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Towards Rescuing Pedagogy during the Coronavirus Pandemic:

Unleashing the Digital in Higher Education

The Case of Third Year EFL Learners at the University Centre of Mila

A Dissertation Submitted in Partial Fulfillment for the Requirement of the Master's Degree in
Didactics of Foreign Languages

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Dedication I

To the ones who kept striving to make my life thriving.

Dounya

Dedication II

To my family for their charge-free education and support.

To my mate for going through all of this with me.

To the memory of my teachers who deserve to be called one.

Last, to whoever READs this work and benefits from it.

Hayame

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Abstract

The underpinning purpose of the current research is to explore the relation between digital teaching/learning during the COVID-19 pandemic and the possibility of rescuing pedagogy and the academic year from being disrupted. Within the framework of the current study, five research questions are raised: (1) Are the proportions of students and teachers who are prepared for digital learning/teaching and those who are not the same? (2) Based on students' and teachers' opinions, is there a pedagogical connectedness between learners, teachers, and the administration in the wake of the digital? (3) Has emergent digital teaching/learning boosted learners' autonomy during the pandemic? (4) Is there a relationship between learners' knowledge of digital technology use and boosting their autonomy? (5) Is there a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology? A structured questionnaire is administered to students and another to teachers in-person and online to gather the needed data. The participants are 103 third year students of English at Mila University Centre and 98 university teachers of Languages (English, Arabic, and French) from different Algerian universities. The collected data are computed using the Chi-square test for Goodness of Fit and the Chi-square test for Independence in SPSS. In performing the analysis, the results revealed that ensuring pedagogical continuity, during the COVID-19 pandemic, is related to the digital only from the teachers' perspectives. Implications and recommendations are thereby discussed.

Key words: COVID-19 pandemic, online/digital teaching, digital technology, pedagogical connectedness, pedagogical rescue.

List of Abbreviations

CBL: Collaborative Blended Learning

CDC: Centre for Disease Prevention and Control

COVID-19: Coronavirus Disease 2019

ECDC: European Centre for Disease Prevention and Control

GB: GigaByte

H1: Alternative Hypothesis 1

ICTs: Information and Communication Technologies

MERS: Middle East Respiratory Syndrome

RNA: Ribonucleic Acid

SARS-CoV: Severe Acute Respiratory Syndrome Coronavirus

Q: Question

UN: United Nations

UNESCO: United Nations Educational, Scientific and Cultural Organisation

WHO: World Health Organisation

%: Percentage

α: Alpha

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General Introduction

1. Statement of the Problem

The Coronavirus pandemic (COVID-19) has had an unprecedented effect on the whole world. Due to its contagious nature, people who were in physical contact infected each other and thousands of people's lives were lost every day. To save human's life, the World Health Organisation (WHO) has sounded the alarm and insisted on social distancing. This measure has led to applying precautionary measures such as closing gathering places; as a consequence, all economic, social, cultural, religious activities were disrupted, transportation was stopped, travels were postponed, many events were cancelled, and more importantly educational institutions were closed. As a response to schools and educational institutions closures, the ministries of education all over the world asked to adopt digital teaching to guarantee learning continuity during this pandemic. The Algerian university was of no exception and launched academic platforms for courses delivery. Despite the fact that e-learning or digital teaching has never been adopted in the Algerian universities, we cannot assume that all teachers and students were prepared for this emergent transition. Indeed, the transition from a face-to-face classroom into a fully online class was challenging for everyone; however, it was the inevitable decision with which teachers and students alike had to cope. Therefore, the problem of this study revolves around the investigation of the extent to which digital technology rescued pedagogy during the pandemic.

2. Aims of the Research

The aim of the present study is to scrutinise the relationship between digital teaching/learning and the rescue of pedagogy or the academic year from being disrupted, in higher education, amid the COVID-19 pandemic. Further, it seeks to explore the relationship

between the use of digital technology and pedagogical connectedness alongside learners' autonomy.

3. Significance of the Study

Due to the COVID-19 pandemic preventive measures, digital teaching/learning was emergently adopted in the Algerian university for the first time. Thus, much research is needed in this area to scrutinise its efficiency in higher education. Although it was assumed that digital technology has rescued pedagogy and the academic year from being disrupted, it was unclear whether students' and teachers' use of digital technology enabled them to cope with this transition. The current research, therefore, is meant to raise teachers' and students' awareness towards pedagogical connectedness among pedagogical staff and practical knowledge of technology use as important aspects to ensure the continuity of pedagogy. Moreover, an emphasis made on learners' autonomy may call the teachers' attention to help learners enhance their autonomy. Furthermore, it may arouse the curiosity of future researchers to target different aspects of digital teaching/learning during the COVID-19 pandemic and beyond.

4. Research Questions

So as to achieve the aims, the following questions are raised:

1. Are the proportions of students and teachers who are prepared for digital teaching/learning (e.g., internet access, practical knowledge of digital technology use) and those who are not the same?
2. Based on students' and teachers' opinions, is there a pedagogical connectedness between students, teachers, and the administration in the wake of the digital?
3. Did emergent digital teaching/learning boost learners' autonomy during the pandemic?

4. Is there a relationship between learners' knowledge of digital technology use and boosting their autonomy?
5. Is there a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology?

5. Hypotheses

In order to achieve the aims, the following hypotheses are tested:

1. The proportions of students and teachers who are prepared for digital teaching/learning (e.g., internet access, practical knowledge of digital technology use) and those who are not are different.
2. There is a pedagogical connectedness between students, teachers, and the administration in the wake of the digital.
3. Emergent digital teaching/learning boosted learners' autonomy during the pandemic.
4. There is a relationship between learners' knowledge of digital technology use and boosting their autonomy.
5. There is a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology.

6. Means of Research

For the purpose of collecting the necessary data we opted for the survey method; we utilised two quantitative questionnaires for both students and teachers. The student's questionnaire is administered to third year students of English at Mila University Centre. Meanwhile, the teacher's questionnaire is administered to university teachers of languages at Mila University Centre and teachers in other universities. Further, the collected data are

statistically analysed and presented through the Microsoft Excel, and SPSS software using the Chi-square tests which are conducted for the purpose of examining the set hypotheses.

7. Structure of the Study

This study is a whole of two chapters. The first chapter is devoted for the theoretical part through which a literature review about pedagogy and technology, the COVID-19 pandemic and the educational disruption, and digital teaching/learning is provided. On the other hand, the second chapter is devoted for the practical work where the methodology used is explained, the collected data are analysed, and the main findings, implications, limitations, and recommendations are discussed.

Chapter One: Pedagogy and Digital Teaching during the Coronavirus Pandemic

Introduction

In a digital world, aspiring to enhance the quality of education is thought to be related to integrating technology in the teaching/learning process. This can be demonstrated by getting through the multiplicity of learning theories which are influenced by the continual advancement in technology. Indeed, COVID-19 pandemic, despite the troubles it caused, has also uncovered the importance of digital technology and its necessity for ensuring the continuity of pedagogy during the lockdown. This chapter, therefore, is set to spotlight the use of technology through a number of modern pedagogical approaches to teaching. Moreover, it endeavours to account for COVID-19, the main cause of educational disruption. Finally, it seeks to provide insightful information about digital teaching/learning practices.

1.1. Pedagogy and Technology Use

1.1.1. *Definition of Pedagogy*

Albeit the term pedagogy is frequently used in education, reaching a clear definition of it is not an easy task. The origin of the term 'pedagogy' goes back to the Greek word 'paidagōgos' meaning "child leader", Latin 'pedagogia', Middle French 'Pédagogie'. This indicates that the word pedagogy was, once upon a time, merely concerned with upbringing children (Valkova, 2012, as cited in Shah, 2021). However, its meaning was extended to encompass the process of teaching different age groups, not only children. A broad definition of pedagogy can be that of Merriam Webster Dictionary (n.d.): "the art, science, or profession of teaching".

In modern times, it is agreed that pedagogy stands for education or teaching; however, if we dig deeper in the literature on this concept, we will find that its meaning is more

profound. A deeper conceptualisation is provided by Marion (2017) who introduced this term as the methodical study of teaching that aims at providing the most appropriate ways for learning in order to reach previously designed outcomes. In the same course of thought, Winch and Gingell (1999) claimed that pedagogy, in the widest sense, is the methods of teaching. Alexander (2008) stated that pedagogy "encompasses the performance of teaching together with the theories, beliefs, policies" (p.3) Added to this, Murphy (1996) clarified that it encompasses "interactions between teachers, students and the learning environment and learning tasks" (p.17). Oxford English Dictionary (n.d.) defined pedagogy as "The art, occupation, or practice of teaching. Also: the theory or principles of education; a method of teaching based on such a theory".

On the whole, pedagogy is an applied science (Shah, 2021) that appears to embody the theoretical aspects together with the practical scope of teaching, that is, the theories, methods, and approaches to teaching. Of course, teaching and learning theories are but two sides of the same coin, for they go together.

1.1.2. Learning Theories

In an attempt to enhance the quality of education, new theories are developed each time so as to explain how learning takes place. Often, developing new theories is meant to overcome the shortcomings of the previous ones. Cognitivism, for instance, was a reaction to the behaviourist theory.

1.1.2.1. Behaviourism

Although Behaviourism goes back to the 1920's, most of its tenets are considered in today's classes. Learners are expected to give a response to a certain stimulus, a response which is then either reinforced or punished. Behaviourists are concerned with studying

observed, recorded and measured behaviours. It all started with Pavlov's experiment on dogs or what is known as classical conditioning; this entails the belief that learning is a habit formation in the sense that every stimulus is followed by a response. This was supported by Watson who was the first to use the term behaviourism, claiming that mind and consciousness are ignored in the learning process (Picciano, 2017, p.166). Central to behaviourism learning strategies is the practice of drilling and questions/answers. For that, the use of technology, computers, within the framework of this theory was limited to student-computer interaction. In other words, technology plays the role of a mechanical tutor which provides learners with the practice of grammatical and lexical drills and feedback.

1.1.2.2. Cognitivism

Cognitivists opposed the claims of the previous theory for a set of reasons; one of which is the complexity of human behaviours. Responses are only assumed to be conditioned by what can be measured and observed. In addition, behaviourists ignored cognitive factors like imagination and motivation which may be involved in making decisions (Picciano, 2017, p.167-168).

Psychologists and linguists popularised the cognitive theory principles with their critiques to behaviourist beliefs. A point in case is Chomsky's review of Skinner's work, a review constructed on the theory of Universal Grammar. Chomsky held that a child creates hypotheses out of the information presented to him, analyses and tests them as an innate ability (Picciano, 2017, p.168, Harasim, 2012, p11, Molina et al., 2005, p.17). Given the cognitive trend, many psychologists contributed to it and extended it to their area of research. For example, Bloom suggested a taxonomy of learning objectives, highlighted the importance of the individual's cognitive skills. His taxonomy is composed of six cognitive levels: remembering, understanding, applying, analysing, evaluating and creating (see Figure 1.1)

with the condition that the learner cannot pass to a higher level unless he accomplishes the lower one (as cited in Picciano, 2017).

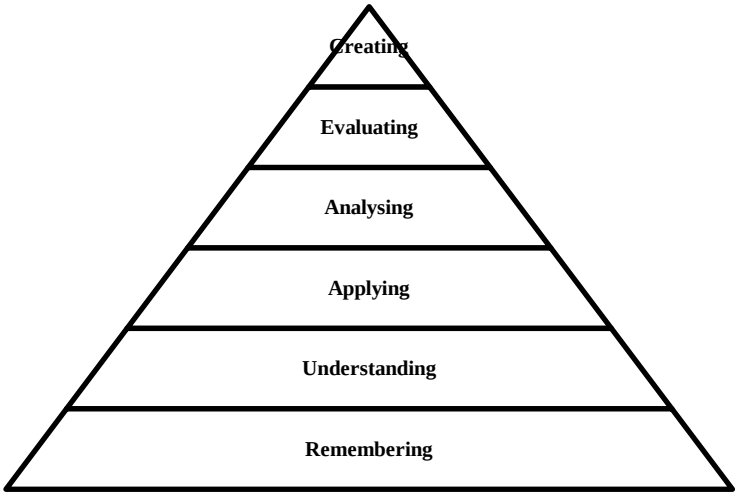

Figure 1.1. Bloom's Taxonomy of Learning Objectives (Bloom,1956)

In line with the new era and the use of technology in education, cognitivists set new challenges for artificial intelligence to raise up in order to cope with the learners' mental capacities and different cognitive abilities so as to replace human instructors in the future (Harasim, 2012, p.11).

1.1.2.3. Social Constructivism

The constructivist theory suggested that the learners should be aware of their learning to happen. If the learners are not fully conscious about them receiving an input, learning will not take place. Rather than memorising information, constructivists suggested that the learner constructs and stores knowledge via experiencing events (Bates, 2015, p.54, Giustini, 2008, p.111). This theory has three models: the cognitive, the radical and the social model. The former is concerned with the information being stored the same way computers function, the radical model deals with the social nature of the learning event, and the latter is meant to bind between the two previous models.

