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HOW ANXIOUS ARE ONLINE ESP LEARNERS? EXPLORING STUDENTS' ANXIETY IN VIDEO, AUDIO AND TEXT-BASED COMMUNICATION IN AN ONLINE CLASSROOM

Abstract

This study examines the level of anxiety students experience during ESP university classes in response to three different modalities of digital classroom environments, i.e., virtual classrooms which require participation in varying degrees of engagement – by means of video, audio and text-based interaction. In a cross-sectional survey, a total of 184 ESP students at four different faculties completed a modified version of the Situational Communication Apprehension Measure (SCAM, McCroskey & Richmond, 1985) which aimed to determine the level of anxiety the students report feeling during video, audio and text-based synchronous online ESP classes. The main results indicate that the highest levels of anxiety were found with classroom contexts where students took part in lessons by means of a camera, with somewhat lower levels of anxiety found in contexts where students used the microphone to communicate with the language instructor and the other students. We propose that the main reasons behind these results lie in the overwhelming amount of visual and audio cues students are exposed to during online lessons, in particular the issues regarding gaze, the mirror effect, and dissonance of being physically present in one environment and mentally in another.

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Key words

foreign language anxiety, online classroom, multimodality of communication, ESP, university students.

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1. INTRODUCTION

Although online learning has been part of educational practices and research for quite a while, it seems that it became a hot issue only recently, due to the Covid 19 crisis. While online learning comes in many forms and places different expectations on students related to their engagement in this learning context, in this paper we consider a specific type of online learning that is planned and organized so that it virtually replaces the physical classroom and is carried out synchronously. The theoretical basis for analyzing these virtual classrooms is afforded in the view of institutional genres of academic discourse which treats traditional classroom communication (e.g., lectures, seminars, presentations) as a specific class of classroom genres (Fortanet, 2005). In its bid to emulate aspects of traditional classrooms in a digital setting, the online classroom becomes an extension of the traditional classroom genre. If we are to consider that “[...] a genre is socially constructed and intimately related to the social context in which it is situated” (Xia, 2020: 142), i.e., that it is characterized by its purpose, audience and tone, in the classroom of English for Specific Purposes (ESP) the digital genre refers to different modes of online communication that can facilitate the development of foreign language skills and content knowledge. Digital genres exhibit new opportunities for multimodality, hypertext, and interactivity (Hafner, 2019), so that online lessons can rely on various synchronous and asynchronous approaches for engaging students in activities, whereas the multimodality of this learning environment allows interaction in three channels of communication: as video, audio or text-based communication.

However, in spite of a number of benefits offered by the digital learning environment, there have also been reports of online students facing certain challenges, such as isolation, lack of self-discipline and technical literacy (Kaufmann & Vallade, 2020). Language learning is tightly connected to the affective domain and foreign language anxiety (FLA), defined as a situation-specific anxiety unique to the FL learning context (Horwitz et al., 1986; MacIntyre, 2017), has been extensively documented to significantly hinder the language learning process (Horwitz et al., 1986; MacIntyre & Gardner, 1994). FLA is associated with lower levels of academic achievement, self-perceived proficiency and willingness to communicate (Botes et al., 2020; Dewaele, 2017; Dewaele & Pavelescu, 2019; Horwitz, 2001, 2010; MacIntyre, 2017). This negative effect of language learning anxiety is mainly documented in learning occurring in a conventional, face-to-face classroom. However, in a digital language learning context, literature reports on students’ anxiety have been scarce (Russell, 2020; Wang & Zhang, 2021) and usually failed to address this question in relation to the multimodality of communication, i.e., video, audio or text-based communication. The present paper aims to contribute to filling this research gap by examining ESP students’ (self-reported) level of anxiety in the three modalities of communication in synchronous online learning. Considering that in the 21st century academic activity and communication are mediated by digital

technologies, which enable scholars to engage in new social practices (Albero-Posac & Luzón, 2021), this certainly extending to the domain of teaching, and taking into account evident practical and economical aspects of (attending and delivering) online courses, we believe that online teaching and learning will be more and more dominant in the years to come. As a matter of fact, some forms of technology-supported and mediated lessons, such as flipped classroom, have already been in use and proved efficient (Knežević et al., 2020). It can be assumed that with further technological advances teaching and learning practices will continue to change and evolve into new digital forms. Thus, exploring the students' interactive behavior and their level of anxiety in digital educational context may be beneficial for planning, designing and delivering online ESP courses.

