

Danka Sinadinović*

University of Belgrade – Faculty of Medicine

<https://orcid.org/0000-0002-3643-5917>

Sofija Mičić Kandijaš**

University of Belgrade – Faculty of Medicine

<https://orcid.org/0009-0003-9332-031X>

STRIKING THE BALANCE: INTEGRATING TECHNOLOGY-MEDIATED INSTRUCTION WITH TRADITIONAL CLASSROOM IN ENGLISH FOR MEDICAL ACADEMIC PURPOSES

This paper examines the integration of technology-mediated instruction into traditional face-to-face teaching through the example of an EMAP compulsory course. It compares three instructional formats (traditional, fully online, and blended) with a focus on their potential to support language skills development, grammar and vocabulary acquisition, and exam preparation, and examines the impact of introducing online and blended component on students' overall achievement and on performance in grammar/vocabulary and reading comprehension components of the final examination. The findings highlight the importance of integrating technology-mediated instruction as a strategic means of enhancing student engagement, improving learning outcomes, and addressing the challenges inherent in large-group instruction.

Keywords: English for Medical Academic Purposes (EMAP), Information and Communication Technologies (ICT), classroom-based instruction, online learning, blended learning, flipped classroom, English for Specific Purposes (ESP)

1. INTRODUCTION

Although educators had long relied on various media to support the learning process, the COVID-19 pandemic significantly accelerated the integration of information and communication technologies (ICT) into teaching, underscoring

* danka.sinadinovic@med.bg.ac.rs

** sofija.micic-kandijas@med.bg.ac.rs

their importance as an essential component of higher education (HE) curricula. A substantial number of traditionally classroom-based courses are now delivered either fully online or in a blended (hybrid) format, combining ICT-supported learning with traditional in-person instruction. This approach has also been successfully applied in the field of English for Specific Purposes (ESP), with numerous studies reporting positive outcomes of technology-assisted teaching compared to traditional instruction (Veselá, 2012; Lungu, 2013; Mijomanović et al., 2018; Kurucova et al., 2018; Vukčević-Lacković & Sinadinović, 2020; Gerasimova et al., 2022; Li & Wang, 2023).

At the Faculty of Medicine, University of Belgrade, English language courses are offered in both compulsory (*English language 1* and *English language 2*) and elective formats (*English language 3*, *English language 4* and *English language 5*). Whereas the elective English courses have gradually evolved into fully online formats, the compulsory courses have largely retained a traditional, i.e., classroom-based, model of teaching. Moreover, these courses are taught in large groups containing 70 to 120 students, which poses significant challenges for effective management. Due to pandemic-related closures, the compulsory courses were temporarily transformed into fully online courses, which initiated the gradual transformation of *English language 2* into a blended course oriented toward the flipped classroom model.

The aim of this paper was 1) to present and compare three modes of teaching *English language 2* at the Faculty of Medicine, University of Belgrade (i.e., traditional, online and blended) with regard to their potential to promote the development of learners' language skills and acquisition of grammar and lexical knowledge, as well as to provide effective preparation of the final exam, and 2) to examine the impact of the integration of technology-mediated instruction on learners' final examination performance, both in overall achievement and in two specific components of the exam (i.e., grammar/vocabulary section, and reading comprehension section). In accordance with the aims of the study, the research questions were formulated as follows:

1. Are there significant differences in final examination results and failure rates among learners across traditional, online, and blended modes of delivery?
2. Has the incorporation of technology-mediated instruction into the traditional course led to improvements in learners' performance on specific components of the final examination (i.e., grammar/vocabulary, and reading comprehension)?

Following the Introduction, the paper is organized as follows: Section 2 presents the theoretical foundations of ICT integration in ESP and EMAP instruction and introduces the two principal modes of online delivery (fully online and blended/hybrid). Section 3 outlines the methodological framework and the analyzed corpus, while Section 4 is dedicated to the results of our research and discussion. Finally, Section 5 offers concluding remarks and considers implications for the further development of the *English Language 2* compulsory course.

2. THEORETICAL FRAMEWORK

2.1. The place of ICT in ESP and EMAP teaching

In contrast to General English (GE), ESP is grounded in the particular learning needs of its target learners (Orr, 1998). ESP learners are expected to develop the ability to communicate effectively in their future professional environments (Živković, 2016, p. 155). As it addresses learners' specific needs, ESP is regarded as specialty-oriented (Hutchinson & Walters, 1987). Consequently, ESP emphasizes language use in context, drawing extensively on authentic materials that engage learners in real-life communicative tasks (Živković, 2016, p. 155).

A clear point of convergence between ICT and ESP is their shared emphasis on fostering learner autonomy, with the intention of creating a more interactive and motivating learning environment (Kabaly & Bitari, 2021, p. 118). Teachers also have to adapt to changed circumstances, so Bjekić et al. (2004, pp. 336-352) emphasized the need for computer competencies as an essential requirement for meeting the demands of the teaching profession. Generally, ICT is regarded as a valuable source of materials and motivation for both teachers and students, facilitating greater interactivity in the learning process (Chapelle, 2001, p. 175). In a pilot study investigating students' perceptions of modern technologies in the ESP classroom at the Faculty of Civil Engineering and Architecture, University of Niš, Živković (2016) reported highly positive outcomes across several domains, including motivation, creativity and innovation, learner autonomy, communication skills, teamwork, and collaborative learning. The sample of 145 undergraduate students expressed strong enthusiasm for ICT-based instruction, highlighting, among other aspects, a heightened sense of control over their learning, opportunities to approach content from multiple perspectives, increased autonomy within the classroom, and exposure to authentic materials and cognitively demanding tasks relevant to their future professions.

