

## ICT USE AND INSTRUCTION MODES IN PANDEMIC AND POST-PANDEMIC CONTEXTS: A STUDY ON ESP STUDENTS' MOTIVATION AND ACADEMIC PERFORMANCE

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**Abstract:** *The implementation of information and communication technology became crucial amidst the Covid-19 pandemic. Several studies have been carried out on the effect of technology-mediated instruction modes on learners from diverse educational backgrounds, yet few articles have discussed the pandemic aftereffects in ESP students. This study seeks to investigate the use of technologies and the impact of the pandemic on ESP students' motivation and academic outcomes. Data was collected from 116 students assigned to three groups, the Experimental 1 group (N=39) and the Control group (N=48) data was gathered in 2021-2022 post-pandemic context. The Experimental group 2 (N=29) data collection took place in 2020-2021 pandemic context. A medium-impact blend ESP course was implemented with both Experimental groups while the Control group experienced coursebook based traditional instruction. Group comparisons revealed the detrimental effects of the pandemic and the positive impact of the ICT-mediated medium blend implementation on both students' motivation and academic outcomes. These findings contribute to identify the pandemic aftereffects and the challenges for all of the stakeholders in this particular context.*

**Key words:** *information and communication technology, blended-learning, english for specific purposes, intrinsic motivation, Covid-19 pandemic.*

### 1. INTRODUCTION

The Covid-19 pandemic outbreak and its spread in January 2020 brought about lockdown and quarantine periods requiring higher education (HE) teachers to make unprecedented efforts to rethink and adapt lectures and assessment criteria to online teaching and learning contexts (Ali, 2020; Moorhouse, 2020; Castillo-Rodríguez et al., 2023). Although the education syllabi in HE institutions have undergone a process of tailoring contents and face-to-face (f2f) instruction to information and communication technology (ICT) and online learning management systems (LMS), the pandemic context temporarily heightened this transition to extensive ICT-mediated teaching and learning practices (Fortanet-Gómez & Ruiz-Madrid, 2023). The upheaval of moving to online instruction modes e.g., blended learning (BL) and fully virtual courses (Gaffas, 2023) has been determined by governments regulations and social restrictions limiting f2f interactions and the number of students in class. As a result, both teachers and students endured unwonted mental health issues as reported in Lee (2020) and Roy et al. (2020) that may well have affected teaching and learning practices and students' academic outcomes. As noted by Reimers et al., (2021) the collapse of the educational system during the pandemic resulted in students lacking equal learning opportunities compared to previous years.

Correspondingly, a considerable amount of literature has been published on pandemic and post-pandemic HE online language teaching and learning practices in English as a second and foreign language (ESL/EFL, henceforth) (see Zainnuri et al., 2022 for a systematic literature review). Nonetheless, to the best of our knowledge, few researchers have addressed the effects of the interim curricular adaptations in the English for Specific Purposes (ESP) students' motivation and learning outcomes during and post-Covid-19 pandemic. Hence, given the differences between ESL/EFL and ESP instructional practices and learning goals, mainly related but not limited to conceptual and procedural knowledge (Jendrych, 2013), this study explores the effects of an ad-hoc designed medium-blend course adaptation (Alammary et al., 2014) on ESP students' academic performance and motivation (SDT, n.d.) in pandemic and post-pandemic instruction contexts. In addition, this research has been envisaged to further extend the current knowledge of the pandemic aftereffects when BL and ICT-mediated practices are implemented in the ESP teaching and learning context.

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## 2. ICT USE AND INSTRUCTION MODES IN THE PANDEMIC AND POST-PANDEMIC CONTEXTS

ICT implementation has been traditionally reported to enhance learners' learning engagement and goals achievement (Muñoz-Luna & Taillefer, 2018; Tavakoli et al., 2019) since they are often assumed to favour the use of technologies. Nonetheless, students' digital competence (DC henceforth) requires prior instruction to avoid the mismatch between HE teachers' expectations and learners' current digital expertise (Waycott et al., 2010; Gisbert & Esteve, 2011; Valtonen et al., 2011). Even though HE traditional f2f lecturing embeds pedagogical, practical, and social benefits (French & Kennedy, 2017), there is the extended vision that traditional teaching does not stimulate students' learning and content knowledge acquisition (Hadie et al., 2021). This has led to more interactive and engaging lecturing that combines different teaching modalities with the objective of catering diverse learning styles (see Girón-García & Boghiu-Balaur, 2021 *Cybertask* model).

The pandemic context required a rapid response at the cost of students and teachers' DC. Such a worldwide adaptation to online lecturing was mainly achieved using live videoconferencing software and LMS supporting asynchronous access to teaching and learning materials. Despite every effort to tailor teaching practices to the pandemic context, technological issues, internet access, teacher-student, and student-student interactions along with teachers and students' digital literacy have been identified as challenges still to overcome (Clark-Wilson et al., 2020). Regarding teaching and learning practices, BL has been reported as the main instructional teaching mode throughout the pandemic (Crawford et al., 2020; Sutherland et al., 2023). Referred to as the integration of contact teaching and instructors' design of computer-mediated learning resources (Hubackova & Semradova, 2016; Hua & Wang, 2023), BL allows manifold instructional practices. Prior analysis of teaching programmes' adaptations to computer-mediated teaching practices, Alammery et al. (2014) distinguished three BL design approaches: i) *low-impact blend* refers to traditional f2f teaching and the design of computer-mediated tasks; ii) *medium-impact blend* implies the adaptation of existing activities to an online-mediated context; iii) *high-impact blend* requires instructors reconsideration of learners' curricular needs to re-conceptualise and redesign courses embracing an effective combination of ICT.

