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STUDENTS' ANXIETY IN FOREIGN LANGUAGE LEARNING ENVIRONMENTS: ONLINE VERSUS ON-SITE CLASSROOMS

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Abstract
As the world continued to grapple with the pandemic of COVID-19, Algerian universities had enforced a transition to a blended teaching approach, requiring both teachers and students to adapt. Accordingly, third-year Licence chemistry students received online and on-site lectures among which English for Specific Purposes lectures. This sudden transition from face-to-face to online teaching had an effect on university students namely at the emotional level which led this research to investigate the impact of both modes of course delivery on students' affective filter specifically anxiety. A correlational research design was used to understand the relationship between anxiety and the learning environment. Two anxiety tests on online and on-site learning were administered to 16 chemistry students receiving English for Specific Purposes courses. Thus, the current research findings revealed that there is no significant difference in the students' levels of anxiety whether learning online or in the traditional classroom. These findings necessitate future implications of applying practical techniques and strategies to reduce anxiety in both learning environments to create a suitable and supportive atmosphere that works for better comprehensible input for university students.

Keywords: affective filter, anxiety, blended learning, English for specific purposes, learning environment

Introduction
Despite the challenges imposed by the pandemic, it promoted the usefulness of digital technologies all over the globe. Indeed, teachers were encouraged to be "Open-mindedness and increase their motivation to adapt to the new teaching setting that focuses on an online system, encouraging students' positive attitude and learning motivation" (Tanjung, 2022, p. 360). Since the shift to the blended and online teaching and learning prioritized students and teachers' safety and attention, desire to it has been more than recommended. Lorenzo (2005) described

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ESP students as being "Adults who already have some knowledge of English and are studying the language to convey a range of technical skills and conduct basic job-related functions." As cited in (Farahsani & Harmanto, 2022, p. 639). In fact, the ESP module in the Department of Chemistry at the University of Sidi-Bel-Abbes (Algeria) relied on a blended teaching where students took the advantages of online courses and attending in-person classrooms. Similarly, both classes targeted reduced levels of anxiety in order to support the learning atmosphere and enhance the students' understanding.

The American linguist Stephen Krashen worked on a hypothesis, which is built based on two main interrelated aspects, students' understanding and their affective filter. In other words, when students feel motivated, confident and less stressed, their affective filter would be lowered and it would allow them to receive the course input effortlessly. However, if these students encountered many psychological obstacles as high anxiety joined with low levels of motivation and confidence, the input will be blocked. (Krashen, 1982)

Hence, it is essential to take into account this theory in order to establish a calm atmosphere for language learners to enhance their understanding. Whether the learning setting is virtual or physical, reducing stress has caught the attention of many scholars who have established effective methods and approaches for educators and learners to minimize anxiety levels. This facilitates the absorption of information, as evidenced by the findings of Young's (1991) study.

Therefore, the aim of this study is to explore the relationship between students' anxiety levels in relation to the learning atmosphere in both of virtual and traditional classrooms. The objective is to identify the optimal learning environment that offers ESP students a clearer and an easier-to-understand educational experience with the least levels of anxiety. Furthermore, whether the class is on-site or online, the teaching techniques and strategies can make a difference in the students' levels of anxiety. Accordingly, (Horwitz, 1986. p.131) suggested two main techniques that work for a less provoking foreign language learning environment "1) They can help them to cope with their existing anxiety-provoking situation, or 2) they can make the learning context less stressful". Hence, the latter implications are the focus of the current paper applied by the teacher in both environments.

Literature Review

In the field of second and foreign language learning, the linguist Stephen Krashen worked on five main hypotheses, which are acquisition-learning, natural order, monitor, input, and affective filter hypothesis (Raju & Joshith, 2019, p.43). These hypotheses explain and describe the way learning and acquisition take place. Hence, teachers are provided with clearer images of the whole learning process, which facilitate for them to choose the most convenient methods and techniques for their learners. A common agreement lies on the fact that Krashen's hypothesis of the affective filter plays a key role in facilitating language acquisition. According to (Du, 2009, p.164) "The ignorance of the relationship between the students' affective factors and their learning will have negative influence on the teaching and learning effect. So, only teachers pay attention to the role of the students' affect in L2 teaching can the learning effect be guaranteed". Besides, these psychological factors are the reason behind either the

success or failure of learning. Indeed, (Fehrenbach, 2020) said, "The affective filter is a mechanism that effectively allows or prohibits language input". As cited in (Yuhui & Sen, 2015)

