Face-to-face vs. Emergency Remote Teaching during the Covid-19 lockdown. A comparative analysis of Ecuadorian undergraduate polytechnic students' performance.

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Research Article

Keywords: COVID-19, ERT, EFL, Ecuador, Student performance

Posted Date: April 12th, 2022

DOI: https://doi.org/10.21203/rs.3.rs-1401352/v1

Abstract

The COVID-19 outbreak has changed education, mainly by shifting face-to-face classes to online sessions. Online courses are not new as many educational institutions offer distance or hybrid learning courses. However, emergency remote teaching (ERT), into which education has shifted, attains differences. This study aims to identify student performance differences depending on teaching modality (face-to-face and ERT). Studies considering the COVID-19 pandemic and information originating from Ecuador are scarce, making this study relevant. This quantitative research used a two-way ANOVA to analyze skills results from exams given in the academic year 2019 (face-to-face) and 2020 (ERT). Results were not statistically significant at $p < .05$, which concurs with the existing literature.

Introduction

Since the beginning of the 21st century, the Earth's population has endured several epidemics already. These viral diseases have usually had their origin in the wildlife, and they have spread to humans either directly or using domestic animals. Influenza originated from wild birds, Ebola, SARS, and MERS-Cov came from bats while Dengue, Chikungunya, and Zika from mosquitoes. All these illnesses have something in common, the spread of the infection in humans with consequences for public health (Reperant and Osterhaus, 2017).

Severe Acute Respiratory Syndrome, a respiratory illness originated by a virus associated with Coronavirus. It was first reported in Asia on February 26, 2003. Over the next few months, this illness moved to more than two dozen countries covering North and South America, as well as Europe and Asia, before the outbreak was contained. (Maunder et al., 2003; CDC, 2016). Then came the Avian Influenza (H5N1), which spread from 2003 to 2009. It infected 417 people, killing two hundred fifty-six of them (Kandeel et al., 2010). The next stop is the Middle East Respiratory Syndrome (MERS-CoV). This disease broke in 2012, officially reported in September, but the first case was identified in Jordan in April 2012. MERS is also a severe respiratory illness with symptoms including fever, cough, and shortness of breath. Perlman and McIntosh (2020) reported that MERS-CoV infected two thousand six hundred sixty-eight people worldwide, and four out of every ten patients have died (CDC, 2019). Finally, the Ebola virus attacked the world, peaking in the years 2013 and 2014. This virus has reported by 2019 a total of 3,296 cases, from which 2,196 resulted in death (Aruna et al., 2019).

On December 31, 2019, the World Health Organization (WHO) reported a new outbreak occurring in the Chinese city of Wuhan, the Hubei Province's capital (WHO, 2020a). This virus started spreading fast, and the WHO proclaimed the pandemic status on March 11, 2020 (WHO, 2020b). Due to the novel COVID-19, countries have confronted significant health issues requiring changes in how their citizens live. On March 18, one hundred countries implemented school closures because of the declared pandemic. This decision affected more than eight hundred million children, teenagers, and young adults, according to Viner et al. (2020).

Mhlanga, D., & Moloi, T. (2020) explain that the Covid-19 virus can be transmitted directly by contact with an infected person when they sneeze or cough or indirectly by touching surfaces or objects forming the environment of an infected person. One of the measures to aid in controlling the illness is physical distancing, one or two meters away from one another seems to limit the spreading ratio (Jones et al., 2020). This action, proposed by WHO, has been taken seriously by the Ecuadorian government, pursuing several efforts to ensure the Ecuadorians' health. One of the steps taken was the use of a quarantine. The quarantine, said Rea, Palacios, and Yuquilema (2020), has meant locking down people in their homes and suspending face-to-face attendance to educational institutions in the country.

Universities, in general, have had to face decisions on how to continue with their educational activities while keeping the students, their faculty, and staff members safe from catching the virus (Hodges et al., 2020). These researchers explain that, in general, educational institutions decided to cancel their regular classroom sessions and called upon their faculty to embrace teaching online. Thus, preventing further spreading of the COVID-19 virus.

