[1]Aaron Luis Emmanuel S. Navarro

[2]John Paul Q. Tomas

[3]Mary Christine A. Tomas

The Impact of Online Learning on Students and Teachers: A Systematic Literature Review Investigating the Effects during the COVID-19 Pandemic

JES
Journal of Electrical Systems

Abstract: - In the year 2020, the COVID-19 pandemic put the world at a standstill. The pandemic has dramatically impacted the lifestyle of many people in the world as it restricts traveling and physical contact to avoid spreading the infection of the disease. It has severely changed how education works due to shifting to online learning. This paper aims to conduct an intensive analysis of the current studies conducted in the years 2020-2022 regarding the impact of online learning on students and teachers during the COVID-19 pandemic. This paper will determine the factors that affect students' using online learning. Additionally, the effects on teachers and professors will also be included in this study. The aim of this paper is to provide a complete understanding of the effects of online learning on students and teachers during the pandemic and to provide information for educational institutions. The study found that different factors impact students and teachers in online learning, with some similarities. The sudden shift to online learning had a significant effect on students. According to the gathered literature, students' most common difficulties are technological and psychological issues, such as unstable internet connections, lack of socialization and interaction among other students, and isolation. For teachers, problems with internet connections and a lack of training in using technology for online learning also significantly impacted the delivery of lectures. Both students and teachers generally prefer traditional, face-to-face classes.

Keywords: Online learning, difficulties of online learning, education institutions, COVID-19, Systematic Literature Review

CCS CONCEPTS

CCS CONCEPTS -> E-learning ~ Distance Education ~ Student Satisfaction

ACM Reference Format:

This block will be automatically generated when manuscripts are processed after acceptance.

1. INTRODUCTION

Online learning is the delivery of education through electronic or digital means. Online learning is done by utilizing multimedia and internet platforms to deliver online lectures and lessons to students. Other than the delivery of the course in an online manner, online learning also helps students to learn about time management. It removes the necessity of physically showing up in a classroom for the lecture. Additionally, online learning helps the student engage in the lesson other than showing up for attendance. It determines the students' engagement in the course they are taking. Despite the sudden shift in learning modality, educational institutions have no other choice but to utilize online learning. Shifting to fully online learning poses a considerable challenge in delivering lectures and courses. Regardless of the challenges displayed by shifting to online learning, educational institutions are ready to shift to online learning. To fully embrace the usage of online learning, the same question can be asked to the learners [1]. Students wanting to continue learning regardless of the sudden shifting of learning modality have no choice but to pursue their lectures and courses online.

The goal of this paper is to conduct an intensive analysis of the current studies that were conducted in the years 2020-2022 regarding the impact of online learning on students and teachers during the COVID-19 pandemic. This

[1] School of Information Technology Mapúa University Makati City, Metro Manila, Philippines
alesnavarro@mymail.mapua.edu.ph

2School of Information Technology Mapúa University, Makati Metro Manila, Philippines

jpqtomas@mapua.edu.ph

3School of Information Technology Mapúa University, Makati Metro Manila, Philippines
mcatomas@mapua.edu.ph

paper will determine the factors that affects the students on using online learning. Additionally, the effects on teachers and professors will also be included in this study. The aim of this paper is to provide a complete understanding of the effects of online learning on students and teachers during the pandemic, and to provide information for educational institutions.

The systematic literature review used methodologies aimed at delivering a thorough and robust analysis of the available materials.

1.   The researchers searched for relevant literature and studies using keywords associated with online learning and COVID-19, sourced from reliable databases such as Google Scholar, Science Direct, Springer, and similar platforms.

2.   The researcher carefully selected the relevant literature and studies to ensure credibility. The relevant literature and studies must be published in the year 2020, and so on.

3.   The collected relevant literature and studies were analyzed to create a systematic literature review. The collected relevant literature and studies are then placed in a tabular format.