As a dynamic and rapidly evolving branch of ESP, EMAP is distinguished by its extensive reliance on authentic materials (Sinadinović & Mičić Kandijaš, 2015). Its distinctive linguistic features include a highly specialized vocabulary rich in technical terms, numerous words of Greek and Latin origin, fixed medical phrases used exclusively within the medical domain, a wide range of abbreviations, and frequent use of compound words (Mičić 2009, p. 75). Regarding earlier research on ICT integration in this field, Askari Arani (2004) conducted a quasi-experimental study with two groups of second-year medical students ($n = 60$), comparing their test results upon using text-based coursebook materials (control group, $n=28$) or Internet-based authentic articles (case group, $n=32$). The findings indicated that case-group students achieved better results and showed greater interest in up-to-date, authentic sources, which allowed them to stay aligned with current developments in medicine and global affairs. The author, thus, underscored the importance of aligning classroom language and topics with those circulating in contemporary media, such as television

and online platforms, as this relevance enhances student motivation and encourages active participation in discussions (Askari Arani, 2004, p. 82). In a qualitative analysis of 30 reflection papers on an online elective Medical English course, Mijomanović et al. (2018, pp. 48–49) identified several notable student perceptions. Participants appreciated the flexibility to manage their own time, felt that the online format promoted more individual work compared to traditional classes, and perceived the course as personalized, addressing them as individuals. They also reported that the format aided memorization, enhanced the retention of knowledge, and provided a sense of accomplishment upon completing each online task.

Perceptions of ICT integration in ESP teaching are generally positive; however, this does not imply the absence of challenges. For instance, Shaabi (2010) examined the ICT practices of six ESP instructors in Saudi Arabia, focusing on classroom changes and the factors influencing ICT implementation. Based on a semi-structured interview with teachers and class observations, he concluded that the transition to ICT was impeded by socio-cultural barriers, which affected both learners' and teachers' attitudes toward technology in the learning environment. In his case study of inactive learners enrolled in an online graduate course, Beaudoin (2002) observed that certain learners experienced discomfort in electronic learning environments, while Yu-Chih & Cifuentes (2001) reported that some online students expressed a sense of detachment.

2.2. Online and Blended Approaches to Teaching

The traditional teaching approach has often been criticized for its teacher-centered nature and for positioning learners as passive recipients; consequently, a shift toward a more facilitative role for teachers has been suggested (Richardson, 2003, p. 1627) and it has been further accelerated by the continual advancement of ICT, especially learning management systems (LMS) such as Moodle or Blackboard. Whereas traditional face-to-face instruction requires teachers and students to interact in the same physical space, ICT-assisted instruction enables such interaction across different locations (Graham & Dziuban, 2007, p. 270). The live, synchronous environment of the traditional classroom (Wu et al., 2010, p. 155) has been gradually, and to varying degrees, supplanted by fully online (virtual) or blended (hybrid) modes of course delivery (Gaffas, 2023, p. 10330).

2.2.1 Online (virtual) learning

Online teaching models typically rely on LMS, which offer learners a range of tools and features such as forums, quizzes, assignments, and chat discussions that facilitate the learning process (Gaffas, 2023, p. 10332). In this teaching model, courses can be delivered both synchronously and asynchronously, but there is no traditional face-to-face instruction involved. On the positive side, Broadbent (2017, p. 24) concluded that the use of multimedia materials in online courses promoted a

higher degree of self-regulated learning strategies compared to traditional instruction. Moreover, Dixson (2010, pp. 1–2) cited several studies (Maki & Maki, 2007; Robertson et al., 2005; Robinson & Hullinger, 2008; Conolly et al., 2007) indicating that online students often outperformed their counterparts in traditional settings, spending more time on tasks, demonstrating higher levels of engagement, and achieving stronger learning outcomes. On the other hand, Gaffas (2023, pp. 10330–10335) referenced several studies (Hara & Kling, 2000; Horspool & Lange, 2012; Alhamami, 2018; Boiling et al., 2012; Dixson, 2010; Mathew et al., 2019; Yunhadi et al., 2020) that identified key challenges faced by online learners, including limited social interaction and peer contact, reduced academic support, fewer opportunities for questioning and the use of nonverbal cues such as gestures and body language, lower levels of course satisfaction, and diminished motivation. Gerasimova et al. (2022, p. 54) also found that students were reluctant to engage in exclusively online lessons, complaining of the absence of face-to-face communication, difficulties in overcoming procrastination, and the lack of opportunities for pair work. To address these challenges, a strong teacher presence has been recognized as essential for effective online learning, encompassing practices such as providing feedback, enhancing student motivation, responding to questions, encouraging course-related discussions, and supporting students' active participation (Dixson, 2010, pp. 2–3; Boling et al., 2012).

2.2.2. Blended (hybrid) model

Considering these factors, blended learning may represent the most effective way to combine the advantages of both traditional and online instruction (Konoplianyk et al., 2021, p. 193; Gaffas, 2010, 10330; Francescucci & Foster, 2013, p. 80). In other words, this model is a combination of face-to-face (i.e., classroom-based) instruction and distance, technology-mediated, learning. Staker and Horn (2012, p. 3) define it as an educational program that combines two modes of learning: online learning, where students have some control over time, place, path, or pace, and face-to-face learning, delivered through in-class instruction at a designated location outside students' home. According to Graham & Robison (2007, pp. 103-104), this model promotes a learner-centered approach and enhances learning outcomes. Its ICT-supported component integrates computer-assisted learning, online individual learning, offline individual learning, and online group interaction, while the traditional component offers face-to-face classroom instruction, informal peer interaction, and formal engagement with both teachers and classmates (Lalima & Dangwal, 2017, p. 130). Momchilova (2021, p. 3) notes that the adoption of blended learning in ESP instruction seeks to cultivate key competencies in ESP students, including reading and comprehending technical publications, writing technical reports and articles, delivering presentations, communicating with colleagues, and engaging in discussion and analysis of various technical issues relevant to their field of study. Farmati et al. (2023, p.117-118) looked

