Mediterranean Journal of Social & Behavioral Research
2025, 9(2), 45-54
ISSN 2547-8559 (Print)
ISSN 2547-8567 (Online)
https://www.mjosbr.com/

Research Article **OPEN ACCESS**

The impact of asynchronous online learning on EFL students' mental health and academic achievements in post-COVID-19 Algeria

Nadia Ghounane [1]*, Asma Rahmani [2]

[1] University of Saida, Dr. Moulay Tahar, Saida, ALGERIA
[2] Batna 1 University, Batna, ALGERIA
***Corresponding Author:** nadoushben@ymail.com

Citation: Ghounane, N., & Rahmani, A. (2025). The impact of asynchronous online learning on EFL students' mental health and academic achievements in post-COVID-19 Algeria. *Mediterranean Journal of Social & Behavioral Research*, 9(2), 45-54. https://doi.org/10.29333/mjosbr/17212

ABSTRACT

The outbreak of COVID-19 has changed education worldwide. Technology has become the only gate for all universities and institutions to carry out the learning/teaching process. Some countries introduced technology years before the pandemic and encountered no difficulties in shifting from offline to online modes. Countries, where technology is still in its infancy, struggled to switch modes. The situation affected students' learning behavior, self-efficacy, motivation, and learning achievements. Most researchers noticed the influence during the post-pandemic era. This paper aims to shed light on the sudden shift from the offline to the online mode by exploring the impact of asynchronous online learning on first-year EFL master's students' mental health and how it affects their academic achievements in post-COVID-19 Algeria. The significance of the study lies in finding solutions to raise students' self-esteem and change their learning behavior after they switch to the offline mode in the post-pandemic era. To collect data, the researchers employed both quantitative and qualitative methods, which included a semi-structured questionnaire and classroom observations. The researchers conducted the study with 92 first-year EFL master's students at Saida University, Algeria. The study indicated that students suffered from mental health issues during the pandemic. These issues led to their low self-esteem due to the use of asynchronous online mode. The results also revealed that students' low self-esteem affected their learning behavior and, subsequently, their motivation. The analysis also revealed that a lack of motivation led to low academic performance during the post-pandemic era.

Keywords: Algerian first-year EFL master's students, asynchronous online mode, learning behavior, mental health, post-COVID-19, self-esteem

Received: 11 Jul. 2023 ◆ Accepted: 16 Sep. 2025

INTRODUCTION

Studies linked students' self-esteem to motivation and learning behavior. It is an essential pillar in building the students' skills, and henceforth, it plays a vital role in learning achievements. Researchers have conducted numerous studies on the relationship between these variables, including attitudes, self-esteem, motivation, learning behavior, and academic achievement. Researchers turned their research interest towards exploring the connection between the new emerging technologies and students' self-efficacy and how it affects their motivation and learning behavior.

The sudden shift to online learning after the outbreak of COVID-19 has raised debates due to many constraints that faced its implementation, including teachers' and students' *techno-resistance* and lack of training, net problems, and inadequate infrastructure. These problems were among the first challenges to arise with the introduction of online learning in the Algerian context following the COVID-19 pandemic outbreak.

After the outbreak of COVID-19, Algerian universities quickly transitioned to the online mode by training teachers on how to use platforms such as Moodle and Microsoft Teams. Universities ignored students' training to access these platforms. They instructed teachers to post their lectures following the *asynchronous online* mode. This instruction faced some resistance since teachers were not trained to prepare online courses or assignments, nor were they familiar with the appropriate pedagogical procedures. Universities forced teachers to upload handouts and other pedagogical supports and neglected the importance of teacher and student interaction. This means that they neglected the *synchronous online* mode.

The absence of teacher/student interaction during the pandemic led to many consequences that affected students' academic achievements in the four linguistic skills, mainly academic writing. The

primary reason for students' low academic achievements is the online learning mode implemented during the two academic years, 2020/2021 and 2021/2022. The asynchronous online mode was the only formal mode that most Algerian universities used during the pandemic. Teachers tend to upload handouts on Moodle. This mode lacks the most essential components of the learning process, namely, teachers' and learners' communication and interaction. Teachers developed the lectures without learning objectives or pedagogical standards for an online course. This fact led students to develop negative attitudes towards using Moodle and learning through the asynchronous online mode. The negative attitudes resulted in developing learning anxiety and low self-esteem. The current paper explores the impact of asynchronous online learning on students' self-esteem and how it affects their learning behavior, motivation, and academic achievements. The significance of the study lies in finding solutions, as teachers continue to use the platform in the post-pandemic period, on the one hand, and in examining the impact of students' low academic achievements resulting from a lack of self-esteem and motivation. The researchers set the following research objectives:

- Shed light on students' low self-esteem as a result of learning through the asynchronous online mode.
- Explore the impact of the asynchronous online mode on students' psychological state and how it leads to mental health issues.
- Investigate how the students' mental health affects their attitudes, motivation, and academic achievements in the post-COVID-19 era.

The following research questions spring from the previous research objectives:

- How did the asynchronous online learning mode affect the students' self-esteem?
- How did the asynchronous mode affect the students' psychological state and lead to mental health issues?
- How did the students' mental health issues affect their attitudes, motivation, and academic achievements in the post-COVID-19 era?

The present paper starts with a review of the related literature and then proceeds with describing the methods used for data collection. The article also presents the research instruments, the findings, the discussion of the results, and suggests some recommendations.

LITERATURE REVIEW

Asynchronous vs. Synchronous: Blending the Modes to Bichronous

Studies showed many types of online learning, including *asynchronous*, *synchronous*, *hybrid,* and *bichronous* modes. The first type does not take place in real-time. Teachers tend to upload courses and assignments on platforms. In this type, interaction occurs through the use of blogs and discussion boards. Students can access it at any time and download learning materials (Fordham University, n. d.). The *synchronous mode* provides a space where students and teachers can interact in real-time through a video conference or audio chat. Teachers can share their teaching materials, such as PowerPoint presentations, and raise debates (Mihlali et al., 2024). The *hybrid mode*, known as *blended learning*, combines online and face-to-face education. Students learn online and often meet in person during the semester (Fordham University, n. d.). Lastly, the *bichronous* mode combines the synchronous and asynchronous online methods, i.e., teachers upload lectures and assignments and meet students through video conferencing.

