

## Student's acceptance of e-learning during the COVID-19 pandemic

Nur Farha Shaafi<sup>1</sup>, Zulinda Ayu Zulkipli<sup>2</sup>, Nur Ainaa Najiha Mohd Azam<sup>2</sup>, Mohammad Mubarrak Mohd Yusof<sup>2</sup>

<sup>1</sup>Department of Science Education, Faculty of Psychology and Education, Universiti Malaysia Sabah, Kota Kinabalu, Malaysia

<sup>2</sup>Department of Science Education, Faculty of Education, Universiti Teknologi MARA, Puncak Alam, Malaysia

### Article Info

#### Article history:

Received Sep 8, 2022

Revised Sep 5, 2023

Accepted Sep 27, 2023

#### Keywords:

Acceptance

Electronic-learning

Pandemic learning

### ABSTRACT

Electronic learning (e-learning) has become the main method of teaching and learning for many educational institutions during the COVID-19 pandemic. The purpose of this study is to investigate the students' acceptance of e-learning during the COVID-19 pandemic. Quantitative research methods were utilized in order to obtain the necessary data. A total of 100 respondents from three science courses, which were Biology (ED247), Chemistry (ED260), and Physics (ED248) in the Faculty of Education, University Teknologi MARA, Puncak Alam answered a questionnaire given via Google Forms. The IBM SPSS version 25.0 software was used for data analysis. The results show that the students' acceptance towards e-learning is low based on research question 1 (mean=3.05, SD=.796), research question 2 (mean=1.18, SD=.386), research question 3 (mean=1.18, SD=.435) and research question 4 (mean=1.44, SD=.608). In conclusion, the student's acceptance of e-learning during the COVID-19 pandemic is significant to improve an educational process by creating and sustaining meaningful learning.

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### Corresponding Author:

Mohammad Mubarrak Mohd Yusof

Department of Science Education, Faculty of Education, Universiti Teknologi MARA

42300 Bandar Puncak Alam, Selangor, Malaysia

Email: mubarrak@uitm.edu.my

## 1. INTRODUCTION

Early in the year 2020, the world was on the verge of coming to an unparalleled halt due to the COVID-19 pandemic that was caused by the SARS-CoV-2 virus. On 11th March 2020, The World Health Organization (WHO) announced that COVID-19 is a pandemic. In terms of health, the novel coronavirus has impacted people of all ages, with the worst symptoms and death rates occurring among the elderly and those with illnesses [1], [2]. The COVID-19 pandemic has caused unanticipated disruptions to society and the economy, in addition to bringing to light numerous existing difficulties and challenges in the field of health. The COVID-19 issues had a wide influence on the well-being of all groups in society in every affected country around the world [3], [4]. Most countries affected by the pandemic attempted to prevent the spread of the coronavirus to different degrees, including by imposing drastic measures such as prohibiting public events, limiting domestic and foreign travel, implementing testing and contact tracing, and closing educational institutions [5], [6].

Physically closing educational institutions such as schools and universities has proved to be an effective technique to limit the COVID-19 virus from spreading, but it created many problems for students and teachers, as well as their friends, families, and employers, which resulted in major impacts on society and the global economy. Furthermore, it is very likely that when the educational institution re-opens after the

lockdowns, they will not return to the pre-pandemic ways of doing things [7]. The COVID-19 pandemic has affected all people involved in educational institutions, especially educators and students. The first wave of the COVID-19 outbreak had a major impact on students in the first four or five months of 2020, resulting in significant changes in their daily lives and, perhaps more alarmingly, their prospects for the near and distant future [8]–[10]. In the post-pandemic setting, the norms that regulate many aspects of our lives will need to be reconstructed in detail, which is likely to result in significant changes in how the future economy is structured [11].

The first cases of COVID-19 in Malaysia happened on February 4, 2020 and the number of cases rapidly increased by March 2020 due to a religious event that happened in Sri Petaling, Kuala Lumpur. After that incident, Malaysia was listed as having the most positive cases of COVID-19 in South East Asia. The number of cases then kept rising from 533 cases to beyond, causing the Prime Minister of Malaysia to announce a lockdown measure, called the movement control order (MCO), to control the spread of the virus. Social distancing rules were also implemented. As a consequence, learning institutions were closed across the country. Higher education institutions were ordered by the Ministry of Higher Education to start arranging and preparing for distance learning (DL) modes, re-organizing any examinations and helping students with electronic learning (e-learning) for the duration of the COVID-19 pandemic lockdowns [12].