Empirical research has found students' perception of fully online teaching and learning practices not to be as effective as BL or traditional f2f instruction (Markova et al., 2017; Agung et al., 2020). This has led to poor student understanding of subject content, a lack of interaction and sustained interest (Mishra et al., 2020) sometimes bringing about an increase in academic procrastination (Heo et al., 2022). Long et al. (2022) studied the effects of switching from f2f to fully online remote learning during the Covid-19 pandemic. Authors scrutinized 230 students' perceptions of five learning environment scales: student cohesiveness, teacher support, involvement, task orientation, and equity. Results unveil an overall statistically significant decline in all scales, the students' cohesiveness scale, "the extent to which students are friendly and supportive of one another" (Long et al., 2022: 347) being the one that deteriorated the most. Likewise, Alkhudiry and Alahdal's (2021) case study examined 160 undergraduate students' self-perceived competence and relatedness as intrinsic motivation enhancers (Deci & Ryan, 2010) in a fully virtual learning context forced by the pandemic. Findings revealed that the virtual learning mode is viable due to students' self-perceived content learning and performance satisfaction. Although participants felt prone to continue with online learning courses after the pandemic, the analysis of participants' videotaped learning experiences revealed a lack of engagement and active participation which may question their preparedness for autonomous learning practices.

This is in agreement with previous literature on BL implementation as a means to achieve a balance between f2f traditional instruction and exclusively online courses (Bernard et al., 2014; Means et al., 2009). In addition, studies on BL teaching mode reported students' self-regulation and self-efficacy enhancement, positive emotional engagement, improved academic performance and motivation (Spanjers et al., 2015; Shyr & Chen, 2018; Spring et al., 2018; Yen et al., 2018; Lane et al., 2021; Sutherland et al., 2023). Campillo-Ferrer and Miralles-Martínez (2021) investigated 179 undergraduate students' learning motivation and learning perception under BL flipped classroom implementation during the Covid-19 pandemic. A Likert-scale questionnaire was developed and administered on a pre and post-test basis to analyse participants' motivation, their self-perceived learning and the assessment of the strategies and activities to deliver the lessons. It was found that participants positively perceived the instruction and the activities implemented in conjunction with an overall increase in their intrinsic and extrinsic motivations. These results point towards the benefits of audiovisually-mediated lecturing, students' interaction fostered via ICTs, DC development, and self-learning pace as previously reported in Collado-Valero et al. (2021) and Monzonis et al. (2020).

## 3. ON BL, MOTIVATION AND LANGUAGE LEARNING

In line with the above-described empirical studies, the adoption of BL has also proved positive in the EFL learning context since it can contribute to students' academic performance, language learning achievement, active participation, and enhanced motivation (Trinder, 2017; Buragohain, 2018; Crawford & Jenkins, 2018;

Holmes & Prieto-Rodríguez, 2018; Chen, 2021). As Sutherland et al. (2023) propose “Motivation for engagement with BL arises from intrinsic motivation and leads to more positive experiences when compared to a student relying on external reward or extrinsic motivation” (Sutherland et al., 2023, Self-regulated learning section, para.1) Therefore, this online learning mode makes language content and practice available and accessible from numerous online sources (Sharma & Barrett, 2008). On this subject, Escobar-Fandiño et al. (2019) – as cited in Khojasteh (2023: 110) – underlined that motivation regarding language learning differs from other disciplines since “learning another language, foreign from learners’ native language, has always been very challenging, especially for low proficiency students who are less motivated to learn the language”. Conceived as an affective factor, which is part of a set of individual learner differences that may interweave (Lightbown & Spada, 2021), motivation is key for succeeding in the processes that lead to learning. As regards ESL/EFL teaching and learning practices, motivation is decisive in such process (Zhou, 2018) since it strives students’ readiness and desire to spend time and make every effort to complete tasks, co-operate, and engage in the learning process (Alshenqeeti, 2018) which may eventually result in language learning.

A growing body of literature has investigated the role of the implementation of ICTs in EFL pandemic or post-pandemic teaching and learning contexts (Zainnuri et al., 2022). Bailey’s (2022) research on videoconference EFL classes and social presence proved the relevance and beneficial aspects of interactions in a pandemic context. A cross-sectional survey was designed to study 547 EFL students’ self-perceived learning, their social presence and interaction types. The author concludes that students positively valued the learner-instructor, learner-learner, and learner-content interactions. Hence, participants’ social presence in videoconference courses has been reported to positively influence learning outcomes and learners’ satisfaction amidst the pandemic. Hua and Wang (2023) examined 942 Chinese EFL students’ learning preparation and achievement within BL in a post-Covid-19 context. Under the principles of the 3P (i.e., presage, process, product) teaching and learning theory, a multiple mediation model was envisaged to study the mediating role of learning engagement or academic procrastination in participants’ academic self-concept and course experience on learning achievement. Findings supported the view that learning engagement and academic procrastination partly intervene in participants’ academic self-concept on learning achievement. In addition, learning engagement and academic procrastination was found to mediate course experience effect on learning achievement.