Teachers sometimes combine these modes on learning platforms like Moodle, Blackboard, and Microsoft Teams. Cancino and Avila (2021) named these platforms learning management systems (LMSs). Watson and Watson (2007, p. 28) (as quoted in Cancino & Avila, 2021, p. 25) defined it as:

> The infrastructure that delivers and manages instructional content identifies and assesses individual and organizational learning or training goals, tracks the progress toward meeting those goals, and collects and presents data from supervising the learning process of an organization as a whole.

These platforms include all instructions for an online mode. Previous studies like those conducted by Pella (2014) and Raza et al. (2021) stressed the point that these platforms are more effective in the synchronous mode rather than the asynchronous mode (as cited in Cancino & Avila, 2021, p. 26).

Synchronous online learning is more beneficial than asynchronous mode, as demonstrated by Salmon (2013) and Teng et al. (2012) in their studies. They stated that this mode promotes collaborative education and more interaction (as cited in Fernandez et al., 2022). According to Fernandez et al. (2022), the advantage of synchronous online learning is that "students can ask questions, seek answers, get immediate feedback, and share opinions and ideas in the class as the session proceeds will be real-time" (p. 3). Synchronous online learning has many advantages. The student can develop his academic community, which includes his instructors and classmates. It helps students to participate in face-to-face learning and get teachers' feedback (Wind Kofoed, 2020). Fernandez et al. (2022) highlighted that teachers and students were not able to have lectures through the synchronous mode, mainly during COVID-19, since they "undergo various personal issues and may not be able to take up the online classes as per the schedule given by the teacher" (p. 3).

The asynchronous online mode has been widely used in platforms like Moodle, Edmodo, Teams, and Blackboard during the COVID-19 pandemic to provide accessibility to students at any time. Wind Kofoed (2020) claimed that "asynchronous learning enables students to learn with flexibility in their comfort zone" (as cited in Fernandez et al., 2022, p. 3). Asynchronous online learning also allows the student to develop self-dependent learning, i.e., the student can study without depending on his/her teachers. Wind Kofoed (2020) also pointed out that both modes have advantages and disadvantages. Instead, he called for a blended approach, i.e., the use of both modes and the *bichronous mode.* Martin et al. (2020) highlighted that *bichronous online* learning is "the blending of both asynchronous and synchronous online learning, where students can participate anytime, anywhere during the asynchronous parts of the course but then participate in real-time activities for the synchronous sessions" (p. 4). **Figure 1** gives an overview of the blending of asynchronous and synchronous modes:

As **Figure 1** shows, students can benefit from combining both modes through video or audio conferencing and accessing learning materials like forums, assignments, and handouts.

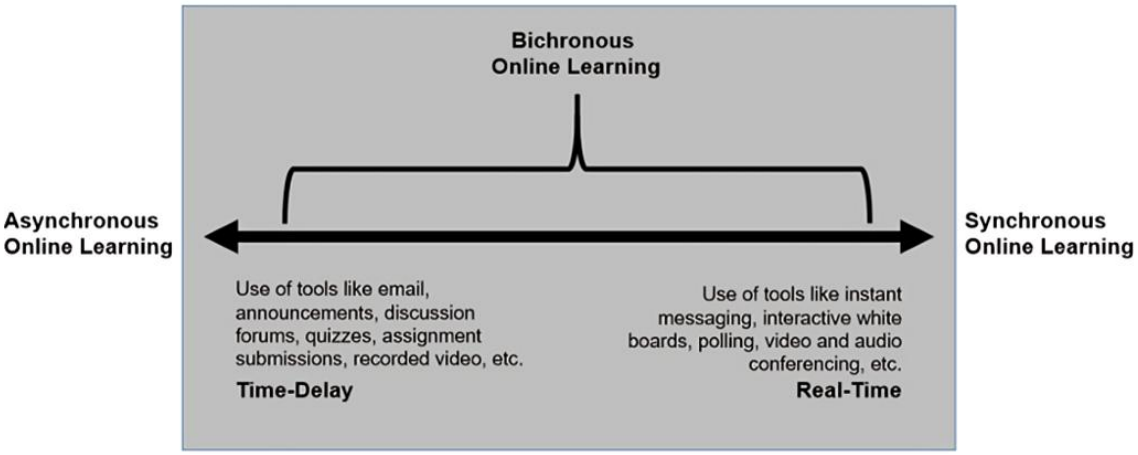

Figure 1. Blending the asynchronous and the synchronous online modes (Adapted from Martin et al., 2020, p. 3)

Many researchers have conducted studies on synchronous and asynchronous modes during the pandemic (see studies by Al-Areibi et al., 2022; Alzahrani et al., 2023; Fabriz et al., 2021), while bichronous mode has received the least attention. Utomo and Ahsanah (2022) pinpointed that bichronous online learning is like hybrid/blended learning. Blended learning combines synchronous or asynchronous modes with face-to-face learning, while bichronous learning combines only the online mode, i.e., the asynchronous and synchronous modes. Rehmand and Fatima (2021) maintained that the application of synchronous and asynchronous learning increased students' engagement and created interactive learning (as cited in Utomo & Ahsanah, 2022, p. 137). To the authors' knowledge, no researchers have explored how to blend the bichronous online mode and face-to-face learning.

Online Learning and Students' Self-Esteem

Studies on self-efficacy and self-esteem started long before the dawn of research on technology use in education. Workman and Stenard (1996), Kurtz et al. (2009), and Pullmann and Allik (2008) turned their attention to exploring the learners' psychological state and how it is affected by technology use (as cited in Vakoufari et al., 2014).

The pandemic has impacted students' psychological state since universities switched to online instruction. Countries were in quarantine, and universities shifted suddenly to online mode. The students experienced anxiety, which led to *technophobia* or *techno-stress*. The sudden shift also affected their self-esteem since researchers claimed the two concepts are interrelated. Dolgova et al. (2021) (as cited in Mateo et al., 2022, p. 2) highlighted that:

> Self-esteem and state anxiety are indeed correlated, based on the students' determination (…). The correlation among the variables, which is the poor self-esteem and anxiety among students in a new normal education (online learning), may impact their mental health as a result of anxiety.