According to (Krashen's, 1982) hypothesis, the affective filter has two directions. On the one hand, it allows the input in case the learner's psychology is helpful including high motivation and self-confidence with low levels of anxiety. On the other hand, if a learner is facing psychological barriers like high anxiety joined with low levels of motivation and confidence, the input will be blocked. Similarly, (Ahdab, 2016, p. 121) explains, "The affective filter can be raised or reduced according to the environment that learners are in". Therefore, the learner's psychology is attached to the outside environment, which controls their psychology. Indeed, the present study is interested in measuring students' anxiety in two learning environments, the on-site and the online, especially for the online class that has gained the ground due to the COVID-19.

Learning has been implemented as a web-based learning accessible via many resources formats that are not limited to a particular place or time as explained by (Javed *et. al.* 2014, p. 448) "It can be an efficient way of delivering course materials and the resources can be made available from any location and at any time, potential for widening access". However, it has been noticed by many researchers that online learning affects students' emotions and consequently their affective filter such as the works of (Camacho-Zu~niga, 2021) and (Gallardo & Matts, 2021). The present study will focus on one of the factors of the affective filter, anxiety, which at a high level may constitute a major obstacle to second or foreign language learning.

Anxiety caught the interest of many researchers who examined it in the field of second/foreign language learning. For instance, (Zhneg, 2008, p. 8) reveals its reasons and results. He believes "It is indeed a central emotional construct that is essential in influencing second/foreign language learning". A similar work affirms that the fewer students are stressed the more understanding they receive (Esmaeeli, 2023). On the contrary, if those students are anxious, their input will be limited and insufficient.

Indeed, anxiety is an important factor in any language classroom. (Horwitz, Horwitz & Cope, 1991) define it as "A distinct complex of self-perceptions, beliefs, feelings, and behaviors related to classroom language learning arising from the uniqueness of the language learning process". As cited in (Zhneg, 2008, p. 2). In other words, it is a negative psychological state that takes place whenever the learner is exposed to a foreign language learning environment. According to Nishar's investigation findings, the main causes behind the students' anxiety in the classroom were their negative expectations about both their ability to comprehend the teacher and themselves if compared to their peers (Nishar, 2018). Furthermore, (Alnuzaili & Uddin, 2020, p.270) list several reasons that may cause this emotional state:

> The problem of anxiety of learners in an FL classroom can be due to many factors as previous studies concluded such as test anxiety, strict classroom environment, cultural background, interference of the mother tongue, fear of negative evaluation, perfectionist tendency, learners' stylistic preferences, personality traits, and learners' linguistic capacity.

If anxiety is linked to the learning environment, previous works have investigated the impact of online and on-site classes on students' anxiety some studies were for implementing virtual classes for a reduced anxiety such as Russell's (2020, p.2) work. It suggested some practical strategies that would work for reducing students' learning anxiety by "Helping online language learners feel less isolated, less anxious, and more connected to their teacher and to their peers". Nonetheless, other researches such as (Young, 1991), focused on "Creating a Low-Anxiety Classroom Environment: What Does Language Anxiety Research Suggest?" raised both, the idea that anxiety exists in the on-site class and there are reliable strategies and techniques to reduce it.

Therefore, it would be interesting to see how both online and on-site learning environments affect students' anxiety, consequently the affective filter, and the student's ability to receive comprehensible input.

Method

The current study was carried out in the Department of Chemistry of Djillali Liabes University of Sidi-Bel-Abbes. Examining the relationship between anxiety in both of online and traditional classrooms, the study's goal is to find out how the learning environment affected third-year chemistry students' anxiety during ESP courses. Hence, it provides an answer to the following research question: What is the least anxiety-provoking environment for chemistry students when learning ESP?

The purpose of this study is to investigate the link between two variables: learners' anxiety and the learning environments. Thus, a blended learning environment took place in which students' anxiety in the online semester has been measured and compared to their on-site anxiety levels to extract the most relaxing one. To make it possible, a correlational research design was used. This design is described as "A correlational study seeks to ascertain relationships between two or more variables. Simply put, does an increase or decrease in one variable correspond to an increase or decrease in another variable?" (Tan, 2014. p. 269).

Sample Population

This study focused on ESP courses and involved 16 students as research participants who were chemistry students in their third year at Djillali Liabes University of Sidi-Bel-Abbes in Algeria. The participants were adults aged 20 to 23 years old, all specializing in the field of chemistry precisely Fundamental chemistry. This sample accepted to take part and contribute to the research by answering two online tests through Google Forms.