into the effect of blended learning on language skills. They referenced several studies (Abbas, 2015; Agustina et al., 2020; Kurčikova et al., 2014; Kurucova et al., 2018; Shalatska et al., 2020) indicating that blended learning had a greater impact on writing and vocabulary development than on reading and speaking, as it provided students with diverse opportunities to practice ESP writing, thereby broadening their vocabulary as well. Regarding speaking and communication skills, findings are mixed: Kurčikova et al. (2014) and Kurucova et al. (2018) argue that blended learning is not particularly effective in developing speaking abilities, whereas Agustiani et al. (2021) suggest that it can enhance communication skills by providing opportunities for online discussions that extend practice beyond the classroom.

Based on an elective Medical English course, Vukčević Lacković and Sinadinović (2020) concluded that a blended learning environment was superior to both traditional classroom instruction and fully online course delivery. Overall, procrastination is considered one of the major drawbacks of blended learning, due to the lack of strict oversight in the online component (Abbas, 2015). Other challenges may arise from large group sizes, varying levels of English proficiency, differences in student motivation, and limited access to teaching materials (Stanišić et al., 2022, p. 303). In addition, the availability of technology and reliable Internet connection should also be considered (Duong & Nguyen, 2021).

One promising innovation within this framework is the *flipped classroom*. In this model, students engage with online materials before class, while classroom time is devoted to discussions, guidance, and activities designed to promote higher-order thinking skills (Howitt & Pegram, 2015, p. 458). The term *flipped classroom* was introduced in 2007 by Bergmann and Sams, who wished to support their students in organizing self-study more effectively, improving cognitive skills, and shifting the focus from memorization and recall to deeper understanding and application. There is still no consensus on its exact nature, as it has been described as a technology, method, approach, model, or principle (Konoplianyk, 2021, p. 195).

Konoplianyk et al. (2021, pp. 197–198) propose that flipped learning in ESP should be structured around the revised Bloom's taxonomy (Anderson & Krathwohl, 2001), which organizes learning objectives by cognitive processes from lower-order skills (remembering and understanding) to higher-order skills (applying, analyzing, evaluating, and creating). According to this framework, activities targeting lower-order thinking should be completed in the pre-class phase, tasks involving application and analysis should be carried out during face-to-face sessions, while activities fostering evaluation and creation are best suited for the post-class phase. Khoshima et al. (2025, p. 211) highlight that the flipped classroom approach fundamentally shifts learning from a teacher-centered to a student-centered model, emphasizing flexibility and active student engagement. However, Li and Wang (2023, p. 353) identified the instructor's presence as a key factor in promoting learner engagement in the flipped ESP course, where students valued teacher support and prompt feedback. When it

comes to the development of language skills, different authors have reported the positive impact of flipped classroom on the reading comprehension skill (Putri and Nurkhamidah, 2023; Khoshima et al., 2025).

3. METHODOLOGY

The first part of this study examines the compulsory course *English Language 2* across its three modes of delivery: a traditional face-to-face course, a fully online course, and a blended course. When presenting these modes, we focus on the potential of the available instructional materials, teaching methods and teaching and learning circumstances to facilitate the development of learners' language skills, promote the acquisition (and retention) of grammar and vocabulary knowledge, and support effective preparation for the final examination. The second part of the study investigates the impact of introducing online and blended modes of delivery on students' performance in the final examination, considering both overall achievement and outcomes in two specific sections of the test, i.e., grammar/ vocabulary, and reading comprehension.

Based on our research questions, we formulated the following hypotheses:

1. Students receiving instruction through online or blended modes will achieve higher overall scores on the final examination than those receiving only traditional classroom instruction;
2. Students receiving instruction through online or blended modes will demonstrate greater gains in grammatical and lexical competence, as measured by the relevant section of the final exam, than those taught exclusively in the traditional classroom mode; and
3. Students receiving instruction through online or blended modes will obtain higher scores in the reading comprehension section of the final examination than those taught exclusively in the traditional, face-to-face, mode.

In the presentation of the three variants of the English Language 2 course, several aspects are covered: the instructional materials employed, the extent of teacher involvement, the technical characteristics of the learning environment (e.g., classroom setting, class size, and available equipment), the potential for developing the four language skills, the scope and method of fostering grammar and vocabulary acquisition, and the approach to exam preparation. Following the presentation of all three teaching models, a comparative analysis was undertaken with the aim of identifying points of convergence and divergence.

The corpus analyzed in the second part of the study consisted of examination records from three June exam sessions at the Faculty of Medicine, University of Belgrade: June 2018 (pre-COVID, conducted entirely through traditional face-to-face instruction), June 2022 (during the COVID period, conducted fully online), and June 2024 (post-COVID, delivered in a blended format). In total, three examination

records with 801 entries were reviewed to determine the number of candidates, pass rates, and failure rates for each session. In addition, the distribution of grades among successful candidates was examined across five-score ranges (51–60, 61–70, 71–80, 81–90, and 91–100)¹. Apart from examination records, a random sample of 150 final tests (50 from each of the three sessions) was analyzed to assess learners' performance in two specific components of the final test across the selected June exam sessions: grammar/vocabulary component, and reading comprehension component.

