STUDIA UBB PHILOLOGIA, LXIX, 4, 2024, p. 285 - 305
(RECOMMENDED CITATION)
DOI:10.24193/subbphilo.2024.4.13

ICT-ENHANCED MARITIME ENGLISH TEACHING AND LEARNING AT TERTIARY LEVEL. A CONTRASTIVE ANALYSIS

Mariana BOERU[1]

Article history: Received 6 March 2024; Revised 25 June 2024; Accepted 15 October 2024; Available online 10 December 2024; Available print 30 December 2024.

ABSTRACT. ***ICT-Enhanced Maritime English Teaching and Learning at Tertiary Level. A Contrastive Analysis.*** This article aims to investigate the academic impact of employing ICT means and approaches in the context of teaching ESP to Marine Electrical Engineering students at "Mircea cel Batran" Naval Academy, Romania. The research question to be answered is whether a switch from a face-to-face, paper-based learning setting to a face-to-face, digital, interactive one would influence the overall academic performance of our students, with a focus on elements such as student interest, motivation, and autonomy. The article reports on and discusses the findings of quantitative and qualitative research conducted by the author on two separate groups of second-year Naval Academy students. First, a control group was selected and offered the traditional, paper-based, face-to-face course in English for Marine Electrical Engineering for the second year of study, while the experiment group was exposed to the digital, interactive version of the same course, which had been uploaded on the Academy Moodle LMS platform. Both groups underwent identical mid-semester and final semester assessments, and their results were recorded and compared. A keen interest was taken in the exposed levels of specialized lexical content retention and its subsequent, successful communicative contextualization. Moreover, the research cohorts were administered an end-of-semester questionnaire that sought to identify how students related to the course materials in terms of their level of interest and motivation and the perceived relevance and efficiency of the course

[1] **Mariana BOERU** is a lecturer at the Department for Marine Electrical and Electronic Engineering, The Faculty of Marine Engineering, "Mircea cel Bătrân" Naval Academy, Romania. Research interests: teaching and assessing within ESP programs at tertiary level, e-learning and digital pedagogies, gamification in ESP, ICT tools and ESP, ESP curriculum development. Email: mariana.boeru@anmb.ro.

content and format, etc. In addition to the contrastive evaluation of the course methodology employed in both cases under investigation, the research study also looked at the students' perceptions of the added value of several other factors, such as access to course materials and the possibility and ease of self-study, which correlate with the development of students' learning autonomy and the acquisition of transversal skills for life-long learning. Ultimately, this article seeks to bring into discussion some key aspects of integrating ICT means into the teaching of ESP at the tertiary level, as technology-informed ESP has become an indisputable and inevitable evolution within 21st century language teaching practices.

Keywords: *ESP, ICT, e-learning, digitalization, contrastive research*

REZUMAT. ***Predarea şi învăţarea limbii engleze maritime prin intermediul mijloacelor TIC la nivel universitar. O analiză contrastivă.*** Acest articol îşi propune să investigheze impactul academic al utilizării mijloacelor TIC în contextul predării limbii engleze de specialitate pentru studenţii la Inginerie Electrică şi Electronică Navală, din cadrul Academiei Navale „Mircea cel Bătrân", România. Întrebarea de cercetare a acestui studiu este dacă trecerea de la un context de învăţare faţă în faţă tradiţional, la unul faţă în faţă digital, interactiv, ar influenţa performanţa academică generală a studenţilor noştri. Cercetarea vizează acele elemente precum interesul studenţilor, motivaţia şi autonomia lor de învăţare. Articolul raportează şi analizează rezultatele cercetărilor cantitative şi calitative efectuate de autor pe două grupuri separate de studenţi din anul II la Academia Navală. În primul rând, a fost selectat un grup de control care a urmat cursul de limba engleză pentru inginerie electrică marină, anul II de studiu, în format tradiţional faţă în faţă, în timp ce grupul experimental a fost expus la versiunea digitală, interactivă a aceluiaşi curs, care fusese încărcat pe platforma online Moodle a Academiei Navale. Ambele grupuri au fost supuse unor evaluări identice la jumătatea semestrului şi la final de semestru, iar rezultatele lor au fost înregistrate şi comparate. Un interes deosebit a fost acordat gradului de retenţie a conţinutului lexical specializat şi contextualizarea comunicativă ulterioară a acestuia. Mai mult, studenţilor vizaţi de studiu li sa administrat un chestionar de sfârşit de semestru care a urmărit să identifice modul în care aceştia se raportează la materialele de curs în ceea ce priveşte nivelul lor de interes şi motivaţie şi relevanţa şi eficienţa percepută a conţinutului şi formatului cursului etc. Pe lângă evaluarea contrastivă a metodologiei de curs folosită în ambele cazuri investigate, studiul de cercetare a analizat şi percepţiile studenţilor cu privire la valoarea adăugată a mai multor alţi factori, cum ar fi accesul la materialele de curs şi posibilitatea şi uşurinţa studiului individual, care se corelează cu dezvoltarea autonomiei de învăţare şi dobândirea de competenţe transversale pentru învăţarea pe tot parcursul vieţii. În esenţă, acest articol urmăreşte să aducă în discuţie câteva aspecte cheie ale integrării mijloacelor TIC în predarea limbii engleze de specialitate la

nivel academic, deoarece predarea limbajelor de specialitate bazată pe tehnologie a devenit o evoluție incontestabilă și inevitabilă în cadrul practicilor de predare a limbilor străine din secolul XXI.

Cuvinte-cheie: *predarea limbajelor de specialitate, mijloace TIC, e-learning, digitalizare, cercetare contrastivă*

Introduction

It is undeniable that the advent of ICT has tremendously impacted and profoundly transformed the field of ESP in terms of its educational settings, the teaching and learning approaches and strategies, the input format, and the teacher-student and student-student interaction and communication patterns. In fact, today, ICT can no longer be regarded simply as an additional tool in the teaching and learning of ESP but rather as its underlying support framework. ESP in itself is now recognized as "a major player in both research and pedagogy in applied linguistics." (Hyland 2022, 202), having developed "a number of specific affinities, (…) a special relationship" (Sarré, 2021) with ICT.