2. DISCUSSION OF RELATED WORKS

This section of the paper discusses the collected 30 related literature and studies. All of the collected studies focus on the impact of online learning during COVID-19 on students and teachers. The collected literatures and studies are compiled and analyzed to create a summary of the gathered studies. A conclusion is made at the end of the literature review.

Table 1 displays all the collected relevant papers which were published from the years 2020 to 2022. The studies are categorized by the target respondent of the research.

Table 1. Collected Related Literature and Studies

Ref No.	Title	Author	Target Respondent
[1]	A structural equation model predicting adults' online learning self-efficacy	Noriel P. Calaguas, Paolo Maria P. Consunji	Adult Filipinos
[2]	Assessing the effect of the COVID-19 pandemic, shift to online learning, and social media use on the mental health of college students in the Philippines: A mixed-method study protocol	Leonard Thomas S. Lim, Zypher Jude G. Regencia J. Rem C. Dela Cruz, Frances Dominique V. Ho, Marcela S. Rodolfo, Josefina Ly-Uson, Emmanuel S. Baja	College Students
[3]	Barriers and Challenges of Computing Students in an Online Learning Environment: Insights from One Private University in the Philippines	Bernie S. Fabito, Arlene O. Trillanes, Jeshnile R. Sarmiento	College Students and Faculty Members
[4]	Barriers to Online Learning in the Time of COVID-19: A National Survey of Medical Students in the Philippines	Ronnie R. Baticulon, Jinno Jenkin Sy, Nicole Rose I. Alberto, Maria Beatriz C. Baron, Rober Earl C. Mabulay, Lloyd Gabriel T. Rizada,	Medical Students

Ref No.	Title	Author	Target Respondent
		Christl Jan S. Tiu, Charlie A. Clarion, John Carlo B. Reyes	
[5]	Challenges to Online Engineering Education during the Covid-19 Pandemic in Eastern Visayas, Philippines	Perante Wenceslao, Gomba Felisa	Engineering Students
[6]	Course Satisfaction and Student Engagement in Online Learning Amid Covid-19 Pandemic: A Structural Equation Model	Erick T. Baloran, Jenny T. Hernan, Janice S. Taoy	College Students
[7]	Exploring the Online Learning Experience of Filipino College Students During Covid-19 Pandemic	Louie Giray, Daxjhed Gumalin, Jomarie Jacob, Karl Villacorta	College Students
[8]	Faculty Perception toward Online Education in a State College in the Philippines during the Coronavirus Disease 19 (COVID-19) Pandemic	Rome B. Moralista, Ryan Michael F. Oducado	Faculty Members
[9]	Mathematics self-concept and challenges of learners in an online learning environment during COVID-19 pandemic	Rex Bringula, Jon Jester Reguyal, Don Dominic Tan, Saida Ulfa	College Students
[10]	Motivation and Learning Strategies of Education Students in Online Learning during Pandemic	Ernie C. Avila, Ana Maria Gracia J. Genio	College Students
[11]	Online Learning and Students' Mathematics Motivation, Self-Efficacy, and Anxiety in the "New Normal"	Leo A. Mamolo	Senior High School Students
[12]	Perceived Proficiency with Technology and Online Learning Expectations of Students in the Graduate Program of One State University in the Philippines	Julie Fe D. Panoy, Rose R. Andrade, Loraine B. Febrer, and Delon A. Ching	Graduate Students
[13]	Preference analysis on the online learning attributes among senior high school students during the COVID-19 pandemic: A conjoint analysis approach	Ardvin Kester S. Ong, Yogi Tri Prasetyo, Thanatorn Chuenyindee, Micheal Nayat Young, Bnofacio T. Doma, Dennis G. Caballes, Raffy S. Centeno, Anthony S.	Senior High School Students