4. RESULTS AND DISCUSSION

4.1. Comparison of the three variants of *English language 2* course

4.1.1. *English language 2* as a traditional classroom-based course

In its traditionally delivered, classroom-based format, *English Language 2* is organized as 90-minute sessions combining lectures with exercises based on the coursebook *English for Medicine and Related Sciences* (Mičić Kandijaš, 2017; 2019). Classes are held in large lecture halls with groups of 100 – 120 students. Instruction primarily utilizes PowerPoint presentations, but it adopts an interactive approach, aiming to engage students as active participants rather than passive recipients of knowledge; however, this is not always feasible in very large classes.

Although the curriculum and coursebook are designed to foster all four language skills, their practical implementation has been uneven. Reading comprehension is well covered through authentic medical texts, both from the coursebook and supplementary sources, followed by comprehension exercises. For this reason, learners should be adequately prepared for the reading comprehension component of the final exam, although the format of reading comprehension tasks available in the coursebook does not always correspond to that employed in the exam paper. On the other hand, other language skills are insufficiently addressed in this classroom-based course, owing either to technical limitations, the challenge of managing large class sizes, or a combination of both. Listening comprehension is rarely practiced in class due to inadequate technical facilities, which restricts students' exposure to authentic listening materials; consequently, learners' only in-class listening input comes from the teacher and peers, while supplementary listening activities are recommended as independent practice. Speaking is addressed only partially, as large group sizes limit opportunities for individual participation, despite teachers' efforts to include discussions, pair work, and debates whenever possible. Writing is practiced least frequently, primarily because the curriculum does not predict writing exercises as whole-class activities, so teachers do not have enough time to provide adequate in-class feedback on learners' written work in such large classes as ours.

¹ None of the English courses at the Faculty of Medicine are graded using marks; instead, students are awarded points. The point ranges correspond to marks as follows: 51–60 points equate to a mark of 6, 61–70 to 7, 71–80 to 8, 81–90 to 9, and 91–100 to 10.

Grammar and vocabulary are continuously practiced through exercises provided in the coursebook (e.g., fill-in-the-gap tasks, matching activities, multiple-choice items). Correct answers are subsequently discussed in class, and learners are frequently assigned additional tasks requiring them to apply newly acquired grammar and vocabulary in context, thereby reinforcing both accuracy and communicative competence.

Exam preparation typically entails practicing tests from previous terms, followed by whole-class discussion and teacher feedback, enabling learners to become familiar with the format and expectations of the final examination well in advance.

4.1.2. *English language 2 as a fully online course*

English language 2 was first delivered as a fully online course during the pandemic years (2020/2021 and 2021/2022) via *Reticulum*, the Faculty of Medicine's Moodle-based platform. The curriculum was fully preserved, with new materials released weekly and remaining accessible until the end of the course. Students were given one week to complete their assignments. The online format included recorded lectures, reading and listening comprehension quizzes based on authentic YouTube-hosted video clips, forum discussions, interactive grammar lessons, exam practice quizzes, writing assignments, and Q&A forums.

This delivery mode provided a more balanced treatment of language skills compared to the traditional classroom. Reading and listening comprehension were systematically developed through authentic, up-to-date materials such as video clips, journal articles, and podcasts followed by Moodle-based quizzes. Writing received significantly more attention than in face-to-face teaching, as students were assigned an essay-writing task (*Eating disorders in today's world*) based on provided video and written materials on a given topic, for which they later received individualized feedback. In contrast to the traditional classroom, an entire week was allocated to this specific writing assignment, which allowed the teacher sufficient time to carefully evaluate each submitted essay and provide comprehensive feedback with suggestions for improvement. Writing practice was further reinforced through participation in online discussion forums, where students articulated their views on a range of topics in written form. Speaking was the only skill that could not be practiced directly, since the asynchronous format offered no real-time interaction with teachers or peers.

In this mode of delivery, grammar and vocabulary received greater emphasis than in the traditional classroom. Moodle-based lesson activities were systematically employed to teach and practice specific grammatical structures, requiring learners to achieve complete accuracy before progressing to subsequent tasks. These lessons remained continuously accessible, enabling students to use them at their own pace and revisit them during the exam preparation period, which promoted learner autonomy. Vocabulary was frequently practiced through quiz-like exercises that provided immediate feedback, thus supporting both retention and self-regulated learning.

Exam preparation incorporated Moodle-based quizzes with instant feedback, enabling students to review both correct and incorrect responses. In general, students were permitted to retake these exam-like quizzes an unlimited number of times; however, as the final examination approached, the number of attempts was restricted to two, with a time limit of one hour. This approach familiarized learners with the format of the examination they were required to take. Additionally, Q&A forums were continuously available, providing learners with opportunities to seek clarification or comment on particular test options, with the teacher remaining readily accessible to respond.

4.1.3. *English language 2 as a blended course*

In the post-COVID period, teaching returned to the traditional classroom but was supplemented with online materials delivered through *Reticulum*, aiming to establish a blended approach. Following the pandemic model, new materials are released weekly and remain available throughout the course. Learners are encouraged to consult them prior to face-to-face classes (which is consistent with the flipped classroom approach and is constantly encouraged) or to revisit them later for knowledge consolidation. Although lectures are once again classroom-based, in accordance with accreditation requirements, the exercises are now based not only on the coursebook but also on the extensive range of materials available on Moodle.

With regard to language skills, the current format resembles the pre-pandemic model, where reading comprehension remained the most thoroughly addressed in-class skill. However, the integration of online materials has substantially improved opportunities for listening and writing practice. Students are expected to complete listening comprehension quizzes on *Reticulum* (using their phones when the lecture hall lacks technical support) and to engage in online discussion forums, thereby strengthening skills that were previously underdeveloped. Listening comprehension, long recognized as both crucial and neglected in language learning (Mičić Kandijaš & Čajka, 2014), has been significantly enhanced through this hybrid model. Speaking, however, continues to be constrained by large-group settings, leaving learners with limited opportunities for active oral participation.