Instruments

A group of sixteen students took two anxiety tests in order to examine how both learning environments, online and face-to-face classes, affected their levels of anxiety while learning English for Specific Purposes (ESP). The two tests, anxiety test one and anxiety test two, were adapted from Gardner's Attitude/Motivation Test Battery (AMTB) model (2004). Both tests included 13 questions, open-ended and close-ended one. The former type of questions were used to gather explanations and details about their attitudes and reactions. However, the second form of questions, the close-ended ones, intended to measure students' positions from (1), strongly disagree, to (6), strongly agree,

about various aspects related to their psychology precisely anxiety in both environments.

Anxiety Test One

After attending an online semester via Udemy platform, a group of 16 students in the academic year 2021/2022 completed the Anxiety Test One (AT1). This test was specifically designed to assess the level of anxiety experienced by students in the online class.

Anxiety Test Two

The second administration of the Anxiety Test Two (AT2) occurred with the same group of participants at the end of the second semester's on-site sessions. Its objective was to measure the anxiety levels of students within the traditional classroom.

Research Procedure

During the academic year 2021-2022, our research was conducted through a blended mode of teaching. The students received their ESP courses online in the first semester and then attended their on-site classes. Indeed, the first semester courses were delivered via a free platform: Udemy. Whereas, the on-site semester relied on face-to-face courses at the university classrooms and laboratories.

Before designing the syllabus, the teacher conducted Needs Analysis to gathered information about those students' needs, lacks and wants. Accordingly, an e-syllabus that included three units and six main courses has been designed. In each course, students had access to two main videos, a theoretical and a practical one. The course videos were in an asynchronous format, which enabled students to download them and access the visual transcription. In addition to that, all videos possess additional resources such as PDF files, YouTube links, and websites in relation to each course content. The researcher has distributed the Anxiety Test One (AT 1) at the end of the online semester courses.

Because the research was based on a blended learning, students studied the second semester at the university. Moreover, the on-site syllabus was developed in accordance with the online one, matching unit numbers, time and structure. Each face-to face course was joined with resources like handouts, whiteboard usage, allowing students to take part and make experiments. This allowed students to collaborate in pairs and groups, utilizing laboratory resources and chemical substances. The university schedule allocated one hour per week for the English course. At the end of the on-site semester, students accepted to fill the Anxiety Test Two (AT 2) in order to measure their anxiety during these on-site sessions.

Findings and Discussion

The objective of this section is to examine and discuss the results in order to answer this research question and verify its associated hypotheses.

What is the least anxiety-provoking environment for chemistry students when learning ESP?

H1: The online learning environment is the least anxiety-provoking for students.

H0: There is no significant difference between online and on-site learning environments for students' anxiety.

In order to determine whether the hypotheses are valid or not, it is necessary to compare the Mean variable of both cases within the same sample. Additionally, the statistical results rely on the student t-test unilaterally for the same sample, i.e., the student t-test associated with the two-paired sample, which is the most appropriate test for analyzing the data collected from both (AT1) and (AT2) tests.

The tests utilized a scale consisting of 13 anxiety-related items. Both tests were analyzed using SPSS.V.25, where the Standard Deviation and Mean (the average of its components) were calculated for each individual. Indeed, the current research follows the same data analysis method used in the research entitled "Quantitative Analysis of the Foreign Language Anxiety: Chinese and Pakistani Postgraduates in Focus". (Malik, Qin, khan & Ahmed, 2020).

Data Analysis

The findings are presented in two main sections: descriptive statistics and statistical test results. The initial section, descriptive statistics, facilitates the comparison of the Mean for online and on-site classes within the same sample. The latter section, statistical test results, utilizes the Wilcoxon test for each item of anxiety to provide detailed and separate results for the 13 items of anxiety. Additionally, the student t-test unilateral is conducted for the same sample, preceded by a normality test as a prerequisite. Both sets of test results are then compared to the probability value, p-value. Consequently, if the calculated p-value is greater than the 0.05 (5%) significant level, the null hypothesis is accepted.

Descriptive Statistics

The below table displays the overall Mean and the Standard Deviation of anxiety, which is a quantitative variable included in the interval measurement.