Ref No.	Title	Author	Target Respondent
		Morfe, Christine S. Bautista	
[14]	Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines	Jessie S. Barrot, Ian I. Llenares, Leo S. del Rosario	College Students
[15]	A Glimpse into the Lived Experiences and Challenges Faced of PWD Students towards Online Learning in the Philippines Amidst COVID-19 Pandemic	Ann Jesamine Dianito, Jomarie Espinosa, Jimboy Duran, Jhoselle Tus	PWD students
[16]	College students' use and acceptance of emergency online learning due to COVID-19	Patricia Aguilera-Hermida	College Students
[17]	Effectiveness of Online Learning In Pandemic Covid-19	Awal Bahasoan, Wulan Ayuandiani, Muhammad Mukhram, Aswar Rahmat	College Students
[18]	Evaluation online learning of undergraduate students under lockdown amidst COVID-19 Pandemic: The online learning experience and students' satisfaction	Mahmoud Maqableh,, Mohammad Alia	College Students
[19]	Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE	Elham Hussein, Sumaya Daoud, Hussam Alrabaiah, Rawand Badawi	College Students
[20]	Online learning amid the COVID-19 pandemic: Students' perspectives	Muhammad Adnan, Kainat Anwar	College Students
[21]	Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations	Fernando Ferri, Patrizia Grifoni, and Tiziana Guzzo	Experts
[22]	Online learning and its problems in the Covid-19 emergency period	Rimba Hamid, Izlan Sentryo, Sakka Hasan	Students
[23]	Online learning performance and satisfaction: do perceptions and readiness matter?	Huei-Chuan Wei, Chien Chou	College Students

Ref No.	Title	Author	Target Respondent
[24]	Online Learning Readiness Among University Students in Malaysia Amidst Covid-19	Ellen Chung, Geetha Subramaniam, Laura Christ Dass	College Students
[25]	Students' perceptions toward vocational education on online learning during the COVID-19 pandemic	Khusni Syauqi, Sudji Munadi, Mochamad Bruri Triyono	Mechanical Engineering Students
[26]	Students' Perception of Online Learning during COVID-19 Pandemic: A Case Study on the English Students of STKIP Pamane Talino	Antonius Styawan Sugen Nur Agung, Monika Widyastuti Surtikanti, Charito A. Quinones	College Students
[27]	Teachers' Elementary School in Online Learning of COVID-19 Pandemic Conditions	Irfan Fauzi, Iman Hermawan, Sastra Khusuma	Teachers
[28]	Teachers' Perception of Online Learning during Pandemic Covid-19	Retno Puji Rahayu, Yanty Wirza	Teachers
[29]	The impact of online learning during COVID-19: students' and teachers' perspective	Deepika Nambiar	Students and Teachers
[30]	Transition to online learning during the COVID-19 pandemic	David John Lemay, Paul Bazelais, Tenzin Doleck	College Students

3. RESULTS

This section of the paper will present the reviewed and analyzed literature relevant to the paper's objectives, divided into two sub-sections: the impact on students and the impact on teachers.

3.1 *Impact on Students*

The sudden shift to online learning had a significant effect on students. According to the gathered literature, the most common difficulties students encounter are technological and psychological issues. Technological issues include unstable internet connections and incompatible devices. Unstable internet connections hinder the student's ability to learn online since an internet connection is a mandatory service needed for online learning. Incompatible devices also present an obstacle for students as online learning requires specific applications that the educational institution uses [3-5][7][9][16-18][20-21][22][26]. These difficulties have negatively impacted student engagement and motivation, making online learning a less effective learning modality.

Psychological issues include stress, anxiety, and depression. Psychological issues mainly resulted from the lack of interaction and socialization from other students and teachers. The lack of interaction with other students resulted in feelings of isolation. The feelings of isolation resulted in students experiencing stress, anxiety, and depression [14][19][30]. These psychological issues resulted in students having less concentration and an additional distraction in online learning, making it more difficult for students.

However, despite the negative factors presented earlier, positive factors still benefit students in online learning. Online learning offers a safer environment than traditional learning. It allows students to stay in the comfort of their own homes. Especially during the COVID-19 pandemic, wherein leaving an establishment can increase the

risk of getting infected or exposed to other illnesses. In addition to online learning having a safer environment, students find it more convenient. Online learning does not require students to go to the campuses of the educational institution, and students find online learning to be much more cost and time effective due to no longer having to spend currencies on transportation. With transportation out of mind, students have more free time to do other activities [7][19].