Nevertheless, few studies have been devoted to exploring motivational aspects in the ESP BL teaching and learning context during and after the pandemic (Silvestre-López & Girón-García, 2023). Recently published research has focused on ESP students’ motivation and perceptions of different learning modalities, online task environments and students’ self-perceptions in Covid-19 pandemic times (Beltrán-Palanques, 2023; Bobkina & Domínguez-Romero, 2023; Gaffas, 2023; Silvestre-López & Girón-García, 2023). In an attempt to compare virtual and BL modalities, Gaffas (2023) studied 80 undergraduate ESP students’ perceptions of i) course design, learning materials and LMS use, ii) student-instructor and student-student interaction, iii) individual learning processes, and iv) course outcomes. Results on course design indicated that participants positively assessed the virtual learning mode when compared to the BL group. Regardless the instructional treatment, students perceived the course as time and effort demanding while reporting an unclear structure of materials, and technical and interaction-processes issues. On the other hand, students had positive views on time and place learning flexibility, increased motivation, and self-learning pace control. Even though participants praised for the acquisition of DC skills, the outcomes concerning conceptual knowledge learning, problem-solving skills, and learning self-regulation were not positively rated.

Similarly, Silvestre-López and Girón-García’s (2023) quasi-experimental research design was conducted to compare Psychology ESP students’ content-learning achievement, intrinsic motivation and task-usefulness perception during the pandemic. A pool of 114 participants were divided into a control group experiencing a live online synchronous session, and two experimental groups, i.e., an asynchronous Moodle LMS-mediated session and a synchronous teacher-guided Google Meet mediated session. Pre and post-tests’ results revealed higher content-learning outcomes in both experimental groups, but no significant differences were found between these two groups. Participants under the asynchronous mode perceived this pedagogical treatment as more intrinsically motivating and useful than those under the synchronous mode. Bobkina and Domínguez-Romero (2023) studied 76 Computer Engineering ESP students’ self-perception of digital oral skills commands in online environments in pandemic times. Having performed audiovisually recorded pitches presenting mobile applications, students were surveyed (i.e., 22 items Likert-scale questionnaire) to explore the following areas: i) content/cognition and linguistic, ii) physical and socioemotional, and iii) technical. Qualitative data was gathered to explore the students’ self-perceived strengths and weaknesses in building digital oral communication. Results unveiled students’ difficulties performing digital oral communication in the three main areas explored, the linguistic area being the most troublesome even impeding digital communicative skills development. Socioemotional results show lack of confidence and speaking anxiety when recording their pitches. Students portrayed low DC skills concerning their role as audiovisual content developers.

Beltrán-Palanques (2023) surveyed 18 ESP students enrolled in the Bachelor's Degree in Video Game Design and Development with the objective of exploring students' learning experiences and discussing the effects of a digitally enriched teaching proposal. The worsening of the sanitary situation allowed the implementation of two three-hour sessions, an on-site and an online session using diverse ICT and digital resources (i.e., Google Jamboard, Google Slides, Mentimeter, Google Meet, and Discord). Topic-focused instruction followed the visualization and multimodal analysis of Elevator Pitch examples, these are short presentations in which speakers persuasively introduce products or ideas with the aim of obtaining funding from investors. The analysis phase set the basis for students' design, recording, and assessment of their own Elevator Pitch asynchronous presentations. Participants completed a 17-items questionnaire to reflect on their experience and perceptions of face-to-face and online sessions, in addition to their asynchronous presentation performance. Results unveiled ESP students' preference for and satisfaction with the on-site face-to-face session albeit the online session was perceived as more interactive due to the use of multiple communication channels (i.e., Discord chat and Google Meet breakout rooms). Overall, students perceived the task and ICT resources used as useful for group work presentation design, peers' assessment, and asynchronous delivery.

#### 4. METHODOLOGY

As previously reported, ICT use and BL instruction seemed to have accommodated pandemic and post-pandemic teaching and learning practices with overall positive results compared with fully online instruction. Despite the beneficial role of ICT and Web 2.0 applications in the ESP teaching context (Işık-Taş & Kenny, 2020), the lack of empirical studies on ESP students' motivation and learning outcomes combining ICT usage and BL teaching mode in pandemic and post-pandemic contexts calls for further research. The importance of this empirical study relies on ESP curricular demands since it requires students to experience and overcome challenges in specific discipline expertise. Such requirements should fit a number of workplace settings, consider students' professional careers and mobility, and the current socio-political and socio-economic contexts (Camiciottoli, 2010; Kennedy, 2012). Li (2018: 9) delineates the characteristics as fundamentally portraying the ESP realm: i) the need for ESP disciplines to meet specific learners' needs, ii) the implementation of proper teaching methodologies, iii) the accomplishment of discipline-related activities which should consider the tailoring of linguistic resources and textual genres with such an aim, and iv) clear-cut teaching and learning practices' design to suit specific discipline training.