Vygotsky (1978) stated that learners' "cognitive growth occurs first on a social level, and then it can occur within the individual" (as cited in Amineh & Asi, 2015, p.13). Vygotsky underlined the importance of the 'more capable peers' whether it was the instructor or any knowledgeable company that is encountered. Focus here is on appropriate assistance and motivated mates which results in the learner accomplishing the task successfully. Lave and Wenger (1991) proclaimed that learning takes place in a social setting with people who share the same orientations; only then can the practice provide the appropriate conditions for amateurs to develop.

In trying to develop students' critical thinking and reasoning, teachers are advised to consider the learners' different capacities and backgrounds. That is, the unparalleled learners' skills and competences require the teacher to accommodate the tasks to be challenging for all learners in the class (Matusov, 2001).

1.1.3. Pedagogical Approaches and Technology Use

Technology integration in education dates back to 1960's. Around this period, computer use was restricted to university campus research facilities as a means to facilitate and promote teaching (Beatty, 2010, p.18). In the beginning of technology emergence in education, technology was merely an aid to teaching. However, the continual advancement in technology has extended the role of digital technology and led to founding new ways for course delivery. In other words, teaching and learning have become no longer restricted to campus; students do not have to attend in-person in order to study; instead, they can study at distance through e-learning platforms (see Section1.3). Additionally, new approaches to teaching emerged with a potential of improving the quality of education and, therefore, triggering the efficiency of pedagogy.

Since pedagogy is about defining what methods are better to be adopted to impart knowledge in different teaching sessions through a set of approaches and strategies (Yadav, 2020), it is preferable to highlight the use of technology through a number of high tech modern approaches to teaching including the flipped approach, the inquiry-based approach, and the personalised approach.

1.1.3.1. The Flipped Approach

Flipped learning or reversed learning was first introduced by Bergmann and Sams, secondary school teachers of chemistry. It is considered as a type of blended learning. Unlike the traditional model, the flipped model tends to introduce students to understanding the input at home through pre-recorded videos or any other digital tools; after that, they come to class to put what they have grasped into practice (Bergmann & Sams, 2012). That is to say, the lower level of learning (remembering and understanding, to use Bloom's terms) takes place at home while the higher level of learning (applying and analysing) takes place in the classroom with a more extended time (see Table 1.1). This approach uses a high level of technology in the classroom.

Table 1.1.
Comparison of Class Time in Traditional versus Flipped Classrooms (Bergmann & Sams, 2012)

Traditional Classroom		**Flipped Classroom**	
Activity	**Time**	**Activity**	**Time**
Warm-up activity	5min.	Warm-up activity	5min.
Go over previous night's homework	20min.	Q&A time on video	10 min.
Lecture new content	30–45 min.	Guided and independent practice and/or lab activity	75 min.
Guided and independent practice and/or lab activity	20–35 min.		

1.1.3.2. The Inquiry-Based Approach

Inquiry-based learning is encouraged since the time of Socrates who believed in the potential of questioning in promoting learners' thinking skills (Delic et al., 2016). However, its actual emergence dates back to 1960's. This approach emphasises active learning; the teacher holds the role of a facilitator while the students are supported to engage in the learning process through exploring the material by themselves. In other words, students are encouraged to ask questions, inquire about what they want to learn, and solve complex problems; all along, this boosts the students' curiosity.

Since this approach pushes students to ask questions, technology is of great importance because it provides students with internet and a variety of online tools that help them achieve their end.

1.1.3.3. The Personalised Approach

Personalised learning is student-centred in approach. A customised plan is designed for each learner according to his/her own needs, preferences, and skills (Lathan, 2021). In this approach, Information and Communication Technologies use is of great importance; it provides authentic materials, facilitates learning and makes it flexible. Moreover, technology acts as a personal cognitive and social tool (Järvelä, 2006); it helps students develop their own skills and build social relationships. According to Järvelä (2006), personalised learning is imperative in education, and it can only be effective when technology matches learners' preferences.

1.2. The Coronavirus (COVID-19) Pandemic, Preventive Measures, and Educational Disruption

1.2.1. Coronavirus Disease (COVID-19)

1.2.1.1. Definition

The Coronavirus is one of the viruses that target the human's respiratory system. As reported by the World Health Organization (WHO, 2020a), coronaviruses can be defined as "a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV)". In line with WHO (2020a), the novel COVID-19 has never been detected in humans before.

1.2.1.2.Origin

According to the World Health Organization (2020a), the Coronavirus disease (COVID-19) has first emerged in December, 2019 in Wuhan city, Hubei province, China. Thenceforward, it has spread throughout the world to be declared an international public health emergency on January 30, 2020, and a pandemic on March 11, 2020. In the same vein, WHO (2020a) investigations have shown that the Coronavirus disease is caused by a severe acute respiratory syndrome virus (SARS-CoV2). It is said to have a zoonotic origin; in other words, it is proved to be transmitted from animals, namely bats, to humans, yet the way it is hosted and transmitted is not clearly identified. In the same context of public health, laboratory tests proved that its genetic makeup is nearly similar to SARS-CoV of 2003 which belongs to the same family of viruses named Coronaviridae (Liu et al., 2020). This indicates that this new virus is not of a completely novel origin; however, it had an unprecedented effect on humanity, not because of its severity, but because of its rapid transmissibility through close contact between people.

1.2.1.3.Genetic Makeup and Transmissibility

Coming back to its genetic makeup, the Coronavirus genome consists of a single strand of Ribonucleic acid (RNA). As claimed by Jogalekar et al. (2020), "The genome encodes for both structural and non-structural proteins. Structural proteins include spike glycoprotein (S; consists of 2 domains—S1 and S2), envelope protein (E), membrane protein (M), and nucleocapsid protein (N)." (p.965)

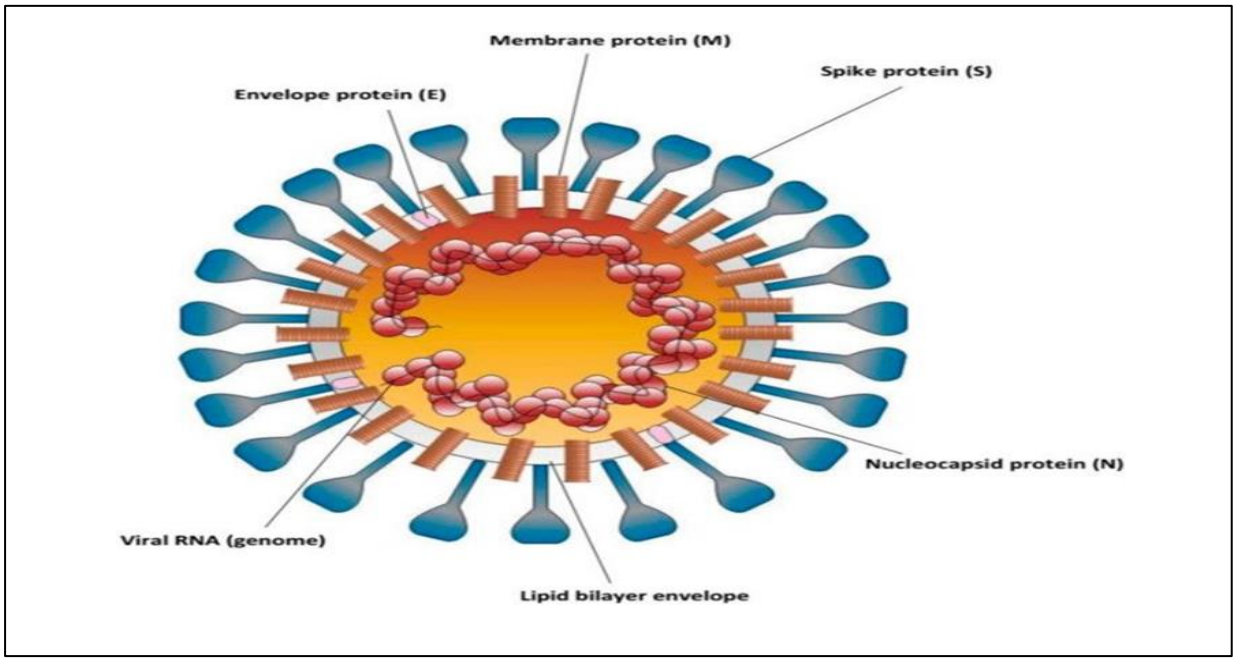

Figure 1.2. Schematic Diagram of SARS-CoV-2 Structure (Hadi et al., 2020)

The one-stranded RNA viruses are usually known of their rapid transmission. As in the case of SARS-CoV2, it spreads through close contact between individuals. WHO (2020c) reported that the most common ways through which the Coronavirus virus spreads are droplets of saliva or discharge from the nose when an infected person coughs, sneezes, or exhales. Additionally, people do not only get infected through direct contact with humans, but also through touching contaminated surfaces.

1.2.1.4. Symptoms

Each disease has its specific symptoms; however, some diseases happen to share the same symptoms which might be misleading when it comes to identifying the illness. In the case of coronavirus disease, its symptoms are practically similar to those of Influenza. Therefore, it is necessary to be well informed of the Coronavirus symptoms in order to be able to handle the situation before long. As it has been pointed out by WHO (2020d), the common symptoms that indicate COVID-19 infection among individuals fall primarily under fever, dry cough, fatigue, but in some cases, taste or smell loss, nasal congestion, nausea or vomiting, diarrhea, sore throat, runny nose, and headache can be observed as well.

As aforementioned, this virus is contagious and transmits rapidly through close or physical contact; thus, to mitigate its prevalence, many precautionary measures have been carefully drawn and strictly implemented such as hygiene, masks, and social distancing.

1.2.2. COVID-19 Preventive Measures

1.2.2.1. Hygiene and Masks Measures

Personal hygiene, hand washing, and sanitation are considered as the first line of defence against viral infectious diseases. WHO (2020b) pointed out that "Frequent and correct hand hygiene is one of the most important measures to prevent infection with the COVID-19 virus" (p.1). That is, abiding by hygiene measures is essential in ensuring public safety since the virus transmits through touching persons or contaminated places. In their turn, Centers for Disease Control and Prevention (CDC, 2020) stated that wearing masks is required in public places, clarifying that this measure should be considered by both infected and non-infected persons because the symptoms do not appear directly; they rather take about 14 days to emerge. Of note, this measure tends to reduce the virus spread as long as it is duly applied.

1.2.2.2. Social Distancing Measures

In response to the highly contagious Coronavirus disease and in addition to hygiene measures, governments have adopted a set of social distancing measures in an attempt to control its spread including: stay-at-home-recommendations, educational institutions closures, workshops closures, mass gathering cancellations, etc. Social distancing can be defined as the measures that tend to ascertain physical distancing. In Merriam-Webster dictionary (n.d.), social distancing is defined as:

> "the practice of maintaining a greater than usual physical distance (such as six feet or more) from other people or of avoiding direct contact with people or objects in public places during the outbreak of a contagious disease in order to minimize exposure and reduce the transmission of infection."

During these hard times, many social distancing precautions were taken. The European Centre for Disease Prevention and Control (ECDC, 2020) arranged social distancing measures under two levels: individual and group.

1.2.2.2.1. Individual Social Distancing Measures

These measures affect primarily the individual; they include isolation of cases, quarantine of contacts, and stay-at-home recommendations.

Isolation of cases includes cases that are diagnostically confirmed of having been infected or suspected to be infected by the Coronavirus. In this situation, cases with severe symptoms are hospitalised whilst patients who develop mild symptoms are directed to receive health care at home or at dedicated isolation facilities. This procedure can be taken voluntarily or mandatorily depending on the patient's state.

Quarantine, as stated by ECDC (2020), is applied either voluntarily or obligatorily. Usually, this measure concerns non-infected persons who might have been exposed to the virus by being close to, or in physical contact with, someone who is proved to be infected. In this case, the person should be confined for about 14 days, watching for the symptoms in the aim to monitor them and detect new cases earlier.

Stay-at-home recommendations are measures which restrict people from leaving their homes, except for urgent situations, in the aim to reduce physical contact between people. Particularly, it is taken to limit the number of people who are exposed to the virus, a situation that might mitigate the virus expansion.

1.2.2.2.2. *Group Social Distancing Measures*

Group social distancing measures or measures affecting multiple persons, in line with ECDC (2020), are meant to orient settings where gatherings are possible. These measures include the closure of educational institutions, closure of workshops, cancellation of mass gatherings, etc.

Educational institutions ranging from pre-primary schools to universities embody a large population that is exposed to daily close, or physical, contact. Therefore, applying this measure in educational institutions contributes hugely to limiting the virus exposure.

Workplace closure is meant to mitigate the virus expansion. As stated by ECDC (2020), workplaces including offices, factories, retail outlets, agricultural production, construction, restaurants, cafes/bars, sports clubs, transport were set into closure. Meanwhile, workplaces that cannot unavoidably be closed, due to their exigency, tended to reduce the number of employees and implement a physical distancing.