The poor self-esteem, which the students experienced after the sudden shift to the online mode, led to online anxiety, which in turn developed into a *techno-resistance*.

Some other researchers studied the correlation between social identity and self-esteem. Chernysheva (2021) investigated this correlation. He found in his study that students familiar with social networks can develop good self-esteem since they have already established their *virtual social identity*. Students who use virtual spaces more than five hours per day have not experienced *techno-stress* because they have developed *e-readiness* and subsequently good self-esteem.

Studies highlighted that students' psychological state affects academic achievements. Some of these studies claimed that there is an "increased anxiety and depression among students during the pandemic". The possible reasons "behind the negative impact of online learning on psychological well-being are thought to come from lack of feedback, lack of opportunities for communication, cognitive load, technophobia, and reduction in enthusiasm" (Zahao, 2022, as cited in Al Awaji et al., 2022, p. 2). Learning online during the pandemic has developed students' anxiety, which affects the learner's self-esteem and, subsequently/their academic achievement. Khalil et al. (2020) averred that the outbreak of the COVID-19 pandemic and the sudden shift to online learning led to many behavioral challenges.

There are no studies in the Algerian context that dealt with students' self-esteem and its impact on their educational achievements during the COVID-19 pandemic. To study students' low academic achievements, you need to dig deeper into the effects of COVID-19 and the sudden change to the online mode on their mental health. The researchers will introduce readers to the impact of the sudden shift to online learning on students' mental health, self-esteem, and motivation.

Effects of Online Learning on Students' Mental Health During the Pandemic

Al Awaji et al. (2022) stated that researchers should give more importance to finding solutions to the post-effects of the pandemic because the prolonged isolation and lack of communication between students and their instructors led to low academic achievements. Son et al. (2020) claimed that there is an urgent need to explore the effects of COVID-19 on students' mental health.

Studies worldwide, like those of Leones et al. (2020), have shown that university students experience mental health disorders. Among the factors that lead to mental disorders are social isolation, lack of communication, and the use of social media. Baker and Algorta (2016) maintained that social media leads to depression. Giusti et al. (2021) argued that social media aggravated students' mental health issues in addition to "lack of interaction and emotional support, and physical isolation." These factors "were associated with negative mental health trajectories" (p. 2). Baker and Algorta (2016) concluded that most countries had implemented preventive measures to reduce cases of

COVID-19. This leads to "psychological distress and challenging learning abilities" (p. 3). Azmi et al. (2022) pointed out that COVID-19 impacted all people worldwide, particularly students who "were physically and mentally affected by the lockdown and the shift from physical person-to-person classroom to virtual learning (online classes)". This fact "increased the prevalence of psychological stress, anxiety, and depression among university students" (p. 1).

After the lockdown, students became worried about learning due to academic disruptions (Fatima et al., 2025; Neamhom & Chumprasittichok, 2024). They also developed *technostress* towards the use of educational platforms in addition to their fear and "uncertainty about the future because of (…) fear of failing examinations, inability to concentrate during lectures" (Azmi, 2021; Aristovnik, 2021, as cited in Azmi et al., 2022, p. 2). Many factors lead to mental health issues. Apart from these factors, researchers like Elmer et al. (2020), Hussein et al. (2020), and Sharma et al. (2020) reported that students received less social and emotional support from their classmates, close friends, and parents during the confinement (as cited in Babb et al., 2022).

Depression, distress, and anxiety were among the mental health issues among students (Shamim et al., 2024). At the same time, researchers like Eysenbach et al. (2020) claimed that "most of these symptoms were based on health concerns for themselves and family, difficulty concentrating, sleep disturbances, social isolation, and academic concerns" (as cited in Babb et al., 2022, p. 141). The causes of distress, depression, and anxiety are not limited to the abovementioned issues. Teachers delivered the course content through the asynchronous online mode, technical assistance, and interaction with peers and teachers.

Most importantly, the reasons can also be limited to *e-readiness* to use LMSs like Moodle. The lack of *e-readiness* is because some countries have recently introduced online learning. "Many students suffer from access to new technology resources. The lack of IT knowledge was identified as a significant impediment to non-technical instructors" (Hasan & Bao, 2020, p. 2).

Some studies, like the one conducted by Kentucky Counseling Center (2021), argued that remaining in front of a Zoom session for many hours can lead to *Zoom fatigue* and *social isolation*. "There is information overload during an online class, and facing the screen for prolonged periods is mentally draining" (p. 6).

Simamora (2020) maintained that online learning causes many health problems for students. Among these problems, he cited fatigue, eyesight, and headache since they had to do many assignments online. He also added that the disadvantages of online learning are linked to the student's motivation by the end (as cited in Sri, 2020, p. 24). Many studies reported that Overusing platforms to learn and do assignments within a short time affected the student's motivation toward online learning and educational platforms. The researchers will prove this claim through the current research paper.

Regarding mental health and academic achievements, some researchers like Yahiaoui et al. (2022) proposed *learning outcomes*. Yahiaoui et al. (2022) linked the concept to students' learning experiences. This "change can occur in terms of knowledge, skills, and attitudes" (p. 3). Self-esteem, attitudes, motivation, and academic achievements are interrelated and form the students' learning experience. The researchers will prove this point through the current research paper.

The Impact of Online Learning on Students' Motivation

Studies showed that online learning impacted students' motivation long before the outbreak of COVID-19. Haranti (2015) studied the relationship between them and found an impact (as cited in Elshareif & Mohamed, 2021, p. 128). Lin et al. (2017) (as cited in Meşe & Sevilen, 2021, p. 14) conducted another study before the pandemic. Lin et al. (2017) explored the relationship between motivation and asynchronous online learning. They also investigated students' motivation and the use of asynchronous online courses. "The students had low levels of intrinsic and extrinsic motivation in their online education course. The researchers elaborated on the low motivation and discussed that it might have been caused by a lack of real-time interaction with instructors and classmates".

Long before the pandemic outbreak, researchers like El-Seoud et al. (2014) highlighted that including e-learning in learning does not motivate students. El-Seoud et al. (2014) argued that researchers linked motivation to the teacher's role. They justified that the use of e-learning has weakened the student-teacher relationship.