This study will look at the literature produced on the topic of the integration of ICT in ESP practices to date and proceed to review those concepts to be verified in the research study herein under discussion. In addition, it will consider previous research findings that are relevant to its specific study objectives and correlate them to its own conclusions in the hope of providing further insight. The research study details, procedures, and findings will be described and discussed against the theoretical and pedagogical background previously presented.

Clarifying Concepts. Literature review

ICT Resources. ICT in ESP goes back all the way to the 1990s with the early days of word processors and students' unidirectional interaction with texts, progressing through the advent of Web 2.0 and the wide access to online resources, and reaching the current state of a multifaceted, profound interconnection based on crosspollination between ICT and ESP.

Collis and Moonen discussed the employment of ICT in connection to what they called "flexible learning" from several standpoints. First, they identified ICT resources as "learning resources." (Collis and Moonen 2001, 10-11) Nowadays, ESP teachers can choose from a large selection of free or paid ICT resources; the free ones also known as Open Educational Resources (OER).

As such, there is an array of learning apps dedicated to numerous varieties of occupational English and equally substantial multimedia interactive learning software as well as specialized online dictionaries, etc. Teachers can also exploit various online authentic textual, graphic, audio, and video content and online collections of specialized materials for different professional fields in the form of webpages, blogs, wikis, etc.

Second, they connected ICT to "the instructional organization of learning," referring, for instance, to Learning Management Systems such as Moodle, on which Massive Open Online Courses (MOOCs) can be uploaded and delivered; and, finally, they acknowledged ICT as being instrumental in facilitating synchronous and asynchronous "communication" within a learning context with tools such as email, chats, messaging, forums, and live video conferencing facilities, either integrated into an LMS or freestanding.

Types of ESP. The intrinsic relationship between the different learner communities' own, specific linguistic needs and the latter's transformation into the objectives and approaches of various ESP courses has prompted the emergence of quite a wide variety of types of ESP: EAP (English for Academic Purposes), EOP (English for Occupational Purposes), EAOP (English for Academic Occupational Purposes, combining EAP and EOP), and ESCP (English for Sociocultural Purposes for learners who, for instance, are seeking local community membership) (Belcher 2017, 3). Sarré goes even further and uses what he calls different "grains of specificity within ESP" (Sarré, 2021) combined with the extent of familiarity of the learner with the target context to identify EGAP (English for General Academic Purposes), English for Specific Academic Purposes, English for General Professional Purposes (e.g. general professional oral or written communication skills such as correspondence and participating in meetings), English for General Occupational Purposes (e.g., English for the hospitality industry), and English for Specific Occupational Purposes (e.g., English for tourist guides, receptionists, etc.). (Sarré, 2021)

Learning theories in ESP. The current integration of ICT into ESP practices has meant taking the principles of constructivism, connectivism, and Task-Based Language Teaching and harnessing their combined effects in a technology-driven setting that aims to cater to the learners' specific needs as much as possible. Constructivism views learners as actively constructing meaning and knowledge and making choices while trying to make sense of their experiences and creating their own learning system. (Driscoll, 2000, 376) Mamakou and Grigoriadou deem socioconstructivism "the appropriate paradigm for ESP learning in tertiary education," claiming that a constructivist approach to language learning is "absolutely appropriate for adult learners that need to develop academic and professional/vocational discipline-specific language skills through a

collaborative setting." (Mamakou and Grigoriadou 2009, 463) In this approach, collaboration emphasizes the social dimension of learning - the fact that learners learn through interaction and cooperation with other learners, the teachers, and even other professionals belonging to their field of work. Hence, the relevance of the professional socio-cultural context, which encompasses a particular group's learning experience.

The socioconstructivist view of learning through collaboration and networking is broadened and enhanced by the theory of connectivism, which is defined by George Siemens as "the ability to see connections between fields, ideas, and concepts," an ability that he sees as a "core skill." (Siemens 2005, 6) Connectivism means the practice of connecting resources (material and human alike) as a perpetual learning strategy, creating useful information patterns which is what is "required to learn in our knowledge economy." (Siemens 2005, 4) What is more, with the tremendous advance of ICT, which has opened learners' access to multidimensional networking in the field of education, Siemens argues that the conjugated effect of technology and connectivist learning activities has been the propulsion of "learning theories into a digital age." (Siemens 2005, 4).

The way ESP teaching approaches have operationalized these theories has been mostly through task-based and project-based activities that facilitate the learners' collaborative use of the language in a manner that is adequate to meet real-life professional objectives and outcomes. These activities are centered on the learners and their need for real communication skills and specialist lexical knowledge. Thus, ESP teachers strive to involve their students in engaging, interactive, collaborative and connective activities in which meaning and knowledge are actively co-constructed and linguistic proficiency is performative and goal-oriented. As Hyland points out, there should be "a focus on inductive, discovery-based learning, authentic materials, and an emphasis on a guided, analytical approach to teaching." (Hyland 2022, 213)

In this context, especially with ICT being more and more embedded in ESP, the role of the teacher has shifted from being the main source of knowledge to being a facilitator, "a guide to support learners through the process of learning." (Gimeno-Sanz 2014, 29) It is obvious that there are now multiple hats that language teachers have to wear. For instance, Li (2018) outlined the evolving roles of teachers in ICT-based ESP, connecting specific digital tools and activities to a certain teacher role: organizer for Wikis, audience/reader for blogs, guide for corpus projects, participant/facilitator on online forums, and evaluator for students' oral and written work. (Li 2018, 16)