Grammar and vocabulary are acquired and practiced both in class, using coursebook materials, and through an extensive range of Moodle-based exercises. Some of these exercises can be completed during class (primarily via mobile devices), while others are recommended for post-class consolidation, as they provide instant feedback and do not require the teacher's presence. Particular emphasis is placed on the continuous integration of Moodle-based grammar lessons, as they effectively support students' preparation for the grammar section of the final examination.

Exam preparation combines online quizzes with in-class feedback and explanations, while the option to repeat quizzes at home offers additional benefits for self-paced learning.

4.1.4. Areas of convergence and divergence among the three instructional models

With regard to instructional materials, the classroom-based model of teaching is the only one that relies exclusively on the contents of the coursebook. Although the coursebook includes authentic materials considered essential in the ESP field, online and blended modes of delivery are superior in terms of their relevance and potential to engage learners more effectively. Videos, podcasts, posters, announcements, articles, television programs, and similar materials become outdated relatively quickly; therefore, regularly updating them is important to maintain learners' interest and engagement.

Teacher involvement differs across the instructional models, although the teacher remains consistently present and active. Whereas the traditional face-to-face model of *English Language 2* is predominantly teacher-centered, the online and blended models adopt a more student-centered approach, offering feedback and support while simultaneously fostering learner autonomy. As consistent teacher presence can help address procrastination, differences in English proficiency, and variability in student motivation, we tend to agree with authors who have identified teacher presence as a critical factor in online and blended learning environments (Dixson, 2010; Boling et al., 2012; Gerasimova, 2022; Li & Wang, 2023).

Regarding the technical characteristics of the learning environment, it should be noted that the traditional mode of delivery is seriously constrained by extremely large class sizes and insufficient equipment. Both online and blended models, in contrast, address these limitations by providing flexible access to learning materials and activities, thereby mitigating the challenges associated with large, technically under-resourced classrooms.

With regard to the facilitation of language skills, there is considerable variation across the three instructional models. Reading comprehension is the only skill consistently promoted in all three formats, providing students with sufficient practice. Listening comprehension, which is largely neglected in the traditional mode due to technical constraints, receives appropriate attention in online and blended formats. Writing, almost entirely absent in the traditional model because of large class sizes, is adequately addressed in the fully online format and, to a significant extent, in the blended format as well. Finally, speaking receives insufficient attention across all models: it is entirely absent in the fully online format, and in the traditional and blended formats it is constrained by class size. Thus, speaking remains a persistent challenge, underscoring the need for additional strategies to promote oral communication in technology-mediated contexts. This observation aligns with Kurčikova et al. (2014) and Kurucova et al. (2018), who noted the limited effectiveness of blended learning in developing speaking skills.

In terms of promoting grammar and vocabulary acquisition, all three models provide students with adequate materials. The online and blended formats, however,

rely extensively on Moodle-based grammar lessons, which encourage learner autonomy while simultaneously preventing students from bypassing essential stages in the learning process. As previously noted, the integration of an online component also enables a greater variety of authentic materials, which positively contributes to vocabulary expansion, which is consistent with the findings reported by Farmati et al. (2023).

Finally, in both the online and blended formats, learners engage with Moodle-based exam preparation quizzes that provide immediate feedback, enabling them to review both correct and incorrect responses. In addition, the flexibility to revisit quizzes at any time supports knowledge retention. By contrast, the classroom-based model benefits from the teacher’s immediate presence but offers less scope for learner autonomy, as students may remain passive and rely on more active peers to supply correct answers and interact with the teacher. For this reason, we argue that medical students receive more effective and comprehensive exam preparation when a technology-mediated component is incorporated.

4.2. Analysis of final examination performance

In the second part of the study, the examination records from three June exam sessions (June 2018, June 2022, and June 2024) were analyzed to determine the number of students who took the exam in each session, as well as the pass and failure rates. The results are summarized in Table 1.

Table 1. Distribution of candidates, pass rates, and failure rates across three June exam sessions

	JUNE 2018 (TRADITIONAL)	JUNE 2022 (ONLINE)	JUNE 2024 (BLENDED)
no. of students who took the exam	235	261	305
no. of students who passed the exam	222 (94.0%)	257 (98.5%)	303 (99.3%)
no. of students who failed the exam	13 (6.0%)	4 (1.5%)	2 (0.7%)

The higher number of students who took the exam in June 2024, compared to the other two sessions, is not pertinent to the present study, as it stems from organizational issues at the Faculty of Medicine, where multiple examinations are occasionally scheduled simultaneously. By contrast, the variation in failure rates across the three sessions is of particular significance: the rate declined by several percent in both the online and blended formats. Although the failure rate in June 2018 (traditional

mode) was not high, the near absence of failures in the online and blended formats is noteworthy. This outcome may be attributed to more effective exam preparation through repeatedly accessible quiz-based practice, as well as to improved mastery of all assessed components. Furthermore, it may be concluded that students exposed to online or blended modes of delivery are generally well-prepared for the examination, demonstrating a clear understanding of its structure and requirements.

The examination records were subsequently analyzed to investigate the distribution of grades among successful candidates across five score ranges (51–60, 61–70, 71–80, 81–90, and 91–100). These results are presented in Table 2.