Table 1. Descriptive Statistics of Anxiety Scale

	Mean	Q1	Median	Q3	Std-Dev	Min	Max
Online Semester	4,2067	3,635	4,1154	4,807	0,666	3,23	5,46
On-site Semester	3,9231	3,692	3,8077	4,327	0,14	3	5

Q1: First quartile: One-quarter of the population: 25 %
Median: Two quarters of the population: 50%
Q3: Third quartile: Three-quarters of the population: 75 %

The descriptive statistics showed that on the one hand, in the online semester, the Mean was 'Slightly Agree' which is 4,2. Hence, students were generally comfortable and less stressed. Besides, the majority of students (75%) were described as 'Moderately Agree' as shown by the third quartile (Q3 = 4,8). On the other hand, in the on-site semester, there was no significant difference in students' levels of anxiety in comparison to the online semester because the Mean was within 'Slightly Agree' (Mean = 3.9), and 75% of students were considered as 'Slightly Agree' (Q3= 4.3). Consequently, the difference between the two Means was 0.284, which did not seem to be a significant difference. As a result, the difference would be checked via the t-test.

The Standard Deviation results, in comparison to the Means of online semester = 4.2067 and on-site one= 3.9231, was seemed insignificant. This

suggests that there is minimal variation among the participants in terms of their anxiety levels. Consequently, the findings from both groups imply that the sample is consistent and homogeneous.

Statistical Tests Results

The statistical test results included the results of three tests. Firstly, the normality test was applied via the Kolmogorov-Smirnov test and the Shapiro-Wilk test as requirements. Secondly, Wilcoxon test results for each item of the anxiety scale was used to gather details about each item separately. Finally, a t-test took place to compare the students' overall anxiety levels in both classes.

Normality Tests

The t-test was a parametric test that required the normal distribution of the data subject. It is done using both the Kolmogorov-Smirnov test and Shapiro-Wilk test because the participants' number was sixteen. The below table shows the two tests' results.

Table 2. Normality Tests for Anxiety Scale

	Kolmogorov-Smirnov test		Shapiro-Wilk test	
	K-S statistic	p-value	S-W statistic	p-value
Online Semester	0,119	0,2	0,956	0,596
On-site Semester	0,18	0,178	0,931	0,254

Table 2 displays that the p-value is greater than the 5% significant level in both tests, which means that anxiety is naturally distributed in both of the online and on-site classes.

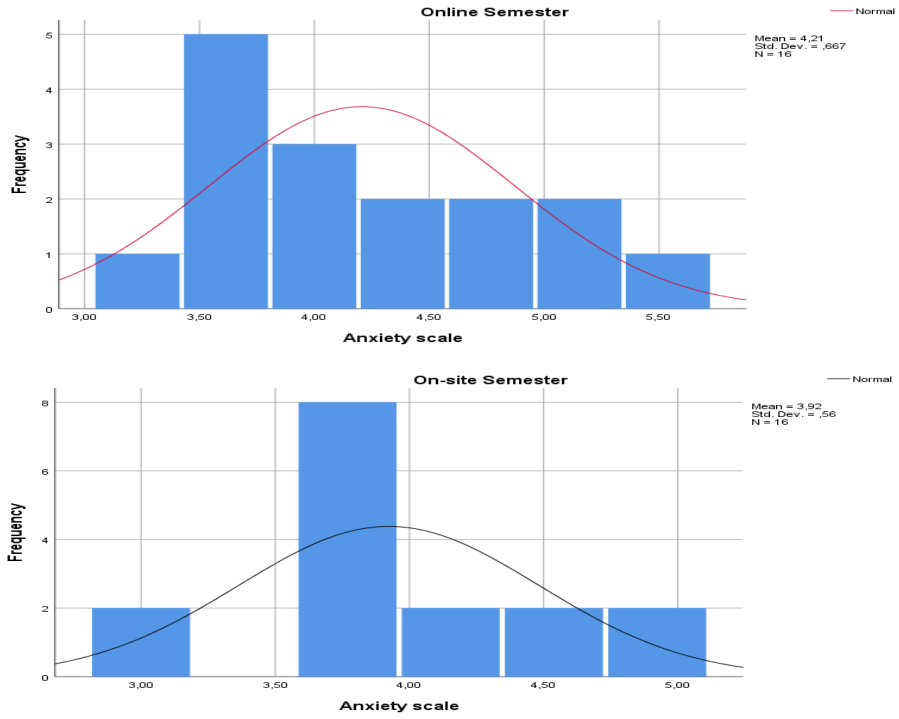


Figure 1. Histogramme of Anxiety Scale

The latter results are also supported by the figure representation of the probability distribution (see Figure 01), which indicates a symmetrical distribution

centred on their mean. In other words, the student's anxiety in the online class corresponds to the level of anxiety felt in the on-site class.