3.2 *Impact on teachers*

Students were not the only ones affected in the sudden shift to online learning. Despite the difficulties and challenges that may arise to shifting to online learning, education institutions have no choice but to conduct an emergency change of learning mode. Teachers are also affected by this change.

Educational institutions conducted an emergency change of traditional learning to online learning. This sudden shift to online learning has significant effects on the institution and teachers. The challenges faced by teachers are similar to those of the students. Technological issues has been the most common factor that affected the teacher's ability to conduct online learning. Technological issues include difficulty in utilizing the device, encountering problems with software or hardware, or the lack of familiarity in using tools provided by the educational institution. These technological issues can interrupt teachers from effectively delivering lessons. These technological issues can also prevent stable and consistent interaction to students [27-29]. Furthermore, resolving the technological issues can be time consuming, which can take away valuable time that could have been used to teaching the class. In some cases, trying to resolve the technological issues can result to more problems.

4. CONCLUSION

According to the available research, there are many elements that can impact the effectiveness of both teachers and students when it comes to virtual education. For students, the most important factors that can affect the learning process on digital platforms include technological difficulties, social concerns, and psychological matters. The technology-related issues refer to trouble with establishing a stable connection or the capability of the devices used. The social considerations involve the need for greater interaction and socialization between the students. The students also need help learning online as there is a need for more communication between the students and their teacher. Psychological matters are those related to mental health, which can be brought about by the seclusion and the additional workload that come with online studying. Similarly, the teachers also have to deal with the same difficulties, such as trouble with internet connections, usage of the application provided, and complications on devices.

5. IMPLICATION FOR FUTURE RESEARCH

This study suggests that future researchers should conduct more studies regarding the impact of online learning on teachers other than students. With numerous amounts of studies regarding the effects of online learning on students, the effects on teachers shall also be explored. As such, conducting an evaluation of the impact of online learning on teachers can provide a more broad and complete investigation of the overall impact of online learning. It also suggests that future researchers should focus on exploring the effects in a post-COVID-19 period. It is important to continue studying the effects and factors to create essential changes to improve the utilization of online learning in a post-pandemic setting.

REFERENCES

[1] Noriel P. Calaguas and Paolo Maria P. Consunji. 2022. A structural equation model predicting adults' online learning self-efficacy. Educ Inf Technol 27, 5 (June 2022), 6233–6249. DOI:https://doi.org/10.1007/s10639-021-10871-y

[2] Jhoselle Tus, Ann Jesamine Dianito, Jomarie Espinosa, and Jimboy Duran. 2021. A Glimpse into the Lived Experiences and Challenges Faced of PWD Students towards Online Learning in the Philippines Amidst COVID-19 Pandemic. (2021), 767155 Bytes. DOI:https://doi.org/10.6084/M9.FIGSHARE.14033435.V1

[3]   Bernie Fabito, Arlene Trillanes, and Jeshnile Sarmiento. 2021. Barriers and Challenges of Computing Students in an Online Learning Environment: Insights from One Private University in the Philippines. IJCSR 5, 1 (January 2021), 441–458. DOI:https://doi.org/10.25147/ijcsr.2017.001.1.51

[4]   Ronnie E. Baticulon, Jinno Jenkin Sy, Nicole Rose I. Alberto, Maria Beatriz C. Baron, Robert Earl C. Mabulay, Lloyd Gabriel T. Rizada, Christl Jan S. Tiu, Charlie A. Clarion, and John Carlo B. Reyes. 2021. Barriers to Online Learning in the Time of COVID-19: A National Survey of Medical Students in the Philippines. Med.Sci.Educ. 31, 2 (April 2021), 615–626. DOI:https://doi.org/10.1007/s40670-021-01231-z