These basic premises considered, ESP teaching and learning practices require students' mastery of "key terminology and concepts" (Stoller & Robinson, 2018: 30) and discourse competence (i.e., effective communication skills, and the understanding and production of authentic oral and written texts) which are indicators of students' progress from general English to the ESP discipline demands. Although the use of coursebooks is generally accepted to ease that process, the need for students to develop language and communication skills may well deserve further research regarding ICT implementation amidst the pandemic and post-pandemic contexts. Hence, we first explore the effects of an ICT-mediated medium-impact blend adaptation in pandemic and post-pandemic ESP students' motivation; second, we examine the potential effects of the pandemic on students' academic outcomes under BL conditions. The following research questions are formulated:

RQ1. What is the effect of ICT use on ESP students' motivation under BL and traditional teaching conditions in pandemic and post-pandemic teaching and learning contexts?

RQ2. What is the effect of ICT use on ESP students' academic performance under BL and traditional teaching conditions in pandemic and post-pandemic teaching and learning contexts?

##### 4.1. Participants, context, and instructional treatment design

The data was collected from a total of 137 first-year students, yet this pool was reduced to 116 aged 18-20 ( $M=18.18$ ;  $SD=.486$ ) due to data incompleteness. Participants enrolled in the first semester basic training course *Communication in the English language for tourism I* at the faculty of Economics, Universitat de València voluntarily participated in the study. For the purposes of this study, data was gathered from three groups: an Experimental 1 ( $N=39$ ) and a *Control group* ( $N=48$ ) in a post-pandemic context (2021-2022), and an Experimental 2 group ( $N=29$ ) amidst Covid-19 pandemic (2020-2021).

This empirical research was conducted in two phases: the first phase was implemented in the academic year 2020-2021 (i.e., Experimental 2) since the easing of Covid-19 restrictions in the Valencian Community allowed the design of a medium-impact blend ESP course. This consisted of synchronous in-class f2f lecturing using the coursebook *English for international tourism intermediate* (Strutt, 2007) and the adaptation of already existing course tasks, activities, and projects to the institutional LMS Moodle and Blackboard Collaborate software. In addition, ProWritingAid online application and Microsoft Office software were used for the writing tasks and oral presentations. The second phase was carried out in the 2021-2022 post-pandemic context with neither in-class



population restrictions nor social distancing measures. This stage was characterised by the implementation of the previously described medium-impact blend with a sample of participants (i.e., Experimental 1) while coursebook-based traditional teaching practices were adopted (i.e., Control group). A description of activities, tasks and projects in both instructional practices is provided in Table 1 below.

Table 1. Traditional teaching and BL instruction.

10 Unit tests (individual)	Descr	Multiple-choice and fill in the gaps activities to practice unit-related grammar and vocabulary aspects along with specific phraseology.
	Trad	Immediate explicit feedback provision along with teachers' explanation as requested in class.
	BL	Adaptation to LMS Moodle quizzes. Explicit asynchronous feedback provision using dialogue boxes.
3 Essay writing (individual)	Descr	Students write i) a tourist destination promotional brochure, ii) a formal email of apology, and iii) a cover letter as an introduction to their CV.
	Trad	Teachers' double correction using first an error correction code for students to self-check and improve their essay. Last, teachers' explicit written feedback provision.
	BL	LMS Moodle-mediated assignment. Students participated in a workshop on the automated written feedback application ProWritingAid and self-checked their first writing drafts. They uploaded their final version to Moodle for language instructors' correction and explicit feedback provision.
5 Role-play practice (in-pairs)	Descr	In pairs, students prepare five coursebook-based model dialogues along the semester.
	Trad	In class performance and rubric-based assessment along with explicit feedback provision on the strengths and weaknesses of students' speaking skills.
	BL	Students self-record the dialogues using Blackboard Collaborate and upload the video onto a Moodle assignment. Explicit rubric-based delayed feedback provision.
1 Oral presentation (in-groups)	Descr	Prior research, students prepare an oral presentation promoting a niche tourism destination.
	Trad	In class presentations that entail peers' comments and teachers' rubric-based immediate feedback provision on presentations' content and skills.
	BL	Audiovisually recorded presentations using Blackboard Collaborate. The video files were uploaded onto a Moodle assignment for explicit asynchronous rubric-mediated feedback provision.

Note: Descr = activity/task/project description, Trad = traditional teaching and learning practices (i.e., Control group), BL = medium-blend adaptation (i.e., Experimental 1 and Experimental 2 groups).

#### 4.2. Instruments for data collection and analysis

Grounded in the Self-determination theory, motivation depends on learners' self-determination to achieve a goal which is influenced by competence, autonomy, and relatedness' human needs (Ryan & Deci, 2017). Although both intrinsic and extrinsic motivation may shed light on students' individual differences, the intrinsic motivation inventory (IMI) (SDT, n.d.) allows the study of students' intrinsic motivation, its positive and negative predictors, and self-regulation processes on task performance. Based on the IMI, the inquiry of participants' motivation consisted of a 27 items Likert scale questionnaire ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was administered online using Google Forms at the end of the term and divided into five different subscales i.e., interest/enjoyment, perceived competence, effort/importance, pressure/tension, and value/usefulness. The total of the questionnaire was also computed (i.e., IMI). Likert Scale mean range was calculated to set the parameters for the interpretation of results (see Table 2 below).

Table 2. Motivational mean range values.