2. FOREIGN LANGUAGE ANXIETY IN TRADITIONAL AND ONLINE CLASSROOMS

In second language acquisition literature, anxiety is recognized as a crucial challenge to language learners (Oteir & Al-Otaibi, 2019). One of the most widely cited definitions of foreign language anxiety is the one offered by Horwitz and associates (Horwitz et al., 1986). These authors define foreign language anxiety 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” (Horwitz et al., 1986: 128). According to them, this anxiety is situation specific and as such distinctive from the anxiety caused by learning other academic subjects. The explanation for this idea lies in the fact that learning a foreign language requires a higher level of self-concept and self-expression than learning any other subject, supporting thus the view of foreign language anxiety being a unique type of anxiety. These researchers have also identified three primary sources of foreign language anxiety, namely, fear of negative evaluation, test anxiety and communication apprehension (Horwitz et al., 1986). Communication apprehension, defined as “the fear or anxiety an individual experiences as a result of either real or anticipated communication with another individual or group of people” (McCroskey, 2006: 40), has widely been examined in the context of foreign language learning and speaking has been reported as the most anxiety-provoking language skill (Boonkit, 2010). Apart from communication apprehension, research into foreign language anxiety has pointed to other anxiety-causing factors, such as gender, academic achievement, previous experience in foreign language learning and willingness to communicate (Radić-Bojanić & Topalov, 2021). Contextual factors such as the learning environment have also proved to affect the students' level of anxiety (Luo, 2012). Namely, if the class environment is perceived as uncomfortable, cold and stressful, learning anxiety is more likely to arise among foreign language learners.

Addressing the field of learning languages for specific purposes, more precisely learning ESP, research on students' anxiety has not been very extensive.

Investigating anxiety among Spanish university students learning ESP, Amengual-Pizzaro (2018) found that most students suffered from average to high anxiety levels, with communication apprehension appearing as the main source of anxiety. The author also reported significant negative correlations between students' self-perceived English proficiency and the levels of anxiety in speaking and listening skills. On the other hand, in her studies on the reasons for speaking anxiety in ESP classes, Čepon (2016a, 2016b) found that, from the students' point of view, it is actually a lack in the knowledge of the carrier content that provokes speaking anxiety in the context of ESP.

All of the studies addressed above have focused on the examination of anxiety in a physical classroom with eye-to-eye communication situations. Research into foreign language anxiety in an online classroom, as already stated in the introductory part of this paper, has been of a much narrower scope. As pointed out above, anxiety is closely related to environment (Gardner & MacIntyre, 1993) and the network multimedia environment in which online learning takes place is quite different from the traditional, classroom-based environment and as such may affect learners' emotions and cause internet learning anxiety (Wang & Zhang, 2021). Internet learning anxiety is "an emotional response of learners in the learning process under the network environment, which is caused by information overload, various uncertain factors in network learning, and difficulties in the learning process. It is a kind of anxiety phenomenon under specific environmental conditions" (Wang & Zhang, 2021: 3). These conditions, considering the evident lack of empirical reports on this topic, are yet to be explored and described in full. Although not identical, this type of anxiety may be related to so called 'computer anxiety', i.e., "the tendency of individuals to be uneasy, apprehensive, or fearful about current or future use of computers" (Igbaria & Parasuraman, 1989, as cited in Brown et al., 2004: 84). Research into computer anxiety clearly shows that computer anxious individuals are at a significant disadvantage compared to those lacking this fear in computer-mediated communication environments (Brown et al., 2004). Furthermore, communication apprehension can also contribute to internet learning anxiety since the digital learning environment includes teacher-student and/or student-student interaction. However, digital communication has its own specificities and one of them is increased multimodality (Mirović et al., 2019). According to Grewal et al. (2022), multimodality of digital communication encompasses numeric, text, audio, image and video modes of communication. This further implies that unlike in the traditional, physical classroom environment, communication in the synchronous online environment may appear without eye contact, with students interacting using only the microphone, or the text chat option, so what holds true for communication apprehension in a traditional classroom may not extend to the online setting. Finally, it has to be taken into account that, when it comes to learning languages, communication is in a foreign language and this situation, as described in the previous section, provokes additional fear manifested as foreign language anxiety. All these aspects definitely need to be taken into

consideration when analyzing online foreign language anxiety. In the context of the current study, the term 'online foreign language anxiety' refers to the anxiety students experience while interacting in a synchronous language classroom through video, audio or text-based communication.