[5]   Perante Wenceslao and Gomba Felisa. 2021. Challenges to Online Engineering Education during the Covid-19 Pandemic in Eastern Visayas, Philippines. IJLTER 20, 3 (March 2021), 84–96. DOI:https://doi.org/10.26803/ijlter.20.3.6

[6]   Erick T. Baloran, Jenny T. Hernan, and Janice S. Taoy. 2021. COURSE SATISFACTION AND STUDENT ENGAGEMENT IN ONLINE LEARNING AMID COVID-19 PANDEMIC: A STRUCTURAL EQUATION MODEL. Turkish Online Journal of Distance Education (September 2021), 1–12. DOI:https://doi.org/10.17718/tojde.1002721

[7]   Louie Giray, Daxjhed Gumalin, Jomarie Jacob, and Karl Villacorta. 2022. Exploring the Online Learning Experience of Filipino College Students During Covid-19 Pandemic. jip 10, 1 (January 2022), 227. DOI:https://doi.org/10.26811/peuradeun.v10i1.691

[8]   Rome B. Moralista and Ryan Michael F. Oducado. 2020. Faculty Perception toward Online Education in a State College in the Philippines during the Coronavirus Disease 19 (COVID-19) Pandemic. ujer 8, 10 (October 2020), 4736–4742. DOI:https://doi.org/10.13189/ujer.2020.081044

[9]   Rex Bringula, Jon Jester Reguyal, Don Dominic Tan, and Saida Ulfa. 2021. Mathematics self-concept and challenges of learners in an online learning environment during COVID-19 pandemic. Smart Learn. Environ. 8, 1 (December 2021), 22. DOI:https://doi.org/10.1186/s40561-021-00168-5

[10] Ernie C. Avila and Ana Maria Gracia J. Genio. 2020. Motivation and Learning Strategies of Education Students in Online Learning during Pandemic. PSYCHOLOGY AND EDUCATION (2020).

[11] Leo A. Mamolo. 2022. Online Learning and Students' Mathematics Motivation, Self-Efficacy, and Anxiety in the "New Normal." Education Research International 2022, (January 2022), 1–10. DOI:https://doi.org/10.1155/2022/9439634

[12] Julie Fe D. Panoy, Rose R. Andrade, Loraine B. Febrer, and Delon A. Ching. 2022. Perceived Proficiency with Technology and Online Learning Expectations of Students in the Graduate Program of One State University in the Philippines. IJIET 12, 7 (2022), 615–624. DOI:https://doi.org/10.18178/ijiet.2022.12.7.1661

[13] Ardvin Kester S. Ong, Yogi Tri Prasetyo, Thanatorn Chuenyindee, Michael Nayat Young, Bonifacio T. Doma, Dennis G. Caballes, Raffy S. Centeno, Anthony S. Morfe, and Christine S. Bautista. 2022. Preference analysis on the online learning attributes among senior high school students during the COVID-19 pandemic: A conjoint analysis approach. Evaluation and Program Planning 92, (June 2022), 102100. DOI:https://doi.org/10.1016/j.evalprogplan.2022.102100

[14] Jessie S. Barrot, Ian I. Llenares, and Leo S. del Rosario. 2021. Students' online learning challenges during the pandemic and how they cope with them: The case of the Philippines. Educ Inf Technol 26, 6 (November 2021), 7321–7338. DOI:https://doi.org/10.1007/s10639-021-10589-x

[15] Jhoselle Tus, Ann Jesamine Dianito, Jomarie Espinosa, and Jimboy Duran. 2021. A Glimpse into the Lived Experiences and Challenges Faced of PWD Students towards Online Learning in the Philippines Amidst COVID-19 Pandemic. (2021), 767155 Bytes. DOI:https://doi.org/10.6084/M9.FIGSHARE.14033435.V1

[16] Patricia A. Aguilera-Hermida. 2020. College students' use and acceptance of emergency online learning due to COVID-19. International Journal of Educational Research Open 1, (2020), 100011. DOI:https://doi.org/10.1016/j.ijedro.2020.100011