Needs analysis. Authentic materials. Right from the onset, ESP has been defined by its pursuit of the specific needs of the target learners (Paltridge and Starfield, 2013, Arnó-Macía, 2012, Belcher, 2009), determined through needs

analysis. This has profoundly influenced the objectives, the content, the resources, the approaches, and the dynamics of ESP programs. More precisely, when establishing the learners' profile with the help of needs analysis, course designers should consider, as Hyland points out, the "learners' goals and backgrounds, their language proficiencies, their reasons for taking the course, their teaching and learning preferences, and the situations they will need to communicate in." (Hyland 2006, 73) It is important to notice the multifold insight provided by Hyland's list. First, there are the learners' initial background and linguistic proficiency constituting the foundation onto which the learning experiences will be articulated, and second, there are the learner's own learning objectives formulated in close connection to their envisaged performance in real-life professional communicative contexts, the starting point and the end point of their learning experience being bridged by *their teaching and learning preferences*. This stresses the outmost importance of the learners' own input into their learning process. In ESP, learners are not passive recipients of imparted knowledge unilaterally selected by teachers but rather invested actors who constantly shape their learning experience, influencing what, how, and how much they learn. Moreover, learners are themselves sources of authentic information and experience that are to be exploited by language teachers. For instance, Marine Electrical and Electronic Engineering students who have already been on their cadet training voyage onboard merchant ships can impart their real-life expertise in English during the course, engaging, thus, in communicative practices that connect their language skills to their real-world knowledge.

A significant role of needs analysis is to offset "any excesses of theory-building with practical applications." (Hyland 2022, 205) Indeed, there is a difference between EFL and ESP in terms of course objectives, with the former striving for linguistic proficiency while the latter being more focused on developing strategic communicative skills. Consequently, training learners for the real-life tasks they will need to perform and targeting the acquisition of the linguistic content they will have to comprehend, operate with, and interact with has warranted the value placed on authentic materials in ESP practices.

Authentic materials refer to authentic textual (articles, blogs, forums, wikis, technical manuals, procedures, etc.), visual (e.g., pictures of various equipment), audio and video (practical demonstrations, specialist lectures, interviews, etc.), digital (specialist software, etc.), and graphical (maps, graphics, diagrams, etc.) inputs, while authentic communicative tasks mimic those performed by learners in their professional contexts either orally or in writing (providing explanations, giving instructions, making demonstrations, issuing orders, asking and answering questions, participating in discussions, describing processes, making inquiries, writing plans, reports, etc.).

According to Li, the Internet is the prime source of "natural, context-rich, and culturally specific materials" (Li 2018, 12). Authentic materials offer the advantage of not being edited, which, while raising some comprehension challenges due to a likely excess of unfiltered information, may nevertheless open opportunities for negotiation of meaning and self-study strategies. Learners have the possibility of becoming adept at processing large amounts of multi-format content; they learn how to seek and locate necessary information quickly and how to synthesize the collected information into comprehensible forms. In this way, they develop their life-long learning skills by doing online research for group projects and preparing presentations, just like they will do later on in real life.

In addition to being an ever-expanding repository of up-to-date and relevant, specialized learning material in all the forms mentioned above, the Internet allows learners to interact with various specialists in their particular field of expertise, authentic sources in their own right. On social media, for example, learners can find expert advice on various topics explored in their language course. In addition, there are numerous academic research programs that seek to bring together the learning communities and the communities of practice, facilitating a fruitful exchange of ideas. Such an example is *SeaMentors*, https://seamentors.com/, an Erasmus+ KA2 strategic partnership program led by "Mircea cel Bătrân" Naval Academy in partnership with four other maritime universities and one maritime innovation company. The program has created an online platform to enable the transfer of experiential knowledge and offer career guidance and mentoring to cadets and young seamen at the beginning of their careers. The platform brings together experienced seafarers and shipping companies' managers in live dialogue with aspiring cadets who have, thus, the opportunity to access all the available theoretical, practical, material, and human resources. This is an example of putting socioconnectivist theories into practice by connecting one's own knowledge to that of authentic sources online and, consequently, expanding one's competence in the process.

Online learning spaces. LMSs. One important affordance of integrating ICT in ESP is the opportunity to develop a learner-oriented educational environment in the form of LMSs or VLEs where communication and cooperation are facilitated mostly by embedded tools such as emails, messages, notices, online collaborative workspaces, live video conferencing, etc. They constitute what Bloch called "a space for creating new forms of communicating." (Bloch 2013, 385). Such online learning environments also incorporate a variety of innovative resources and activities and, most importantly, facilitate learner self-direction, simultaneously boosting motivation and engagement.

It is considered essential for ESP learners to develop autonomous learning skills and strategies, to become independent, and to assume full responsibility for their own learning journey. "Learning, as a self-organizing process" (Siemens 2005, 4), requires a proactive and self-reflecting attitude toward learning in which learners self-manage by setting individual objectives and milestones, developing digital competences, making choices as to which types of tasks and activities they find most efficient, etc. On online learning platforms, learners can track their own progress, practice and revise at their own pace, create their own resource collections (online portfolios of their own work, mini glossaries, etc.), and acquire the digital competences they will use throughout their entire professional lives. This idea is echoed by Deacon, Parkin, and Schneider, who argue that nowadays language graduates need "more specific and wide-ranging skills if they are to compete in the current and future job markets. It is now widely accepted that universities have a direct responsibility to prepare students for employment, and, in the 21st century, *this preparation needs to include digital literacy and competencies*." (2017, 137, emphasis mine) By exercising their digital literacy, ESP learners can connect to communities of practice worldwide, accessing opportunities on a global scale.