Vivanco-Saraguro (2020) indicated that cessation of educational activities has directly affected more than four and a half million children in Ecuador. Cabrera (2020) explains how the lockdown has affected both students and teachers. Students have had to go through the abrupt but imperative change in methodology from face-to-face to digital interaction. At the same time, teachers have seen how the situation affected their work stability and were confronted with the obligation of migrating their classes to a new digital reality. The use of technological tools became a must, for which not everyone has been prepared (Cabrera, 2020).

The Ecuadorian stakeholders are making great efforts. Its authorities, teachers, and students have been trying to cope with all the adversities of getting classes back on track during the lockdown (Vivanco-Saraguro, 2020). The Ecuadorian Ministry of Education, aware of the difficulties some students could have with the use of technologies, developed a plan. The new form of education scheme includes virtual learning and the use of WhatsApp messages and the radio, television, and printed texts (Hodges et al., 2020; Rea, Palacios, and Yuquilema, 2020). In addition, several high schools and universities retook their classes, some with a few weeks into their regular activity calendar, and started using virtual meeting apps like Zoom, WebEx, Google meet, or Microsoft Teams.

This paper aims to make a statistical comparison of the assessment results of the year 2019, with regular face-to-face classes and the year 2020, which was affected by the COVID-19's lockdown, making classes remote. The results obtained would add to the very scarce body of literature regarding higher education students' performance during the COVID19 pandemic. Moreover, the study compares the results of polytechnic university students who take English as a transversal subject during their stay in the university. Additionally, results originate from South American countries and, more specifically, Ecuador, where very little data exists.

The following research question has been defined to function as a beacon guide for this research: How does online learning compare with face-to-face learning when the curriculum is held constant? In addition, two additional sub-questions have been posed to aid with the attainment of this question:

Research sub-question 1 (RQ1): Are there significant differences in students' academic performance as a function of the different teaching methods?

Research sub-question 2 (RQ2): Are there significant differences in student performance in an English course regarding productive skills?

Literature Review

CALL

Computer-Assisted Language Learning (CALL) is defined as searching for and studying computer science applications for language teaching and learning (Levy, 1997). Meanwhile, Parmaxi, Zaphiris, Papadima-Sophocleous, and Ioannou (2013) explain that CALL explores the use of computing techniques and media for language teaching and learning. CALL has become a worldwide methodology to teach English. The processes focus on the student and are not teacher-centered, which means that teachers need to understand the use of information technologies (IT) more than ever.

Papadima-Sophocleous (2012) ascertain that adequate training is needed to understand the pedagogical use of technologies in language teaching. Hence, instructors must attain the practical skills to re-design their courses and include portions of their classes based on IT. For Chun (2011), The field of CALL is a multidisciplinary one, drawing on linguistics, psychology, education, and computer science.

CALL, says Chapelle (2010), includes a variety of technologies used for language learning. They involve using CD-ROMS with interactive multimedia exercises, electronic materials, such as dictionaries or grammar checkers, used for reference by the students, and electronic communication among students in the target language via e-mails, blogs, and wikis (Papadima-Sophocleous, 2012). Furthermore, Parmaxi, Zaphiris, Papadima-Sophocleous, and Ioannou (2013) explain that other technologies used are videos, virtual learning environment, and computer-mediated communication (CMC). The researchers also identified the use of e-mail interactions with native speakers, slow-down tools for videos during listening activities, and multimedia glosses. Using these tools has reported positive effects on vocabulary acquisition, listening, and overall comprehension of a foreign language (Chun, 2011).

Warschauer and Kern (2000) identified in their research that this approach is individualized and interactive, aiming to support the course content. Such materials are student-centered, allowing learners to perform autonomously. CALL aids teachers, as explained by Dung (2020), in mediating the language teaching process by presenting information in the class and then reinforcing what has been done utilizing exercises online and then by assessing the proposed class's learning objectives.