Table 2. Distribution of grades among successful candidates in three June exam sessions

SCORE RANGE	JUNE 2018 (TRADITIONAL)	JUNE 2022 (ONLINE)	JUNE 2024 (BLENDED)
51 – 60	19 (8.5%)	5 (1.9%)	7 (2.3%)
61 – 70	33 (14.9%)	15 (5.8%)	18 (6.0%)
71 – 80	54 (24.3%)	36 (14.1%)	53 (17.5%)
81 – 90	77 (34.7%)	110 (42.8%)	108 (35.6%)
91 – 100	39 (17.6%)	91 (35.4%)	117 (38.6%)

Analysis of the three selected examination sessions reveals that student achievement is higher in the online and blended formats compared to the traditional format. The lowest score range (51–60) shows the smallest proportion of students in the online format (1.9%), followed closely by the blended format (2.3%), whereas in June 2018, when the course was delivered exclusively in the traditional format, 8.5% of students fell into this range. A similar pattern is evident in the 61–70 score range, where the proportions are considerably lower in the online (5.8%) and blended (6.0%) formats than in the traditional format (14.9%). Conversely, the higher score ranges demonstrate a pronounced advantage of technology-mediated delivery. In the online format, 42.8% of students scored within the 81–90 range, while in the blended format 38.6% reached the highest interval (91–100). Interestingly, June 2018 recorded the highest proportion of students in the 81–90 range (34.7%), but the percentage of students achieving the highest scores (91–100) was markedly lower (17.6%) compared to the other two formats.

Overall, students performed well across all three examination sessions. However, the largest proportions of students in the online and blended formats were concentrated in the highest score ranges, whereas in June 2018, the traditional format, nearly three to four times as many students fell into the lowest score range, and twice as many were in the 61–70 range, compared to the technology-mediated formats. These findings indicate that student achievement is higher under online and blended instruction, which aligns with the conclusions of Dixson (2010).

The results presented in Tables 1 and 2 support our first hypothesis, which suggested that students receiving instruction via online or blended modes would achieve higher overall scores on the final examination compared to those receiving exclusively traditional classroom instruction.

Finally, a random sample of 150 final exam papers (50 from each of the three sessions) was analyzed to evaluate learners' performance in two components of the test² (grammar/vocabulary section and reading comprehension section) across the three observed exam sessions. The grammar/vocabulary section carries a maximum of 70 points, while the reading comprehension section is worth 30 points; accordingly, the results of the corpus analysis are reported relative to the total score and expressed as percentages. The findings are summarized in Table 3.

Table 3. Learners' performance in *English language 2* final exam test

EXAM SESSION	GRAMMAR + VOCABULARY	READING COMPREHENSION
JUNE 2018 (TRADITIONAL)	56/70 (80%)	22/30 (74%)
JUNE 2022 (ONLINE)	61.78/70 (88%)	27.48/30 (91.6%)
JUNE 2024 (BLENDED)	64.16/70 (92%)	25.44/30 (84.8%)

Overall, learners' performance on the final test was exceptional across all three instructional models. The analysis of the selected corpus indicates that achievement in the grammar/vocabulary section was comparable across the three modes, although the online and blended formats outperformed the traditional face-to-face model. This increase in scores in the online and blended settings may be attributed to the implementation of Moodle-based grammar lessons and frequent quiz-like vocabulary exercises, which promote retention and enable students to apply newly acquired lexical items in context. The opportunity to repeatedly access and complete these online lessons and quizzes likely contributed substantially to students' final

² The English Language 2 final exam paper adopts a multiple-choice format comprising three sections: Grammar (40 points), Vocabulary (30 points), and Reading Comprehension (30 points). The Grammar section includes 20 items designed to assess a range of grammatical structures, including modal verbs, relative pronouns, relative clauses, linkers, participles and infinitives, indirect speech, conditional clauses, prefixes and suffixes, as well as the definition of medical terms. Each item follows a uniform multiple-choice format, consisting of a stem and three response options. The Vocabulary section contains 10 items, divided into two parts: the first assesses knowledge of specific medical terminology, while the second evaluates the ability to understand and apply medical terms in context. As in the Grammar section, multiple-choice items are used, with the second part presenting a gapped text as the stem and three options for each gap. The Reading Comprehension section also consists of 10 items, based on two authentic medical excerpts unknown to students. This section is designed to test vocabulary and grammar in context, alongside general comprehension skills. Objective test formats vary: the first part employs dichotomous answers (i.e., YES, NO, NOT GIVEN) whereas the second requires selecting the most accurate option of the three.

examination performance. Moreover, learners' extensive exposure to authentic online materials, both audio-visual and written, may have further facilitated the acquisition and retention of relevant vocabulary and grammatical structures. In comparison with previous research, it is noteworthy that the highest performance in the grammar/vocabulary section was observed in the blended format, a finding consistent with Farmati et al. (2023), who cited several studies demonstrating that blended learning exerts a greater impact on vocabulary (and writing) than on reading and speaking.

With regard to learners' performance in the reading comprehension section, both the online and blended formats again outperformed the traditional model, and this time the difference was even more pronounced. The exceptional result achieved in the fully online format (91.6%) is not unexpected, as during the pandemic *English Language 2* students were extensively engaged with Moodle-based quiz-style reading comprehension exercises. These exercises, which tested understanding of contemporary medical articles discussed weekly, closely mirrored the structure of the final examination, encompassing both dichotomous items and tasks requiring the selection of the most accurate response. The superior outcome in the online format, compared to the blended mode, may be explained by the fact that in the online course students were required to complete the quizzes within specified time frames to obtain weekly attendance credit, ensuring consistent practice. In contrast, in the blended format these activities are occasionally completed in class but are more often recommended as pre- or post-class tasks, with completion largely dependent on students' self-discipline. Nevertheless, the blended format also yielded a high level of achievement (84.8%), which is approximately ten percentage points higher than the result obtained under the purely traditional model. This finding resonates with previous research highlighting the positive effects of flipped classroom approaches on reading comprehension skills (Putri & Nurkhamidah, 2023; Khoshima et al., 2025).