LMS features offer numerous advantages to the language learner: *Availability* and *accessibility.* In terms of availability, LMSs host content that can be accessed by multiple users at any time from anywhere with a web connection. LMSs can include tutorials and further instructions on how to use their features, which adds to their perceived ease of access. *Privacy.* LMSs are private learning spaces that can only be accessed via a registered student or teacher account and a course membership. Only learners and their teachers can access individual student information, which has a positive impact on the overall trust and openness of the learners towards the learning environment and the learning process itself. *Tracking and reporting:* Leaners can visualize a coherent content organization by units, lessons, etc., which conveys the idea of progress. They can track their work with the help of the built-in features; they can see their progress reports and their quiz scores, which can act as motivating factors. *Evaluation.* LMSs have built-in testing features and allow for pre-course, progress, and final evaluations. Tests can be easily updated; teachers can open and close tests, time tests, set the number of allowed retakes, etc. Tests can include audio, video, pictorial, and graphic input in addition to the classical textual content. *Feedback.* Interactive online activities offer immediate feedback, either in the form of the correct answer or extended written feedback and further clarifications. Students can also receive written feedback on their writing assignments, with useful commentary and even links to further online resources outside the LMS. *Updateability*. LMSs allow for regular updates of the posted

educational content, while the types of activities and resources made available by the platform (e.g., Moodle) are constantly expanded and upgraded with new and improved learning tools and features.

Research studies on LMS s in ESP. There is a plethora of published studies on the impact of digital technology on ESP practices. Herein, however, I will review some relevant studies focused on the research of LMSs and their effects on ESP learning. In this way, I intend to connect the present research to the literature already available on the subject at hand.

In 2015, Reza Dashtestani and Nadežda Stojković published a review of 55 research studies on the use of technology in ESP. Discussing the findings of the studies concerned with the use of CMSs (Course Management System)and LMSs (Learning Management System) in ESP training, Dashtestani and Stojković conclude that "there is adequate qualitative and quantitative evidence that illustrates that integrating CMSs/LMSs in the ESP instruction would increase student engagement and participation in the classroom (…)The use of LMS can also improve student autonomy and independence" (Dashtestani and Stojković 2015, 437) and that they have an overall positive impact on the quality of instruction. (Dashtestani and Stojković 2015, 451) One of the studies showed that the use of Moodle as a LMS improved the students' intake of specialized vocabulary. (Perea-Barberá and Bocanegra-Valle 2014) All studies indicated an overall positive attitude of the learners towards ICT resources and technology-enhanced education in general.

In particular, Kučírková, Kučera, and Vydrová conducted an experimental investigation of the results of a pilot ESP e-learning course in Business English, using a control and an experiment group of students. They also employed end-of-course questionnaires to find out the students' views on e-learning. The control group was taught in a face-to-face setting, while the experiment group was exposed to e-learning. Using pre- and post-tests, the researchers wanted to determine whether the format of training impacted its effectiveness in any way, as evidenced by the differences in test results. Apparently, the differences were not significant enough to indicate one teaching format as yielding better results than the other: "The e-learning method did not help the important improvement of the skills, but at the same time it did not worsen them." (Kučírková, Kučera, and Vydrová 2012, 182) The questionnaires revealed overall positive attitudes towards e-learning, with special appreciation of the flexibility and practicality offered by the LMS used on the online course: "In general, students also expressed that they were satisfied with the possibility to do, finish, or revise activities in Moodle at home, and the lessons in an electronic form seemed to be practical for them." (Kučírková, Kučera, and Vydrová 2012, 183)

Other studies (Knežević, 2017, Gupta and Vohra, 2017, Alcántar, et al., 2018, Keshtiarast et al., 2022) came to the same conclusions. Gupta and Vohra, in particular, emphasized the opportunity to develop digital competences and learning strategies. According to the researchers, "most of the students were enthusiastic about the course regarding adopting new technologies that promote and enhance language learning by blending online and face-to-face communication tools." (Gupta and Vohra 2017, 9) Alcántar et al. analyzed the views of a very large cohort of International Business students at a Mexican public university on the use of technology as a tool in support of language learning, trying to determine the factors considered favorable to ICT-based learning by students. The authors report that 60% of the students agree that using ICT tools strengthens their learning, with an emphasis on their reading skills (Alcantar et al. 2018, 11); however, they also point out that students tend to shy away from more technical applications such as Prezy, Cmaps, etc. The researchers attribute this fact to the students' lack of exposure to a variety of digital tools, as they point out that "students and teachers alike do not know the pedagogical use of the foregoing materials." (Alcantar et al. 2018, 12) Thus, they emphasize the importance of teacher training in developing digital pedagogies with a view to incorporating ICTs more in their teaching practice: "lack of teacher training affects the operation and activities in blogs or educational platforms; and presenting only activities from a data repository has a demotivating effect on the students who use these technologies since it limits their learning." (Alcantar et al. 2018, 12)

An interesting finding resulted from the study conducted by Gimeno-Sanz in 2017 on an online course provided by the university LMS. The researcher found that 83% of the respondents considered the online environment less threatening than a face-to-face one (Gimeno-Sanz 2017, 257), while 88% -Sanz 2017, 258) It seems that studying on an LMS in a more autonomous way, using the incorporated digital tools to organize and pace one's learning process, is more motivating and encouraging for some students, especially lower-level ones, who might experience performance anxiety in a face-to-face setting. The 2020 survey conducted by the same Gimeno-Sanz, this time on 14.000 learners from four B2 MOOCs, targeted student motivation, expectations, and learning styles. The findings indicated the lack of human interaction in online learning as a demotivating factor. On the other hand, technology-based materials were found to be better suited for self-paced learning and for self-access learning, offering more flexibility and accessibility. The respondents appreciated online materials as more engaging, interactive, dynamic, and richer in audio-visuals. Plus, the online materials were considered useful in reinforcing knowledge by offering the possibility of follow-up due to the incorporation of immediate feedback and scoring systems. Finally, learners felt they learned faster and more while attending online courses. (Gimeno-Sanz 2020)

The Research Study

Test cohorts. The present study investigated the second-year, second-semester, Maritime English seminar for Marine Electrical and Electronic Engineering students. The control group and the experiment group were each made up of 20 second-year students in the 2022-2023 academic year.