Chapelle (2010) explains that CALL materials must attain impact on students through novelty, variety, presentation, and content. In addition, the author says that materials used must confront learners to the authentic use of language to obtain a mental response. Also, these environments existing on the web require students to develop their autonomous learning skills as they can access the information at any time and work on the assignments at their own pace (Heift and Schulze 2007). It also, continue the authors, permits learners to use any resources they may find on the web in more effective ways than simply surfing it without achieving anything concrete.

Virtual classrooms

Virtual classrooms are not as new as one might think. According to Dung (2020), They came into existence in the sixties at the University of Illinois, where they created a system linking students' computers to the university's server to access course materials and recorded classes. However, virtual classrooms have evolved over the years, and recently they have taken the shape of massive open online courses (MOOCs). These courses consist of short video lectures, computer-graded exams, and discussion forums online (Kim, 2016).

Rea, Palacios, and Yuquilema (2020) cite Santos explaining that virtual classes develop in digital environments where an exchange of information occurs so that participants acquire knowledge. Nonetheless, traditional and virtual classrooms, demonstrates Alhat (2020), are not so different. He states that there is the issue of participants being in a different remote location, but other than that, the interaction between students and teachers is like in a face-to-face classroom. So, it can be said that using online platforms, teachers and students share facts, their doubts are resolved, and participants can be evaluated.

There are three types of virtual classrooms, according to Dung (2020); there are asynchronous online classes, synchronous virtual classrooms, and hybrid online courses. In the first one, the class does not happen in real-time, and learners are autonomous in the coursework (Dung, 2020; Glenn, 2016). Furthermore, in this type of virtual classroom, students have no time constraints, as there is no class meeting time for communicating and responding to a set of questions established by the instructor (Skylar, 2009).

The teacher and the students simultaneously interact online in a synchronous online class (Dung, 2020). In this kind of online course, the teacher leads the process, and the students are all logged on, simultaneously communicating directly with each other (Skylar, 2009). Contrary to asynchronous online courses, the synchronous type promotes class planning. Instructors revolve their classes around slide presentations for live sharing, reducing the transactional distance between students and teachers (McBrien, Cheng, and Jones, 2009).

Advantages and disadvantages of virtual classrooms

Using virtual classrooms attains several advantages. First, using virtual platforms is easy, and access is quick and straightforward (Posey, Burgess, Eason, & Jones, 2010). Additionally, Apostu et al. (2014), who carried out a study in Romania, established that users could have quick access to the class information

from anywhere after registering in the cloud, providing an Internet connection. This characteristic allows learners to access the class without time zones or geographic locations (Apostu et al., 2014).

Another benefit of virtual classrooms is that, given the required equipment, they can allow children in remote villages to access class (Alhat, 2020). This researcher explains that the technology used in virtual learning works best with small groups because learners can cultivate their communication and social skills. Posey, Burgess, Eason, and Jones (2010) and Dung (2020) believe that the notion of distance in a virtual classroom acts in favor of teachers and learners who do not need to move to meet for class. Sokhulu (2020), who studied a course in South Africa, identified how digital technologies helped graduate students to carry on with their research studies, albeit they were locked down in their homes. In a qualitative study performed in Vietnam, Dung (2020) identified that virtual classrooms protect individuals' health and provide safety for the community.

The literature has also reported the drawbacks of implementing virtual classrooms, despite the benefits above. Vivanco-Saraguro (2020) asserts that the pandemic could be critical for low-class students due to their limitations in continuing their studies in this new technological environment. Castellano, Coronel, and Quintero (2020) explain that seventy-four percent of students attending virtual classes in Ecuador must share their electronic devices with other household members. In addition, forty-five percent of them deal with unstable connections and problems accessing the learning platforms (Castellano, Coronel, and Quintero, 2020).

Sokhulu (2020) mentions that the obvious lack of personalized or formal instruction on the environments' use is a significant disadvantage. Most students and some teachers were faced with dealing with online teaching platforms, which were entirely new for most of them, and they had to do it quickly. Some teachers complained of a lack of accompaniment, especially for those not tech-savvy (Posey, Burgess, Eason, & Jones, 2010).