Several studies have shown the positive impact of online learning on students' motivation. Herath et al. (2021) believed that there is a strong correlation between motivation and e-learning (as cited in Yahiaoui, 2022, p. 3). Herath et al. (2021) also added studies like those of Meşe and Sevilen (2021) and Sandybayev (2020) showed that e-learning is more effective than the traditional methods of learning (as cited in Yahiaoui et al., 2022). They further maintained that teachers cannot motivate students to take an online course unless it is related to their learning outcomes. Herath et al. (2021) concluded that "the relationship between e-learning and students' outcomes is mediated by motivation" (as quoted in Yahiaoui et al., 2022, p. 3).

Studies conducted by Cahyani et al. (2020), Rachmat (2020), and Simamora (2020) reported that students who experienced a lack of motivation to learn before the pandemic were more influenced by other factors, including mental health issues like stress, depression, and anxiety. These researchers also mentioned other factors like "learning environment, learning time, and instrumental supports, which in turn affected the achievement" (as cited in Sri, 2020, p. 24). Students with high levels of motivation showed positive attitudes toward learning online. Fitiyani et al. (2020) and Simamora (2020) claimed that "intrinsic factors highly motivate university students in online learning. The enthusiasm and ambition to understand and add new knowledge have driven them to study hard even online" (as cited in Sri, 2020, p. 24).

Regarding the impact of asynchronous online learning on students' academic achievements and motivation, researchers conducted a few studies. The authors of this article reported a survey by Aque et al. (2021). Aque et al. (2021) linked students' motivation in learning science through the asynchronous online mode to factors like self-efficacy and performance goals.

Online Learning in Algeria During the Pandemic

After the pandemic outbreak, Algerian universities hastened to introduce online learning through LMSs like Moodle and Microsoft Teams. Universities adopted the asynchronous online mode to post the lecture content and other pedagogical materials. Interaction between students and their instructors was absent since the ministry limited face-to-face learning (Abdelouafi, 2021; Ghounane, 2022). Most students have developed technostress since they were unfamiliar with

LMSs like Moodle. Students shared positive attitudes toward using Facebook, Google Meet, Zoom, and Jitsi as learning platforms due to their easy access. Some teachers used synchronous online learning by scheduling online video conferencing through the Big Blue Button app in Moodle.

Students showed positive attitudes toward using these apps rather than Moodle due to their accessibility. Teachers shared the same attitudes. Some of them used apps like Google Meet and Zoom. Algerian students developed negative attitudes toward the use of LMSs due to many reasons, including "lack of motivation to use e-learning, inadequate English expertise, lack of technical support from institutes and instructors, inadequate access to technology, and overall lack of e-learning content development experience are seen as the major obstacles to efficient e-learning systems" (Hasan & Bao, 2020, p. 2). These obstacles led to technostress, negative attitudes, and a lack of motivation in the Algerian context. Hasan and Bao (2022) claimed that "because of these challenges, students are mentally frustrated to complete their courses successfully" (p. 2).

COVID-19 has opened the door widely to reconsider the use of online education and LMSs in Algeria. Zina and Ahlem (2021) stated that online learning in Algeria "requires planning, manipulation, and training for students and teachers, mainly because this type of knowledge is aimed at 02 million students with different specialties and languages" (p. 170). Algerian universities switched to online mode by using the Moodle platform. Institutions did not train teachers and students on how to use the Moodle platform. Most teachers were against the use of online platforms to upload their lectures. They developed *techno resistance* since some of them presented a *generation gap*. Old teachers whose teaching experience exceeded 15 years showed this gap through negative attitudes. The time devoted to preparing online lectures was not enough. The situation led teachers to upload handouts without considering their forms. This led to the development of technostress and negative perceptions. Students experience stress and anxiety since some of them live in rural places where there is no internet. They had problems accessing the platform due to their low background in using Moodle, missing passwords, and low social income. Most students accessed the platform through their mobile phones. The course content delivered through the platform also raised the students' techno-stress and led to a negative development in their use of Moodle. Algerian researchers did not explore the impact of Moodle on students' learning behavior. The researchers will investigate this research gap. Algerian researchers did not examine the effects of asynchronous online learning on students' academic achievement, taking into account their self-esteem, anxiety, mental health status, and motivation.

METHODS AND MATERIALS

The present work sheds light on the impact of asynchronous online learning on Algerian EFL students' mental health, self-esteem, motivation, and academic achievements in the post-pandemic era. The researchers merged both quantitative and qualitative methods. Mozyrko (2022) maintained that "quantitative data gives you the *what*, but qualitative data gives you the *why*, providing you with all you need to make an informed decision" (para. 12).

Participants

The researchers conducted the study during the first semester of the 2022/2023 academic year, i.e., in the post-pandemic period when students transitioned to face-to-face learning. Universities use online mode to provide students with handouts, activities, and learning materials. The researchers selected 92 first-year EFL Master's students from the department of English language and literature, Saida University, Algeria. They followed random sampling. Shadish et al. (2002) stated that "random sampling ensures that results obtained from your sample should approximate what would have been obtained if the entire population had been measured" (as cited in Reeger & Aloe, 2019, para. 2). The researchers selected participants during the research methodology sessions. The sample contains 42 females and 50 males aged from 19 to 38 years old. All the selected students had a Moodle account.

Research Instruments

The researchers employed a semi-structured questionnaire administered online through Google Forms. The questionnaire contains three sections. The first section of the questionnaire includes demographic information about the participants, their ages, and their genders. The second section explores students' mental health, including depression and anxiety. The third section consists of questions investigating students' self-esteem, the impact of asynchronous online learning, and students' academic achievements.

To determine the factors that affect students' motivation, the researchers observed the lectures posted asynchronously in Moodle. We selected the two specialties (literature and didactics) from master one, department of English language and literature, Saida University. The observation started during the first semester of 2022/2023 when the Algerian ministry instructed all universities to switch to face-to-face learning mode. We also scheduled video conferencing using Big Blue Button for some sessions in the research methodology module. The researchers divided the section into two groups: control and experimental. We uploaded courses randomly, as usual, without respecting the format of an online course to the control group. We use the analysis, design, development, implementation, and evaluation (ADDIE) model proposed by Kurt (2017) to design our asynchronous lectures. After following the ADDIE model, the lectures were uploaded in Moodle asynchronously for the experimental group.