Their initial level of general English knowledge was established with the help of an integrated reading, listening, and writing test. The initial test content (reading and listening texts, the topic of the writing task) pertained to the general Maritime English sphere discussed throughout the first year of study and the first semester of the second year. The initial test did not include any specialized Marine Electrical and Electronic Engineering lexical items that would be introduced beginning with the second semester of the second year of study. Both groups were administered the same test. Their results placed both groups at an initial level of general English around B1/B1+, according to CEFRL, with an overall homogenous distribution.

Maritime English language training at the Romanian Naval Academy. Maritime English (for the merchant navy) is a compulsory 2-hour/week seminar over five semesters for all maritime engineering undergraduate programs at "Mircea cel Bătrân" Naval Academy in Constanța. Each major (Navigation, Marine Mechanical Engineering, Marine Electrical and Electronic Engineering, Port Management) includes a core general Maritime English course spread over more or less the first year of study and then branches out into its own major-specific, specialized Maritime English course for the rest of the undergraduate program. There are 28 hours of English training per semester, resulting in a total of 140 hours per undergraduate program.

The aims of the second year, second semester, Maritime English seminar for Marine Electrical and Electronic Engineering target the students' acquisition of specialized Maritime English vocabulary pertaining to the ten topical units making up the semester coursework and its efficient contextualization in oral and written professional communicative settings using appropriate language communicative functions and register. The ten units are: direct current, alternating current, electrical installations, ships' operational requirements, basic electrical design, electro-magnetic compatibility, main components of electrical system: generators, motors, and cables, main components of electrical systems: switchboards, breakers, starting equipment, automation and communication systems. In addition, the development of students' comprehension of specialized oral and written texts is pursued throughout the seminar. The target language functions to be developed throughout the course are describing equipment and processes, explaining cause and effect, giving details, providing instructions, etc.

The traditional face-to-face course is based mostly on the dedicated course book and teacher-developed supplementary materials, including audio and video content. Texts are generally selected from technical manuals. In order to acquire the target vocabulary and develop their comprehension skills, students are required to carry out a variety of learning tasks, which include fill-in, true/false, multiple choice, matching, ordering, open-ended comprehension questions, vocabulary crosswords and puzzles, etc. As far as developing their productive skills, students are involved in short discussions as part of the production phase of the lesson after doing vocabulary and text comprehension work. In addition, they are asked to prepare and deliver short PowerPoint presentations as part of their end-of-course assessment. Course assessment involves an initial test at the beginning of the seminar, a mid-course test, a final test, and a PowerPoint presentation on an assigned topic selected from those studied during the seminar.

The online course is uploaded onto the Academy LMS (Moodle), a media-rich electronic learning environment. It is delivered face-to-face in a multimedia lab with a smartboard, internet connection, and networked teacher and student laptops. The course is organized around the same 10 topical units as the face-to-face paper-based one. In each seminar, the students log onto the ADL platform, access the course, and work on the assigned unit on their individual computers. The students are listed as participants, and their grades can be viewed by both the teacher and the individual student. There is a built-in progress report tool wherein students can keep track of their progress and grades. In terms of communication tools, the platform allows for announcements; there is a chat option, a forum, messaging tools, etc. The students are notified of any communication in their e-mails. Each unit includes a dedicated online mini-dictionary of key terms, illustrated with pictures or audio input where possible. The course materials also include grammar notes, fact sheets, diagrams, videos, etc. There is an accompanying vocabulary practice test, which accounts for 10% of the unit grade. The theoretical grammar content is then practiced with the help of other interactive, multi-choice exercises. Grammar accounts for 20% of the unit grade. The unit reading, listening, and video content contextualizes the key concepts, and students develop their comprehension skills with the help of a variety of interactive exercises. In addition to the exercises loaded onto the platform, students practice with a variety of web-based gamified learning activities, such as online jeopardy games (for collaborative work), dedicated Quizlet flashcards, Wordwall games, etc. The *knowledge* part accounts for 10% of the unit grade. A series of learning strategies have been embedded in the online interactive coursework design so as to facilitate and foster learner

autonomy. For instance, the self-assessment exercises for each unit allow several attempts so that each student can choose their own learning strategy. There is also a unit final test, which accounts for 50% of the unit grade and includes items testing all the elements listed above (vocabulary, grammar, and text comprehension). All units are structured in the same manner. The average grade of each unit contributes to the final semester grade. Students have to take a mid-course test and a final test and deliver a PowerPoint presentation at the end of the course to evaluate their productive skills and their integration of the target specialized vocabulary.

Research objectives and procedures. The research aimed to investigate how and to what extent a switch from a face-to-face, paper-based learning process to a face-to-face, digital, interactive one would positively influence the overall academic performance of our students. In addition, the research sought the opinion of the students regarding the use of digital technology to optimize their English language learning experience, trying to identify those factors considered favorable by the respondents, with a focus on elements such as student interest, motivation, and autonomy. The quantitative and qualitative research was conducted on two separate groups of second-year Naval Academy students. The control group was offered the traditional, paper-based, face-to-face course, while the experiment group was exposed to the online version described above. Both groups underwent identical mid-semester and final semester assessments, and their results were recorded and compared. A keen interest was taken in the exposed levels of specialized lexical content retention and its subsequent, successful communicative contextualization, as evidenced by their presentations of the assigned research project. The research cohorts were administered an end-of-semester questionnaire that sought to identify how students related to the course content, format, and pedagogy in terms of their level of interest and their perceived relevance and efficiency, all directly connected to the students' level of motivation. In addition to the contrastive evaluation of the course methodology employed in both cases under investigation, the research study also looked at the students' perceptions of the added value of several other factors, such as access to course materials and the possibility and ease of self-study, which correlated with the development of students' learning autonomy and the acquisition of transversal skills for life-long learning.