Mean Range	Scale Range	Interpretation
1.00-1.80	Strongly disagree	Low
1.81-2.60	Disagree	Low-Moderate
2.61-3.40	Neutral	Moderate
3.41-4.20	Agree	Moderate-High
4.21-5.00	Strongly agree	High

The use of Cronbach alpha reliability estimate confirmed the internal consistency of the questionnaire and its subsequent subscales ( $\alpha > 0.70$ ). Students' academic performance was also studied to seek for differences in participants academic outcomes concerning the teaching and learning conditions under study. Data is provided on participants continuous assessment, exam marks, and course grades (i.e., CA, EM, and CG correspondingly). To compare the three groups' motivational subscales and academic performance variables, Shapiro-Wilk normality tests and the Levene test for equality of variances were calculated using SPSS V.29. A summary of Cronbach alpha results and Levene statistic is provided in Table 3.

Table 3. Cronbach alpha reliability and Levene's test results.

		Group							
		Experimental 1 (N=39)		Control (N=48)		Experimental 2 (N=29)			
Subscales	Items	M(SD)	$\alpha$	M(SD)	$\alpha$	M(SD)	$\alpha$	Levene statistic	p
Interest	5	4.16(0.65)	0.86	3.06(0.64)	0.77	3.19(0.65)	0.76	0.481	0.620
P. Comp	4	3.80(0.65)	0.83	3.33(0.64)	0.80	3.42(0.67)	0.82	0.020	0.980
Effort	2	4.38(0.59)	0.72	4.12(0.73)	0.74	4.24(0.78)	0.80	0.534	0.588
Pressure	3	1.99(0.89)	0.87	2.89(1.04)	0.88	2.73(1.08)	0.87	0.589	0.557
Value	13	4.34(0.58)	0.93	3.65(0.70)	0.93	3.69(0.72)	0.93	0.550	0.578
IMI	27	3.96(0.45)	0.91	3.45(0.43)	0.86	3.50(0.43)	0.85	0.152	0.859
CA		3.05(0.49)		2.13(0.83)		2.30(0.64)		0.614	0.498
EM		4.10(1.02)		4.05(1.05)		4.13(1.35)		1.240	0.293
CG		7.15(1.38)		6.18(1.60)		6.44(1.84)		1.928	0.150

Note: CA = reports values between 0-4, EM reports values between 0-6, CG reports values between 0-10.

Given these initial mean score differences and the results from the normality tests and Levene's statistic ( $p > .05$ ), we further compare groups' motivation and academic performance under BL and traditional teaching and learning practices in pandemic and post-pandemic contexts to seek for significant differences in their motivation and academic outcomes.

## 5. RESULTS

This section has been structured around the research questions. To examine the effect of BL ICT-mediated and traditional teaching instruction modes in pandemic and post-pandemic contexts, we ran a one-way ANOVA to look for mean difference significance in participants' reported motivation (i.e., the adaptation of the IMI questionnaire) and their academic performance (i.e., CA, EM, CG). Table 4 presents the summary of the ANOVA measurements and eta squared results comparing the three groups.

Table 4. One-way ANOVA results.

	Experimental 1 (N=39)	Control (N=48)	Experimental 2 (N=29)			
	M (SD)	M (SD)	M (SD)	<i>F</i>	<i>p</i>	$\eta^2$
Interest	4.16 (0.65)	3.06 (0.64)	3.19 (0.65)	34.163	<.001	0.377
P. Comp	3.80 (0.65)	3.33 (0.64)	3.42 (0.67)	6.013	0.003	0.096
Effort	4.38 (0.59)	4.12 (0.73)	4.24 (0.78)	1.469	0.235	0.025
Pressure	1.99 (0.89)	2.89 (1.04)	2.73 (1.08)	9.298	<0.001	0.141
Value	4.34 (0.58)	3.65 (0.70)	3.69 (0.72)	13.233	<0.001	0.190
IMI	3.96 (0.45)	3.45 (0.43)	3.50(0.43)	16.479	<0.001	0.226
CA	3.05 (0.49)	2.13 (0.83)	2.30 (0.64)	20.457	<0.001	0.266
EM	4.10 (1.02)	4.05 (1.05)	4.13 (1.35)	0.057	0.945	0.001
CG	7.15 (1.38)	6.18 (1.60)	6.44 (1.84)	4.114	0.019	0.068

Significant differences were found in the motivation subscales under study but for students' perception of effort ( $p > .05$ ). Likewise, students' academic performance was found to statistically differ as regards their CA performance and their final CG; nonetheless, no significant differences were found in their EM. Given these mean score variations, post-hoc Bonferroni tests (Table 5) were performed to seek for group differences and answer to the research questions.

Table 5. Bonferroni post-hoc test multiple comparisons.

Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% CI	
						Lower Bound	Upper Bound
Interest	Experimental1	Control	1.10417*	0.140	<0.001	0.7626	1.4457
		Experimental2	0.96839*	0.159	<0.001	0.5799	1.3569
	Control	Experimental1	-1.10417*	0.140	<0.001	-1.4457	-0.7626
		Experimental2	-0.13578	0.153	1.000	-0.5084	0.2368
P. Comp	Experimental1	Control	0.47436*	0.141	0.003	0.1307	0.8180
		Experimental2	0.38528	0.160	0.055	-0.0056	0.7761
	Control	Experimental1	-0.47436*	0.141	0.003	-0.8180	-0.1307
		Experimental2	-0.08908	0.154	1.000	-0.4640	0.2858
Effort	Experimental1	Control	0.25962	0.151	0.268	-0.1085	0.6277
		Experimental2	0.14324	0.172	1.000	-0.2755	0.5619
	Control	Experimental1	-0.25962	0.151	0.268	-0.6277	0.1085
		Experimental2	-0.11638	0.165	1.000	-0.5180	0.2852
Pressure	Experimental1	Control	-0.90438*	0.217	<0.001	-1.4326	-0.3761
		Experimental2	-0.74418*	0.247	0.010	-1.3450	-0.1433
	Control	Experimental1	0.90438*	0.217	<0.001	0.3761	1.4326
		Experimental2	0.16020	0.237	1.000	-0.4161	0.7365
Value	Experimental1	Control	0.69329*	0.144	<0.001	0.3421	1.0445
		Experimental2	0.64953*	0.164	<0.001	0.2501	1.0490
	Control	Experimental1	-0.69329*	0.144	<0.001	-1.0445	-0.3421
		Experimental2	-0.04377	0.157	1.000	-0.4269	0.3394