The fact that COVID-19 has a major influence on students, teachers and educational organizations all over the world, changed the whole perception on the learning process [13]–[15]. Adapting the learning process from face-to-face learning to DL did not happen overnight. Thus, it raised many challenges and problems during the adapting period. Nevertheless, educators around the world have chosen to use various technological tools to construct teaching material for e-learning for students [16], [17]. Thus, it is crucial for learning institutions to construct their curriculum, be innovative and utilize the new teaching approaches and practices in light of the COVID-19 pandemic [18], [19].

## **2. LITERATURE REVIEW**

### **2.1. Conceptual/theoretical framework of study**

This study focuses on students' adoption of e-learning during the COVID-19 pandemic. During the COVID-19 pandemic, all institutions in Malaysia were ordered to physically close in order to control the spread of the virus. As a result, e-learning became a critical method to ensure that the lessons can continue. E-learning is a method of extending a lesson in which educators interact with students via a virtual platform. As a result, the purpose of this study is to examine learning practices and strategies used in e-learning in Malaysia. Other than that, the study seeks to investigate the students' attitudes and approaches towards e-learning.

### **2.2. Authentic-context learning**

Authentic learning is learning that takes place in the real world. It is a learning approach that pushes students to generate a concrete, practical, and high-quality outcome to share with the rest of the world. It is critical to develop and promote the essential criteria, planning, schedules, resources, and support to accommodate student success after an instructor gives a motivational challenge or a student selects their initiative [20]. The instructor takes on the role of a sidekick or event organizer, a facilitator who collaborates with their students to create something new. While skills, knowledge, and behaviors are engaged in the real-world, meaningful situations, processes become the dominant factors. Actualized learning is authentic learning. Learning gets genuinely active only when student initiatives are directed toward a meaningful audience outside of the classroom. When learning efforts are intended for activities that extend beyond the classroom walls, long-term, and transportable learning emerges.

Authentic-context learning has become typical practice for educational professionals [21]. Face-to-face learning in the classroom is one example of authentic-context learning [21], [22]. This is because students require a world to discover on their own. This concept of learning is based on their touch and experience. Students had previously been concentrated on facts and theory, but the utilization of authentic-context learning has allowed for a more seamless transition from evidence-based curriculum to everyday situations in which it is applied. In general, students do better in authentic-context learning activities because their passion increases when the material they need to acquire is specifically sought. The real world presents unique difficulties for which students may be required to build solutions, and the variation from the teaching plan or text books, stimulates both students and teachers. Learning in authentic contexts allows students and educators to spend time critically evaluating their work through reflection and discussion with peers and educators [23]. Students' development is influenced by the comments they receive. As a result, it must be appropriate and consistent in order to obtain the desired outcome in the students' practice.

Students must be self-regulating in their learning by understanding the purpose, defining goals for themselves, determining which solution or approach to use, and putting their plan into action to attain those goals. Educators should design their classrooms with this perspective in mind, encouraging students to develop self-control habits by allowing them to be responsible for their own learning. Moreover, students should be informed of self-regulating behaviors and presented with the opportunity to create and practice learning-promoting behaviors. Finally, instructors and their instructional styles, and classroom management are critical in improving such skills.

### 2.3. Problem-based learning

Problem-based learning (PBL) is a teaching style in which students are taught concepts and principles through the use of challenging real-world issues rather than the straightforward presentation of facts and theories. PBL can help students acquire critical thinking skills, problem-solving talents, and social skills such as communication skills in addition to the course material. It can also facilitate collaborative work, the discovery and evaluation of research resources, and lifelong learning [24]. PBL can be used in any type of learning scenarios. In the literal definition of PBL, the approach is employed as the primary mode of instruction throughout the whole semester. However, different views and applications range from incorporating PBL into lab and design classes to merely utilizing it to kick off a real conversation.