Mass gatherings comprise large numbers of people; these include conferences, meetings, cultural events (cinemas, theatre), festivals, religious activities, sporting events (football, Marathon runs), etc. Given the fact that trying to keep a physical distance for safety may work indoors, it is unlikely to work outdoors in public stations and so on. Therefore, setting these environments into closure is the most rational decision to contain the virus.

It is worth mentioning, however, that the efficiency of social distancing measures is achieved when it is implemented in the right time. Additionally, the measure of social distancing is controlled by a set of policies. In order to reduce the stress people may experience and the feeling of being home-imprisoned while they are hosted, the lockdown has always been limited to an expiry date. This may be extended in case the situation gets worse.

1.2.3. Educational disruption during the Coronavirus Pandemic

With the implementation of social distancing measures, governments worldwide have had to abide by the decision of closures of schools and educational institutions to mitigate the virus spread. This led to an unprecedented educational disruption starting from pre-primary schools to higher education institutions; billions of pupils and students all over the world were out of schools.

According to the United Nations (UN, 2020), education has been facing a colossal range of disruptive learning challenges throughout the world; “more than 250 million children were out of schools and nearly 800 million adults were illiterate” (UNESCO, 2018, as cited in UN, 2020). However, the disruption caused by COVID-19 is the largest in the history of education; more than 1.58 billion learners (children and adults) got out of schools due to the pandemic lockdown. In these times of uncertainty, students and parents alike have been worried about the accomplishment of the academic year. This massive disruption did

not, however, last for long. As soon as UNESCO has launched a global education coalition, a multi-sector partnership effort that is meant to ensure educational continuity at distance, governments worldwide initiated educational platforms for this concern. To put it clearly, learning could persist digitally although schools did not open.

While the use of distance learning is common in developed countries, it must have been very challenging in the majority of third-world countries. One example is the Algerian university which has launched and updated a digital platform (Moodle) and adopted distance learning for the first time. To put it another way, unleashing the digital in higher education has marked a turning point in the Algerian educational system. We cannot assume, therefore, that teachers and students were prepared for this emergent transition. Not all of them were well-informed of technology use. Besides, not all of them were equipped with the necessary tools that ensure digital learning success.

Due to the lack of treatment and the uncertainty of expectations about the upcoming situations and the future of education in the light of COVID-19 pandemic, adopting digital teaching/learning was the inevitable decision with which teachers and learners alike had to cope. In this sense, many educational institutions organised online workshops on the use of some virtual learning environments to facilitate the process and make this experience successful. A good case in point is Mila University Centre which has organised several online workshops for teachers via Google Meet. Although virtual theoretical workshops on practical matters might not be as sufficient as in-person practical training, this initiative was, to some extent, helpful, or so it seems, in making clear basics for technology use in education and specifically in distance education.

1.3. Digital/Online Distance Learning during the COVID-19 Pandemic

1.3.1. Transition to Digital/Online Learning during the COVID-19 Pandemic

As aforementioned, the COVID-19 preventive measures of social distancing have led to higher educational institutions closure and, therefore, cancelled face-to-face traditional classes. The necessity to ensure pedagogy continuity has led governments and ministries of education all over the world to adopt distance education. As a matter of fact, distance learning or e-learning did not really exist in the Algerian educational system except for correspondence courses for baccalaureate candidates which used to be presented via television (Khiar, 2020). In other words, the Algerian university is mainly concerned with face-to-face mode of teaching; that is, students are obliged to regularly attend their classes in-person according to a designed schedule.

To push further in these lines, it is noteworthy to point out that the Algerian online learning during the pandemic has gone through two phases: the phase of fully online learning during the lockdown. Then, the second phase, blended learning, which started by the fall of 2020 and it is still underway (2020-2021). Further elaboration about these two modes of learning is provided in what follows.

1.3.2. Types of Digital/Online Learning

1.3.2.1. Fully Online Learning

Online learning is a kind of distance learning with no possibility for face-to-face interaction. It gives the freedom of schedule choice to the students themselves, which in many ways suits the busy learners. Learners should have access to the internet, as it is impossible to work offline (Means et al., 2010).

As motivation is considered the key for students to access the online platforms and take the lesson, Burns (2011) suggested the major motivations online learning provides: It is cost-effective for it covers the transportation issues and time spent travelling from and to the campus. Many may question its effectiveness compared to the traditional classes input, here comes the enhancement activity, the second advantage. In 2010, a study conducted on the evaluation of evidence-based practices in online learning studies, it was discovered that students witnessed an improvement scale similar to that in a face-to-face class. With that being said, accessibility to teachers' data and different web information plays a major role in the superiority of online learning over the traditional one (Burns, 2002, Means et al, 2010).

Unlike other types of distance learning, e- learning does not exclusively depend on online materials. At the end of the day, it might incorporate materials that are to be treated at home as a piece of schoolwork or an additional undertaking (Berman, 2006). As for Algeria, e-learning was taught within the syllabus for so long, yet it is a very new practice. The process of integrating distance learning, or e-learning, was accelerated because of the emergency to accomplish the academic year during the lockdown.

1.3.2.2. Blended Learning

As its name suggests, blended learning is the mixing of the face-to-face learning with distance, or online, learning. The beginning of blended learning goes back to the term hybrid learning, which reflects the idea of using computer-based instruction and direct traditional instruction. Blended learning is meant to improve the learning experience and to obtain better outcomes.

As indicated by Baldwin-Evans (2006), blended learning can be pretty much as basic as consolidating two diverse learning techniques like watching a documentary film (informal learning) after attending a history class (formal learning). According to Kudrick et al. (2009),

blended learning falls into two categorical learning types: collaborative and concept based blended learning. The collaborative blended learning (CBL) is originally derived from Vygotsky's social constructivism theory; it aims at creating a social environment for learners to acquire best by completing a set of assignments together. Furthermore, it is meant to emphasize the motivation and the development of problem-solving skills while taking the task more than the nature of the task with the support of the information communication technology (Monteiroa, 2015, p564). Whereas CBL accounts for the togetherness in solving problems online, concept-based blended learning is more of an individual oriented learning (Caner, 2012, p.26-27).

1.3.3. Online Learning Modalities (Synchronous/ Asynchronous)

Distant lessons delivery can be either synchronous; i.e., live with instant give and take between the teacher and the learners via video conferencing and chat applications, or asynchronous; i.e., the teacher uploads the learning materials (written or recorded lectures, books, videos, etc.) in the learning digital platform so that learners are able to access them whenever needed. The former is similar to traditional classes in many ways; for instance, the designed schedule is fixed, and the number of sessions is determined. In other words, students are obliged to join the virtual class on time; otherwise, they will not get the chance to compensate for what they miss. Asynchronous learning, however, gives the students the freedom to choose the time to study and check their courses. It is important to point out that selecting the appropriate modality can be determined by the demands of the module, appropriateness of digital tools, or sometimes the administrative rules of the institution.

1.3.4. Online Tools

1.3.4.1. Moodle Platform

According to Dougiamas (2014), the Moodle platform designer and the managing Director of Moodle Pty Ltd, Moodle is a web-based application. Its first version dates back to 2001, yet the more usable one was released on August 20, 2002. Having the belief that learners are more likely to grasp the knowledge when they are together (Dougiamas, 2014), the Moodle platform is intended to provide teachers and learners with a space within which they can collaborate and communicate in order to enhance their learning experiences. Through this platform, users can upload courses and assignments, create forums and chatrooms, share links, etc. It is to be noted that this platform is an open source; therefore, it can be installed and used freely by everyone worldwide.

In Algeria, all universities have Moodle platforms. Mila University Centre, for example, opened its doors for the first vague of baccalaureate graduates in 2008, yet the site was created by the year 2012, the same year it was put into use. The platform was intended to deliver lectures in the form of video conferences or to submit them in pdf/word format, besides, making quizzes and sharing links for the benefit of the students.

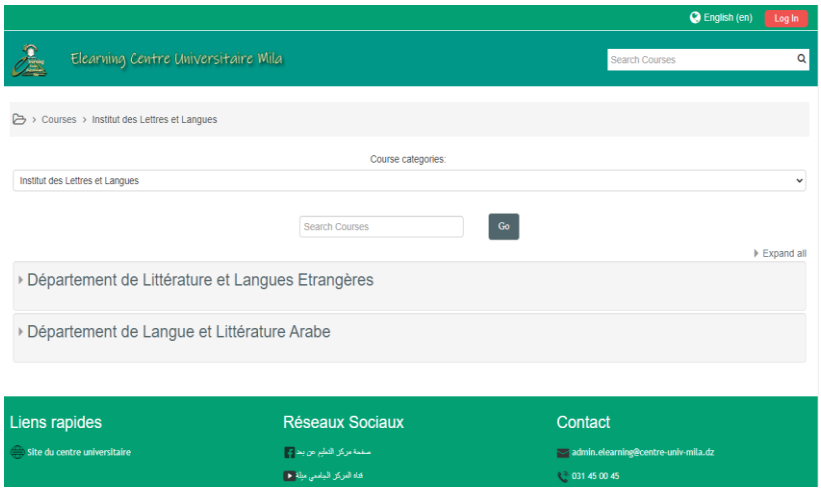

Figure 1.3. Mila University Centre Moodle Platform

As an attempt to explore Mila University teachers' familiarity with Moodle before the pandemic, an interview was made with Mila University computer engineers who are responsible for developing university websites and platforms. They pointed out that e-learning is a new practice in Algeria with which teachers were not really familiar. Due to teachers' unfamiliarity with the various functions Moodle offers, computer engineers helped in training teachers through an on-going series (a session each week) of how to use Moodle and to benefit the most from it to achieve good outcomes. For example, years before the pandemic, in the academic year of 2016/2017, a special seminar was organised in Mila University Centre. The day was successful on the basis that most teachers got the chance to attend and interact by asking questions. When COVID-19 stroke, it was time to move to the next step. Thus, the platform was put into practical use because of the urgent need, precisely in the educational year 2019/2020.

1.3.4.2. Google Meet

Google Meet is a platform associated with Google multiple applications; it is used for conducting meetings, allowing 30 users per session. The meetings host must log in to his/her email through a certain browser (Chrome, Firefox, Mozilla, Opera, etc.) and schedule a meeting, which is eventually shared with other participants.

Figure 1.4. Google Meet Home page

Google Meet provides several options, which is perhaps why it attracted users from all around the world to adopt it for their lessons delivery. One of those options is the ability to plan and create a room prior to the actual time. The details provided within the screen like the camera icon and the microphone icon make Google Meet easy to use; seemingly one does not need a guide to figure out which button to press. Lastly, it offers the record option that allows both the host to save version of the session, and the audience as well with the permission of the meeting holder.

1.3.4.3. Google Classroom

On August14, 2014, Google classroom, a digital educational platform developed by Google, was released. In the beginning, its use was limited to educational institutions. In order to log in, you need to have an institutional e-mail. However, the update of 2017 has come with a new feature which enables everybody to use it, not only educators.

According to Keeler and Miller (2015), what makes the use of this platform advantageous is that all you need to do is to install the application and sign in with your Google account. Then, every action you take in this platform takes place online along with other Google digital tools such as Google docs and Google drive.

Google Classroom provides a virtual pedagogical connectedness between teachers and students. As asserted by Keeler and Miller (2015), using Google Classroom, teachers and students are able to communicate, upload and download lessons and assignments, and organise their schedules through the calendar feature. It is worth mentioning that there are two areas in Google Classroom: one for teachers, and the other for students. Each one is able to see and use a set of various features. Moreover, this platform ensures the privacy for all participants; only members who are invited can access this virtual classroom.

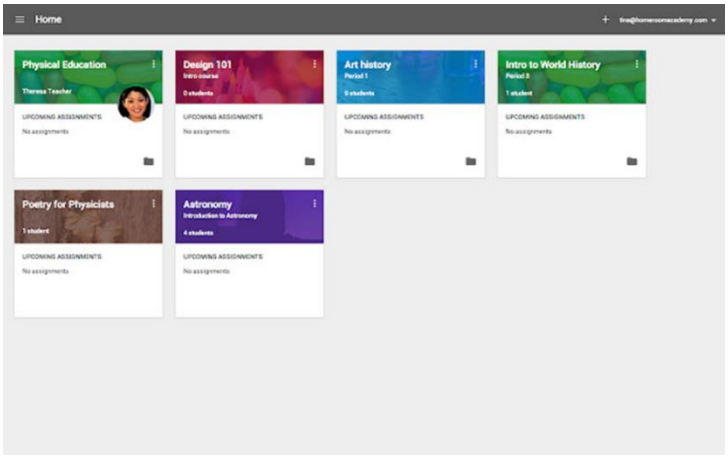

Figure 1.5. Google Classroom Home Page

1.3.4.4. Social Networks

In recent years, integrating social media in education has become a common practice among educators. However, during the Coronavirus pandemic, this practice has enormously increased. Statista (2021a, 2021b), a business data platform, maintains that the number of active users has elevated during the global lockdown. Facebook, WhatsApp, and Telegram have been widely used as an e-learning tool alongside educational digital platforms. As stated by Qureshi et al. (2014) "Social media websites have the ability to meet the needs of basic as well as specific academic requirements" (p.442). Students and teachers opt for such social networking applications because they are easy to use, free of cost, offer opportunities to promote collaborative learning, etc.