Although scant, research on online foreign language anxiety has focused on the role of anxiety manifested in the traditional classroom and whether it affects online learners or whether the distance factor makes it easier for these learners to communicate in L2 with less restraint. Thus, Hurd (2007) reports that the distance factor contributes to some marked differences with regard to the nature and extent of language anxiety between classroom and online learners, emphasizing also that for some students this distance factor actually leads to the absence of language learning anxiety. On the other hand, Pichette (2009) reports that there is no difference in anxiety profiles between face-to-face and distance learners. This finding, however, is contradicted by Dogan (2020), who found a positive correlation between the students' foreign language classroom anxiety and their online learning anxiety, suggesting that foreign language classroom anxiety is transferred to the digital environment and affects online language learning. This, however, accounts for merely 30% of online learning anxiety and the remaining 70% are to be contributed to other factors (Dogan, 2020). Russell (2020) claims that a quick transition from traditional to the digital medium of instruction without enough preparation time, as we experienced in the last three years, is also a source of anxiety. Kaisar and Chowdhury (2020) report that the feeling of isolation and network connection problems contribute to students' online language learning anxiety. Wang and Zhang (2021) found that the lack of learning motivation and foreign language learning ability cause anxiety among online language learners. According to Chametzky (2019), a mismatch between learners' expectation and experience and a kind of technophobia felt towards the online learning environment trigger online learning anxiety.

As can be seen from this brief literature review, apart from being scarce, the literature reports on FLA in online classes have also been contradictory and therefore inconclusive. Similarly, the sparsity of reports on anxiety in Language for Specific Purposes (LSP) in the traditional classroom is even more pronounced in online contexts, with no compelling conclusions as to the level and underlying structure of FLA in this setting. This implies that FLA in the LSP context needs to be addressed from various angles and include a broader selection of variables, which opens up a wide space for exploring this phenomenon from diverse perspectives. The present study aims to contribute to this unexplored area by analyzing the presence of FLA in the three channels of communication in synchronous online language learning, as well as by exploring the contribution of certain individual and contextual factors to the students' anxiety. Accordingly, the research questions addressed in the study are the following:

RQ1: What level of anxiety do ESP students report in three modalities of communication in synchronous online learning (with camera and microphone, with microphone only, and using text chat only)?

RQ2: Is there a significant difference in the reported levels of anxiety across the three different ESP classroom contexts?

RQ3: What individual and contextual variables are significant predictors of ESP students' reported levels of anxiety in video, audio and text-based communication during synchronous online learning?

3. METHOD

In order to answer the above research questions, this study employed a survey method with a cross-sectional design. On a random sample of university students, using a reliable instrument (McCroskey & Richmond, 1985), the advantage of the adopted design was that it allowed for statistical estimates of the target population by inferring from the answers of the respondents (Fowler, 2013).

3.1. Participants

The participants in this study were 184 university students aged between 19 and 24 (mean age=20.58, SD=1.62) who, as part of the requirements of their respective study programs, took synchronous online ESP classes during the spring semester of school year 2020-2021 at the University of Novi Sad. It is important to point out that due to the pandemic prevention measures, all participants had only the option of attending online courses in real time, as this was the only mode of lesson delivery allowed at the respected faculties throughout the academic year. The responses were collected at the end of the spring semester, which allowed a substantial amount of time for adapting to the ESP course and online lesson delivery in general. Of the total number of participants 94 were male and 90 were female BA students studying at one of the four faculties shown in Table 1.

	GENDER		TOTAL
	Male	Female	
Faculty of Sciences	27	28	55
Faculty of Education	4	8	12
Faculty of Technical Sciences	23	14	37
Faculty of Economics	40	40	80
TOTAL	94	90	184

Table 1. Gender distribution of participants across faculties

As for the ESP courses taught at the four faculties that were part of this investigation, although oriented toward different areas, they were organized in a similar fashion,

which means that activities usually centered around printed texts, with reading and listening activities first, then followed vocabulary and grammar practice, and finally speaking activities mainly in the form of discussions or role plays. Longer writing tasks were given as assignments and therefore were not part of synchronous lessons. During the classes, the language instructors participated with their cameras on all the time. As for the students, they had the freedom to choose the mode of communication for their interaction with the language instructors and other students, although their language instructors encouraged the use of camera and microphone. All classes were delivered via the platforms Microsoft Teams or Zoom. While the distribution of participants across different faculties varies, proportionately corresponding to the number of students enrolled at the respective faculties, the size of the groups in which students attended online classes remains similar for all four faculties.

Students studying at other faculties at the University of Novi Sad were not part of this research as they did not communicate online in real time with their language instructors and their fellow students during their ESP university classes, but took part in other forms of online classes which were not the focus of this study (completing tasks on learning platforms individually, listening to recorded lectures, making posts in class forum discussions, etc.). All of the study participants reported to have been technically equipped to participate in all three modalities of communication in online lessons.