Emergency Remote Teaching

The pandemic has brought several measures, one which has affected education in general, obliging many higher education institutions to make a sudden and drastic move to online instruction. Hodges et al. (2020) explain that this action has been identified as emergency remote teaching (ERT). The authors explain that ERT is a temporary solution covering an immediate problem, the COVID-19 outbreak. The primary goal of ERT is to supply momentary access to instruction and the necessary support in a timely and reliable manner and which must be available during an emergency or a crisis, such as the one we are now living with (Hodges et al., 2020).

The literature has reported studies realized in several contexts, such as in Italy (Aboud, 2020). The researcher relied on six participants' responses to semi-structured interview questions to explore the impact of E-learning on EFL teachers' identities after being exposed to E-learning. Research carried out in Indonesia by Atmojo and Nugroho (2020) looked at 16 EFL teachers' reflections on their practices in carrying out online EFL learning and their challenges. In China, Davies et al. (2020) present a reflective overview of how five courses from four Sino-foreign universities based in China responded to the COVID-19 crisis. In Hong Kong, Forrester (2020) studied the challenges and potential solutions of moving a group's speaking assessment from face-to-face to virtual mode during the coronavirus pandemic. Another research realized in Colombia, Hernández, and Flores (2020), aimed to identify whether the e-learning modality stimulated the learning process according to twenty-two English teachers. In the university of Patras in Greece, Karalis, and Raikou (2020), investigated students' assumptions and emotions regarding the shift to online teaching in two academic courses during the crisis. Finally, in Japan, Nae (2020) discusses the different challenges ERT poses compared to face-to-face instructions, such as the cultural specificities of a Japanese ESL classroom.

Ferri, Grifoni, and Guzzo (2020) identified three challenges that ERT faces. Namely, there are technological, pedagogical, and social challenges. Among the technical challenges identified, the authors mention the access to the required infrastructure, such as the devices needed for a digital classroom and the Internet. These results are also supported by Carrillo and Flores (2020) and Thomas and Rogers (2020). The need for interactive multimedia teaching materials to engage and maintain students' motivation was the most important challenge identified, followed by the lack of a proper form for giving student feedback and evaluation (Thomas and Rogers, 2020). Finally, Ferri, Grifoni, and Guzzo (2020) mention that the most significant social challenge students face during the COVID-19 pandemic is the lack of a suitable home learning environment to study challenge that has also been identified by Estrella (2020) and Doyle (2020).

Methods

For this study, the researcher examined differences in student achievement in both face-to-face and ERT classes. The teacher-researcher has been assigned the last level of the English as a foreign language courses offered by the university. This course's learning objective is to take learners to the B2 level according to the Common European Framework of Reference (CEFR). To obtain the data, the researcher looked at test results from the researcher's courses in the academic year 2019 before the COVID-19 outbreak when classes were face-to-face and the courses to his charge in the academic year 2020 during the pandemic when classes were online.

3.1. Class description

This researcher examined the differences in student achievement, as previously mentioned, of level five (out of five) of the university's languages department's English levels. English is a transversal subject, meaning that every student must take the five English levels, no matter the degree they are studying, during their university stay. Therefore, following the recommendation issued by Means et al. (2009), this researcher looked at students' results in the exams they had to take, focusing on such exams' speaking and writing sections. This analysis was done on the exam results of the two semesters of the 2019 academic year, the last year of the face-to-face classes, and the two semesters from the 2020 academic year when the ERT had to be implemented.

Bernard et al. (2004) and Means et al. (2009) recommend that the researcher making this kind of comparative analysis describes the instructional methods used in face-to-face and online classes to make comparisons meaningful. Following such proposition, the analysis was done over two different academic years, starting in 2019, when the face-to-face teaching process was the instructional model. During this academic year, the researcher was assigned classes in both planned semesters. In the first term, the languages department's academic coordinator appointed three courses to the teacher-researcher with a total of ninety-five students. For the second term, again, three classes were given to the teacher-researcher with a total of ninety-three students. The second academic year to be analyzed was 2020, when the COVID-19 pandemic broke out. The lockdown affected the vacation period, which started two weeks after the scheduled commencement; this class period was not considered for this investigation. However, the two regular semesters did form part of the analysis of this paper. In the first term of 2020, the teacher-researcher was charged with three courses with a total of eighty-six pupils. While on the second term, four classes were taught with a total of one hundred-ten students.