[17] Awal Nopriyanto Bahasoan, Wulan Ayuandiani, Muhammad Mukhram, and Aswar Rahmat. 2020. Effectiveness of Online Learning In Pandemic Covid-19. International Journal of Science, Technology & Management 1, 2 (July 2020), 100–106. DOI:https://doi.org/10.46729/ijstm.v1i2.30

[18] Mahmoud Maqableh and Mohammad Alia. 2021. Evaluation online learning of undergraduate students under lockdown amidst COVID-19 Pandemic: The online learning experience and students' satisfaction. Children and Youth Services Review 128, (September 2021), 106160. DOI:https://doi.org/10.1016/j.childyouth.2021.106160

[19] Elham Hussein, Sumaya Daoud, Hussam Alrabaiah, and Rawand Badawi. 2020. Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE. Children and Youth Services Review 119, (December 2020), 105699. DOI:https://doi.org/10.1016/j.childyouth.2020.105699

[20] Muhammad Adnan and Kainat Anwar. 2020. Online learning amid the COVID-19 pandemic: Students perspectives. JPSP 1, 2 (June 2020), 45–51. DOI:https://doi.org/10.33902/JPSP.2020261309

[21] Fernando Ferri, Patrizia Grifoni, and Tiziana Guzzo. 2020. Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. Societies 10, 4 (November 2020), 86. DOI:https://doi.org/10.3390/soc10040086

[22] Rimba Hamid, Izlan Sentryo, and Sakka Hasan. 2020. Online learning and its problems in the Covid-19 emergency period. J. Prim. Edukasia 8, 1 (January 2020), 86–95. DOI:https://doi.org/10.21831/jpe.v8i1.32165

[23] Huei-Chuan Wei and Chien Chou. 2020. Online learning performance and satisfaction: do perceptions and readiness matter? Distance Education 41, 1 (January 2020), 48–69. DOI:https://doi.org/10.1080/01587919.2020.1724768

[24] Ellen Chung, Geetha Subramaniam, and Laura Christ Dass. 2020. Online Learning Readiness Among University Students in Malaysia Amidst Covid-19. AJUE 16, 2 (August 2020), 45. DOI:https://doi.org/10.24191/ajue.v16i2.10294

[25] Khusni Syauqi, Sudji Munadi, and Mochamad Bruri Triyono. 2020. Students' perceptions toward vocational education on online learning during the COVID-19 pandemic. IJERE 9, 4 (December 2020), 881. DOI:https://doi.org/10.11591/ijere.v9i4.20766

[26] Antonius Setyawan Nur Agung, Monika Widyastuti Surtikanti, and English Language Education Study Program, STKIP Pamane Talino. 2020. Students' Perception of Online Learning during COVID-19 Pandemic: A Case Study on the English Students of STKIP Pamane Talino. SOSHUM 10, 2 (July 2020), 225–235. DOI:https://doi.org/10.31940/soshum.v10i2.1316

[27] Irfan Fauzi and Iman Hermawan Sastra Khusuma. 2020. Teachers' Elementary School in Online Learning of COVID-19 Pandemic Conditions. ji 5, 1 (June 2020), 58–70. DOI:https://doi.org/10.25217/ji.v5i1.914

[28] Retno Puji Rahayu and Yanty Wirza. 2020. Teachers' Perception of Online Learning during Pandemic Covid-19. JPP 20, 3 (December 2020), 392–406. DOI:https://doi.org/10.17509/jpp.v20i3.29226

[29] Deepika Nambiar. The impact of online learning during COVID-19: students' and teachers' perspective. DOI:https://doi.org/10.25215/0802.094

[30] David John Lemay, Paul Bazelais, and Tenzin Doleck. 2021. Transition to online learning during the COVID-19 pandemic. Computers in Human Behavior Reports 4, (August 2021), 100130. DOI:https://doi.org/10.1016/j.chbr.2021.100130