PBL began with a challenge from Lin and Chan [25] to clarify the problem's context. Because the problems are open-ended and generated by the teacher, this approach reverts to the traditional approach, which starts with data and then moves on to the difficulties. PBL conflicts with real-world concerns, and the learning strategy is student-centered, whereas authentic-context learning incorporates real-world events and the learning strategy is content-centered [26]. Furthermore, one of the approaches' key features is that it motivates the instructor to use particular skills and abilities as assistance when solving problems. Educators are to blame for the problems that have arisen as a result of this method; it should be modified to fit the constraints that exist in all educational systems. As a result, students will handle complicated challenges while emphasizing leadership and cooperation abilities in order to build a collaborative working environment. However, to ensure that the group work is performed efficiently, the instructor should be a great listener to what is being addressed and discussed by the students during the group work. If the level of discussion is not at the target level, the instructor should ask more questions to broaden and deepen the discussion and increase the group's performance [27].

### 2.4. Electronic-learning (e-learning)

The term "e-learning" refers to education that occurs over the internet and is another option for educators and students to obtain knowledge [28]. It is also known as online learning, among many other terms. E-learning, can be considered as a type of DL, which refers to any learning process that takes place at a distance rather than in a typical classroom [29], [30]. E-learning is by far the most popular method during the COVID-19 pandemic. According to the Sloan Consortium, online registrations are growing at a faster rate than the general student population, and higher education institutions expect this trend to continue. According to Angrist, Lang, and Oreopoulos [31], over 1.9 million students were enrolled in online courses.

For teaching and learning purposes, e-learning makes use of a computer and an internet connection. To be a successful medium and obtain high-quality education on a wide range of subjects, online courses require a large audience of learners. The use of electronic media, physical separation between teacher and students, and two-way communication are the main characteristics of e-learning [32]. The same is true for face-to-face learning, i.e., if no students are interested in receiving information from the educator, the information process cannot be considered successful.

Furthermore, e-learning can provide a variety of approaches to learners with specialized training and unique demands [33]. Individual and group work is supported by a variety of tools and learning approaches in an e-learning environment that minimize students' reliance on instructors as a source of knowledge. It emphasizes the important role of online tools in enhancing social interaction in the classroom. In summary, e-learning focuses on how students search for knowledge on their own rather than relying on teachers. This strategy can be student-centered learning, in which students solve problems on their own, with the teacher acting as a guide for support.

### 2.5. Advantages and disadvantages of e-learning

E-learning is a platform that allows students to be assessed on any form of information from anywhere and at any time utilizing internet-connected devices such as a mobile smart phone, laptops, desktop computers and tablets. Its main advantage is that students may access e-learning anywhere with a decent internet connection, and they can easily comprehend the knowledge within a short time as the information is already at their fingertips. The effectiveness of e-learning has been evaluated in a number of studies. Although learning in a classroom is more personal and dynamic, there are numerous advantages to taking an

online course, mainly related to its flexibility and affordability. As mentioned by Hussein-Farraj, Barak, and Dori [32], time savings, no travel expenses, and no need to have time away from work are also other advantages of e-learning. By introducing learners to viewpoints and knowledge via technological resources rather than face-to-face interactions, social relationships are formed that can build a framework for improving their self-confidence and self-image [34]. Furthermore, continuing to assess and play in e-learning would aid students in developing their imagination, creativity and allowing them to think outside the box and can also come up with ideas while using a variety of applications. Indeed, e-learning has made a significant contribution to collaborative learning [33], [35], [36].

While e-learning offers numerous advantages, some students prefer conventional or face-to-face learning for a variety of reasons. These students feel lonely and disconnected in an online class setting. For many students, the inability to respond quickly and successfully to queries or tasks is frustrating and discouraging. Students' confidence can be harmed if they fail to employ nonverbal communication with teachers or peers, such as facial expressions or body language. For some students, the lack of social interactions with peers has a substantial influence on their learning [37]. Online courses need a high level of self-discipline and concentration, and digital content may be more difficult to interpret because it requires focus from the beginning. Perhaps the students have trouble staying focused for long periods of time.