3.2. Instrument

General and online foreign language anxiety was measured using the shorthand version of the Situational Communication Apprehension Measure (SCAM, McCroskey & Richmond, 1985). Compared to other anxiety measuring instruments, such as the Foreign Language Classroom Anxiety Scale – FLCAS (Horwitz et al., 1986) or the Public Speaking Class Anxiety Scale – PSCAS (Yaikhong & Usaha, 2012), all of which explore a broader classroom context, the current instrument seemed most suitable for this study as it focuses on the situational component of FLA. Conversely, focusing on online learning anxiety, the questionnaire by Alibak et al. (Online Test Anxiety Inventory – OTAI, 2019) addresses apprehensive feelings experienced during testing, which was not included in the scope of this research. At this point it is also necessary to address the fact that since the data for this research were collected (April-May 2021) at least one new questionnaire exploring the factors associated with students' online learning anxiety was developed (Online Learner Anxiety Scale – OLAS, Ritzhaupt et al., 2022). However, although focusing on the construct under investigation and very detailed, the instrument does not address the central issue of the present study, i.e., students' anxiety in relation to the three modalities of online communication. Nevertheless, the inclusion of this questionnaire in the design of the present study, with considerable modifications matching the research questions,

would certainly have improved the overall findings and their implications. Unfortunately, at the time this research was conducted, the reports on affective variables as they relate to online learning contexts, prompted by the transition to online classes, were still being written and, short of attempting to construct a new instrument that would more adequately probe the complexities of online learning anxiety during ESP classes, we decided to rely on a questionnaire that, though it measures more general apprehension, had previously been attested and could easily be modified to test anxiety experienced in particular modalities of online communication.

The original SCAM questionnaire asks the respondents to rate how accurate a statement representing feelings of apprehension/confidence is of themselves relative to a particular situation. In this research, which is part of a larger-scale research investigating a number of additional factors related to students' experiences with online ESP classes, it was necessary to minimize the risk of respondent fatigue. Therefore, the researchers first independently to each other selected ten items from the original questionnaire (five representing feelings of anxiety and apprehension, e.g., 'I feel insecure' and 'I feel uneasy', and five items representing feelings of confidence, e.g., 'I feel peaceful' and 'I feel self-assured') with the aim of compiling a list of items that would be most easily understood by the respondents. A comparison of the three lists revealed a 70% agreement. The remaining selected items that were agreed upon by two researchers were discussed, following which a full agreement was reached. The items were then translated into the Serbian language, after which we asked three English teachers to perform back-translation of the selected items to ensure that they were translated accurately into the Serbian language.

The participants were asked to rate on a 5-point Likert scale the same ten statements in three virtual classroom situations (lessons in which they communicate with the language instructor and other students using the camera, lessons in which the communication is handled using the microphone and, finally, lessons where students communicate with the language instructor and the rest of the group using the chat option). The responses ranged from 1 – 'I strongly disagree' to 5 – 'I strongly agree'. We decided to opt for a 5-point scale rather than a 7-point one used in McCroskey and Richmond (1985) because even though the latter provides more points of discrimination, a relatively large number of response items and a relatively small number of respondents were found to be a good justification to use the 5-point scale, assuming that such a scale would be less confusing for the respondents and would increase response rate. Additionally, the 5-point version of the scale has also been used in previous research (e.g., Kissau et al., 2010).

Exploratory factor analysis (EFA) and Cronbach's alpha (α) were employed to evaluate the construct validity and reliability of the modified questionnaire (see Table 2). First, the five questionnaire items corresponding to feelings of anxiety and apprehension were reverse coded. Second, the normality and factorability of the data were checked with respect to the thresholds recommended by Bartlett (1954), Finch and West (1997) and Kaiser (1974), and found to be acceptable (Skewness <

2, Kurtosis < 2, the Kaiser–Meyer–Olkin index (.936) and Bartlett’s Test of Sphericity ($\chi^2 = 2151.766$; $df = 45$; $p < .000$). Third, EFA was conducted using principal axis factor analysis with varimax rotation on the original 10 questionnaire items. Following the conventions suggested by Hair et al. (1995) (communalities > .5, factor loading > .4, eigenvalues > 1 and the cumulative percentage of variance > 60%), the analysis yielded a single-factor solution accounting for 65.21% of the variance.

Item (I feel...)	FL	h ²
... disturbed (R)	.758	.575
... peaceful	.799	.638
... relaxed	.881	.777
... insecure (R)	.814	.663
... dejected (R)	.767	.588
... satisfied	.846	.716
... uneasy (R)	.828	.686
... unhappy (R)	.673	.553
... self-assured	.806	.649
... good	.881	.777
(R) - reverse coded; FL - factor loading; h ² - communalities		

Table 2. Construct validity of the modified SCAM questionnaire

The reliability of the modified scale in the three different modality contexts is as follows:

1. Online foreign language anxiety using video communication – $\alpha=.939$
2. Online foreign language anxiety using audio communication – $\alpha=.932$
3. Online foreign language anxiety using text-based communication – $\alpha=.909$

The above reported Cronbach’s alphas are generally considered good indicators of a scale’s reliability.