1.3.4.4.1. Facebook

Integrating Facebook in online classes as an e-learning tool is highly increasing. Due to its significant potential on enhancing the learning experiences, educators have become more encouraged to experience other social networks in an attempt to improve the quality of education. Using Facebook groups or pages, learning communities can upload files, share links, make announcement, and communicate; in other words, this platform tends to create a

pedagogical connectedness among learners, instructors, and administrations. A good case in point is what has so far taken place in Mila University Centre, though this needs to be proved

1.3.4.4.2. WhatsApp

WhatsApp as an instant messaging application was created in 2009. Though it was not initially meant to education use, it is widely spread among university students and instructors. It offers synchronous learning through instant chats, audio and video calls. It enables students to communicate with their teachers, share lectures, make enquiries, and learn collaboratively with large group members.

1.3.4.4.3. Telegram

Like WhatsApp, Telegram is an instant messaging application that offers synchronous learning. It was officially released in 2013 as a social communication tool. Later, its use extended to the field of education, and it came to function as an e-learning tool. Although the features of WhatsApp resemble those of Telegram in many ways, there are some differences. For instance, it allows one to share files of big size up to two GigaBytes (2GB).

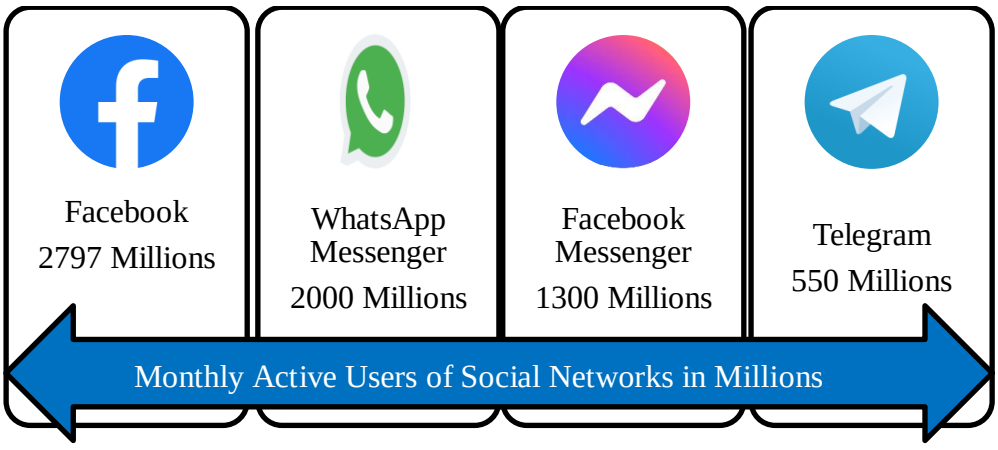

Figure 1.6. The Number of Active Users of Social Networks during the Coronavirus Pandemic (Statista, June 2021)

1.3.5. Learners' and Teachers' Roles in Online Teaching/ Learning

Engaging in an online teaching/ learning denotes determining each participant's responsibilities. In other words, both teachers and students should be aware of their duties so that they will be able to carry out the learning process as need be.

1.3.5.1. Online Learners' Role

Online learners, in the first place, are expected to be equipped with certain competences. Given the fact that online learning is said to be learner-centred in approach, the learner is required to handle the responsibility of his/her own learning in terms of the use of ICTs, self-regulated learning, and online course outcomes attainment.

In this regard, Birch (2001, as cited in Borges, 2008) mentioned a list of competences by which online learners should be characterised. According to him, there are five main competences that make up the role of the online learner: Operational, Cognitive, Collaborative, Self-directing and Course-specific competences.

Operational competence embodies knowledge of the use of ICTs in online environments. This includes adequate knowledge of the use of ICT tools for communication, collaboration, information search, retrieval, analysis and dissemination.

Cognitive competence has to do with the ability to reach course information, learn in a critical way, adopt reflective learning, provide others with help and ask for it when necessary.

With regard to the third competence, the online learner should have the intention to participate in communicative practices, class discussions and activities, collaborative work with classmates and teachers. In addition, he/ she needs to ask for feedback and to learn from it.

Self-directing competence denotes autonomous learning within which the learner takes the responsibility for his/her own learning. That is, the learner is able to set goals and plans for his/her own learning, to learn from mistakes, to accept and respect others' opinions.

Course-specific competence is concerned with language in use. That is, learners are asked to put what they have learnt into practice including knowledge and communicative skills through using the acquired terminology, exchanging ideas, expressing opinions, etc.

1.3.5.2. Online Teachers' Role

Coping with novelties occurring in the whole teaching and learning dynamics, the teachers' role has changed over time. The emphasis made on the information communication technology literacy is highly recommended. Indeed, teachers cannot and will not be replaced by technology; rather, teachers need to upgrade their materials and acquire modern skills. Technology made teachers' job grow more professional and easier to some extent, opening new scopes for teachers everywhere across the globe (Dooly, 2010, p282-288).

Paliwal and Singh (2020) suggested four competences every online teacher needs to maintain: course design, communication, time management and technical competency. Unlike in-person teaching, online teaching is more about the content than the material (e.g. text book). Thus, designing a course requires the teacher to consider methods which surpass the limitations proposed in online teaching (like space and time). Along with the previous necessities, the instructor is entailed to assess his/her learners. Furthermore, online teaching, especially synchronous classes, demands the teacher to engage learners in different tasks and push them to participate for getting better outcomes. In other words, the teacher should create an academic online atmosphere within which everyone is engaged in the discussion. In addition, online teaching is time consuming, thus, the skill to manage students and cover the lesson activities within the time provided is needed. Moreover, technical competency is vital

for online teaching because it helps teachers create flexible learning. (Paliwal and Singh, 2020, p5-7).

Even though learners take the bigger part in this online teaching/learning process, teachers, on their part, should guarantee computer skills as a basic teaching skill.

1.3.6. Online Assessment

Assessment is of paramount importance to teaching; by all accounts, it is meant to reflect the learners' understanding and progress and determine the achieved outcomes. For fact, it is said to enhance the quality of education. Teaching whether face-to-face or online should always be coupled with assessment because the latter has an effective potential in learners' achievement. As asserted by Biggs and Tang (2007), "What and how students learn depends to a major extent on how they think they will be assessed" (p.163). This means that students focus their learning on what they will be tested in. This demonstrates the necessity of aligning the learning outcomes with the assessment practices. As regards online and blended learning environments, teaching methods in line with assessment strategies demand a holistic reconsideration of their traditional practices.

Well-designed assessment tasks will influence the way in which students approach the problems and thereby improve the quality of their learning (Ragupathi, 2016, p.2). This denotes the importance of assessment in achieving the learning outcomes, as well as enhancing the learning experiences. In keeping with the same idea, Tilghman (2011) asserted that successful online assessment requires instructors to "construct successful assessment strategies and frameworks that are specifically designed for online learning environments; ensure that the assessments are aligned with course objectives, activities and assignments; and effectively implement the appropriate online assessment" (p.404). That is to say, teachers

are required to be well-informed of both online assessment types and tools that are compatible with the online learning objectives.

1.3.6.1. Online Assessment Types and Tools

Reviewing the literature on online assessment, Donnan (2007) pointed out that online assessment encompasses: traditional assessment submitted online, automated online assessment, invigilated online assessment, online interaction, group assessment online, critical reflection and meta-cognition, and authentic assessment. More elaboration is found below (see Table 1.2).

Table 1.2.
Online Assessment Types and Tools (Donnan, 2007)

Assessment Type	Examples	Tools
Traditional assessment submitted online	- Essays - Case studies - Article reviews - Proposal writing - Report writing	(1) LumiNUS Files (upload via student submissions) (2) Online marking and feedback (3) ExamSoft + Rubrics
Automated online assessment	- Online Quizzes (MCQs, MRQs, FIBs, T/F, matching, ordering) - In-video quizzes - Assessment of prior knowledge	(1) LumiNUS assessment (2) ExamSoft
Invigilated online assessment	- Mid-semester exams - Final exams (MCQs, short answers, essays)	(1) LumiNUS assessment (2) ExamSoft
Online interaction	- Contributions to forums, chats, blogs and wikis - Reading summaries - Collaborative learning - Critical reviews	(1) LumiNUS assessment (2) LumiNUS Forum (3) LumiNUS Chat (4) Blogs/wikis/Google docs

Group assessments online	- Online presentations - Group online projects - Role play - Online debates	(1) Screencast (Ink2Go) (2) LumiNUS Files (3) YouTube (4) Google Docs
Critical reflection and meta-cognition	- Electronic portfolios - Online journals, logs, diaries, blogs, wikis - Embedded reflective activities - Peer & self-assessment	(1) e-portfolio (2) Wikis (3) Blogs (4) Peer assessment tools
Authentic assessment	- Scenario based learning - Laboratory/field trip reports - Simulations - Case studies/Role play - Online oral presentations and/or debate	

1.3.6.2. Types of Online Questions

According to Ragupathi (2016), types of online questions vary in consistency with the form of assessment, summative or formative, and the course objectives. These include multiple choice questions, multiple response questions, fill in the blanks questions, true/false questions, matching questions, and essays.

In multiple choice questions (MCQs), students are given questions, incomplete sentences or statements followed by a list of choices from which students are asked to select the right option. Usually, the suggested list comprises one correct answer with two or more distracting incorrect options. Of note, suggested choices should not be clear and easy to determine; they should be probable distractors. It is important to mention that MCQs are said to be consistent with knowledge of facts and basic terminology (factual information), knowledge and understanding of principles and interrelationships among various concepts which relate to the

same subject (conceptual information), and knowledge about how to do something (procedural information).

Like multiple choice questions, multiple response questions (MRQs) provide students with a list of responses from which students are asked to choose the right response; contrariwise, MRQs allow students to select more than one answer.

Fill in the blanks questions focus on assessing students' recall of information through examining different areas including spelling of items.

True/False questions are said to be easy to construct. They are generally consistent with factual information and naturally dichotomous information.

Matching questions tend to assess students' understanding of related information. To put it clearly, students are provided with two lists of words or expressions that share a specific relationship on the basis of which students are asked to match appropriate pairs together.

Essays are used to answer open questions which cannot be constructed using other types. This type is meant to assess higher levels of students' understanding and skills including analysis and synthesis. Unlike the abovementioned types that are automatically graded, essays are graded manually online.

1.3.7. Digital/Online Teaching and Learner's Autonomy

Learner's autonomy is associated with the learner-centred approach. According to Wall (2003) autonomy is the ability to, personally, direct and take the responsibility of the language course. To put it differently, learners depend on their own in order to determine their goals, select what to learn, and show commitment throughout the language course (Warni et al., 2018). Teachers, on their part, are responsible to encourage them, and address their roles in the autonomous classroom.

Digital teaching or e-learning is of crucial importance to fostering learner's autonomy. Through the use of information communication technologies (ICTs), it offers an easy access to a variety of digital materials and tools. Furthermore, it creates flexibility in terms of time and place. In addition, it supports learner's individualization regardless of the individual differences among learners who are engaged in the learning community because it targets different learning styles. Consequently, integrating ICTs have the potential to trigger learner's motivation towards learning inside and outside the classroom. What is more is promoting self-confidence (Brown, 2001, as cited in Condrat, 2014; Warni et al., 2018).

In autonomous learning, learners have three main roles: a communicator, an experimenter, and an intentional learner. To start with, classroom engagement and interaction between the learners facilitates the language learning process; thus, as communicators, learners are in charge of the topic discussed and tasks. Furthermore, it is necessary to create opportunities for learners through which they can experiment different language aspects. The latter allows learners to use utterances and explore where it appropriately fits within the cultural context. Moreover, learners who are taught in an autonomous classroom are more likely to develop a sense of awareness of their own learning process (Little et al, 2017, p.17-19). To conclude, learners who are introduced to an autonomous classroom are able to carry out a self-directed autonomous learning outside institutional settings (Cotterall, 1998, p.3).

Conclusion

Integrating digital technology in education is of paramount importance. It facilitates teaching/learning and creates flexibility in the classroom as long as teachers and students are aware of the various opportunities technology offers to improve the teaching/learning experience. Over the last decades, employing technology in education as an aid has witnessed a high increase; however, with the outbreak of the COVID-19, the use of technology has

increased widely. As a response to the closure of educational institutions, countries worldwide adopted digital learning to ensure pedagogy continuity. In this sense, different types of digital learning and the tools utilised along with some online pedagogical practices are identified in this chapter.