The research instrument consisted of a questionnaire that was created to meet the objectives of the research based on a review of the literature and echoing previous relevant research. It comprised 5-point Linkert scale closed-ended questions with two options in each polarity, a median one, and an open-ended question.

Test results. Discussion of findings. Both the control and the experiment groups were administered the same mid-course and end-of-course tests. The tests consisted of multiple-choice items testing their acquisition of the target specialized vocabulary and their comprehension of written and oral specialized texts. Mention must be made that the experiment group was also offered online interactive self-assessment tests within each topical unit; however, these results were not considered in the contrastive analysis of the test results since the control group course did not offer them. Both groups were tested on their written and oral presentation skills. The descriptive rating grid rated students based on their task fulfillment, organization, delivery, and grammatical and lexical accuracy, with an overall maximum score of 100 points. Table 1. below summarizes the test results for both the control and the experiment groups in ascending order.

Table 1. Control group and experiment group test results

Control group					Experiment group				
Stds.	Initial level	Mid Test (100 max. pts.)	Final Test (100 max. pts.)	PPT Presentation (100 max. pts.)	Stds.	Initial level	Mid Test (100 max. pts.)	Final Test (100 max. pts.)	PPT Presentation (100 max. pts.)
S 01	A2+	67	72	68	S 01	A2+	72	78	66
S 02	B1	70	76	70	S 02	A2+	73	80	68
S 03	B1	70	78	70	S 03	B1	75	80	68
S 04	B1	70	84	74	S 04	B1	75	82	70
S 05	B1	72	86	74	S 05	B1	76	84	70
S 06	B1	73	89	76	S 06	B1	76	85	70
S 07	B1	76	87	80	S 07	B1	78	86	72
S 08	B1	78	86	80	S 08	B1	79	86	72
S 09	B1	80	89	82	S 09	B1	82	90	80
S 10	B1	80	88	86	S 10	B1	83	88	86
S 11	B1	81	89	90	S 11	B1	84	92	86
S 12	B1	82	90	90	S 12	B1	84	88	86
S 13	B1	85	88	92	S 13	B1	86	87	84
S 14	B1	86	92	92	S 14	B1	89	94	88
S 15	B1	89	90	90	S 15	B1+	92	98	90
S 16	B1+	90	94	94	S 16	B1+	94	96	90
S 17	B1+	91	95	96	S 17	B1+	96	98	92
S 18	B1+	92	96	96	S 18	B1+	96	99	92
S 19	B1+	94	96	100	S 19	B1+	97	100	96
S 20	B1+	96	100	98	S 20	B2	98	100	100

The test results indicate an overall improvement of the students' scores from the mid-course test to the final test in both the control group and the experiment group, with all students reaching the course objectives. There are no significant differences between the control group and the experiment group in terms of how much the students improved their scores from one test to the next. However, the experiment group seems to have performed slightly better than the control group if we consider their initial levels with higher mid-test and final test scores, especially in the lower-level segment. This might be attributed to the fact that students in the experiment group were more exposed to the types of tasks (multiple choice) used in the mid- and final test, as their course included online self-assessment interactive (multiple-choice) exercises after each unit, with multiple retakes allowed. Therefore, it could be inferred that task format familiarity and extra practice might have had a positive impact on their mid- and final test performance. In addition, lower-level students on the online course seemed to have performed better than the lower-lever students on the face-to-face course. The built-in self-pacing and self-management features of the online course appear to have had a more positive impact on the evolution of the lower-level students. Overall, the online medium seems to have been better suited for vocabulary acquisition and the development of comprehension skills. This finding is supported by insights from literature on the issue: "computer-based vocabulary learning is a frequent and effective approach to developing retention and learning new words." (Regina and Devi 2022, 2365)

However, when analyzing the students' scores in the oral presentation of their assigned research project and correlating them to their initial level and their mid- and final test performance, the control group (the face-to-face, paper-based course) seems to have done slightly better than the experiment group (the online course). Correlating that with the teacher's own observations and notes, it might be the case that students on the online course encountered more difficulty producing extended, organized oral discourse around the key lexical items they acquired during the seminars. They might have managed to acquire the targeted lexical items and developed their reading and listening comprehension skills, but their speaking skills were less developed. This issue is even more evident in the case of lower-level students on the online course. Those were the ones who performed better in their tests than their control group peers but underperformed in their oral presentation evaluations. One explanation is that the face-to-face paper-based course offered more opportunities for speaking practice than the online interactive course, which dedicated more time to the practice of vocabulary and the development of comprehension skills due to its specific format. According to the teacher's informal observations, the students seemed more absorbed by technology in the online coursework and less willing

to leave the digital space in order to interact with each other orally in speaking activities. Another practical observation is that the physical arrangement of the learning space seemed to have impacted the organization of speaking activities. While the face-to-face paper-based course was held in a regular classroom with a whiteboard, a multimedia projector, and multiple possibilities for arranging and rearranging the seats and the overall classroom orientation (i.e., group work, pair work, individual work, frontal teaching, etc.), thus more conducive to oral interaction, the online course was held in a multimedia laboratory with individual computer desks, glass partitions, and a frontal orientation, without any possibility of rearrangement, perfect for individual computer work but less so for class speaking activities with the exception of PowerPoint presentations. These observations point to the need for teachers to design a greater variety of digital activities aiming to develop the students' productive skills, keeping in mind the specificity, the technical possibilities, and the inherent limitations of the online educational environment.

The end-of-course questionnaire asked students from both the control group and the experiment group to evaluate their learning experience in terms of several factors:

The course materials. The students evaluated the topics and format of the reading and listening texts, the video and graphic input, and the vocabulary presented during the course in terms of their level of interest and perceived relevance to their future profession. Both the control group and the experiment group appreciated the topics of the reading and listening texts as "very interesting" and "interesting" (80% combined for the control group and 90% for the experiment group) and "very relevant" and "relevant" (90% combined for the control group and 90% for the experiment group). Given the fact that the course materials are based on technical, authentic, and adapted materials, it appears as though the authenticity of the input has contributed to the students' overall positive attitude towards it, with an equally beneficial impact on their motivation.