In addition to the response variable of anxiety in three different online classroom contexts, the questionnaire also included the following five predictor variables: 1) being alone in the room during classes (a dichotomous variable with answers ‘yes’ or ‘no’), 2) attendance (a dichotomous variable which took stock of the students’ self-reports on whether they attend classes regularly, with possible answers ‘yes’ and ‘no’), 3) gender, 4) ability to tune out surroundings (a nominal variable with options ‘I find it easy to tune out my surroundings during online lessons’ and ‘I find it difficult to tune out my surroundings during online lessons’), and 5) English language proficiency (students’ self-assessment of their proficiency ranging from 1 – poor, to 5 – excellent). The final version of the questionnaire was prepared in Google forms and distributed online.

3.3. Procedure

Data collection took place in April and May 2021. The authors approached university ESP teachers who taught their online classes in real time and asked that they distribute the Google forms questionnaire to their students via e-mailing lists or learning platforms used for classes.

After the data were collected the responses were analyzed using SPSS 25. Mean scores on measures of anxiety were categorized in accordance with the following scale, as suggested by Oxford (1990) and Mokhtari and Reichard (2002) when interpreting self-reports: 1.0-2.4 – high anxiety, 2.5-3.4 – medium anxiety and 3.5-5.0 – low anxiety. To allow for the application of hierarchical linear regressions in analyzing the data, dichotomous variables of attendance, being alone in the room, gender and the ability to tune out surroundings were recoded as dummy variables, assigning functional numerical value to the categorical levels.

4. RESULTS

The first research question sought to identify the level of reported anxiety during ESP classes among students in three modalities of communication in synchronous online learning (with camera and microphone, with microphone only, using text chat only). A simple descriptive analysis of the students' responses is displayed in Table 3.

Modality	Mean ^a	SD	Skewness		Kurtosis		Anxiety (% of respondents)		
			Statistic	Std. Error	Statistic	Std. Error	High	Medium	Low
Online FLA using camera and microphone	2.75	.95	.178	.178	-.894	.355	37.84	36.75	25.41
Online FLA using microphone	3.32	1.08	-.290	.178	-.878	.355	25.41	26.48	48.11
Online FLA using the chat function	3.46	.77	-.592	.178	-.132	.355	11.35	36.22	52.43

^a Lower means indicate higher anxiety and vice versa

Table 3. Descriptive statistics and percentages of students with different levels of anxiety in three online modalities of classroom communication

The lowest mean was found for online FLA when students are required to use both a camera and a microphone in order to take part in an English class, indicating an anxious setting of medium level. This is followed by online FLA when students are required only to use the microphone, and by online FLA connected with classroom practices where students use the chat function to communicate during the English lesson. With respect to the percentages of students with high, medium and low levels of anxiety relative to the three different online classroom contexts, the highest percentage of students who report that they experience high levels of anxiety is found with online FLA using camera and microphone, followed by online FLA using microphone. Conversely, roughly 52% of students report low levels of anxiety when they take part in ESP classes by means of text-based communication.

In responding to the second research question, which focused on identifying significant differences in the reported levels of anxiety across three different ESP online classroom contexts, we conducted a factorial ANOVA testing the effects of the modality of interaction (communicating by means of camera and microphone, only using the microphone and by online chatting) on the students' level of online FLA. The results revealed that there was a statistically significant main effect of the modality of communication on the students' level of anxiety ($F_{2, 555}=29.200, p=.000, \eta_p^2=.095$), with the model accounting for 9.5% of variation in the results. The simple effects are displayed in Table 4.

Modality		Mean difference	p	95% CI	
				Lower bound	Upper bound
Camera and microphone	Microphone	-.563	.000	-.798	-.327
	Chat	-.709	.000	-.944	-.473
Microphone	Camera and microphone	.563	.000	.327	.798
	Chat	-.146	.409	-.381	.089
Chat	Camera and microphone	.709	.000	.473	.944
	Microphone	.146	.409	-.089	.381

Based on observed means.
The error term is Mean Square (Error) = .893.

Table 4. Pairwise comparisons of marginal mean differences in online FLA

The results of pairwise comparisons revealed statistically significant differences in the levels of anxiety between all investigated pairs ($p<.000$), except between the anxiety experienced while communicating by means of a microphone, on the one hand, and online chatting, on the other.