Chapter Two: Investigating the Relation between Digital/Online Teaching during the Pandemic and Rescuing Pedagogy

Introduction

Added to the previous chapter concerned with the literature review on the topic under investigation, the present study encompasses a practical aspect as well. This chapter is, therefore, the core of the current research that seeks to answer the research questions and test the hypotheses so as to achieve the research aims. It covers an in-depth description of the main elements on the basis of which the field work was conducted. First of all, it sets out to introduce the research design including the research aims, the research questions and the hypotheses, the participants, and the data collection tools. Then, it provides a statistical presentation and an analysis of the data collected, along with a discussion of the main findings of both the students' and the teachers' questionnaires. Some limitations of the study together with some pedagogical recommendations for teachers, students, and further research are thereby discussed.

2.1. The Research Design

2.1.1. Aims of the Research

This study aims at investigating the relation between digital teaching/learning during the pandemic and the possibility of rescuing pedagogy and the academic year from being disrupted. Moreover, it seeks to target the relationship between technology use and pedagogical connectedness along with learner's autonomy.

2.1.2. The Research Questions

1.Are the proportions of students and teachers who are prepared for digital teaching/learning (e.g., internet access, practical knowledge of digital technology use) and those who are not the same?

2.Based on students' and teachers' opinions, is there a pedagogical connectedness between students, teachers, and the administration in the wake of the digital?

3.Has emergent digital teaching/learning boosted learners' autonomy during the pandemic?

4.Is there a relationship between learners' knowledge of digital technology use and boosting their autonomy?

5.Is there a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology?

2.1.3. The Hypotheses

1. The proportions of students and teachers who are prepared for digital teaching/learning (e.g., internet access, practical knowledge of digital technology use) and those who are not are different.
2. There is a pedagogical connectedness between students, teachers, and the administration in the wake of the digital.
3. Emergent digital teaching/learning has boosted learners' autonomy during the pandemic.
4. There is a relationship between learners' knowledge of digital technology use and boosting their autonomy.
5. There is a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology.

2.1.4. The Participants

The participants of the present study are third year students of English at Mila University Centre, Department of Foreign Languages, and university teachers of languages (English, French, and Arabic). Out of a total of 223 students, 103 make up the sample of this study. The reason for which third year students are selected is the fact that their learning experience covers the two different phases with which this research is concerned, namely learning before and during the Coronavirus Pandemic, for an equally similar period of time (three semesters in-campus, and three semesters distributed over online learning and blended learning). As for the sample of teachers, there are 98 participants who do not belong to the same university, nor to the same specialty; however, most of them are teachers of English from Mila University Centre and from the universities of Jijel, Setif, Bouira, Constantine, Biskra, Guelma, Tiaret, Batna, El-Oued, and Khenchla.

2.1.5. Data Collection Tools

To achieve the aims of the present study, we opted for the survey method. According to Dörnyei (2003), "By administering a questionnaire to a group of people, one can collect a huge amount of information in less than an hour" (p.9). So as to collect the needed information, two questionnaires were administered to participants, students and teachers respectively.

2.1.6. Statistical Tools

In order for us to answer the research questions and test the corresponding hypotheses, the collected data were computed using two statistical tools:

1. Microsoft Excel Descriptive Statistics: Simple calculations were computed and statistically presented through tables.

2. Statistical Package for the Social Sciences (SPSS) Software (Version 22): Given that the variables of this research are nominal, the Chi-square test was the appropriate option to test the hypotheses. It was opted for two types of Chi-square tests; the first is the Chi-square test for Goodness of Fit while the second is the Chi-square test for Independence. The former type of test is used to determine whether two values, expected and observed, of a single categorical variable are equally distributed on the population or not. The latter examines whether two categorical variables are associated or not. It is noteworthy, however, to state that the collected data have been coded before submitting them to the Chi-square tests.

2.2. The Students' Questionnaire

2.2.1. Description of the Students' Questionnaire

The students' questionnaire aims at exploring the students' preparedness for digital teaching/learning, pedagogical connectedness, and the benefit of digital technology. It is a whole of 9 close-ended items distributed over three sections which cover the main areas of interest. These items include mainly yes/no questions.

The first section (items 1 and 2) deals with the students' background information; it consists of two items that are meant to gather personal data of students in terms of age and gender. The second section (items 3 and 5) is meant to collect information about students' internet accessibility and practical knowledge of digital technology use in education. The third section and the last (items 6 through 9) aims to collect data about learners' pedagogical connectedness, their autonomy, and the benefit of digital technology in rescuing the academic year from being disrupted.

2.2.2. Administration of the Students' Questionnaire

Administering the questionnaire took place in two ways; most students were handed printed copies. At the same time, an online version we created through Google Forms was shared with students via e-mails, Facebook groups, and Messenger groups. Of note, we spent three days to collect the needed data.

2.2.3. Data Analysis and Discussion of the Main Findings

2.2.3.1. Data Analysis

-Excel Descriptive Analysis: This analysis is concerned with questions (Qs) 1 and 2.

Q1. Age

In order for us to collect some personal information about their background, students were asked about their age. As it is presented in (Table 2.1.), the age of fifty-nine students (57%) ranges from 19 to 21. Forty-three students are aged from 22 to 25, and only one student belongs to the range (26-30).

Table 2.1.

Age

Age Range	*Number of Respondents*	*Percentage*
[19-21]	59	57%
[22-25]	43	42%
[26-30]	1	1%
Total	103	100%

Q2. Gender

This question was designed in an attempt to know some aspects of the sample background. As it is shown in (Table 2.2.), most respondents (80%) are females, while males represent just 20% of the whole sample.

Table 2.2.
Gender

Gender	Number of Responses	Percentage
Females	82	80%
Males	21	20%
Total	103	100%

-SPSS Chi-square Tests

To answer the research questions and test the hypotheses, the Chi-square test was used. This consists of two types: the Chi-square test for Goodness of Fit and the Chi-square test of Independence.

❖ Chi-square Test for Goodness of Fit

In order to answer research questions 1 through 3 and 5 and test the corresponding hypotheses, the Chi-square test for Goodness of Fit was used. Of note, the first research question and hypothesis relate to questionnaire items 3 through 5; the second research question and hypothesis relate to questionnaire items 6 and 7; as for the third, they bear upon item 8. This is to mean that – on the whole – to each research question there are sub-questions, and the same goes for the set hypotheses.

- **Hypothesis 1:** The proportion of students who are prepared for digital teaching/learning in terms of internet access and practical knowledge of digital technology use is different from the proportion of those who are not.

Q3. Do you have regular access to the internet?

H_{1a}: The number of students with regular internet access differs from the number of those who are otherwise.

When running the Chi-square test for Goodness of Fit, a significant difference was found between students who have regular access to internet (73 out of 103) and students who do not (30 out of the total), x^2 (1, n = 103) = 17.95, p = .000 (see Tables 2.3a. and 2.3b. below). The Sig. value of .000 is smaller than the alpha value of .05, so we can conclude that the result is significant.

Table 2.3a.

Frequencies

Students' regular access to internet			
	Observed N	Expected N	Residual
No	30	51.5	-21.5
Yes	73	51.5	21.5
Total	103		

Table 2.3b.

Chi square Test Statistics

	Students' regular access to internet.
Chi-Square	17.951[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequencies 51.5.

Q4. I am good at using the computer.

H_{1b}: The proportion of students who are good at using computers is different from the proportion of students who are not.

Once again, the test indicated a significant difference between those who are good at using the computer (80 out of 103) and those who are not (23 out of 103), x^2 (1, n = 103) = 31.54, p = .000 (see Tables 2.4a. and 2.4b.). Given the Sig. value of which is smaller than the alpha value, there is evidence in favour of the set hypothesis.

Table 2.4a.

Frequencies

Knowledge of computer use			
	Observed N	Expected N	Residual
No	23	51.5	-28.5
Yes	80	51.5	28.5
Total	103		

Table 2.4b.

Chi-square Test Statistics

	Knowledge of computer use
Chi-Square	31.544[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.5.

Q5. I am good at using other digital tools: smartphones, electronic tablets, etc.

H_{1c}: The proportion of students who are good at using other digital tools is different from the proportion of students who are not good at using them.

When running the Chi-square test for Goodness of Fit to inform still the first research question, a significant difference was found again between those who are good at using digital tools (100 out of 103) and those who are not (3 out of the total), x^2 (1, n = 103) = 91.35, p = .000 (see Tables 2.5a. and 2.5b.).

Table 2.5a.

Frequencies

Using Digital Tools			
	Observed N	Expected N	Residual
No	3	51.5	-48.5
Yes	100	51.5	48.5
Total	103		

Table 2.5b.

Chi-square Test Statistics

	Using digital tools
Chi-Square	91.350[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell

- **Result of H_1:** To synthesise, the analysis of the abovementioned questions indicated that the proportion of students who are prepared for digital teaching is not equal to the proportion of students who are not prepared i.e. this is evidence for the set hypothesis.

- **Hypothesis 2:** There is a pedagogical connectedness between students and teachers, and between students and the administration.

As previously stated, the second research question and hypothesis relate to questionnaire items 6 and 7, so once again there are sub-hypotheses at play here. Of note, while item 6 is said to inform the first part of the hypothesis, item 7 addresses the second part.

Q6. Is there a pedagogical connectedness between you and the teacher in the wake of the digital?

H_{2a}: The proportion of students who are pedagogically connected with their teachers is different from the proportion of students who are not connected.

This time, the Chi-square test for Goodness of Fit yielded a non-significant difference between students who are pedagogically connected with their teachers (43out of 103) and those who are not connected (60 out of 103), x^2 (1, n = 103) = 2.8, p = .094 (see Tables 2.6a. and 2.6b.). The Sig. value of .09 is greater than the alpha value, so we fail to prove the hypothesis in question.

Table 2.6a.
Frequencies

Pedagogical connectedness between the students and the teacher			
	Observed N	Expected N	Residual
No	60	51.5	8.5
Yes	43	51.5	-8.5
Total	103		

Table 2.6b.
Chi-square Test Statistics

Test Statistics	
	Pedagogical connectedness between the students and the teacher
Chi-Square	2.806[a]
df	1
Asymp. Sig.	.094

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.5.

Q7. Is there a pedagogical connectedness between you and the administration?

H_{2b}: The proportion of students who are pedagogically connected with the administration is not similar to the proportion of students who are otherwise.

Comparing the data this time, the test yielded a significant difference between students who are pedagogically connected with the administration (N=33) and those who are not (N=70), x^2 (1, N = 103) = 13.29, p = .000 (see Tables 2.7a. and 2.7b.). Given the Sig. value of .000, we can conclude that there is evidence in favour of our hypothesis.

Table 2.7a.
Frequencies

Pedagogical connectedness between the students and the administration			
	Observed N	Expected N	Residual
No	70	51.5	18.5
Yes	33	51.5	-18.5
Total	103		

Table 2.7b.
Chi square Test Statistics

	Pedagogical connectedness between the students and the administration
Chi-Square	13.291[a]
df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.5.

- **Result of H_2:** These tests indicated that the students who are pedagogically connected with their teachers are almost the same in proportion as those who are not, contrary to what was hypothesised. By contrast, the proportion of students who are pedagogically connected with the administration is different from the proportion of those who are not connected i.e. just as hypothesised.

➢ **Hypothesis 3:** Emergent digital teaching/learning has boosted learners' autonomy during the pandemic.

Q8. Has digital teaching/learning boosted your autonomy during the pandemic?

The test indicated that there is no significant difference between students who have boosted their autonomy (54 out of 103) and students whose autonomy has not been boosted (49 out of 103), x^2 (1, N = 103) = .243, p = .622 (see Tables 2.8a. and 2.8b.). The Sig. value is greater than alpha, so we failed to obtain evidence for our hypothesis.

Table 2.8a.
Frequencies

	Boosting autonomy through digital learning		
	Observed N	Expected N	Residual
No	49	51.5	-2.5
Yes	54	51.5	2.5
Total	103		

Table 2.8b.

Chi square Test Statistics

	Boosting autonomy through digital learning
Chi-Square	.243[a]
Df	1
Asymp. Sig.	.622

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 51.5.

- **Result of H_3:** The proportion of students who have boosted their autonomy is equal to the proportion of students whose autonomy has not been boosted.

❖ Chi-square Tests for Independence

In an attempt to test the fourth and the fifth hypotheses, the raw data were computed by running the Chi-square test for independence. With regard to the fourth hypothesis, two tests were performed, relating item 4 with 8, and 5 with 8 (see Tables 2.9a., 2.9b. and 2.9c.). This means that the hypothesis at hand has sub-hypotheses, and the same goes for hypothesis five.

- **Hypothesis 4:** There is a relationship between learners' knowledge of digital technology use and boosting their autonomy.

H_{4a}: There is a relationship between knowledge of computer use and boosted autonomy.