Table 5, continued in next page.

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Dependent Variable	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% CI	
						Lower Bound	Upper Bound
IMI	Experimental1	Control	.51632*	.095	<.001	.2846	.7480
		Experimental2	.46580*	.108	<.001	.2022	.7294
	Control	Experimental1	-.51632*	.095	<.001	-.7480	-.2846
		Experimental2	-.05053	.104	1.000	-.3033	.2023
CA	Experimental1	Control	.92098*	.148	<.001	.5593	1.2827
		Experimental2	.74827*	.169	<.001	.3368	1.1597
	Control	Experimental1	-.92098*	.148	<.001	-1.2827	-.5593
		Experimental2	-.17272	.162	.869	-.5674	.2219
EM	Experimental1	Control	.05160	.243	1.000	-.5392	.6424
		Experimental2	-.03486	.276	1.000	-.7069	.6371
	Control	Experimental1	-.05160	.243	1.000	-.6424	.5392
		Experimental2	-.08647	.265	1.000	-.7310	.5581
CG	Experimental1	Control	.97259*	.344	.017	.1349	1.8102
		Experimental2	.71340	.392	.214	-.2393	1.6661
	Control	Experimental1	-.97259*	.344	.017	-1.8102	-.1349
		Experimental2	-.25918	.376	1.000	-1.1730	.6547

\*. The mean difference is significant at the 0.05 level.

Note: Multiple comparisons have been limited due to space and word count limit.

### 5.1. RQ1. BL, ICT, and ESP students' motivation

The first research question was aimed at exploring the BL adaptation of the ESP course and ICT use on participants' motivation in pandemic and post-pandemic contexts. Results from groups' comparisons (Tables 4 and 5) reveal significant differences in the subscale of *interest*, which measures intrinsic motivation,  $F_{(2,113)}=34.163$ ,  $p<.001$ ,  $\eta^2=.377$ . Participants in the Experimental 1 group (i.e., BL post-pandemic condition) reported moderate-high intrinsic motivation compared to the moderate mean score values from the Control group (i.e., traditional teaching post-pandemic condition) ( $p<.001$ ) IC 95% [.7626, 1.4457] and the moderate-high values from the Experimental 2 group (i.e., BL pandemic condition) ( $p<.001$ ) IC 95% [.5799, 1.3569]. This concurs well with the *perceived competence* subscale results as a positive predictor of intrinsic motivation  $F_{(2,113)}=6.013$ ,  $p=.003$ ,  $\eta^2=.096$ . Hence, the Experimental 1 group participants felt more capable of performing computer-mediated tasks and activities in contrast to the control group ( $p=.003$ ) IC 95% [.1307, .8180] and the Experimental 2 group, being this last comparison non-statistically significant ( $p=.055$ ) IC 95% [-.0056, .7761]. Nonetheless, no significant differences were found in the subscale of *effort* between the experimental groups and the control group  $F_{(2,113)}=1.469$ ,  $p=.235$ ,  $\eta^2=.025$  since participants reported moderate-high (i.e., Experimental 2 and control groups) to high (i.e. Experimental 1 group) perceived effort to complete tasks and activities.

Concerning the subscale of *pressure* as a negative predictor of intrinsic motivation, significant differences were identified among groups  $F_{(2,113)}=9.298$ ,  $p<.001$ ,  $\eta^2=.141$ . Participants in the Experimental 1 condition experienced low-moderate pressure values in comparison to the moderate self-perceived *pressure* unveiled by both the control group ( $p<.001$ ) IC 95% [-1.4326, -.3761] and the Experimental 2 group ( $p=.010$ ) IC 95% [-1.3450, -.1433]. As regards the subscale of *value*, significant differences  $F_{(2,113)}=13.233$ ,  $p<.001$ ,  $\eta^2=.190$  were also found. The Experimental1 group highly valued the BL adaptation as opposed to the Experimental 2 group moderate-high results ( $p<.001$ ) IC 95% [.2501, 1.0490] and the Control group under a traditional instruction condition ( $p<.001$ ) IC 95% [.3421, 1.0445]. Overall IMI mean scores also reveal statistical significant differences  $F_{(2,113)}=16.479$ ,  $p<.001$ ,  $\eta^2=.226$  despite the three groups present moderate-high motivation values. The Experimental 1 group accounts for slightly higher motivation degrees than the Control ( $p<.001$ ) IC 95% [.2846, .7480] and the Experimental 2 groups ( $p<.001$ ) IC 95% [.2022, .7294]. It is crucial to note that no mean differences were identified in the comparisons between the Control group and the Experimental 2 group both reporting similar values in the motivation subscales studied.