Wilcoxon Test for Each Item of the Anxiety Scale

The anxiety test consisted of components that were represented by numbers ranging from 1, strongly disagree, to 6, strongly agree. To determine the students' anxiety levels, the most suitable statistical test used was the Wilcoxon signed-rank test for paired samples. This test examined each item of anxiety individually, as shown in table 3.

Table 3. Wilcoxon Test Results for Each Item of the Anxiety Scale

	Online vs On-site		Decision
	W-statistic	p-value (One-tailed test)	
Item1	-0,995	0,16	No difference
Item2	- 0,945	0,172	No difference
Item3	-2,603	0,0045	Online
Item4	-1,724	0,0425	Online
Item5	-0,392	0,3475	No difference
Item6	-1,835	0,033	Online
Item7	-0,669	0,2515	No difference
Item8	-0,933	0,1755	No difference
Item9	-2,374	0,009	Online
Item10	-0,464	0,3215	No difference
Item11	-0,221	0,4125	No difference
Item12	-2,349	0,0095	Online
Item13	-2,172	0,015	Online

No difference: the null hypothesis is accepted
Online: the null hypothesis is rejected at a 5% level of significance

As table 03 displays, there is no significant difference in students' levels of anxiety for the elements: 1, 2, 5, 7, 8, 10, and 11, whilst for elements: 3, 4, 6, 9, 12, and 13 the results show that students are more comfortable and less anxious when learning virtually in comparison to the classroom at a significance level of 5%. These findings are also proved by the open-ended question which searched for the aspects that made them calm including their ability to control most of their learning aspects: suitable timing for each one, any location, even in France for those who got a scholarship. Besides, the ability to control the speed of the course depending on each learner's understanding abilities. Moreover, avoiding embarrassment using comments was beneficial for shy learners. Finally, students found it relaxing to study at home, which was described as calm and secure. This made it less stress-provoking environment. These findings are further supported by the last open-ended question in AT1 (see Appendix 01) which reveals that 81.25 % of them had a positive attitude toward being taught online in the future.

T-test Results

The bellow table displays the findings of the paired samples t-test, which was conducted to compare the Mean of the students' anxiety in both semesters. This became possible after the approval of the normal distribution requirement. As the results of the t-test display, the p-value probability value is greater than the 5% (0.05) significance level, which means that the null hypothesis is accepted and proved.

Table 4. Paired T-test Results

	Mean	Std. dev	95% Confidence Interval		t-statistic	df	p-value (One-tailed)
			Lower	Upper			
Mean Difference	0,28365	0,88231	- 0,1865	0,75381	1,286	15	0,109

Thereby, the difference between the two Means has no significant difference at the level of 5%. Consequently, learning on-site or online did not affect the students' levels of anxiety. Moreover, the last open-ended question of (AT2), selecting the least anxiety-provoking environment, proves the same results in which the highest selection was, 31.25%, for those who believed that both classes are equally stress-provoking environments. However, 25% considered that none of them was stress-provoking. Besides, 25% of them selected the on-site class as the least anxiety-provoking. Whilst, 18.75 % of them selected the online class over the on-site one.

Findings and Interpretation

By comparing the Mean of anxiety levels in online and on-site classes, two test results were obtained. These findings were then used to determine the students' anxiety levels in both learning environments, using descriptive statistics and statistical tests.

Descriptive statistics compared the Mean of each class where the online Mean is 4,2 and the Mean of the on-site class is found 3,9. Consequently, there is no significant difference in the students' anxiety in both classes. Likewise for the statistical tests, the student t-test results revealed that there is no significant difference in both ways of delivering ESP courses regarding the aspect of anxiety because the p-value (probability value) is higher than 5%, which is a significant level. Therefore, the null hypothesis (H0) is accepted. Besides, the Mean of anxiety in both cases can be described as 'Slightly Agree'. Moreover, the last open-ended question of (AT2), see appendix 02, indicates that more than half of the sample population (56.25%) believed that there is no significant difference between the two learning environments.

Conclusion

Due to the pandemic of COVID-19, online technologies has spotted the educational ground and gained attention of many scholars, teachers and researches including the current one. It targets revealing the correlation between the learning environment, online and on-site classes, and students' affective filter precisely

anxiety. Hence, the findings indicate that anxiety was present among students in both learning environments where some students were anxious in both ways of learning, while others were not stressed in either classes.