Tables 2.9a through 2.9c: $X^2(1, N=103) = 2.09$, $p = .147$. The p-value is greater than .05 i.e. there is no significant association between students' knowledge of computer use and boosting learning autonomy.

Table 2.9a.
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of Computer use * Boosted autonomy	103	100.0%	0	0.0%	103	100.0%

Table 2.9b.
*Knowledge of Computer Use * Boosted Autonomy Crosstab*

			Boosted autonomy		
			No	Yes	Total
Knowledge of Computer use	No	Count	14	9	23
		Expected Count	10.9	12.1	23.0
		% within Boosted autonomy	28.6%	16.7%	22.3%
	Yes	Count	35	45	80
		Expected Count	38.1	41.9	80.0
		% within Boosted autonomy	71.4%	83.3%	77.7%
Total		Count	49	54	103
		Expected Count	49.0	54.0	103.0
		% within Boosted autonomy	100.0%	100.0%	100.0%

Table 2.9c.
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.099[a]	1	.147		
ContinuityCorrection[b]	1.469	1	.226		
Likelihood Ratio	2.106	1	.147		
Fisher's Exact Test				.163	.113
Linear-by-Linear Association	2.079	1	.149		
N of Valid Cases	103				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 10.94.
b. Computed only for a 2x2 table

H_{4b}: There is a relationship between knowledge of using other digital tools and boosted autonomy.

Tables 2.10a through 2.10c: $X^2(1, N=103) = .452$, $p = .502$. Again, the p-value is greater than .05. Of note, there are 2 cells which have expected count less than 5 in a

contingency table (2×2), that is, the result is inaccurate. In this case, the Fisher's Exact Test should be considered, but its value (.604) is greater than the alpha value. Once again, there is no evidence for the set hypothesis; that is, learning autonomy is not significantly associated with students' knowledge of using other digital tools.

Table 2.10a.
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of using other digital tools * Boosted autonomy	103	100.0%	0	0.0%	103	100.0%

Table 2.10b.
*Knowledge of Using Other Digital Tools * Boosted Autonomy Crosstab*

			Boosted autonomy		
			No	Yes	Total
Knowledge of using other digital tools	No	Count	2	1	3
		Expected Count	1.4	1.6	3.0
		% within Boosted autonomy	4.1%	1.9%	2.9%
	Yes	Count	47	53	100
		Expected Count	47.6	52.4	100.0
		% within Boosted autonomy	95.9%	98.1%	97.1%
Total		Count	49	54	103
		Expected Count	49.0	54.0	103.0
		% within Boosted autonomy	100.0%	100.0%	100.0%

Table 2.10c.
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.452[a]	1	.502		
ContinuityCorrection[b]	.007	1	.932		
Likelihood Ratio	.457	1	.499		
Fisher's Exact Test				.604	.463
Linear-by-Linear Association	.447	1	.504		
N of Valid Cases	103				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.43.
b. Computed only for a 2x2 table

- **Result of H_4:** The chi-square test for independence indicated that students' learning autonomy is independent of their knowledge of technology use i.e. there is no evidence for the fourth hypothesis.

Moving to the fifth hypothesis, a number of sub-tests were run on items 4 and 5 with 6, 7, and 9. (see Tables 2.11a through 2.16c below)

- **Hypothesis 5:** There is a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology.

H_{5a}: There is a relationship between knowledge of computer use and students' and teachers' pedagogical connectedness.

Tables 2.11a through 2.11c: $X^2(1, N=103) = .591$, $p = .442$. The p-value is > .05, so there is no significant association between students' knowledge of computer use and being pedagogically connected with their teachers

Table 2.11a.
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of computer use * Students' and teachers' pedagogical connectedness	103	100.0%	0	0.0%	103	100.0%

Table 2.11b.
*Knowledge of Computer Use * Students' and Teachers' Pedagogical Connectedness Crosstab*

			Students' and teachers' pedagogical connectedness		
			No	Yes	Total
Knowledge of computer use	No	Count	15	8	23
		Expected Count	13.4	9.6	23.0
		% within Students' and teachers' pedagogical connectedness	25.0%	18.6%	22.3%
	Yes	Count	45	35	80
		Expected Count	46.6	33.4	80.0
		% within Students' and teachers' pedagogical connectedness	75.0%	81.4%	77.7%
Total		Count	60	43	103
		Expected Count	60.0	43.0	103.0
		% within Students' and teachers' pedagogical connectedness	100.0%	100.0%	100.0%

Table 2.11c.
Chi-Square Tests Statistics

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.591[a]	1	.442		
ContinuityCorrection[b]	.280	1	.597		
Likelihood Ratio	.599	1	.439		
Fisher's Exact Test				.482	.301
Linear-by-Linear Association	.585	1	.444		
N of Valid Cases	103				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 9.60.
b. Computed only for a 2x2 table

H_{5b}: There is a relationship between knowledge of computer use and pedagogical connectedness between the students and the administration

Tables 2.12a through 2.12c: $X^2(1, N=103) = 1.44$, $p = .230$. The p-value is > .05 i.e. there is no significant association between students' knowledge of computer use and being pedagogically connected with the administration.

Table 2.12a.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of computer use * Students' pedagogical connectedness with administration	103	100.0%	0	0.0%	103	100.0%

Table 2.12b.

*Knowledge of Computer Use * Pedagogical Connectedness between the Student and the Administration Crosstab*

			Pedagogical connectedness between the students and the administration		
			No	Yes	Total
Knowledge of Computer use	No	Count	18	5	23
		Expected Count	15.6	7.4	23.0
		% within Pedagogical connectedness between the students and the administration	25.7%	15.2%	22.3%
	Yes	Count	52	28	80
		Expected Count	54.4	25.6	80.0
		% within Pedagogical connectedness between the students and the administration	74.3%	84.8%	77.7%
Total		Count	70	33	103
		Expected Count	70.0	33.0	103.0
		% within Pedagogical connectedness between the students and the administration	100.0%	100.0%	100.0%

Table 2.12c.
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.443[a]	1	.230		
ContinuityCorrection[b]	.898	1	.343		
Likelihood Ratio	1.519	1	.218		
Fisher's Exact Test				.313	.172
Linear-by-Linear Association	1.429	1	.232		
N of Valid Cases	103				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 7.37.
b. Computed only for a 2x2 table

H_{5c}: There is a relationship between knowledge of computer use and rescue of the academic year.

Tables 2.13a through 2.13c: $X^2(1, N=103) = .269$, $p = .604$. The p-value is > .05 i.e. there is no significant association between students' knowledge of digital tools and rescuing pedagogy.

Table 2.13a.
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of computer use * Rescue of the academic year	103	100.0%	0	0.0%	103	100.0%

Table 2.13b.
*Knowledge of Computer Use * Rescue of the Academic Year Crosstab*

			Rescue of the academic year		
			No	Yes	Total
Knowledge of Computer use	No	Count	10	13	23
		Expected Count	8.9	14.1	23.0
		% within Rescue of the academic year	25.0%	20.6%	22.3 %
	Yes	Count	30	50	80
		Expected Count	31.1	48.9	80.0
		% within Rescue of the academic year	75.0%	79.4%	77.7 %
Total		Count	40	63	103
		Expected Count	40.0	63.0	103.0
		% within Rescue of the academic year	100.0%	100.0%	100.0 %

Table 2.13c.
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.269[a]	1	.604		
ContinuityCorrection[b]	.076	1	.783		
Likelihood Ratio	.266	1	.606		
Fisher's Exact Test				.634	.388
Linear-by-Linear Association	.266	1	.606		
N of Valid Cases	103				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 8.93.
b. Computed only for a 2x2 table

H_{5d}: There is a relationship between knowledge of using other digital tools and students' and teachers' pedagogical connectedness.

Tables 2.14a through 2.14c: $X^2(1, N=103) = .090$, $p = .764$. The p-value is greater than the alpha value. It should be noted; however, that 2 cells have expected count less than 5 in a contingency table (2×2), that is, the result is inaccurate. Regarding the Fisher's Exact Test is of no evidence since its value (.1) is greater than the alpha value (see Table 2.14c). At all events, there is no significance for the set hypothesis. To put it differently, pedagogical

connectedness between students and teachers is not related to students' knowledge of using other digital tools.

Table 2.14a.
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of using other digital tools * Students' and teachers' pedagogical connectedness	103	100.0%	0	0.0%	103	100.0%

Table 2.14b.
*Knowledge of Using Other Digital Tools * Students' and Teachers' Pedagogical Connectedness Crosstab*

			Students' and teachers' pedagogical connectedness		
			No	Yes	Total
Knowledge of using other digital tools	No	Count	2	1	3
		Expected Count	1.7	1.3	3.0
		% within Students' and teachers' pedagogical connectedness	3.3%	2.3%	2.9%
	Yes	Count	58	42	100
		Expected Count	58.3	41.7	100.0
		% within Students' and teachers' pedagogical connectedness	96.7%	97.7%	97.1%
Total		Count	60	43	103
		Expected Count	60.0	43.0	103.0
		% within Students' and teachers' pedagogical connectedness	100.0%	100.0%	100.0%

Table 2.14c.
Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.090[a]	1	.764		
Continuity Correction[b]	.000	1	1.000		
Likelihood Ratio	092	1	.761		
Fisher's Exact Test				1.000	.624
Linear-by-Linear Association	.089	1	.765		
N of Valid Cases	103				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.25.
b. Computed only for a 2x2 table

H_{5e}: There is a relationship between knowledge of using other digital tools and pedagogical connectedness between the students and the administration.

Tables 2.15a through 2.15c: $X^2(1, N=103) = 1.457$, $p = .227$. The p-value is greater than the alpha value. It should be noted that in a 2 by 2 table 2 cells have expected count less than 5, this is an inaccurate result. On account of Fisher's Exact Test, the result remains insignificant because (.549) is greater than the alpha value (see Table 2.15c). In other words, students' knowledge of using other digital tools is independent of pedagogical connectedness with the administration.

Table 2.15a.
Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of using other digital tools * Students' pedagogical connectedness with administration	103	100.0%	0	0.0%	103	100.0%

Table 2.15.b.

*Knowledge of using other digital tools * Pedagogical connectedness between the students and the administration Crosstab*

			Pedagogical connectedness between the students and the administration		
			No	Yes	Total
Knowledge of using other digital tools	No	Count	3	0	3
		Expected Count	2.0	1.0	3.0
		% within Pedagogical connectedness between the students and the administration	4.3%	0.0%	2.9%
	Yes	Count	67	33	100
		Expected Count	68.0	32.0	100.0
		% within Pedagogical connectedness between the students and the administration	95.7%	100.0%	97.1%
Total		Count	70	33	103
		Expected Count	70.0	33.0	103.0
		% within Pedagogical connectedness between the students and the administration	100.0%	100.0%	100.0 %

Table 2.15c.

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.457[a]	1	.227		
ContinuityCorrection[b]	.335	1	.563		
Likelihood Ratio	2.360	1	.125		
Fisher's Exact Test				.549	.310
Linear-by-Linear Association	1.443	1	.230		
N of Valid Cases	103				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is .96.

b. Computed only for a 2x2 table

H_{5f}: There is a relationship between knowledge of using other digital tools and rescue of the academic year.

Tables 2.16a through 2.16c: $X^2(1, N=103) = 1.008$, $p = .315$. The p-value is greater than the alpha value. Once again, there are 2 cells which have expected count less than 5 in a 2 by 2 table, so the result is inaccurate. When considering the Fisher's Exact Test, the result

with a value of (.558) is not significant. By all accounts, rescuing pedagogy is not associated with students' knowledge of using other digital tools.

Table 2.16a.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Knowledge of using other digital tools * Rescue of the academic year	103	100.0%	0	0.0%	103	100.0%

Table 2.16b.

*Knowledge of Using Other Digital Tools * Rescue of the Academic Year Crosstab*

			Rescue of the academic year		Total
			No	Yes	
Knowledge of using other digital tools	No	Count	2	1	3
		Expected Count	1.2	1.8	3.0
		% within Rescue of the academic year	5.0%	1.6%	2.9%
	Yes	Count	38	62	100
		Expected Count	38.8	61.2	100.0
		% within Rescue of the academic year	95.0%	98.4%	97.1%
Total		Count	40	63	103
		Expected Count	40.0	63.0	103.0
		% within Rescue of the academic year	100,0%	100.0%	100.0%

Table 2.16c.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.008[a]	1	.315		
ContinuityCorrection[b]	.162	1	.687		
Likelihood Ratio	.977	1	.323		
Fisher's Exact Test				.558	.334
Linear-by-Linear Association	.998	1	.318		
N of Valid Cases	103				

a. 2 cells (50.0%) have expected count less than 5. The minimum expected count is 1.17.

c. Computed only for a 2x2 table

- **Result of H_5:** The tests showed that there is no evidence to confirm the fifth hypothesis; thus, there is no significant relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology.