The third research question probed the relative importance of contextual factors (being alone in the room during classes and attendance) and individual factors (gender, ability to tune out surroundings, English language proficiency) in the students' levels of online FLA in different ESP classroom contexts. To answer the

question, a series of three linear regressions were conducted for each of the three online learning scenarios (microphone and camera, microphone only and chat).

The first linear regression was calculated to predict the students' level of anxiety when they participate in an online ESP lesson with their cameras and microphones turned on (online FLA – camera and microphone). A significant regression equation was found ($F_{5,178}=5.942$, $p=.000$), with an R^2 of .143. The students' predicted anxiety equaled to $2.190 + .531$ (Tune out surroundings) + .151 (Proficiency). The students' levels of anxiety decreased .151 points for each grade increase in English proficiency. Furthermore, those students who were able to tune out their surroundings also reported to be less anxious during the classes with both their camera and microphone turned on. The contextual factors of being alone in the room during the lesson, regular attendance and the participants' gender were not found to be statistically significant factors, and made negligible contributions to the regression model.

A second linear regression was calculated to predict the students' level of anxiety when they participate in an online ESP lesson with their microphones turned on (online FLA – microphone). A significant regression equation was found ($F_{5,178}=7.634$, $p=.000$), with an R^2 of .177. The students' predicted anxiety equaled to $2.202 + .403$ (Attending classes) + .520 (Tune out surroundings) + .228 (Proficiency). Their anxiety decreased .228 points for each grade increase in English proficiency. In addition, those students who attended classes regularly and were able to tune out their surroundings also reported to be less anxious during the classes when they participated in the lesson by turning on their microphone. Finally, the factors that were not found to be statistically significant were the contextual factor of being alone in the room during the lesson and the participants' gender.

A third multiple linear regression was calculated to predict the students' level of anxiety when they participate in an online ESP lesson using the chat option (online FLA – chat). A significant regression equation was found ($F_{5,178}=6.666$, $p=.000$), with an R^2 of .158. The students' predicted anxiety equaled to $2.943 + .312$ (Alone in the room) + .269 (Gender) + .396 (Tune out surroundings) + .099 (Proficiency). The students' anxiety decreased .099 points for each grade increase in English proficiency. Male students, students who were alone in the room during the lesson and who were able to tune out their surroundings also reported to be less anxious during the classes when they participated in the lesson by using the chat option.

5. DISCUSSION

Considering the abrupt transition from a traditional classroom to online lessons, it is no surprise that there is overall little published research on online foreign language anxiety. What is more, the generalizability of the published research is also problematic, as different authors report contradictory results and conclusions, as

pointed out in the literature review section (e.g., Dogan, 2020; Hurd, 2007; Pichette, 2009; Wang & Zhang, 2021). More pertinent to the issues investigated in this research, these studies have not considered the multimodality of synchronous online lessons and the effects that various modes of real-time communication may have on students' levels of anxiety. This study, therefore, set out with the aim of assessing the effects of different modalities of online interaction during university level ESP classes on the students' reported online foreign language anxiety.

Regarding the first research question, which focused on ascertaining the levels of anxiety among university ESP learners in different classroom contexts (three different modalities of communication – video, audio and text-based communication), the most obvious finding to emerge from the analysis is that online classroom contexts, particularly those that require students to communicate emulating interaction that normally takes place in a physical classroom environment, i.e., using picture and sound are, in fact, most anxiety-inducing. This finding goes hand in hand with the answer to the second research question, which emerges from the results of the factorial ANOVA and indicates that the differences between the levels of anxiety in different modalities of classroom interaction are statistically significant for the majority of investigated pairs, the only exception being the difference between online classes where students communicate using the microphone, on the one hand, and the chat option, on the other. It would seem that the abrupt transition to online learning, possibly coupled with the overall uncertainty brought about by the pandemic, the lack of social activities and peer interaction, as suggested by Wang et al. (2020), proved a fruitful ground for the development of anxiety and stress among ESP students. A question that inevitably arises from our findings is what is it about using a camera and microphone in online lessons that is so stress-inducing to the point that 75% of students in video-based communication and 52% in audio-based communication report that they feel high and medium levels of anxiety? One of the answers to this question possibly lies in the failure of synchronous online tools to emulate the learning atmosphere of a physical classroom (Wang & Zhang, 2021) and, paradoxically, to provide learners with the appropriate amount of visual cues necessary to understand the nonverbal messages of the language instructor and fellow-students. Among these, one of the most important nonverbal factors for successful and comfortable communication is eye contact (Binetti et al., 2016; Lee, 2023). In face-to-face communicative exchanges, eye contact between interlocutors is highly dynamic and its purpose is to communicate intentions and regulate interactions (Patterson, 2012). What is more, normal gaze is usually brief, whereas both overly brief and overly long gazes can induce discomfort in the speaker (Binetti et al., 2016). When students are speaking in an online lesson, aware that everyone is gazing at them, and at the same time meeting the gaze of others they see on the computer screen, they may experience prolonged eye contact with other meeting participants. This, understandably, may lead to feelings of uneasiness and stress. Bailenson (2021) further theorizes about the negative impact of the 'mirror effect', i.e., anxiety