FINDINGS

Findings of the Questionnaire

The researchers selected the most essential questions from the questionnaire. For the second section of the questionnaire, the researchers tend first to check students' level of satisfaction with asynchronous online learning compared to synchronous online learning through the big blue button in Moodle and face-to-face learning.

The findings from **Table 1** indicate that most students prefer face-to-face learning during the pandemic, although the university limited the number of weeks to seven in the semester. The analysis also revealed that 83.89% of the participants are dissatisfied with asynchronous online learning. Students justified that they were dissatisfied with the way teachers posted lectures, activities, and materials on Moodle. They also added that the interaction between the

Table 1. Students' satisfaction with the three modes of learning

	Asynchronous online learning	Synchronous online learning	Face-to-face learning
Satisfied	11.33%	51.87%	95.66%
Neutral	/	/	/
Dissatisfied	83.89%	36.32%	3.33%
Very dissatisfied	4.78%	11.81%	1.01%

Table 2. Students' mental health issues during the pandemic

	Asynchronous online learning	Synchronous online learning
Depression	73.81%	53.33%
Anxiety	26.19%	46.67%

Table 3. Student's mental health issues in the post-pandemic era

	Asynchronous online learning	Face-to-face learning
Depression	19.33%	31.89%
Anxiety	80.67%	68.11%

teacher, the students, and their peers led to this dissatisfaction and lack of motivation. Fifty-one percent of the students were satisfied with the synchronous mode, as it promotes interaction with teachers and peers. Thirty-six students maintained that video conferencing helps present lectures and not for conducting the practical side, i.e., doing assignments, class activities, and tests.

Assessing students' mental health

The researchers attempted to assess students' mental health issues by exploring depression and anxiety.

Table 2 demonstrates that about 73.81% of the students experienced depression during the outbreak of COVID-19. Students experienced anxiety in the asynchronous online mode. Depression is low in the synchronous mode, with a percentage of 53.33%. The participants explained that they were depressed since they were not familiar with the online mode in general and the sudden shift from the offline to the online mode in particular. Anxiety is raised to 46.67% in the synchronous mode compared to the asynchronous mode. The main reason is that the students were not familiar with using the Big Blue Button in Moodle because they used to attend video conferencing with their teachers using Google Meet. The university did not train them to access a video conference in Moodle. The analysis also showed that students experienced depression more than anxiety during the pandemic. Students lived with exam anxiety due to the lack of face-to-face learning.

Students' mental health issues in the post-pandemic period

At the beginning of the new academic year 2022-2023, the Ministry of Higher Education instructed that all universities should switch to face-to-face learning. Students returned to classes, and Universities decided to keep the online mode limited to the asynchronous mode. The researchers decided to test students' mental health issues since they are linked directly to their academic achievements during the first semester of the same academic year.

The researchers asked students about their mental health issues after designing the online course, which we will explain in the following section. **Table 3** shows that the students experienced low depression in both modes. Depression is low in the asynchronous mode since the university switched to face-to-face learning. Universities are limited to using asynchronous online learning for handouts, activities, and supplementary materials. Students still live in anxiety about using the platform since they are obliged to access Moodle to download activities and texts for reading. Anxiety levels rise to 68.11% in face-to-face learning, as students are aware that the shift from face-to-face learning to asynchronous online learning has impacted their linguistic skills, particularly writing, and their academic achievements.

Table 4. The impact of COVID-19 on students' language skills

	Percentage (%)
Students' writing skills	86.33
Students' speaking skills	79.18

Table 5. Factors affecting students' academic achievements

	Percentage (%)
Asynchronous online learning	61.18
The reduced face-to-face sessions, lack of practice, and teachers' feedback	88.33
Student's mental health issues (depression and anxiety)	79.21
Students' attitudes	65.89
Low self-esteem	70.01
Lack of motivation	69.46

The impact of COVID-19 on students' language performance and academic achievements

The researchers also tested students' language performance and the effects of online learning on their academic achievements (**Table 4**).

The researchers focused on just two skills since they are affected by their skills. The analysis shows that 79.18% of the students have low speaking ability. They also tend to make many pronunciation mistakes, lacking practice in a natural speaking environment. Students need a classroom environment where they can engage in discussions with their peers on various topics under the guidance of their teachers. The classroom is the only environment where students use English, as Algerian people generally do not speak it as their native language. Students' writing skills are the most affected, with a percentage of 86.33%. The researchers test their writing ability in writing essays, abstracts, and general introductions. The COVID-19 outbreak, reduced face-to-face sessions, lack of practice, and limited interaction with teachers led to students having low writing abilities. These factors affect students at all levels.

Table 5 gives an overview of the major factors affecting students' academic achievements. The analysis revealed that the first factor accounts for approximately 88.33%. All students used to study, do activities, and get teachers' feedback in class. They were not familiar with online learning. They justified that the online mode was introduced a few months before the pandemic. The university did not train teachers and students. Students' mental health is considered the second factor, with a percentage of 79.21%. They claimed that they stopped face-to-face learning for three weeks after the outbreak of COVID-19. They lost contact with their teachers and the administration. This raised their depression, anxiety, and fear of losing

Table 6. Information about students' access to lectures using asynchronous mode before the experiment

Students access	Percentage (%)
To download handouts	45.13
To do tests and assignments	39.83
To download additional learning materials (videos, PowerPoint presentations, and books)	15.04

Table 7. Students' weekly access to the newly designed online lectures using the ADDIE model

Students access	Percentage (%)
To download the freshly prepared lectures	73.33
To do assignments/ tests	22.82
To download supplementary materials	3.85

the academic year. It was not until the end of April 2020 that they started accessing Moodle in an asynchronous mode. Their mental state of health also affected their self-esteem, attitudes, and subsequently, their motivation.

Observation

Asynchronous online course for the experimental group using the ADDIE model

Before designing the online course following the ADDIE model, the researchers gathered some information from the experimental group. The researchers listed the results in **Table 6**.