2.2.3.2. Discussion of the Main Findings

Upon analysis of the students' questionnaire, the results of the Chi-square Test for Goodness of Fit proved to be statistically significant only for the first hypothesis. To put it clearly, the proportions of students who are prepared for digital teaching proved to be different from the proportion of students who are not, just as it is hypothesised. For the second hypothesis that is divided into two sub-hypotheses, one of which being significant (pedagogical connectedness between the students and the administration) while the other is not (pedagogical connectedness between the students and the teachers). Besides, no evidence was obtained in support of the third hypothesis i.e. the students who have boosted their autonomy are almost the same in proportion as the students whose autonomy has not been boosted. Likewise, the Chi-square Tests for Independence have not provided enough evidence, for both the fourth and the fifth hypotheses, for the existence of a relationship between the use of technology and learners' boosted autonomy, and the use of technology and pedagogical continuity. That is, boosting learners' autonomy and ensuring pedagogical continuity is not significantly related to the use of digital technology.

2.3. The Teachers' Questionnaire

2.3.1. Description of the Teachers' Questionnaire

Along with the students' questionnaire, the teachers' questionnaire aims at gathering data about teachers' preparedness for digital teaching/learning in terms of internet access and practical knowledge of technology use in education, pedagogical connectedness, and the

benefit of digital technology. This questionnaire consists of eight items distributed over three sections.

The first section addresses two questions (Q1 and Q2) which are concerned with the teachers' background; it seeks to gather information about the teachers' academic degree in addition to their experience with teaching at university. It was thought that demographic information would interest certain readers.

The second section, entitled internet access and practical knowledge of digital technology use, covers two items. The first question (Q3) seeks to collect data about the proportion of teachers who have regular access to the internet and of those who do not. Item four aims to explore teachers' knowledge of digital technology use in terms of using online/digital teaching platforms.

The third section seeks to explore pedagogical connectedness and the benefit of digital technology. The fifth and the sixth items aim to explore pedagogical connectedness among teachers, students, and the administration. For item seven, it is addressed to explore the learners' ability to learn autonomously on the basis of their teachers' opinions. The last question (Q8) is designed to explore whether or not unleashing the digital has helped in rescuing the academic year.

2.3.2. Administration of the Teachers' Questionnaire

Like the students' questionnaire, printed copies were handed in-person to a number of teachers at Mila University Centre whom we could reach, and an online questionnaire was shared with those teachers at the same university whom we could not reach in-person and teachers from other universities via e-mails and Facebook groups. Of note, we spent five

weeks in collecting the necessary data. Comparing the huge number of e-mails we sent to teachers, the number of responses we received is very small.

2.3.3. Data Analysis and Discussion of the Main Findings

2.3.3.1. Data Analysis

-Excel Descriptive Analysis (It is concerned with Qs 1 and 2**)**.

Q1. What academic degree do you hold?

This question is meant to determine the academic degree of teachers. The table below shows that about half of the respondents (51%) hold a Doctorate degree; thirty-two teachers (33%) hold a Magister degree, and sixteen teachers (16%) have a Master degree.

Table 2.17
Teacher's academic degree

Academic Degree	Number of responses	Percentage
Doctorate	50	51%
Magister	32	33%
Master	16	16%
Total	98	100%

Q2. How long have you been teaching at university?

The collected data about teachers' experience in teaching at university showed that twenty-four participants have less than five years while 46% have been teaching for more than five years, ranging from five to ten years. To push further, twenty-five teachers indicated that they spent more than ten years (11-20) and four of the total spent over twenty years as university teachers.

Table 2.18

Experience in teaching at university

	Number of respondents	Percentage
Less than 5 years	24	24.5%
[5-10]	45	46%
[11-20]	25	25.5%
Over 20 years	4	4%
Total	98	100%

-Chi-square Tests

Chi-square tests are used again to analyse the teacher's questionnaire, answer the research questions and test the corresponding hypotheses.

❖ **Chi-square Test for Goodness of Fit**

The Chi-square test for Goodness of Fit is opted for to answer research questions 1 through 3 and test the corresponding hypotheses. It should be noted that the first research question and hypothesis relate to questionnaire items 3 and 4; the second relate to items 5 and 6; as for the third, they bear on item 7. That is, to almost each research question there are sub-questions, and the same goes for the set hypotheses.

- **Hypothesis 1:** The proportion of teachers who are prepared for digital teaching/learning in terms of internet access and practical knowledge of digital technology use is different from the proportion of those who are not.

Q3. Do you have regular access to the internet?

H_{1a}: The number of teachers with regular internet access differs from the number of those whose internet access is not regular.

Performing the Chi-square test, a significant difference was found between teachers who have regular access to the internet (91 out of 98) and teachers whose internet access is otherwise (7 out of 98), X^2 (1, n = 98) = 72.00, p = .000 (see Tables 2.19a and 2.19b below).

Table 2.19*a.*
Frequencies

	Teacher's regular access to internet		
	Observed N	Expected N	Residual
No	7	49.0	-42.0
Yes	91	49.0	42.0
Total	98		

Table 2.19b.
Chi-square Test Statistics

	Teacher's regular access to internet
Chi-Square	72.000[a]
df	1
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.0.

Q4. Are you well informed of using online/digital teaching platforms (Moodle, etc.)?

H_{1b}: The proportion of teachers who are well informed of using online/digital platforms (e.g., Moodle) is significantly different from the proportion of teachers who are not.

Again, the performed test indicated a significant difference between teachers who are well informed of using online/digital platforms (74 out of 98) and those who are not so (24 out of 98), X^2 (1, n = 98) =25.510, p = .000 (see Tables 2.20a & 2.20b below). The Sig. value of .000 is smaller than alpha, so the result is significant.

Table 2.20a.
Frequencies

	Using online/digital platforms (e.g., Moodle)		
	Observed N	Expected N	Residual
No	24	49.0	-25.0
Yes	74	49.0	25.0
Total	98		

Table 2.20b.

Chi-Square Test Statistics

	Using online/digital platforms
Chi-Square	25.510[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (0,0%) have expected frequencies less than 5. The minimum expected cell frequency is 49,0.

- **Result of H_1:** To synthesise, the analysis of the aforementioned questions indicated that the proportion of teachers who are prepared for digital teaching/learning is not equal to the proportion of teachers who are not prepared i.e. this is evidence for the set hypothesis.

➢ **Hypothesis 2:** There is a pedagogical connectedness between students, teachers, and the administration.

As aforementioned, the second question and hypothesis relate to questionnaire items 5 and 6.

Q5. Do you feel pedagogically connected with your students?

H_{2a}: The proportions of teachers who are pedagogically connected with students and of those who are not are different.

When conducting the test, a significant difference was found between teachers who are pedagogically connected with their students (71 out of 98) and those who are not (27 out of 98), X^2 (1, n = 98) = 19.75, p = .000. The Sig. value of .000 is smaller than the alpha value of .05, so the result is significant. (See Tables 2.21a & 2.21b)

Table 2.21a.

Frequencies

	Pedagogical connectedness between the teacher and his students		
	Observed N	Expected N	Residual
No	27	49.0	-22.0
Yes	71	49.0	22.0
Total	98		

Table 2.21b.

Chi-Square Test Statistics

	Pedagogical connectedness between the teacher and his students
Chi-Square	19.755[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.0.

Q6. Do you feel pedagogically connected with the administration?

H_{2b}: The proportion of teachers who are pedagogically connected with the administration is not similar to the proportion of teachers who are not connected;

The performed test produced a significant difference between teachers who are pedagogically connected with the administration (80 out of 98) and those who are not (18 out of 98), x^2 (1, n = 98) = 39.22, p = .000 (see tables 2.22a & 2.22b). The Sig. value of .000 is smaller than the alpha value. This indicates that the result is significant.

Table 2.22a.

Frequencies

	Pedagogical connectedness between the teacher and the administration		
	Observed N	Expected N	Residual
No	18	49.0	-31.0
Yes	80	49.0	31.0
Total	98		

Table 2.22b.

Chi-Square Test Statistics

	Pedagogical connectedness between the teacher and the administration
Chi-Square	39.224[a]
Df	1
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.0.

- **Result of H_2:** To synthesise, the analyses of the abovementioned questions indicated that the proportion of teachers who are pedagogically connected with their students and the administration is significantly different from the proportion of teachers who are otherwise, with the former surpassing by far the latter.

➢ **Hypothesis 3:** Emergent digital teaching boosted learners' autonomy during the pandemic.

Q7. From your perspective, were your students able to learn autonomously during the pandemic?

H_3: There is a difference in proportion between teachers who believe that their learners were able to learn autonomously and those who think otherwise.

When running the test, the results indicated a significant difference between teachers who believe that their learners were able to learn autonomously (27out of 98) and those who do not believe so (71 out of 98), x2 (1, n = 98) = 19.75, p = .000 (see Tables 2.23a and 2.23b).

Table 2.23a.
Frequencies

	Autonomous Learning		
	Observed N	Expected N	Residual
No	71	49.0	22.0
Yes	27	49.0	-22.0
Total	98		

Table 2.23b.
Chi-Square Test Statistics

	Autonomous learning
Chi-Square	19.755[a]
df	1
Asymp. Sig.	.000

a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 49.0.

- **Result of H_3:** The analysis of item 7 revealed that the proportion of teachers who believe their students were able to learn autonomously differs from that of the reverse situation. This time, however, the latter group of teachers surpassed the former in count.

❖ Chi-square tests for Independence

The Chi-square test for Independence is used to answer research question 5 and to test the corresponding hypothesis. It must be noted that the fourth research question and hypothesis concern data from the students' questionnaire and should, therefore, not be addressed here. As for the fifth, they bear on item 4 and 8.

➢ **Hypothesis 5:** There is a relationship between pedagogical continuity, during the COVID-19 pandemic, and the use of digital technology.

Tables 2.24a through 2.24c: X^2 (1. N=98) =6.07, p =.014. The p-value is smaller than the alpha value; i.e., rescuing the academic year from being disrupted is related to teachers' practical knowledge of using online/digital platforms (e.g. Moodle).

Table2.24a.

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Using online/digital platforms * Rescue of the academic year	98	97.0%	3	3.0%	101	100.0%

Table 2.24b.

Using Online/Digital Platforms * *Rescue of the Academic Year Crosstab*

			Rescue of the academic year		Total
			No	Yes	
Using online/digital platforms	No	Count	11	13	24
		Expected Count	6.4	17.6	24.0
		% within Using online/digital platforms	45.8%	54.2%	100.0%

	Yes	Count	15	59	74
		Expected Count	19.6	54.4	74.0
		% within Using online/digital platforms	20.3%	79.7%	100.0%
Total		Count	26	72	98
		Expected Count	26.0	72.0	98.0
		% within Using online/digital platforms	26.5%	73.5%	100.0%

Table 2.24c.

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.076[a]	1	.014		
ContinuityCorrection[b]	4.835	1	.028		
Likelihood Ratio	5.678	1	.017		
Fisher's Exact Test				.018	.016
Linear-by-Linear Association	6.014	1	.014		
N of Valid Cases	98				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 6.37.

b. Computed only for a 2x2 table

- **Result of H_5:** The analysis of the abovementioned question indicated that there is evidence for the set hypothesis. This means that during the COVID-19 pandemic, there is a relationship between pedagogical continuity or rescuing the academic year and the use of digital technology.

2.3.3.2. Discussion of the Main Findings

This time, from the perspective of participant teachers, all the Chi-square Tests for Goodness of Fit provided evidence for the first two hypotheses. In other words, there is (1) a differential preparedness among teachers for digital teaching/learning, (2) a pedagogical connectedness between learners, teachers, and the administration, just as it is hypothesised. Conversely, the difference in proportions concerned with the hypothesis is significant; though, it is in contrary with the assumption. That is, emergent digital teaching/learning has not boosted learners' autonomy during the pandemic. Likewise, when running the Chi-square

Test for Independence to examine the fifth hypothesis, the results proved to provide favourable evidence. To put it differently, ensuring pedagogical continuity seemed to be associated with the use of digital technology.

2.4. General Discussion

Overall, comparing the results obtained from students' questionnaire and teachers' questionnaire, one can notice that the results obtained of the examined assumptions are not always similar, that is, the assumption which is met herein, with the students' questionnaire, is not necessarily met therein, with the teachers' questionnaire. When examining the first hypothesis, a significant difference between teachers and students who are prepared for digital teaching/learning (regular internet access and practical knowledge of technology use) and those who are unprepared is identified. This indicated that the first assumption is statistically met with evidence that most students and teachers are prepared in terms of internet access and knowledge of technology use. For the second hypothesis, a significant difference is found in pedagogical connectedness between students and teachers; however, the difference in connectedness with the administration proved to be significant with teachers, yet it is insignificant with students. Thus, there is not enough evidence to confirm the set hypothesis. When comparing the data obtained from the analysis of the third hypothesis, the results turned out to be at variance. According to students, the number of students who have boosted their autonomy is equal to those who have not. However, the findings of the teachers' questionnaire revealed that most students were not able to learn autonomously; i.e. a significant difference is found to support the set hypothesis. Once again, the fourth hypothesis which is merely related to the student's questionnaire is rejected; in other words, learners' boosted autonomy is not associated with the use of digital technology. Meanwhile, the fifth hypothesis is met in view of the findings obtained from the teachers' questionnaire, yet it is rejected with regard to the students' questionnaire. To conclude,

boosting learners' autonomy is independent of learners' knowledge of the use of technology. In contrast, ensuring pedagogical continuity, during the COVID-19 pandemic, is partially related to the use of digital technology.