The respondents evaluated the format of the course content (paper course book vs. online digital texts) as "very interesting" and "interesting" (75% combined for the control group and 90% for the experiment group) and "very relevant" and "relevant" (80% combined for the control group and 90% for the experiment group). It appears as though the experiment group found the topics and format of the course materials slightly more interesting and relevant to their future profession than the control group. This might be justified by the appeal of digital technology to our student population of digital natives, given the fact that the content in itself was mostly the same in both cases, only the format was obviously different. The video and graphic input and the vocabulary presented during the course were equally appreciated as very interesting and very relevant by both groups.

The course activities. The students then critically looked at the types of learning activities carried out during the course. The activities were found to be "very interesting" and "interesting" (70% combined for the control group and 85% for the experiment group) and "very relevant" and "relevant" (85% combined for the control group and 90% for the experiment group). The experiment group students seemed to be more appreciative of the learning activities, finding them more interesting and relevant than the control group. It might be the case that the accessibility and interactive features of the online course contributed to a more positive attitude of the students, even if the types of activities were essentially the same in both cases (e.g., true/false, multiple choice, fill in the gaps, matching, etc.). The online students might have liked the instant individual feedback, the lack of the pressure of checking answers in plenary, and the fact that they could redo the activities as many times as they wanted, as opposed to the face-to-face class during which not everybody might have gotten the chance to finish the task or have it checked. The students were also asked to evaluate how much they felt they had developed their speaking skills during the course. The control group was quite positive in their appraisals, with 60% of them stating they had made "very much" and "good" progress (combined). The experiment group was less confident in their speaking skills, as only 40% of them (combined) felt they had made "very much" and "good" progress. It is obvious that the students' perceptions correlate with their test results, as the online course offered fewer opportunities for speaking development.

Learning experience. The students were then asked to express their opinions on the best way to learn Maritime English by choosing one out of the four given options: 1) face-to-face with a teacher; 2) face-to-face with a teacher and aided by digital technology; 3) a distance online course with an online tutor; 4) a self-access online course without a tutor. Both the control group and the experiment group opted massively for option number two (85%-90%), the control group as a desire for the future and the experiment group as confirmation of a positive learning experience. The on-site blended learning setting seems to have emerged as the most popular option, as students appear to be ready to embrace technology but not yet willing to forego the benefits offered by a face-to-face learning process in which the presence of a teacher is an enabling factor, providing instant, constructive feedback and offering facilitation that is meant to support and guide the progress of the students towards autonomy and self-empowerment.

Open-ended question. The respondents were also asked to consider an open-ended question aimed at investigating what elements they liked best during the course. Here are some positive elements mentioned by the control group: "It is useful for my work," "I can understand electrical engineering

English," "I improved my English speaking," "I can participate in an interview at a crewing company," etc. The experiment group mentioned the accessibility of the online course: "I was able to study from home if I missed a seminar," the grade tracking system: "I could see my course results," the extra features like the unit dictionaries with visual input: "I could look up words in the online dictionary," the interactive gamified tasks: "I liked the flashcards and the online games," etc.

Conclusions

To sum up, it seems that digital technology had an overall positive impact on the learning process, enhancing students' learning experience, increasing their level of interest, and thus boosting student motivation and autonomy. In addition, motivation seems to have been connected to the perceived relevance of the course and the possibility of employing the linguistic knowledge and skills gained during the course outside of it in real-life professional contexts. These findings support the view that emphasizes the importance and benefits of implementing ICT within ESP practices, not simply as an additional teaching tool but rather as "a long-range strategy for future vocational training, with flexibility and the facility of access representing an enabler of life-long learning as well as a catalyst for change and sustainability." (Pop 2010, 1186)

This research study has carried out a contrastive analysis of a face-to-face ESP course in Maritime English versus its digitalized online version taught on-site. The study has identified the relevant affordances offered by the integration of ICT in ESP as listed in the literature review and verified them against its own findings. Moreover, this study has critically connected to previous similar research and has contributed its own findings by trying to illuminate some of the issues affecting the students' learning experience in an ICT-enhanced setting. While this study has confirmed the generally acknowledged positive contributions of ICT in the teaching of ESP, with special mention given to the facilitation of the development of digital skills and inclusive learning at all levels, it has also shown the need for what Hyland calls "the development of innovative language teaching practices" (2022, 210) as he points out that research studies seem to have pushed classroom methods towards the margins of the academic forum on the greater topic of ICT in ESP (Hyland 2022, 203). Thus, study has revealed the necessity of developing more diversified, engaging communicative activities, which are then shown to be efficient in developing the students' productive skills on an online course.

WORKS CITED

Alcántar, María del Rocío Carranza, Claudia Islas Torres and Mónica Lizbeth Maciel Gómez. 2018. "Perception of Students Regarding the Use of ICT and Learning English." *Apertura* 10, no. 2: 1-18. http://dx.doi.org/10.32870/Ap.v10n2.1391.

Arnó-Macía, Elisabet. 2012. "The Role of Technology in Teaching Languages for Specific Purposes Courses." *The Modern Language Journal* 96 (Special Issue): 89-104. doi:10.1111/J.1540-4781.2012. 01299.

Belcher, D. 2009. "What ESP is and can be: An introduction." In *English for Specific Purposes in Theory and Practice*, edited by Diane Belcher, 1-20. University of Michigan Press.

Belcher, D. 2017. "Recent Developments in ESP Theory and Research: Enhancing Critical Reflection and Learner Autonomy through Technology and Other Means." In *Synergies of English for Specific Purposes and Language Learning Technologies*, edited by Nadežda Stojković, Milorad Tošić and Valentina Nejković, 2-19. Cambridge Scholars Publishing.