The curriculum for both years remained the same, using the same core textbook, an international English book of which five units were used for the English V subject (see Appendix 1), and the supplementary materials suggested by the department. The teaching methodologies used, namely the communicative approach, the flipped classroom approach, and cooperative and collaborative learning approaches. Both the face-to-face and the ERT classes met twice in the week, two hours per week. The assessment in both academic years remained the same. There are two compulsory non-cumulative exams that learners must obtain a minimum of sixty marks out of one hundred on average to pass the course. If they do not reach the said minimum, students have a makeup exam containing all the information reviewed during the whole semester.

3.2. Participants

The following information generalizes the demographic information obtained from several demographic surveys utilized during the two years matter of this research. Of the total students enrolled in the university, around fifty-five percent are men, while the women conform the resting forty-five percent. Although there is a dispersion of ages from eighteen to twenty-eight years, most students (eighty-one percent) are aged nineteen to twenty-four years. At the same time, more than fifty percent of the university's students are part of large families (more than four members), and they still live in the family home. Around seventy percent of the students had taken the previous English level in the semester before the terms under revision. Approximately eighty percent of students expressed they like the language. In comparison, the other twenty percent asserted not to like it and confessed to having taken the subject because it is a requirement of the university and they were obliged to take English V, or they could not continue with the subjects of their degree. Around fifty percent of respondents said they have been studying English for more than three years. About seventy percent of respondents believe that speaking is an essential skill to develop when learning a language. On the other hand, speaking and writing are considered the most difficult skills to develop.

The sample for the comparison in this study is considered convenience, non-probability set, and its composition was left to the teacher-researcher's discretion. There were no weights allotted to students based on their gender or any other variable. Students were deemed as single, discrete entities for the purposes of the study at hand. Table 1 shows the distribution of students per year, per term, and by sex.

Table 1. Distribution of students

	2019 (Face-to-Face)			2020 (ERT)		
	Male	Female	Total	Male	Female	Total
IT	51	44	95	72	38	110
IIT	50	43	93	54	32	86
Total	101	87		126	70	
	188			196		

3.3. Data collection

One hundred ninety-three students enrolled, but only one hundred eighty-eight completed the course and obtained a pass or fail grade in the face-to-face academic year. While on the ERT academic year, two hundred and four students enrolled, and a total of one hundred ninety-six of them completed the course and received a pass or fail grade. The data obtained for this paper's comparison came from the results of the exams students had to take during the semester, which is a mid-term and a final set of exams. As has been previously mentioned, only the results of the exam's productive skills sections have been considered for the analysis. The mid-term exam happens during the eighth week of the semester, and the final exam takes place on the sixteenth week of the term.

3.3.1. The oral section

This section will look at the oral section of the exam both on the face-to-face and the ERT years so that the description will make the comparison meaningful (Bernard et al., 2004).

It is necessary to assert that all the languages department exams are developed by teachers who had received the appropriate training for properly designing each section of the English exams. This team and the subject coordinators team reached a consensus on the types of activities that should be used for the oral exam, depending on each of the levels taught.

In the English V level, which is part of this analysis, the teams mentioned decided that the oral examination should be different in the mid-term and the final exams. For the mid-term examination, the teacher should focus on interactive exercises where learners are divided into pairs or three groups. During the face-

to-face year, the teacher and each group selected the group to enter the classroom to choose a situation they would have to create a conversation. To prepare for their examination, each group had a prep time of five minutes. The exams team and the subject coordinators team also designed the corresponding rubrics for this exam, seen in Appendix 2. During the ERT, the groups were randomly selected by the groups section of the Zoom application. Each group was assigned a situation for them to prepare, for five minutes, what they were going to discuss. This interaction was also graded using the same rubric mentioned before.