The researchers included both groups to collect information. **Table 6** indicates that most students (45.13%) accessed Moodle and downloaded lectures posted asynchronously. Thirty-nine percent accessed Moodle to conduct tests and assignments. They justified that they did not access Moodle to download lessons since their peers tend to post the lectures on their Facebook group. Other informants (15.04%) claimed that they also accessed Moodle to download supplementary materials since their teachers tend to select valuable books and videos.

Students prefer to use social media rather than Moodle since, in both settings, teachers can post lectures asynchronously. These details are essential in using the ADDIE model since the researchers included the information as a part of the *analysis phase* of the model.

The researchers proceeded with the design phase based on the details provided by the students. The researchers followed a set of criteria employed to design the online lectures posted weekly on Moodle. The researchers considered the level, the course objectives, the lectures in HTML format, and references. The teacher supported these lectures with activities, assignments, and supplementary materials according to students' needs.

Students download lectures at a rate of 73.33%. Most students from the experimental group tend to access the platform. The researchers did the assignments and tests in class since the university did not train the students on how to conduct an online test (**Table 7**).

Based on the results from the observation, the researchers moved to the *development phase,* where they had to design a PowerPoint presentation that helps the students to understand what to download from the lecture, its supplementary materials, and activities, i.e., the student downloads what they need according to their learning needs. After downloading the lectures and materials, the researchers moved to the *implementation phase,* where they designed and announced a set of

Table 8. Students' motivation toward asynchronous online learning after the experiment

Students access	Percentage (%)
Attitudes/perceptions	71.33
Self-esteem	60.03
Learning strategies	69.77
Learning environment	51.89
Learning goals	64.01
Learning achievements	73.88
Motivation	59.33

activities that the students could download and practice through their Facebook Messenger. The researchers ensured that the students did this step without their interaction. They record the chats and post them to the teacher via the Moodle message option.

In the *evaluation phase*, the researchers tend to conduct a posttest with the experimental group to test their motivation towards asynchronous online learning. The researchers found that the students were more motivated to learn asynchronously in the experiments. The researchers presented the results of the test as follows:

Table 8 reveals that the learning environment has improved through the teacher's guidance, with 51.89%. The results also showed that students' learning goals and needs had been determined through the asynchronous mode since the teacher included the learning objectives of each online course. The researchers found that students' attitudes become 71.33% in relation to their self-esteem. They become self-dependent in learning and acquire new learning strategies. Although the students improved their learning achievements, their motivation is low (59.33%) since there is an absence of face-to-face interaction between the students and each other and their teacher. This is a factor that affects students' motivation. Although the teacher attempted to improve other parameters, including attitudes, self-esteem, learning goals, and achievements, students' motivation remains low.

DISCUSSION

The present paper explored the impact of asynchronous online learning on Algerian EFL students' self-esteem and anxiety state, and how these factors lead to mental health issues that influenced their academic achievements in the post-COVID-19 era. The study revealed that most students were unfamiliar with the online learning environment because they were used to studying following traditional methods. The lack of familiarity with social platforms led them to live in isolation. They failed to switch from the virtual social identity that they developed through social media, mainly Facebook, to create a new one for academic purposes. Most students experienced *techno-stress* and a low level of *e-readiness.* This result is in line with Chernysheva's findings (2021). It also answers the first research question, "How did the asynchronous online learning mode affect students' self-esteem?"

There is a correlation between students' poor self-esteem and state anxiety. Algerian students experienced poor self-esteem and a high level of anxiety due to the absence of interaction with their teachers. Teachers posted lectures through Moodle in an asynchronous online mode. The high level of anxiety and stress led to other mental health issues. This finding is in line with Mateo et al. (2022) study, when they claimed that there is a correlation between self-esteem and anxiety.

These factors may impact students' mental health. The results indicated that students experienced depression more than anxiety. Students experienced exam anxiety due to the lack of face-to-face interaction with their teachers during the pandemic. This result may answer the second research question, "How did the asynchronous online mode affect students' psychological state and lead to mental health issues?"

The study also demonstrated that many factors affect students' motivation to learn through the asynchronous online mode. The learning environment (asynchronous online learning) was the first factor that decreased their motivation since the teacher/student interaction was absent. Students also learned without learning goals, i.e., they just had to learn asynchronously to pass the exams and finish their academic year. Teachers used no active teaching strategies to improve students' academic performance during the pandemic. These factors led to low motivation among students. This result aligns with Aque et al.'s (2021) findings.

The study also revealed that the effect of online learning, mainly the asynchronous mode, had an impact on students' academic achievements in the post-COVID-19 era, or what Al Awaji et al. (2022) called the *post-effects* of the pandemic. The analysis also showed that students had developed negative attitudes toward using educational platforms like Moodle due to their positive attitudes toward Facebook as a learning platform. Social media is regarded as a factor that leads to students' mental health disorders. This finding confirms Guisti et al.'s (2021) results. The nature of online courses that teachers posted through the asynchronous mode led to students' *online fatigue* because they were obliged to read handouts that exceeded 20 pages for each module and do assignments quickly. This affects students' motivation towards online learning, mainly the asynchronous online mode, and leads to mental health issues like depression. This finding aligns with Sri's (2020) study and answers the third research question, "How did the students' mental health issues affect their attitudes, motivation, and academic achievements in the post-COVID-19 era?"

In the post-COVID-19 era, students experienced low depression towards asynchronous online learning since universities switched to face-to-face learning. They experienced high levels of depression since they knew that COVID-19 and the sudden shift to asynchronous online learning affected their linguistic skills and academic achievements.

The findings also demonstrated that students have low language skills during the COVID-19 and post-pandemic periods. The factors that impacted the students' language ability, the researchers can list the following:

- Absence of students and teachers' interaction during the pandemic.
- Absence of teachers' guidance,
- The asynchronous online mode was limited to uploading lectures and supplementary materials without considering students' needs.
- Teachers posted no asynchronous activities on Moodle, which aimed to improve students' speaking and writing skills.
- Absence of asynchronous e-feedback via Moodle Blog. Most teachers send feedback through email.
- The limited number of face-to-face sessions through which teachers hasten to finish syllabi.
- Teachers did not deliver any diagnostic tests after the shift to face-to-face learning.