Bloch, Joel. 2013. "Technology and ESP." In *The Handbook of English for Specific Purposes*, edited by Brian Paltridge and Sue Starfield, 385-401. Boston: Wiley-Blackwell.

Collis, B., and J. Moonen. 2001. *Flexible learning in a digital world. Experiences and expectations*. London: Kogan Page.

Dashtestani, Reza and Nadežda Stojković. 2015. "The Use of Technology in English for Specific Purposes (ESP) Instruction: A Literature Review." *The Journal of Teaching English for Specific and Academic Purposes* 3, no. 3 (Special Issue): 435-456. UDC 811.111'276.6:(159.953.5+52-14).

Deacon, Amanda, Lucy Parkin and Carolin Schneider. 2017. "Looking Beyond Language Skills – Integrating Digital Skills into Language Teaching." In *Innovative Language Teaching and Learning at University: Enhancing Employability*, edited by Carmen Álvarez-Mayo, Angela Gallagher-Brett and Franck Michel, 137-144. Research-publishing.net.

Driscoll, M. 2000. *Psychology of Learning for Instruction*. Needham Heights, MA: Allyn & Bacon.

Gimeno-Sanz, Ana Maria. 2014. "Fostering Learner Autonomy in Technology-Enhanced ESP Courses." In *Languages for Specific Purposes in the Digital Era*, edited by Elena Bárcena, Timothy Read, Jorge Arús, 27-44. Springer International Publishing Switzerland.

Gimeno-Sanz, Ana Maria. 2017. "Analyzing Learner Attitudes to Learning ESP Online." In *Synergies of English for Specific Purposes and Language Learning Technologies*, edited by Nadežda Stojković, Milorad Tošić and Valentina Nejković, 244-275. Cambridge Scholars Publishing.

Gimeno-Sanz, Ana Maria. 2020. "Analyzing Learner Motivation." Conference Paper. The Future of Education. Retrieved from: https://www.researchgate.net/publication/351558903_Analysing_Learner_Motivation.

Gupta, Pooja and Shalini Vohra. 2017. "Technology Integrated English Language Learning: A Case Study." *Advances in Computer Science and Information Technology (ACSIT)* 4, no. 1 (January-March): 5-9.

Hyland, Ken. 2006. *English for Academic Purposes: An Advanced Resource Book*. London: Routledge.

Hyland, Ken. 2022. "English for Specific Purposes: What Is It and Where Is It Taking Us?" *ESP Today - Journal of English for Specific Purposes at Tertiary Level* 10, no. 2: 202-220. https://doi.org/10.18485/esptoday.2022.10.2.1.

Keshtiarast, Bahareh, Hadi Salehi, Omid Tabatabaei and Roya Baharlooie. 2022. "Solving ESP Problems: Students and Teachers' Perceptions of Integrating Information and Communication Technology into ESP Instruction." *Journal of Nusantara Studies* 7, no. 2: 444-472. http://dx.doi.org/10.24200/jonus.vol7iss2pp444-472.

Knežević, Žana. 2017. "IT Students' Perception of Use of Modern Technologies in ESP." In *Synergies of English for Specific Purposes and Language Learning Technologies*, edited by Nadežda Stojković, Milorad Tošić and Valentina Nejković, 285-294. Cambridge Scholars Publishing.

Kučírková, Lenka, Petra Kučera and Hana Vostrá Vydrová. 2012. "Study Results and Questionnaire Survey of Students in the Lessons of Business English E-Learning Course in Comparison with Face-To-Face Teaching." *Journal on Efficiency and Responsibility in Education and Science* 5, no. 3: 173-184. doi: 10.7160/eriesj.2012.050306.

Li, Li. 2018. "Integrating Technology in ESP: Pedagogical Principles and Practice." In *Integrating Information and Communication Technologies in English for Specific Purposes,* edited by Rosa Muñoz-Luna and Lidia Taillefer, 7-25. Springer International Publishing Switzerland.

Mamakou, I. and M. Grigoriadou. 2009. "Project-based instruction for ESP in Higher Education." In *Handbook of Research on E-Learning Methodologies for Language Acquisition*, edited by R. de Cássia Veiga Marriott and P. Lupion Torres, 456-479. Hershey, NY: IGI Global.

Paltridge, Brian and Sue Starfield. 2013. "Introduction." In *The Handbook of English for Specific Purposes*, edited by Brian Platridge and Sue Starfield, 1-4. Boston: Wiley-Blackwell.

Perea-Barberá, M. D. and A. Bocanegra-Valle. 2014. "Promoting Specialised Vocabulary Learning Through Computer-Assisted Instruction." In *Languages for Specific Purposes in the Digital Era*, edited by Elena Bárcena, Timothy Read, Jorge Arús, 129-154. Springer International Publishing Switzerland.

Pop, Anisoara. 2010. "The Impact of the New Technologies in Foreign Language Instruction, Our Experience." *Procedia Social and Behavioral Sciences* 2: 1185–1189. doi:10.1016/j.sbspro.2010.03.169.

Regina, D. and Anitha Devi. 2022. "Computer-Based Vocabulary Learning in the English Language: A Systematic Review." *Theory and Practice in Language Studies* 12, no. 1 (November): 2365-2373. https://doi.org/10.17507/tpls.1211.17.

Sarré, Cédric. 2021. "Technology-Mediated ESP Learning And Teaching (TESPLAT): from language learning theory to ICT integration principles." In *CALL for Background*, edited by Anna Turula, Anita Buczek-Zawila, Peter Lang. 9783631845295. 10.3726/b18284. hal-03829121.

Siemens, George. 2005. "Connectivism: A Learning Theory for the Digital Age." *International Journal of Instructional Technology and Distance Learning* 1: 1–8. https://jotamac.typepad.com/jotamacs_weblog/files/Connectivism.pdf.