For the final exam, the exams team designed another type of activity. For the last examination, students had to work in groups of four, and they had to prepare and give a presentation about a topic they, as a group, had chosen. For this presentation, each student had to speak for a minimum of one minute and a maximum of two minutes. So, each presentation would last anywhere between four and eight minutes, after which a round of questions, one for each member of the group, would follow. Again, the exams team and the subject coordinators team also designed the corresponding rubrics for this exam, as shown in Appendix 3. The same procedure occurred during the ERT.

3.3.2. The writing section

Students must work on writing a five-paragraph essay for the writing section of the exam. For this task, they have one hour, and they do this task one week before the exam takes place. The questions for this section are adapted from the TOEFL independent essay question provided for practice on https://www.toeflresources.com/sample-toefl-essays/. This task is done for both the mid-term and the final exam. The writing section has been done for academic years 2019 with face-to-face instruction and 2020 with the ERT. This activity is graded using the Exams Team and the Subject Coordinators Team's rubrics furnished, as shown in Appendix 4.

3.4 Data Analysis

The first analysis performed on the data gathered was a chi-square using SPSS to determine whether there was a statistically significant difference in grade distribution between the students who received class face-to-face and those who received class using the ERT. The chi-square calculation is useful when making these types of comparisons as it allows researchers to identify the relationship between the teaching modality and students' performance. In addition, the chi-square provides a numerical result that can be used to conclude if there is a statistically significant difference between the teaching modes (Paul and Jefferson, 2019).

The chi-square returned a statistical model that fits the observations entered. Since the p-value obtained is > α, it can be said that the null hypothesis is accepted. Also, evidence is not enough to suggest an association between the grade results of 2020 and 2021. The chi-square statistics returned an χ^2 at 0.02408. It can be accepted that this figure has a -∞ : 3.8415, which is in the 95% region of acceptance. The p-value obtained by the chi-square comes to .848698; this result is not statistically significant at p< .05. Furthermore, the chi-square statistic with Yates's correction is 0.0253, with a p-value of .873682, which concurs that the results are not statistically significant at p < .05. The observed effect size of phi, calculated with $\Phi=\sqrt{(\chi^2/n)}$, is small, at 0.026, meaning that Cramer's V effect size comes to 0.026, indicating the magnitude of the difference between the observed data and the expected data is small.

A paired t-test using T distribution (df=11), two-tailed, was performed to answer the second research question. For this analysis, the average of the Face-to-Face vs. ERT population is assumed to be equal to the μ0. In other words, the difference between the average of Face-Face vs. ERT and the μ0 is not big enough to be statistically significant. The p-value obtained equals 0.8592, ($p(x \leq T) = 0.4296$). This result means that the chance of type I error, rejecting a correct H_0, is too high: 0.8592 (85.92%). Meanwhile, the test statistic T equals -0.1816, is in the 95% acceptance region: [-2.201 : 2.201]. x=-1.83, is in the 95% region of acceptance: [-22.2253 : 22.2253]. The standard deviation of the difference, S' equals 10.098, is used to calculate the statistic. The observed effect size d is small, 0.052. This figure indicates that the magnitude of the difference between the average and μ0 is small.

A two-sample ANOVA - fixed test using F distribution (right-tailed) was performed to analyze the data further and confirm the results. First, the H_0 hypothesis was analyzed, and the p-value obtained was > α, meaning the H_0 cannot be rejected. Also, the results obtained explained that the averages of all groups assumed as equal; in other words, the difference between all groups' averages is not big enough to be statistically significant. A non-significance result cannot prove that H_0 is correct, only that the null assumption cannot be rejected. The p-value obtained in the calculations equals 0.6894, ($p(x \leq 0.1848) = 0.3106$). The result obtained means that the chance of type I error, rejecting a correct H_0, is too high, standing at 0.6894 (68.94%). The larger the p-value is, the more it supports the H_0. The test statistics FA equals 0.1848, which is in the 95% acceptance region: [-∞ : 7.7086]. Finally, the observed effect size η2 is small, standing at 0.044. Such a result indicates that the magnitude of the difference between the averages is small. Results of the ANOVA test are presented in table 2.