## 5.2. RQ2. Academic performance

The second research question was designed to explore the effects of the medium blend adaptation and traditional teaching conditions on participants' academic performance in pandemic and post-pandemic contexts. One-way ANOVA results (Table 4) reveal significant differences in participants' CA  $F_{(2,113)}=20.475, p<.001, \eta^2=.266$  and CG  $F_{(2,113)}=4.114, p=.019, \eta^2=.068$ . Group comparisons (Table 5) show that students in the Experimental 1 group ( $M=3.05, SD=.49$ ) performed better in the dependent variable of CA, which measures the ICT-mediated continuous assessment tasks achievement, in comparison to the Control group experiencing traditional instruction ( $M=2.23, SD=.83$ ) ( $p<.001$ ) IC 95% [.5593, 1.2872] and the Experimental 2 group ( $M=2.30, SD=.64$ ) ( $p<.001$ ) IC 95% [.3368, 1.1597]. Correspondingly, Experimental 1 group achieved significantly higher course grades (i.e. CG) ( $M=7.15, SD=1.38$ ) when compared to the Control group ( $M=6.18, SD=1.60$ ) ( $p=.017$ ) IC 95% [.1349, 1.8102], and the Experimental 2 ( $M=6.44, SD=1.84$ ), albeit Experimental 1-2 comparison results do not statistically differ ( $p=.214$ ) IC 95% [-.2393, 1.6661]. No differences are found in their EM  $F_{(2,113)}=.057, p=.945, \eta^2=.068$ . It is interesting to note that mean differences results from the comparison of the Experimental 2 and Control groups do not differ ( $p>.001$ ) in the dependent variables measuring their academic performance.

## 6. DISCUSSION

This study has examined the effects of adapting the ESP course *Communication in the English language for tourism I* to a medium-blend instruction mode on undergraduate first year students' motivation and academic performance in pandemic and post-pandemic contexts. With that aim, a comparison was carried out of an experimental group (i.e., Experimental 2) under a medium-blend adaptation amidst the pandemic (2020-2021), an experimental group experiencing the same BL instruction (i.e., Experimental 1), and a Control group in which traditional coursebook-based teaching practices were implemented in a post-pandemic context (2021-2022). Such comparisons may shed light on i) the impact of the ad-hoc medium-blend adaptation design using LMS and ICT resources and ii) the aftereffects of the Covid-19 pandemic in both students' motivation and academic outcomes.

Concerning the medium-blend implementation in the ESP class, findings showed that participants in both experimental groups under the BL condition reported higher mean score results in the motivation subscales studied when compared to the Control group. Thus, as previously noted by Hadie et al. (2021) and revealed in the *interest/enjoyment* subscale, participants in the Control group perceived traditional teaching practices less stimulating. This concurs well with previous studies on ICT-mediated BL implementation in the EFL and ESP teaching and learning contexts that suggest heightened intrinsic motivation values (Buragohain, 2018; Crawford & Jenkins, 2018; Chen, 2021; Sutherland et al., 2023). Contrary to expectations, participants' *perceived competence* was found more representative in the experimental groups. Despite first year university students being used to more traditional teaching and learning practices, it was the control group which revealed lower mean scores at non-ICT-mediated task and activities accomplishment. A plausible explanation is linked to the role of perceived competence as a positive predictor of intrinsic motivation (IMI, n.d.), therefore the higher degrees of intrinsic motivation could be determined by a heightened perception of self-competence in ICT-mediated tasks and activities completion.

Regardless of the instructional treatment and context, participants reported moderate-high to high self-perceived *effort*. Both experimental groups' progression towards acquiring DC skills with academic purposes could explain their effort-demanding perception of the ICT-mediated implementation since previous studies have identified students' DC as limited to entertainment (Valtonen et al., 2011; Waycott et al., 2010) in addition to plausible technical and interaction issues in tasks accomplishment as previously reported in Clark-Wilson et al. (2020) and Gaffas (2023). Accordingly, we may hypothesize that experimental groups participants' positive assessment of the *value/usefulness* subscale steams from their perception of the ICT-mediated BL adaptation as a valuable part of their learning experience in contrast to the control group under traditional teaching practices. This substantiates previous findings in the literature that suggest both ESP students' positive response to technology-enhanced course design (Beltrán-Palanques, 2023; Silvestre-López & Girón-García, 2023) and the advantageous roles of ICT and Web 2.0 applications in the ESP context (Işık-Taş & Kenny, 2020; Muñoz-Luna & Taillefer, 2018). Also unexpected was the Control group's perception of higher *pressure* than the experimental groups when overcoming non-ICT mediated tasks and activities. Even though control group participants were used to traditional activities performance –thus leading to less pressure– it can be reasonably assumed that factors such as time and teacher/peers presence could have influenced their self-regulation processes as previously noted by Shyr and Chen (2018). Furthermore, the interactive nature of some of the proposed tasks and activities may have affected ESP students' confidence as reported in Bobkina and Dominguez-Romero (2023).