triggered by viewing oneself during the online meeting. The effect of seeing oneself in the mirror, be it digital or physical, leads to self-evaluation (Gonzales & Hancock, 2011), which may result in feeling overwhelmed and even depressed (Fejfar & Hoyle, 2000). In light of this interpretation, the current findings put focus on the relevance of gaze and mirror effect issues for the field of ESP, as online meetings with foreign partners and associates are a common practice these days. In fact, even though the proliferation of virtual meetings in the workplace in 2021 and 2022 is slowing down, with most countries outside of Asia having recalled their pandemic restrictions, what we are seeing in 2023 is a greater demand for virtual and hybrid meetings to complement live events (Davis, 2022). As the ability to video-communicate in a foreign language represents a necessity in ESP learners' future workplace, the importance of this virtual classroom activity cannot be overstated. Another possible factor contributing to apprehension may be related to the role of silence in conversations. In face-to-face conversations, silence may convey different messages, including consent, attention, disapproval, disagreement, etc. (Holmes & Wilson, 2017), the interpretation of which will depend on the talking behavior and circumstances of the interlocutor (Schoenenberg et al., 2014). However, in online communication, due to technical constraints and difficulty in picking up visual cues that signal turn-taking, delays are commonplace. In connection to this, what previous research suggests is that people tend to perceive silences as signs of hesitation, leading them to conclude that their message was wrong or not desired, or that those who are listening to them are simply not attentive (Schoenenberg et al., 2014). In an otherwise anxious setting, it is quite likely that this will lead to more doubt and self-consciousness. Finally, the failure of video-based online lessons is paradoxically also recognized in the very elements it adds to computer-mediated communication – visual cues and elements of non-verbal communication. Namely, in face-to-face classrooms, facial expressions and body language provide a layer of nuanced meaning to any communication (Holmes & Wilson, 2017). However, while decoding non-verbal behavior in traditional classrooms students are limited to only a few immediate interlocutors (e.g., the language instructor, the partner, group members, or only a number of students who take part in whole-class discussions). In video lessons, on the other hand, students need to exert great effort to process non-verbal messages of everyone they see on their computer screens. This not only consumes a lot of energy, but also induces stress (Petriglieri, 2020, as cited in Fee, 2020).

Turning to the third research question, which investigated the relative importance of contextual factors (being alone in the room during classes and attendance) and individual factors (gender, ability to tune out surroundings, English language proficiency) in the students' levels of online FLA in different synchronous ESP classroom contexts, it is possible to offer several conclusions based on the results of the linear regression models. First, self-assessed proficiency and the students' ability to tune out their physical surroundings appear to be significant factors in all three models. ESP students who rate their English language abilities higher report lower levels of anxiety regardless of the classroom setting,

irrespective of whether this rating is based on objective grades and criteria or on their personal, subjective belief. As far as the context of ESP is concerned, at least the one referring to the traditional classroom, this finding is consistent with that of Amengual-Pizzaro (2018), who noted that students' anxiety levels stood in negative correlation with their self-perceived language proficiency, and with Zhang (2019), who, in a meta-analysis of forty-six studies and 10,228 participants, noted that anxiety has a moderate correlation with performance. In fact, the adverse effect of anxiety on foreign language performance and competence is well documented (for a review see Dewaele, 2017; Dörnyei & Ryan, 2015; MacIntyre, 2017), with research suggesting that cognitive performance of anxious students is negatively affected by their focus on self-related cognition (concern over potential failure and the opinion of others) at the expense of task-related cognition (Dewaele, 2013; Dörnyei, 2009). It is unclear whether the reported levels of anxiety interfered with our participants' self-assessment of their language competence, since this research did not collect data on the students' grades, though this would not be surprising, as "anxious individuals tend to perceive their communication competence to be lower than it is rated by a neutral observer" (MacIntyre et al., 2002: 540). Anxiety in all online contexts is also closely tied to the students' ability to tune out their physical surroundings and immerse themselves in the virtual classroom to the effect that those participants who reported greater ease of immersion were also less anxious during online lessons. The importance of this factor should not be understated, as new reports on the so-called 'Zoom fatigue', i.e., the psychological effect which refers to "the feeling of exhaustion associated with using video conferencing" (Fauville et al., 2021: 2) suggest that the dissonance students experience when physically being present in one space, while mentally in another, creates conflicting feelings (Petriglieri, 2020), which may lead to increased anxiety. Another conclusion that can be drawn from the results is that it appears that the same three factors (the contextual factor of students' self-reported frequency of attending online classes and the individual factors of students' ability to tune out surroundings and their self-assessed proficiency in English) can explain and predict anxiety in both video- and audio-based online classes. Even though students' anxiety is lower when they only use the microphone in order to take part in the lesson, what shapes their affect appears to be identical in both online classroom contexts. While the ability to better tune out their physical surroundings and a better perception of their language abilities contribute to feeling less anxious for all the possible reasons previously discussed, it is the factor of class attendance that appears to be solely tied to anxiety experienced in these two modalities of virtual classroom interaction. This, we believe, is closely connected with the uncertainty experienced in the face of the new and the unknown – the more familiar students are with the virtual classroom rules, its routines and expected behavior, which logically follows from more frequent attendance, the more at ease they feel when they have to interact with the language instructor and the other students.