These factors affected students' engagement and motivation to learn via Moodle. The study proved a strong correlation between self-esteem, attitudes, motivation, mental health state, and students' academic achievements.

CONCLUSION

The study aimed to explore the impact of asynchronous online learning on students' mental health and how it affects their academic achievements in post-COVID-19 Algeria. The researchers found that the sudden shift to online learning, mainly asynchronous online mode, affected students' self-esteem, attitudes, and motivation. This led to many mental health issues, including anxiety and depression. Teaching strategies, students' e-readiness, lack of training, lack of interaction, and the nature of online lectures led to the development of students' mental health issues. These issues had an impact on students' academic achievements, among the main factors affecting students' awareness and motivation to use platforms like Moodle. Students developed a *social identity* through social media, while they failed to create an identity in learning through educational platforms. Researchers should further explore how to create a *social identity* to learn formally through platforms like Moodle by raising awareness and changing attitudes. Universities should put under the lens of what Awaji et al. (2022) called "*the post-effects*" of the pandemic to improve learning through its different modes.

Author contributions: NG: conceptualization, data duration, writing – review & editing; **AR:** literature review, formal analysis, writing – review & editing. Both authors approved the final version of the article.

Funding: No conflict of interest is declared by the authors.

Ethical statement: The authors stated that the study does not require any ethical approval. The highest ethical practices in scientific publications were followed during the study. The study involved minimal risk, did not collect sensitive personal data. All participants were informed about the study and their consents were obtained prior to participation.

AI statement: The authors stated that they used just Grammarly as an AI tool for language editing purposes.

Declaration of interest: No conflict of interest is declared by the authors.

Data availability: Data supporting the findings and conclusions are available upon request from the corresponding author.

REFERENCES

Abdelouafi, H. (2020). *E-learning experience at Algerian universities during COVID-19: University of Draia, Adrar as a model* [Paper presentation]. The 2nd International Scientific Conference on Online Education and Future Jobs Due to the Global Epidemic Crisis.

Al Awaji, N., Zaidi, U., Awad, S. S., Alroqaiba, N., Aldhahi, M. I., Alsaleh, H., Akil, S., & Mortada, E. M. (2022). Moderating effects of self-esteem on the relationship between communication anxiety and academic performance among female health college students during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health, 19*(21), Article 13960. https://doi.org/10.3390/ijerph192113960

Al-Areibi, I., Dickson, B. A., & Kotsopoulos, D. (2022.) An analysis of synchronous and asynchronous online undergraduate motivation during the COVID pandemic. *International Journal of E-Learning and Distance Education, 37*(1). https://doi.org/10.55667/ijede.2022.v37.i1.1213

Alzahrani, H. A., Shati, A. A., Bawahab, M. A., Alamri, A. A., Hassan, B., Patel, A. A., Ahmad, M. T., Abd El Maksoud, W., & Alsaleem, M. A. (2023). Students' perception of asynchronous versus synchronous distance learning during the COVID-19 pandemic in a medical college, in the southwestern region of Saudi Arabia. *BMC Medical Education, 23*, Article 53. https://doi.org/10.1186/s12909-023-04034-5

Aque, A., Barquilla, M., Buan, A., & Bagaloyas, J. B. (2021). Asynchronous learning: Its effects on academic performance and students' motivation in science. *Thaviea Journal of Natural Science Teaching, 4*(1), 17-32. https://doi.org/10.21043/thabiea.v4i1.9806

Azmi, F. M., Khan, H. N., & Azmi, A. M. (2022). The impact of virtual learning on students' educational behavior and pervasiveness of depression among university students due to the COVID-19 pandemic. *Globalization and Health, 18*, Article 70. https://doi.org/10.1186/s12992-022-00863-z

Babb, S. J., Rufino, K. A., & Johnson, R. M. (2022). Assessing the effects of the COVID-19 pandemic on nontraditional students' mental health and well-being. *Adult Education Quarterly, 72*(2), 140-157. https://doi.org/10.1177/07417136211027508

Baker, D. A., & Algorta, G. P. (2016). The relationship between online social networking and depression: A systematic review of quantitative studies. *Cyberpsychology, Behavior, and Social Networking, 19*(11), 638-648. https://doi.org/10.1089/cyber.2016.0206

Cancino, M., & Avila, D. (2021).Switching to fully online EFL learning environments: An exploratory study in higher education. *Journal of Language and Education, 7*(3), 23-42. https://doi.org/10.17323/jle.2021.12101

Chernysheva, T. (2021). Identity and self-esteem of student youth in the digital age. *European Proceedings of Social and Behavioural Sciences, 2021*, 1384-1392. https://doi.org/10.15405/epsbs.2021.05.02.176

El-Seoud, S. A., Taj-Eddin, I., Seddiek, N., Mohamed, M., & Nosseir, A. (2014). E-learning and students' motivation: A research study on the effect of e-learning on higher education. *International Journal of Emerging Technologies in Learning, 9*(4), 20-26. https://doi.org/10.3991/ijet.v9i4.3465

Elshareif, E., & Mohamed, E. (2021). The effects of e-learning on students' motivation to learn in higher education. *Online Learning, 25*(3), 128-143. https://doi.org/10.24059/olj.v25i3.2336

Fabriz, S., Mendzheritskaya, J., & Stehle, S. (2021). Impact of synchronous and asynchronous sittings of online teaching and learning in higher education on students' learning experience during COVID-19. *Frontiers in Psychology, 12.* https://doi.org/10.3389/fpsyg.2021.733554

Fatima, A., Malik, I. A., Ahmad, A., & Aziz, T. (2025). The impact of online learning on university students' mental health during the COVID-19 pandemic: A study of academic stress, uncertainty tolerance, and psychological wellbeing. *Research Journal of Psychology, 3*(1). https://doi.org/10.59075/rjs.v3i1.70

Fernandez, C. J., Ramesk, R., & Manivannnan, A. S. (2022). Synchronous learning and asynchronous learning during COVID-19 pandemic: A case study of India. *Asian Association of Open Universities Journal, 17*(3), 1-14. https://doi.org/10.1108/AAOUJ-02-2021-0027

