and face-to-face learning courses. *J Phys Conf* 2018;1108(1). <https://doi.org/10.1088/1742-6596/1108/1/012094>.
- [9] Fedynich L, Bradley KS, Bradley J. Graduate students' perceptions of online learning. *Res Higher Educ J* 2015;27(27):1–13.
- [10] Butts F, Heidorn B, Mosier B. Comparing student engagement in online and face-to-face instruction in health and physical education teacher preparation. *J Educ Learn* 2013; 2(2):8–13. <https://doi.org/10.5539/jel.v2n2p8>.
- [11] Elshami W, Taha MH, Abuzaid M, Kawas S Al, Abdalla ME. Satisfaction with online learning in the new normal : perspective of students and faculty at medical and health sciences colleges. *Med Educ Online* 2021;26(1). <https://doi.org/10.1080/10872981.2021.1920090>.
- [12] Ortega-Maldonado A, Llorens S, Acosta H, Coó C. Face-to-Face vs on-line: an analysis of profile, learning, performance and satisfaction among post graduate students. *Univ J Educ Res* 2017;5(10):1701–6. <https://doi.org/10.13189/ujer.2017.051005>.