The results presented in Table 3 support our second hypothesis, which proposed that students receiving instruction through online or blended modes would demonstrate superior grammar and vocabulary knowledge compared to those taught exclusively in the traditional classroom setting. Although the percentage differences are modest, there is a consistent increase in performance as instruction shifts from the strictly traditional mode to the online and blended formats.

Our final hypothesis suggested that students receiving instruction via online or blended modes would achieve higher scores in the reading comprehension section of the final exam compared to those taught exclusively through the traditional model. This hypothesis was also confirmed by the results presented in Table 3, which show a marked increase in reading comprehension performance as instruction shifts from the traditional format, particularly in the fully online mode.

5. CONCLUSION

ESP teaching in HE has undergone significant changes over time, largely due to the introduction of ICT and unexpected circumstances such as the recent global pandemic. These changes reflect a continuous shift from in-person instruction to distance (virtual) learning, which may be delivered synchronously or asynchronously and incorporates various features provided by LMS. Given the documented drawbacks of both traditional instruction and fully online course delivery, blended learning, integrating face-to-face teaching with distance learning, has emerged as an effective approach to overcoming the limitations inherent in each of these modes.

Since the compulsory course *English Language 2* at the Faculty of Medicine, University of Belgrade has, over the past several years, been delivered through three distinct instructional formats (traditional face-to-face, fully online, and blended), the present study pursued two objectives: first, to compare these delivery modes in terms of their potential to facilitate the acquisition of language skills, foster grammar and vocabulary development, and provide effective examination preparation; and second, to examine the impact of introducing online and blended modes on students' performance in the final examination, with attention to both overall achievement and outcomes in two specific sections of the test, i.e., grammar/vocabulary and reading comprehension. The findings confirmed all three hypotheses and demonstrated that exposure to online and/or blended instruction resulted in higher overall examination scores, superior performance in grammar and vocabulary, and enhanced outcomes in reading comprehension. These results align with previous research on the influence of technology-mediated instruction on learning outcomes.

The insights gained from this research may inform further adjustments to our teaching materials and methodology, with particular emphasis on strengthening the blended approach to course delivery and systematically introducing the flipped classroom model. The formal adoption of a flipped classroom structure would be especially advantageous in large-group settings such as ours, where pre-class instruction can provide substantial added value by creating more opportunities for interactive in-class activities. In line with Konoplianyk et al. (2021), we argue that the flipped classroom should be organized around the revised Bloom's taxonomy, whereby lower-order skills are developed through independent student work, while higher-order skills are fostered during class sessions. The official integration of the flipped classroom model would also entail a reconceptualization of the teacher's role, from that of a traditional instructor to that of a facilitator, a transition that has thus far been only partially realized in our teaching context. Finally, due to the fact that the full implementation of blended learning and the flipped classroom model depends on accreditation, we actively advocate for their formal recognition and promotion, highlighting the pedagogical benefits they can bring to the fields of ESP and EMAP.

References:

- Abbas, L. (2015). Applying blended learning to English communication courses 101 and 102 at BZU/Palestine: A case study. *Palestinian Journal of Open Education*, 3(2), 1–34.
- Agustiani, M., Ningsih, S., & Muris, A. A. (2021). Students' learning motivation through Edmodo: Blended learning in ESP classroom. *Research and Development Journal of Education*, 7(1), 39–49. <https://doi.org/10.30998/rdje.v7i1.7670>
- Anderson, L. W., & Krathwohl, D. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.
- Askari Arani, J. (2004). The effect of ICT-based teaching method on medical students' ESP learning. *Journal of Medical Education*, 4(2), 81–83.
- Beaudoin, M. F. (2002). Learning or lurking? Tracking the invisible online student. *The Internet and Higher Education*, 5(2), 147–155. DOI: 10.1016/S1096-7516(02)00086-6
- Bjekić, M., Bjekić, D., & Stanković, N. (2004). Kriterijumi informatičke pismenosti nastavnika. In *Komunikaciji i mediji u savremenoj nastavi* (pp. 336–352). Učiteljski fakultet.
- Chapelle, C. A. (2001). *Computer applications in second language acquisition*. Cambridge University Press.
- Boling, E., Hough, C., Kirunsky, M., Saleem, H., & Steven, M. (2012). Cutting the distance education: Perspectives on what promotes positive online learning experiences. *Internet and Higher Education*, 15, 118–126. <https://doi.org/10.1016/j.iheduc.2011.11.006>
- Broadbent, J. (2017). Comparing online and blended learners' self-regulated learning strategies and academic performance. *The Internet and Higher Education*, 33, 24–32. <https://doi.org/10.1016/j.iheduc.2017.01.004>
- Dixson, M. (2010). Creating effective student engagement in online courses: What do students find engaging? *Journal of the Scholarship of Teaching and Learning*, 10(2), 1–13.
- Duong, T. L. N., & Nguyen, N. H. U. (2021). The challenges of e-learning through Microsoft Teams for EFL students at Van Lang University in Covid-19. *Asia CALL Online Journal*, 12(4), 18–29. <https://asiacall.info/acoj/index.php/journal/article/view/60>
- Farmati, C., Yeou, M., & Benzehaf, B. (2023). Blended learning in English for specific purposes instruction: A systematic review. *Digital Education Review*, (44), 114–124. <https://doi.org/10.1344/der.2023.44.114-124>
- Francescucci, A., & Foster, M. (2013). The VIRI (virtual, interactive, real-time, instructor-led) classroom: The impact of blended synchronous online courses