The comparison of participants' academic achievement revealed significant differences in their CA (i.e., tasks, activities, and projects' marks) and CG, yet participants EM do not differ among groups since self-study and autonomous learning are determining factors for success in this variable. Findings suggest that the medium-blend adaptation designed and implemented boosted Experimental 1 group (i.e., BL in post-pandemic) CA marks and

CG when compared to the other groups. Significantly lower CA and CG results were achieved by the Experimental 2 and Control groups, but no significant differences were found between them. Thus, CA achievement and final CG may well depend on the instructional treatment (i.e., BL adaptation or traditional teaching practices) and the instructional context (i.e., pandemic or post-pandemic). Given the fact that no significant differences were found in the EM comparisons among groups, it is the CA marks, derived from teaching and learning practices, which may have a substantial effect on students CG. This is in agreement with Silvestre-López and Girón-García (2023) results on ESP students' task-achievement and content learning when technology-mediated sessions are implemented.

As regards the Covid-19 pandemic aftereffects in ESP teaching and learning practices, findings confirm its negative impact, thus hindering students' motivation and their academic performance as suggested in the literature (Lee, 2020; Reimers et al., 2021). Although the Experimental 2 group perception of the medium-blend adaptation portrays moderate to moderate-high mean score values, the comparison with the Experimental 1 participants, both within the same instructional BL implementation, revealed lower mean score results in the motivation subscales of *interest/enjoyment*, *pressure/tension*, *value/usefulness*, and the overall IMI results. Interestingly, the results from the motivation subscales studied and ESP students' academic performance present similarities between the Experimental 2 (BL pandemic context) and the Control group (traditional teaching practices in a post-pandemic context) since no significant mean differences were found. These values substantiate previous research that identified an overall decrease of students' engagement in task accomplishment, active participation, interest, and peer interaction and support in the pandemic (Mishra et al., 2020; Long et al., 2022).

To sum up, the instructional contexts and treatment conditions have been identified as determining factors for ESP students' motivation enhancement and academic performance. This research has proved both, i) the positive effects of the BL course adaptation derived from the comparison of Experimental 1 and Control groups in a post-pandemic context, and ii) the detrimental effects of the Covid-19 pandemic on students' motivation and performance that stem from contrasting Experimental 1 and 2 groups' results. Crucially, Experimental 2 and Control groups' similarities seem to question the view of technology as a powerful asset in teaching and learning practices during Covid-19. This contrasts previous studies that positively appraised participants' intrinsic motivation enhancement, learning engagement and sustained academic performance as a result of BL instruction during the pandemic (Alkhudiri & Aladhal, 2021; Campillo-Ferrer & Miralles-Martínez, 2021). Conversely, this lends support to Hua and Wang's (2023) reflections on the pandemic as negatively mediating students BL course experience and academic achievement due to their learning engagement and plausible academic procrastination. Therefore, these findings further extend our knowledge of the pandemic as a contextual factor interfering ESP students' engagement with BL (Sutherland et al., 2023) and their motivation for language learning (Escobar-Fandiño et al., 2019).

## 7. CONCLUSION

The evidence from this study supports the idea that BL and ICT-mediated teaching and learning practices have proved positive in the ESP discipline under study. These findings concur conclusively with previous studies suggesting BL potential to boost students' academic outcomes and motivation (Chen, 2021; Lane et al., 2021). Considering ESP specificities, the implementation of ICT in the medium-blend instructional model presented aligns with Sutherland et al.'s (2023) conception of a fit-for-purpose use of technology in HE contexts. Thus, students' preference for and familiarity with the online tools implemented should be examined beforehand as part of their DC needs. We believe that ESP instructors' support and encouragement towards the use of technology lays the foundation for self-regulated ICT-mediated learning, which is likely to promote positive reactions toward BL, reduce students' digital anxiety, and eventually result in prospect of academic success (Silvestre-López & Girón-García, 2023). Our study also evinces the negative effects of the pandemic on ESP students' intrinsic motivation, its predictors, and learning outcomes as previously informed by Long et al. (2022), Hua and Wang (2023), and Gaffas (2023) pandemic and post-pandemic research.

These results need to be interpreted with caution due to the limited number of participants and the fact that we have not traced direct relations between motivational aspects and students' performance. Despite this, the comparison of BL and traditional instructional practices in pandemic and post-pandemic contexts, and the effects of the pandemic as a contextual variable affecting ESP students' motivation and academic outcomes have revealed statistically significant differences among groups. Future research may consider the longitudinal study of the pandemic aftereffects to determine its detrimental effects concerning learning opportunities, motivation, and most importantly students' outcomes as regards conceptual and procedural knowledge acquisition. This may result in future curricular adaptations and pedagogical interventions addressed to palliate the still plausible learning deficiencies due to the pandemic.

As a matter of course, the unprecedented vast bulk of research on ICT-mediated teaching and learning practices brought about by the pandemic should be considered in reference to the digitalisation process of HE institutions and the overgeneralised assumption that ICT-mediated teaching and learning practices have a positive effect

on diverse learning processes and outcomes. Accordingly, due care must be exercised in the implementation of teaching modes and ICT use since student's ICT-derived issues and preference for BL and f2f instruction over fully digital environments has been attested in numerous studies (Agung et al., 2020; Clark-Wilson et al., 2020; Alkhudiry & Aladhal, 2021; Bailey, 2022; Long et al., 2022; Hua & Wang, 2023). Such examinations may pave the way for future decisions concerning the implementation of technology and teaching modes in the educational context.

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