In e-learning, the majority of students' time will be spent listening to podcasts, watching videos, and perusing slide presentations. However, physical activities such as conducting experiments are the only way to get hands-on experience, which is impossible during e-learning classes. Moreover, there are sometimes opposing viewpoints about the amount of resources required for e-learning. When discussing technological concerns, it is possible to become even more frustrated, especially if professional help is not available and hard to reach. Thus, although e-learning is the most cutting-edge method of education, requiring simply a smart device and internet access, it might not be the best solution for everyone.

### 3. RESEARCH METHOD

The aim of this research is to investigate the attitudes toward learning during the COVID-19 among the students in Universiti Teknologi Mara (UiTM), Puncak Alam, Selangor. Quantitative research methods were utilized in order to obtain necessary data. A total of 100 respondents from three science courses, which were Biology (ED247), Chemistry (ED260) and Physics (ED248) in the Faculty of Education, University Teknologi MARA, Puncak Alam answered a questionnaire given via Google Forms. The IBM SPSS version 25.0 software was used for data analysis. The data collected from the Google Form were transferred into the SPSS software during this study as presented in Table 1.

Table 1. Procedure of data analysis

Unit	Section	Statistical tool(s)
1	Demographic data	Descriptive analysis
2	RO 1: to study students' attitude toward e-learning	Descriptive analysis
3	RO 2: to investigate the significant difference for students toward e-learning between courses	Analysis of variance (ANOVA)
4	RO 3: to study students' acceptance towards e-learning during the COVID-19 pandemic	Descriptive analysis
5	RO 4: to investigate the significant difference for acceptance towards e-learning between different courses during the COVID-19 pandemic	ANOVA
6	RO 5: to compare the acceptance on e-learning between gender during the COVID-19 pandemic	Independent sample T-test

### 4. RESULTS AND DISCUSSION

Table 2 shows i.e., demographic information, sciences students' attitude toward e-learning, students' attitude toward e-learning between different courses, sciences students' acceptance of e-learning during the COVID-19 pandemic, acceptance towards e-learning during between different courses during the COVID-19, and acceptance on e-learning between gender during the COVID-19. Each section would discuss on the findings obtained. The details of results would be further discussed in the next section.

#### 4.1. Student's attitudes of electronic-learning between different science courses

Table 3 shows the descriptive analysis for students' attitude toward e-learning between different courses. The second research question is to evaluate if the three courses differ significantly in terms of students' attitudes regarding e-learning. The descriptive analysis shows that students from the Chemistry (ED260) course had the highest mean (mean=3.3167, SD=.47766), while those from the Biology (ED247) course had the lowest mean (mean=3.1375, SD=.49013) for e-learning section. For the face-to-face learning

section, students from the Physics (ED248) course had the highest mean (mean=3.6933, SD=.56990) while those from the Chemistry (ED260) and Biology (ED247) courses had the same, lower mean value (mean=3.6600, SD=.47022; and mean=3.66600, SD=.56241, respectively).