Additional tests were carried out to validate the results of the test performed. First, the Tukey Fence test was done. This statistics test allows investigators to determine between the various pairs of means - if any of them - there is a significant difference. For this study, the Tukey Fence test returned a k=15 to detect outliers, and the test resulted in an F = 83.56672. The F statistic serves researchers to identify whether there is an overall difference between the input sample means. The results (as depicted in table 3) show that the residuals do not contain outliers, meaning that the two-way ANOVA test is robust to the presence of outliers.

Table 2. Tukey Fence test results

Source	SS	df	MS
Between-treatments	761.7813	3	253.9271
Within-treatments	2230.3434	734	3.0386
Total	**2992.1247**	**737**	

A Shapiro-Wilk Test (α=0.05) was then run. It is assumed that the residuals follow a normal distribution (p-value is 0.1699). Therefore, the Shapiro-Wilk test may not identify a deviation from the normal distribution, or more accurately, the normality assumption cannot be rejected. Finally, a test power was done on 2019, 2020, and the factors' interaction. These three factors resulted in a low priori power (0.1952); hence the test may not reject an incorrect H0. In conclusion, it can be said that the design is balanced. Table 2 shows a summary of the calculations performed. The ANOVA results show there is no significant difference in performance between online and F2F students concerning the skill studied.

Table 3. Summary of ANOVA calculations

	2019	2020	Total
N	188	196	**384**
Average			
Speaking	34.5	34.5	**34.5**
Writing	43,5	21	**32.25**
Total	**39**	**27.75**	**33.375**
Variance			
Speaking	1404.5	1404.5	**936.3333**
Writing	2380.5	288	**1058.25**
Std. Deviation			
Speaking	2.1263	1.4858	
Writing	1.4826	1.803	**2.0149**
Mean			
Speaking	6.2308	6.3189	
Writing	8.6432	7.7849	**7.249**
Mean confidence interval (CL:0.95)			
Speaking	[-17.439,86.439]	[-17.439,86.439]	**[-17.439,86.439]**
Writing	[-24.1188,111.118]	[-2.5196,44.5196]	**[-22.967,87.467]**
Differential effects			
Speaking	-5.625	5.625	**1.125**
Writing	5.625	-5.625	**-1.125**

Results And Discussion

The research sub-question 1 (RQ1) asked whether there are significant differences in students' academic performance as a function of the different teaching methods. This question was answered with the chi-square calculation, which reported the p-value at .848698, which is not statistically significant at p<.05. Furthermore, the chi-square statistic with Yates's correction is 0.0253, with a p-value of .873682, which concurs that the results are not statistically significant at p < .05. Therefore, there is insufficient statistical evidence to say there is a substantial difference in students' performance from the academic year 2019 when face-to-face classes were in course and the results from the academic year 2020. These results are supported by similar studies done by Johnson, Aragon, and Shaik (2000), Dell, Low, and Wilker (2010), Paul and Jefferson (2019), and Hodges et al. (2020).

The research sub-question 2 (RQ2) wanted to know if significant differences exist in students' performance in an English course regarding productive skills. Table 4 shows the means and standard deviation for both students who took their classes in the face-to-face teaching mode and those who, due to the COVID-19 outbreak, had to take classes under the ERT teaching modality. The researcher used a two-way ANOVA to test this hypothesis, which is a valuable tool because it assesses the differences between multiple means generating a broader picture of average differences.

Table 4. Mean and Standard Deviation for Academic years 2019 and 2020

	2019		2020	
	Listening	Writing	Listening	Writing
SD	1.34454	2.12627	1.75411	1.14506
Mean	7.52	9.78	8.61	9.73

The ANOVA test for this hypothesis resulted that the difference between the average of Face-Face vs. ERT is not big enough to be statistically significant. As a result, the null hypothesis must be accepted, and the alternative hypothesis must be rejected. The results obtained in the ANOVA test show no significant differences in student performance between face-to-face and ERT teaching modalities concerning students' productive skills. These results are supported by Johnson, Aragon, and Shaik (2000), Dell, Low, and Wilker (2010), Paul and Jefferson (2019), and Nae (2020) and their studies on the differences between online and face-to-face instruction.