Thus, anxiety is a psychological factor that has been present in both foreign language learning classes equally and the students' levels of anxiety in the online class did not differ from the on-site one. As the results suggest, both descriptive statistics and statistical test results revealed that the two learning environments, online and on-site classes, have the same impact on learner's anxiety.

Accordingly, what will affect the students' anxiety positively whether online or on-site are the implemented classroom techniques and strategies. In the current research, the ESP teacher targeted the latter objective in the online class by providing the students with a large number of opportunities that work for their understanding abilities, easiness and a better psychological state, which lowers anxiety in parallel. For the teacher's on-site classroom strategies, encouraging group work and pair work was effective. In addition, the teacher's intentional motivational verbal and nonverbal communication joined with less direct and public criticism.

The research concluded that these strategies and techniques influenced the current research results positively in both classes. Among the current paper's limitations, the research timeframe that lasted only six months, which was divided into three months for each semester. Also, there was a limited number of participants. The latter is drawn as a meaningful suggestion for future papers for the sake of expanding the sample. Moreover, other aspects included in Krashen's affective filter hypothesis as motivation and confidence can be studied in future works.

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Appendices

Appendix 01: Anxiety Test One (AT1)

Dear third year chemistry students,

This test is a part of a research that targets detecting the effects of online learning on your anxiety. I would be thankful if you respond to the suggested questions. Please, tick the answer that you feel more relevant to you, or give a full answer when required.

1. Complete the table using '✓' when appropriate.

Expressions	SD	MD	SD	SA	MA	SA
1. I do not feel pressure if I have to speak in my online class.						
2. I do not feel pressure if I have to write in my online class.						
3. I do not feel pressure if I have to listen in my online class.						
4. I do not feel pressure if I have to read in my online class.						
5. I feel less worried when I use Udemy.						
6. In the online class, I do not focus with the course and I find myself thinking about things that have nothing to do with the course.						
7. Being unrestricted by the online course timing makes me confused.						
8. I feel more tense and confused when being responsible about my learning.						
9. I do not feel anxious when I have to comment using written comments.						
10. I do not get nervous and confused when I am virtually present in class.						
11. I feel uncomfortable when I have to fix technical problems: mail, "Udemy" platform or account.						
12. I do not feel stressed when studying in my environment, home.						
13. I am at ease when doing an online exam on Testmoz.						

(SD= Strongly Disagree, MD= Moderately Disagree, SD= Slightly Disagree, SA= Strongly Agree, MA= Moderately Agree, SA= Strongly Agree)

2. The aspects that made me feel stressed during the online session were:.....
3. The aspects that made me feel calm during the online session were:.....
4. Would you like to be taught online in the future? *Yes *No
Justify…….

Participation noted with thanks

Appendix 02: Anxiety Test Two (AT2)

Dear third year Fundamental chemistry students,

The present test is a part of a research that targets detecting the effects of traditional classroom on your anxiety. I would be thankful if you respond to the suggested questions. Please, tick the answer that you feel more relevant to you, or give a full answer when required.

Expressions	SD	MD	SD	SA	MA	SA
1. I do not feel pressure if I have to speak in my traditional class.						
2. I do not feel pressure if I have to write in my traditional class.						
3. I do not feel pressure if I have to listen in my traditional class.						
4. I do not feel pressure if I have to read in my traditional class.						
5. I do not worry about learning English in the classroom at the university.						
6. In the traditional class, I do not ignored classmates' distractions and I find myself thinking about things that have nothing to do with the course.						
7. Having a limited time in the laboratory and in class makes me confused.						
8. I feel more tense and confused when being fully guided by the teacher.						
9. I am afraid that other students will laugh at me if I participate.						
10. I do not get nervous and confused when I am psychically present in class.						
11. I feel uncomfortable when I face these difficulties: unavailability of laboratories and lack of materials.						
12. I feel stressed when I face imposed timetable and punctuality problems.						
13. I am at ease when doing an exam in class.						

1. Complete the table using '✓' when appropriate.

(SD= Strongly Disagree, MD= Moderately Disagree, SD= Slightly Disagree, SA= Strongly Agree, MA= Moderately Agree, SA= Strongly Agree)

2. The aspects that made me feel stressed during the on-site session were:.....
3. The aspects that made me feel calm during the on-site session were: .....
4. If you compare online to on-site classes, which ones made you feel more anxious? * Online class * On-site class * Both *None
Justify……

Participation noted with thanks