Table 2. Summary of findings

Section	Findings
Demographic data	Gender: there were 23 (23.0%) male students and 77 (77.0%) female students involved in this study. Year of study: the highest number of respondents answering the online survey were fourth year students, with 33 students (33.0%). This is followed by third year students, with 21 students (21.0%), first year students with 20 students (20.0%), second year students with 18 students (18.0%) and finally 8 other students (8.0%). Course of study: the data shows that the largest number of participants enrolled in the Biology (ED247) course, with 40 students (40.0%). This is followed by those from the Physics (ED248) and Chemistry (ED260) courses, with the same number of respondents of 30 students (30.0%). Respondents' interest toward science: the result revealed that 64 (64.0%) of respondents had high interest toward science, while 34 (34.0%) respondents had a moderate interest in science and only 2 (2.0%) respondents had a low interest in science. Respondents' experience of participating in e-learning before the pandemic: the result revealed that 59 (59.0%) respondents had experience participating in any type of e-learning prior to the COVID-19 pandemic. Meanwhile, 41 (41.0%) respondents reported to never having any experience participating in any type of e-learning prior to the COVID-19 pandemic.
Sciences students' attitude toward e-learning	The result revealed that the fourth item which is "I would try to learn on my own" has the highest mean score (mean=3.51, SD=.990) compared to other items while item number seven which is "I like the idea of e-learning class than face-to-face learning" recorded the lowest mean score (mean=2.73, SD=1.043).
Students' attitude toward e-learning between different courses	The result revealed that there were no significant differences in students' attitude on e-learning between three science courses (Biology, Chemistry, and Physics).
Science students' acceptance of e-learning during the COVID-19 pandemic	The result revealed that item number one which is "What do you think of the effectiveness of e-learning during the COVID-19 pandemic?" recorded the highest mean score (mean=3.05, SD=.796) followed by item number four of "I will use e-learning in the future for studies" (mean=1.44, SD=.608). Then, "I will share the benefit of e-learning to others" of item number three comes right behind (mean=1.18, SD=.435) while "Because of the learning during the pandemic, I am exposed to many e-learning strategies" of the item number 2 recorded the lowest mean score (mean=1.18, SD=.386).
Acceptance of e-learning between different courses during the COVID-19 pandemic	The result revealed that there is no significant difference in the acceptance of e-learning during the COVID-19 between three science courses (Biology, Physics and Chemistry).
Acceptance on e-learning between gender during the COVID-19 pandemic	The result revealed that there was no significant difference between male and female students on the acceptance of e-learning.

Table 3. Descriptive analysis for students' attitudes toward e-learning between different courses

	Courses	N	Mean	Std. Deviation	Std. Error
E-learning	Biology (ED247)	40	3.1375	.49013	.07749
	Physics (ED248)	30	3.2792	.77660	.14178
	Chemistry (ED260)	30	3.3167	.47766	.08720
	Total	100	3.2337	.58702	.05870
Face to face learning	Biology (ED247)	40	3.6600	.56241	.08892
	Physics (ED248)	30	3.6933	.56990	.10404
	Chemistry (ED260)	30	3.6600	.47022	.08585
	Total	100	3.6700	.53362	.05336

Table 4 shows the tabulation of data of the students' attitude toward e-learning and face-to-face learning between different courses by using ANOVA. One-way ANOVA revealed that there were no significant differences in the students' attitude toward e-learning between the three courses ( $F=.925$ ,  $df=2$ ,  $sig=.400 > 0.05$ ). Meanwhile, there were also no significant differences in their attitude toward face-to-face learning between the three courses ( $F=.040$ ,  $df=2$ ,  $sig=.961 > .05$ ).

Table 4. ANOVA of students' attitude toward e-learning and face-to-face learning between different courses

	ANOVA	Sum of squares	df	Mean square	F	Sig.
E-learning	Between groups	.639	2	.319	.925	.400
	Within groups	33.476	97	.345		
	Total	34.114	99			
Face-to-face learning	Between groups	.023	2	.012	.040	.961
	Within groups	28.167	97	.290		
	Total	28.190	99			

#### 4.2. Student's acceptance of electronic-learning during the COVID-19 pandemic

Table 5 tabulates the students' acceptance of e-learning during the COVID-19 pandemic. It was found that item number one, which is "What do you think about the effectiveness of e-learning during the COVID-19 pandemic?" recorded the highest mean score (mean=3.05, SD=.796) followed by item number four "I will use e-learning in the future for studies" (mean=1.44, SD=.608). Then, "I will share the benefit of e-learning to others" of item number three comes right behind (mean=1.18, SD=.435), while "Because of the learning during the pandemic, I am exposed to many e-learning strategies" of the item number 2 recorded the lowest mean score (mean=1.18, SD=.386).

Table 5. Students' acceptance of e-learning during pandemic of COVID-19

No.	Item	Mean	Std. Deviation	Mean interpretation
1	What do you think of the effectiveness of e-learning during the COVID-19 pandemic?	3.05	.796	High
2	Because of the learning during the pandemic, I am exposed to many e-learning strategies	1.18	.386	Low
3	I will share the benefits of e-learning to others	1.25	.435	Low
4	I will use e-learning in the future for studies	1.44	.608	Low

#### 4.3. Acceptance of electronic-learning between gender during the COVID-19 pandemic

The descriptive analysis showed that male students have the highest mean score for acceptance towards e-learning followed by female students. However, an independent t-test showed that there was no significant difference between male and female students on the acceptance of e-learning. This finding is contrary to a study done at the University of Ghana [38], which concluded that male students are more likely to accept and participate in e-learning than female students.