Although results have demonstrated that differences in performance in the productive skills analyzed are not significantly different, it is necessary to attempt an analysis of the reasons for these results.

The first issue that seems worth looking at is that even though learners spent all their time at home, meaning they could have spend more time devoted to their learning, which did not occur. Learners appear to be more concerned about just being present during the Zoom classes. However, they know that as a university policy, attendance will not be considered part of their grade during the time of digital courses. As a result, they are more easily distracted than when classes where on campus.

Estrella (2021) identified that students experience many types of distractions during digital classes, being the most common and distracting, the moment when their relatives, with whom they share the household, walk by the location they are using for their classes start talking to them. As a result, they stop paying attention to the class and get lost in their conversations with their relatives. In the same vein, learners confided that they do not want to lose track of the class most of the time, but they feel they are not polite if they just dismiss the relative's conversation. Finally, respondents said that being connected through the computer or cellphone is very easy for them to access their social networks or messaging and get distracted by them (Estrella, 2021).

On a personal note, it seems that teachers have reduced the level of rigor during the COVID-19 pandemic. Furthermore, as learners have a series of difficulties, especially economic ones, they cannot have good access to the Internet because of the high prices they need to pay to have medium service, considering this issue as well as other personal problems learners present, teachers are required to raise their levels of empathy with every single problem students have. Thus, it seems that the strictness levels have had to be reduced.

Conclusions

This research aimed to identify if the emergency remote teaching method (ERT), due to the lockdown established because of the COVID-19 outbreak, had any significant difference in students' performance compared to the face-to-face instruction. The results of this study go further from existing literature, which does not contain much information about higher education students' academic performance during the pandemic. This research compares summative evaluations from two semesters before the COVID-19 pandemic and two semesters during the pandemic of learners of English as a foreign language in an Ecuadorian higher education institution. The study's results confirm what researchers like Johnson, Aragon, and Shaik (2000), Bernard et al. (2004), Means et al. (2009), and Dell, Low, and Wilker (2010) had reported. The medium through which the English classes are imparted, whether face-to-face or emergency remote teaching, is not as important as the instructional strategies utilized. The comparisons made were based on consistent instruction and interaction patterns set by the instructor. However, the basis for the comparisons made in this study did not look at instructional differences but the instruction format. It can then be said that the differences in students' performance were very little no matter the instruction mode in which the class was given.

There certainly are limitations to this study mainly because the researcher did not consider the actual level of the students' skills as it was not possible, nor was it the study's intention. However, it is not far from the truth that there is a chance that the students who took English V during the 2019 academic year (face-to-face classes) could have performed better than the group of students who did the class in the 2020 academic year and vice versa. Also, it is necessary to pin down the fact that nobody was ready for the lockdown and the quick instauration of the ERT (Nae, 2020). Therefore, students were well-versed in traditional classroom settings. However, they were obliged to take online courses, which must have a daunting effect on those who are not tech-savvy or whose Internet connection is not as good as it should be. Moreover, they are not experienced enough in e-learning which can lead to bad scores.

As new lines for research, it is suggested that the issue be analyzed further using qualitative methods and investigate what students and teachers think about the usefulness of online classes and whether they believe they have learned more during the face-to-face classes or the ERT.

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Declarations

1. Conflict of Interest

☐Potential conflict of interest exists:

I wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.

2. Funding

No funding was received for this work.

3. Intellectual Property

I confirm that I have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing I confirm that I have followed the regulations of our institutions concerning intellectual property.

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I further confirm that any aspect of the work covered in this manuscript that has involved human participants has been conducted with the ethical approval of all relevant bodies and that such approvals are acknowledged within the manuscript.

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