2.5.Implications, Limitations, and Recommendations of the Study

2.5.1. Implications of the Study

Subsequent to the general discussion of the students' and teachers' questionnaires, some pedagogical implications are generated in view of the main findings.

To start with, considering pedagogical connectedness among students, teachers, and administration is as important in online classes as in traditional classes. It enables the teachers to know whether the process of learning is taking place. Moreover, the absence of pedagogical connectedness would lead up learners to feel excluded and discouraged. This can drive them to lose their enthusiasm for learning. It is crucial, thereof, to create regular social virtual spaces where they can feel truly involved in a learning process.

In light of the findings, pedagogical continuity is essentially associated with the utilization of online/digital platforms (e.g. Moodle). It is no overstatement that online teaching/learning provides a multiplicity of options which can be difficult to reach in traditional classes; it highly supports learning differences because it offers a variety of opportunities to adjust the methods of imparting knowledge with online learners' needs. Thus, it is suggested to use different digital tools and platforms to make learning flexible and more effective.

Of note, despite the fact that most teachers and students are prepared for digital teaching/learning, the remainder may cause a hindrance to learning.

2.5.2. Limitations of the Study

The findings in this study should be viewed in light of some limitations. The first is the time provided on account of the precautions carried out to prevent the spread of the virus among students. Running the Chi-square Tests requires a large number of subjects; however, we had little time to gather the data because third year students have finished their classes early. Using online questionnaires did not enable us to collect a larger data from teachers from other universities. As a consequence, the survey conducted did not really yield significant results; they are restricted to the current sample. Again, due to time constraints, asking the participants for further details and explanation was not an option. On a final note, the written works which talked the COVID-19 whole impact in the educational and social facade were limited for it is a fresh topic.

2.5.3. Recommendations for Students, Teachers, and Future Research

During the educational disruption caused by the COVID-19 pandemic, the use of digital technology was the appropriate alternative to overcome this interruption. It is said that employing digital teaching/learning in higher education has helped in ensuring the academic year, yet it is not really clear whether digital technology contributed in ensuring pedagogical connectedness and whether learners and teachers alike could take advantage of this opportunity to promote their learning/teaching skills. Building upon the findings of this research, the following recommendations are suggested for students, teachers, and for future research.

2.5.3.1. Recommendations for Students

-Ignorance is no longer an excuse; students are required to be well-informed of digital technology use in education. This includes: practical knowledge of browsing information, sharing files, using collaboration platforms, educational digital platforms, etc.

- Students are required to adapt with digital teaching and attend their online classes.

-Students should stay in contact with their teachers and administration to facilitate learning and accomplish the process in due time.

-In digital teaching/learning, students should know their own roles and responsibilities so that they can perform better.

- Students should benefit from digital teaching/learning to develop their learning skills and boost their learning autonomy.

2.5.3.2.Recommendations for Teachers

- Like students, teachers are required to be well-informed of using digital technology in education.

- Teachers should be aware of the importance of pedagogical connectedness among pedagogy staff because effective teaching is the outcome of their cooperative efforts. In this essence, they should use digital tools with which learners feel comfortable and ready to use so that they can guarantee online connectedness.

- Most learners are social media users, so it is suggested to use social media platforms to contact learners.

- Teachers should prepare learners for online teaching/learning through informing them about the responsibilities of the online learner.

- Online teaching/ learning offers flexibility in the classroom; therefore, teachers should adapt teaching to fit with learners' individual differences.

- Teachers should take advantage of online teaching/ learning to develop their autonomy and their learners' autonomy.

2.5.3.3. Recommendations for Research

Performing the Chi-square Tests demands a large sample. Although the sample upon which this study is conducted is considerable, the results turned out to be invalid for several times. As a consequence, the results obtained cannot be generated. Nevertheless, this study may pave the way for future research to be conducted in the same area. Pertaining to this research, it is suggested to extend the study by expanding the sample and adopting the qualitative method to explore students' and teachers' perceptions regarding the benefit of digital teaching in higher education in enhancing learners' autonomy. It is also suggested to examine the actual changes in higher educational instruction while having access to the use of digital technology. This would allow researchers to further evaluate the effectiveness of digital technology in higher education.

Conclusion

This chapter is devoted for the practical part of the current research which is concerned with investigating the relationship between technology use and pedagogical continuity during the COVID-19 pandemic. It embodies the statistical analysis of the students' and teachers' questionnaires followed by the discussion of the main findings which revealed that pedagogy continuity, during the pandemic, is partly related to the use of digital technology. On the other hand, boosting students' autonomy is independent of their knowledge of digital technology use. Subsequently, on the basis of these findings, a set of implications, limitations, and recommendations are generated.

General Conclusion

Throughout this research paper, it is informed that the current study is sought to investigate the relationship between digital technology and the rescue of the academic year from being disrupted. The research was also conducted to further determine the relationship between the use of digital technology and pedagogical connectedness along with learners' autonomy.

In order to achieve the aforementioned aims of this study, a questionnaire is administered to 103 third year students of English at the Department of Foreign Languages, Mila University Centre. For the same sake, another questionnaire is administered to 98 university teachers of languages (English, Arabic, and French).

The main findings obtained through the analysis of the collected data revealed that the proportion of students and teachers who are prepared for digital teaching/learning is more than those who are not; nevertheless, the pedagogical connectedness did not seem to take place among all the pedagogical staff. Thus, ensuring pedagogy continuity in online distance classes, during the COVID-19 pandemic, is partially related to the use of digital technology. By contrast, boosting learners' autonomy is not related to their knowledge of technology usage. When interpreting the results of this research, one can deduce that what students and teachers know of technology use is not necessarily sufficient to make digital teaching/ learning successful; that is, they may not be well informed of applying their knowledge of technology use in education accordingly with the requirements of distance online learning.

Bringing this to an end, it is important to recall the fact that this research is a small-scale study; however, it addressed a new mode of teaching/learning which has never been implemented in the Algerian university before. This may draw the attention to future research

to target different aspects of digital teaching/learning during the COVID-19 pandemic and beyond.

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Appendices

Appendix A

Student's Questionnaire

Dear student,

We kindly invite you to support our work by filling in this questionnaire which is an essential part of the research study we are conducting on digital pedagogy during the COVID-19 pandemic. We would like to inform you that your answers will be processed anonymously and in aggregate.

Kindly, tick (√) all the answers that apply.

Section One: Student's Profile

1. Age: ……..
2. Gender

Female ⬭

Male ⬭

Section Two: Internet Access and Practical Knowledge of Digital Technology Use

3. Do you have regular access to the internet?

Yes ⬭ No ⬭

4. I am good at using the computer

Yes ⬭ No ⬭

5. I am good at using other digital tools: smartphones, electronic tablets, etc.

Yes ⬭ No ⬭

Section Three: Pedagogical Connectedness during the Pandemic and the Benefit of Digital Technology

6. Is there a pedagogical connectedness between you and the teacher?

Yes ⬭ No ⬭

7. Is there a pedagogical connectedness between you and the administration?

Yes ⬭ No ⬭

8. Has digital learning boosted your autonomy during the pandemic?

Yes ⬭ No ⬭

9. Has digital technology rescued the academic year from being disrupted?

Yes ⬭ No ⬭

Thank you for your collaboration

Appendix B

Teacher's Questionnaire

Dear Teacher,

It would be of your generosity to support our work by filling in this questionnaire which is an essential part of the research study we are conducting on digital pedagogy during the COVID-19 pandemic. We would like to inform you that your answers will be processed anonymously and in aggregate.

Kindly, tick (√) all the answers that apply.

Section One: Background Information

1. What academic degree do you hold?

Master ⬭

Magister ⬭

Doctorate ⬭

2. How long have you been teaching at university?

……

Section Two: Internet Access and Practical Knowledge of Digital Technology Use

3. Do you have regular access to the internet?

Yes ⬭ No ⬭

4. Are you well informed of using online/digital teaching platforms (Moodle, etc.)?

Yes ⬭ No ⬭

Section Three: Pedagogical Connectedness during the pandemic and the benefit of Digital Technology

5. Do you feel pedagogically connected with your students in the wake of the digital?

Yes ⬭ No ⬭

6. Do you feel pedagogically connected with the administration?

Yes ⬭ No ⬭

7. From your perspective, were your students able to learn autonomously during the pandemic?

Yes ⬭ No ⬭

8. Unleashing the digital has helped in rescuing pedagogy and the academic year.

Yes ⬭ No ⬭

Thank you for your collaboration

ملخص

يهدف هذا البحث إلى استكشاف العلاقة بين تبني التعليم الإلكتروني و إنقاذ التعليم والسنة الأكاديمية من الانقطاع خلال جائحة كورونا (COVID-19) . في هذا الإطار ،تم التطرق إلى الأسئلة التالية : (1) هل نسب الطلاب والمعلمين المستعدين لاعتماد التعليم الرقمي (من ناحية توفرالإنترنت والمعرفة العملية لاستخدام التكنولوجيا الرقمية) متماثلة مع ونسب الطلاب و المعلمين الغيرمستعدين متماثلة ؟ (2) بناءً على آراء الطلاب والمعلمين، هل هناك ترابط تربوي بين المتعلمين والمعلمين والإدارة في أعقاب الرقمنة؟ (3) هل عزز التعليم الرقمي من استقلالية التعليم الذاتي للمتعلمين أثناء الوباء؟ (4) هل تعزيز التعليم الذاتي للمتعلمين مرتبط بمعرفتهم العملية حول استخدام التكنولوجيا الرقمية ؟ (5) هل ضمان استمرارية التعليم خلال جائحة كورونا مرتبط باستخدام التكنولوجيا الرقمية؟ لجمع البيانات المطلوبة ، تم توزيع استبيانين منظمين على 103 طالبا من طلاب السنة الثالثة لغة انجليزية من المركز الجامعي ميلة و 98 مدرس جامعي للغات (الإنجليزية والعربية والفرنسية) من مختلف الجامعات الجزائرية. تم اختيار اختبا ر مربع كاي للإجابة على أسئلة البحث واختبار الفرضيات الموافقة. من خلال إجراء التحليل ، أثبتت النتائج أن ضمان استمرارية التعليم، خلال جائحة كورونا (COVID-19) ، مرتبط بالتعليم الرقمي فقط بالنسبة للأساتذة.

الكلمات المفتاحية: جائحة كورونا (COVID-19) ، التعليم الإلكتروني ، التكنولوجيا الرقمية ، الترابط التربوي، انقاذ التعليم.

Résumé

L'objectif sous-jacent de cette recherche est d'explorer la relation entre l'enseignement/ l'apprentissage numériques pendant la pandémie de COVID-19 et la possibilité de sauver la pédagogie et l'année académique d'être perturbée. Dans le cadre de la présente étude, cinq questions de recherche sont soulevées : (1) Est-ce que Les proportions d'étudiants et d'enseignants qui sont prêts à l'enseignement/ l'apprentissage numérique (par exemple, accès à Internet, connaissance pratique de l'utilisation du numérique) et ceux qui ne sont pas, sont identiques ? (2) D'après les opinions des étudiant et des enseignants, y a-t-il un lien pédagogique entre les apprenants, les enseignants et l'administration dans le sillage de technologie numérique? (3) L'enseignement/apprentissage numérique émergent a-t-il stimulé l'autonomie des apprenants pendant la pandémie ? (4) Existe-t-il un lien entre les connaissances des apprenants sur l'utilisation des technologies numériques et le renforcement de leur autonomie ? (5) Y a-t-il un rapport entre la continuité pédagogique, pendant la pandémie COVID-19, et l'utilisation de la technologie numérique ? Un questionnaire structuré est administré aux étudiants et un autre aux enseignants en personne et en ligne pour recueillir les données nécessaires. Les participants sont 103 étudiants de troisième année de l'EFL au Centre Universitaire de Mila et 98 professeurs universitaires de langues (anglais, arabe et français) de différentes universités algériennes. Les données recueillies sont calculées à l'aide de Chi-carre pour la qualité et de l'ajustement et de Chi-carre pour l'indépendance dans le SPSS. En effectuant l'analyse, les résultats ont révélé que l'assurance de la continuité pédagogique, pendant la pandémie de COVID-19, est liée à l'enseignement numérique uniquement à propos des enseignants.

Mots clés : La pandémie de COVID-19, enseignement numérique, technologie numérique, connectivité pédagogique, sauver la pédagogie.