### 5. CONCLUSION

The study findings showed that students in the UiTM Faculty of Education have a more positive attitude toward face-to-face learning over e-learning. However, there was no statistically significant difference for students' attitude toward e-learning between the Biology (ED247), Physics (ED248) and Chemistry (ED260) students during the COVID-19 pandemic. Furthermore, there was also no significant difference between male and female students on the acceptance towards e-learning during the COVID-19 pandemic.

The results of this study revealed that there is indeed work to be done to improve students' acceptance towards e-learning. Malaysian universities that apply e-learning during the COVID-19 pandemic should help to prepare their students for DL, with an emphasis on e-learning. It is intended that the outcomes of this study would help Malaysian universities improve the quality of their e-learning experiences and drive more research in the field of e-learning adoption in the post-COVID-19 pandemic world. E-learning and distant learning, without a doubt, will be one of the future pillars of higher education.

It is vital to look into students' attitudes on e-learning acceptance because students and teachers tend to prefer conventional-based learning where students may meet teachers face to face, despite the fact that e-learning has been around for decades. One of the major reasons why students and teachers favor face-to-face learning is because the process of delivering knowledge can be more efficient. For future research, precise research questions must be explored in order to obtain additional discoveries concerning this area of research rather than focusing solely on demographic data. The research topics could be expanded to include a comparison of e-learning and face-to-face learning, as well as the link between the two. The items should include the various aspects that may influence e-learning acceptability. Technology and system, institutional elements, and instructor traits are just a few examples that can be added. Even after nearly two years of exposure to e-learning, students are likely to have a limited interest in it. When adopting this sort of learning during a pandemic, it is critical to focus on both the educators and pupils to guarantee that the pedagogical session runs smoothly.

### ACKNOWLEDGEMENTS

This paper is part of a research project funded by *Geran Dalaman Penyelidikan Rakan EDU* (Dana Fakulti Pendidikan UiTM Cawangan Selangor) 600-TNCPI 5/3/DDF (EDUCATION) (013/2021), Universiti Teknologi MARA.




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## BIOGRAPHIES OF AUTHORS






**Nur Farha Shaafi**    received the Ph.D. degree from Universiti Malaysia Pahang, Malaysia. She was appointed as Senior Lecturer at the Faculty of Psychology and Education, Universiti Malaysia Sabah, Malaysia. Her current research interest includes educational chemistry, and areas of education. Her publication topics include advanced materials, chemistry, educational science, and educational chemistry. She can be contacted at email: farhashaafi@ums.edu.my.






**Zulinda Ayu Zulkipli**    is a Senior Lecturer at the Department of Science Education, Faculty of Education, Universiti Teknologi MARA, Malaysia. She is passionate about raising the quality of teaching and learning of students and their development in the schools and in the higher education settings. Her current research interest includes science education, cell biology, and biomedical science. She can be contacted at email: zulinda@uitm.edu.my.



**Nur Ainaa Najiha Mohd Azam**    received the Bachelor Degree in Science Education (Hons.) Chemistry from Universiti Teknologi MARA, Malaysia. She was appointed as a research assistant (RA) and work under supervision of Mr. Mohammad Mubarrak Mohd Yusof. Her final year project concerning in the students' acceptance of e-learning in pandemic of COVID-19. She can be contacted at email: ainaanajiha98@gmail.com.



**Mohammad Mubarrak Mohd Yusof**    is a Lecturer in Universiti Teknologi MARA, Malaysia. He was appointed lecturer in the university in 2012 and went on to pursue his graduate studies in physics at the Universiti Teknologi Malaysia, Skudai, Johor, Malaysia. He is passionate about raising the quality of teaching and learning of students and their development in the schools and in the higher education settings. His research interests lie in physics education, creative education, instructional technology, and heutagogy. He can be contacted at email: mubarrak@uitm.edu.my.