Fordham University. (n. d.). *Online learning environments: An introduction.* Fordham University. https://www.fordham.edu/info/24884/online_learning/7897/types_of_online_learning

Ghounane, N. (2022). Learning in the Algerian Context during the Pandemic: Is it Online or Offline? *Arab World English Journal, (*2nd Special Issue on Covid 19 Challenges), 492-503. https://doi.org/10.24093/awej/covid2.33

Giusti, L., Mammarella, S., Salza, A., Del Vecchio, S., Ussorio, D., Casacchia, M., & Roncone, R. (2021). Predictors of academic performance during the covid-19 outbreak: Impact of distance education on mental health, social cognition and memory abilities in an Italian university student sample. *BMC Psychology, 9*, Article 142. https://doi.org/10.1186/s40359-021-00649-9

Hasan, N., & Bao, Y. (2020). Impact of "e-learning crack-up" Perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss". *Children and Youth Services Review, 118*, Article 105355. https://doi.org/10.1016/j.childyouth.2020.105355

Herath, H., Bano, Y., & Vasantha, S. (2021). E-learning capability maturity during Covid 19 pandemic — A qualitative approach. *Qualitity: Access to Success*, 22, 232-236. https://doi.org/10.47750/QAS/22.184.29

Kentucky Counseling Center. (2021). *Mental health effects of online learning.* Kentucky Counseling Center. https://kentuckycounselingcenter.com/mental-health-effects-of-online-learning/

Khalil, R., Mansour, A. E., Fadda, W. A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., Alkhalifah, A., & Al-Wutayd, O. (2020). The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: A qualitative study exploring medical students' perspectives. *BMC Medical Education, 20*, Article 285. https://doi.org/10.1186/s12909-020-02208-z

Kurt, S. (2017). *ADDIE model: Instructional design.* Educational Technology. https://educationaltechnology.net/the-addie-model-instructional-design

Leones, L. M. B., Berba, C. M. P., Chua Jr, A. V., & Sandoval-Tan, J. (2020). Caring for the carers: Safeguarding oncologists' mental health in the time of COVID-19. *Ecancer Medical Science, 14*, Article 1057. https://doi.org/10.3332/ecancer.2020.1057

Martin, F., Polly, D., & Ritzhaupt, A. (2020). *Bichronous online learning: Blending asynchronous and synchronous online learning.* Educause Review. https://er.educause.edu/articles/2020/9/bichronous-online-learning-blending-asynchronous-and-synchronous-online-learning

Mateo, K., Lajom, R. M., Vicente, L. J., & Tus, J. (2022). The self-esteem and its correlation on the anxiety of college students during online learning modality. *Psychology Education.* https://doi.org/10.5281/zenodo.6565346

Meşe, E., & Sevilen, Ç. (2021). Factors influencing EFL students' motivation in online learning: A qualitative case study. *Journal of Educational Technology & Online Learning, 4*(1), 11-22.

Mihlali, L., Chignu, B. I., & Umejesi, I. (2024). Synchronous online learning and career readiness in higher education: Student perceptions, challenges, and solutions. *Frontiers in Education, 9*. https://doi.org/10.3389/feduc.2024.1449363

Mozyrko, B. (2022). *The benefits of merging quantitative and qualitative data in UX studies*. Usability Geek. https://usabilitygeek.com/benefits-of-merging-quantitative-and-qualitative-data-in-ux-studies/

Neamhom, T., & Chumprasittichok, T. (2024). Impacts of online learning class during the COVID-19 pandemic on student performance and their mental health status. *Journal of Health Management, 26*(1), 164-171. https://doi.org/10.1177/09720634231225017

Reeger, A., & Aloe, A. M. (2019). *Technically speaking: Why we use random sampling in reading research*. Iowa Reading Research Center. https://irrc.education.uiowa.edu/blog/2019/11/technically-speaking-why-we-use-random-sampling-reading-research

Sandybayev, A. (2020). The impact of e-learning technologies on Student's motivation: student centered interaction in business education. *International Journal of Research in Tourism and Hospitality,* 6(1), 16-24. https://doi.org/10.20431/2455-0043.0601002

Shamim, A. L., Mufti, N. Q. A., & Shah, M. A. H. (2024). The effects of the COVID-19 pandemic on students' academic performance and mental health. *Regional Science Policy and Practice, 16*, Article 100046. https://doi.org/10.1016/j.rspp.2024.100046

Son, C., Hedge, S., Smith, A., Wang, X., & Sasangohar, F. (2020). Effects of COVID-19 on college students' mental health in the United States: Interview survey study. *Journal of Medical Internet Research, 22*(2), Article e21279. https://doi.org/10.2196/21279

Sri, G. (2020). Students' motivation in online learning during COVID-19 pandemic era: A case study. *Holistics Journal, 12*(2), 23-40.

Utomo, D. T. P., & Ahsanah, F. (2022). The implementation of bichronous online learning: EFL students' perceptions and challenges. *Journal of English Language Teaching, 11*(2), 134-147. https://doi.org/10.15294/elt.v11i2.54273

Vakoufari, M., Angelaki, C., & Mavroidis, C. (2014). Self-esteem and loneliness as factors affecting distance learning students. *European Journal of Open, Distance, and E-learning, 17*(2), 100-116. https://doi.org/10.2478/eurodl-2014-0022

Wind Kofoed, D. (2020). *Synchronous vs asynchronous learning: What's more effective?* EduFlow LMS. https://www.eduflow.com/blog/synchronous-vs-asynchronous-learning-whats-more-effective

Yahiaoui, F., Aichouche, R., Chergui, K., Brika, S. K. M., Almezher, M., Musa, A. A., & Lamari, I. A. (2022). The impact of e-learning systems on motivating students and enhancing their outcomes during COVID-19: A mixed-method approach. *Frontiers in Psychology, 13*, Article 874181. https://doi.org/10.3389/fpsyg.2022.874181

Zina, A., & Ahlem, S. (2021). Perception of e-learning during the health crisis of COVID-19: Case of Algerian university teachers. *Journal of Information Technology Management., 13*(2), 154-172. https://doi.org/10.22059/jitm.2021.80360

❖❖❖