6. CONCLUSION

This study has examined the anxiety students experience during ESP university classes relative to the situational characteristics of the modality of lessons. Thus, anxiety was viewed in response to classes in three different online contexts which required participation in varying degrees of engagement – by means of video, audio and text-based interaction. The main results indicate that the highest levels of anxiety were found with classroom contexts that required students to take part in lessons by means of a camera, with somewhat lower levels of anxiety found in contexts where students used only the microphone to communicate with the language instructor and the other students. We believe the main reasons behind these results lie in the overwhelming amount of visual and audio cues the students are exposed to during online lessons, in particular the issues regarding gaze (Binetti et al., 2016), the mirror effect (Bailenson, 2021; Gonzales & Hancock, 2011), silence (Schoenenberg et al., 2014) and dissonance of being physically present in one environment and mentally in another (Fee, 2020; Petriglieri, 2020).

Even though researchers are yet to publish the results of more extensive research on online FLA, based on our results we believe we can offer a number of practical ways in which anxiety during lessons may be alleviated. Since anxiety appears to be highly situationally dependent, ranging from low in text-based communication, to high in video-based communication, language instructors should experiment with using different modalities of interaction during a single lesson – video-communication should be reserved for small group discussions, or pair work, while they should show flexibility when asking students to turn on their cameras during whole-class presentations or lectures, which is in line with suggestions made by Kathpalia, Kiat and Tom (2020). The negative effects of silence may be moderated by means of text-based communication, since there is no conventional turn-taking, many simultaneous responses are, in fact, welcome and any concerns about interrupting others are minimized. Furthermore, group work in meetings with only a fraction of the entire class may also lessen the lag that happens due to technical constraints and minimize the amount of visual information students need to keep track of when they judge when it is appropriate to take their turn and start speaking. Finally, in response to the mirror effect, the immediate solution would be for language instructors to encourage their students to turn off self-view during classes.

The findings presented in this paper and the practical implications that follow from them are subject to several limitations. While it goes without saying that any study, including this one, that draws on scant previous research, necessarily fails to capture all the individual and contextual factors that may affect online foreign language anxiety, we recognize at least three immediate limitations. The first one is connected with the nature of the variable of proficiency that was included in the research design, which may or may not be an objective indicator of the students' actual knowledge of English. Even though the goal was not to investigate the effects of anxiety on language performance, but vice versa, to ascertain the relative

contribution of self-perceived proficiency to reported anxiety levels, an additional inclusion of an objective indicator of performance, such as the grade, would have provided a better understanding of the complexity of issues under scrutiny. We are, therefore, limited in drawing more accurate conclusions. The second limitation concerns disregard of a number of factors that can affect the level of students' anxiety, such as the role of the instructor, the classroom atmosphere and the content of teaching. The content of teaching seems particularly relevant for the context of learning and teaching languages for specific purposes as previous research (Čepon, 2016a, 2016b, 2022) pointed to its significant impact on students' levels of anxiety. The degree of familiarity with the subject specific content certainly deserves to be explored more deeply in any future research on anxiety-triggering factors in an LSP class, be it online or traditional. Another line of inquiry, though not connected specifically with online LSP classes, may be useful in investigations of students' anxiety in online learning environments regardless of the subject domain, and would investigate more technology-based factors of individual differences suggested by Ritzhaupt and associates (2022), including frequency of technology use, attitudes towards technology, technology anxiety and technology self-efficacy. Finally, the third limitation concerns the very design of the investigation, as cross-sectional studies such as the one reported on in this paper do not necessarily show subtle changes over time. It would be useful if future research included a longitudinal dimension, as it would be able to offer insight not only into any potential changes taking place, but also into the relative direction of those changes.

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