- on student performance, engagement, and satisfaction. *Canadian Journal of Higher Education*, 43(3), 78–91. <https://doi.org/10.47678/cjhe.v43i3.184676>
- Gaffas, Z. M. (2023). Students' perceptions of e-learning ESP course in virtual and blended learning modes. *Education and Information Technologies*, 28(8), 10329–10358. <https://doi.org/10.1007/s10639-023-11579-x>
- Gerasimova, I., Pushmina, S., & Carter, E. V. (2022). A fresh look at blended learning: Boosting motivation and language acquisition in an ESP course for engineering students. *Global Journal of Engineering Education*, 24(1), 52–58.
- Graham, C., & Dziuban, C. (2007). Blended learning environments. In A. G. Picciano & C. R. Graham (Eds.), *Blended learning: Research perspectives* (pp. 269–276). Sloan Consortium.
- Graham, C. R., & Robison, R. (2007). Realizing the transformational potential of blended learning: Comparing cases of transforming blends and enhancing blends in higher education. In A. G. Picciano & C. D. Dziuban (Eds.), *Blended learning: Research perspectives* (pp. 83–110). Sloan Consortium.
- Howitt, C., & Pegrum, M. (2015). Implementing a flipped classroom approach in postgraduate education: An unexpected journey into pedagogical redesign. *Australasian Journal of Educational Technology*, 31(4), 458–469. <https://doi.org/10.14742/ajet.2439>
- Hutchinson, T., & Waters, A. (1987). *English for specific purposes: A learning-centered approach*. Cambridge University Press.
- Kably, H., & Bitari, W. (2021). Pedagogical methods of teaching ESP and related ICT implementation in higher education: A critical assessment. *International Arab Journal of English for Specific Purposes (IAJESP)*, 4(1), 117–128.
- Khoshsima, H., Beikian, A., & Mawlood, B. (2025). Investigating the impact of flipped classroom instruction on ESP students' reading comprehension: Students' attitudes in the spotlight. *Journal of English Language Teaching and Learning*, 17(35), 209–226. <https://doi.org/10.22034/elt.2025.65251.2732>
- Konoplianyk, L. M., Melnykova, K. S., & Pryshupa, Y. Y. (2021). Implementing the flipped classroom: A case study of teaching ESP to the bachelors in automation and computer-integrated technologies. *Information Technologies and Learning Tools*, 83(3). <https://doi.org/10.33407/itlt.v83i3.4170>
- Kučírková, L., Kučera, P., & Vydrová, H. V. (2014). English for specific purposes e-learning experimental research. *Journal on Efficiency and Responsibility in Education and Science*, 7(3–4), 80–86. <https://doi.org/10.7160/eriesj.2014.070308>
- Kurucova, Z., Medová, J., & Tirpakova, A. (2018). The effect of different online education modes on the English language learning of media studies students. *Cogent Education*, 5(1), 1–13. <https://doi.org/10.1080/2331186X.2018.1523514>

- Lalima, D., & Dangwal, K. L. (2017). Blended learning: An innovative approach. *Universal Journal of Educational Research*, 5(1), 129–136. <https://doi.org/10.13189/ujer.2017.050116>
- Li, Z., & Wang, Y. (2023). Adopting online flipped teaching to improve learner engagement in an English for specific purposes (ESP) course in China: A mixed-methods study. *Journal of China Computer-Assisted Language Learning*, 3(2), 335–361. <https://doi.org/10.1515/jccall-2022-0021>
- Lungu, I. (2013). The increasing need for blended-learning models in courses of English for specific courses in Romanian universities. *Procedia – Social and Behavioral Sciences*, 76, 470–475. <https://doi.org/10.1016/j.sbspro.2013.04.056>
- Mićić, S. (2009). *Studije o jeziku medicine u engleskom i srpskom*. Beogradska knjiga.
- Mićić Kandijaš, S., & Čajka, Z. (2014). *Principles of listening comprehension in language learning*. Beogradska knjiga.
- Mićić Kandijaš, S. (2019). *English in medicine and related sciences*. Medicinski fakultet Univerziteta u Beogradu.
- Mijomanović, S., Sinadinović, D., & Mićić-Kandijaš, S. (2018). Students' reflections on an online elective Medical English course. *Primenjena lingvistika*, 19(4), 41–52. <https://doi.org/10.18485/primling.2018.19.4>
- Momchilova, M. (2021). Effective application of blended learning in ESP courses. *Proceedings of the Technical University of Sofia*, 71(2). <https://doi.org/10.47978/tus.2021.71.02.001>
- Orr, T. (1998). ESP for Japanese universities: A guide for intelligent reform. *The Language Teacher*, 22(11). <https://jalt-publications.org/tlt/articles/2428-esp-japanese-universities-guide-intelligent-reform>
- Putri, J., & Nurkhamidah, N. (2023). The implementation of flipped classroom to develop students' reading skill. *Journal of Teaching and Education*, 5, 156–170. <https://doi.org/10.30650/ajte.v5i1.3509>
- Richardson, V. (2003). Constructivist pedagogy. *Teachers College Record*, 105(9), 1623–1640. <https://psycnet.apa.org/doi/10.1046/j.1467-9620.2003.00303.x>
- Shaabi, I. (2010). ESP community in transition: A study of ICT use in a tertiary context in Saudi Arabia (Unpublished master's thesis). Faculty of Education, University of Wollongong.
- Sinadinović, D., & Mićić-Kandijaš, S. (2014). Authentic materials in teaching English for medical purposes. In *Book of proceedings, III International Conference Language for Specific Purposes: Past, Present, Future*. Faculty of Organizational Sciences.
- Staker, H., & Horn, M. B. (2012). *Classifying K–12 blended learning*. Innosight Institute. <https://www.christenseninstitute.org/wp-content/uploads/2013/04/Classifying-K-12-blended-learning.pdf>

- Stanišić, N., Gajić, T., Đerić, I., & Rončević, M. (2022). Blended learning approach to teaching ESP at tertiary level. In *Sinteza 2022 – International Scientific Conference on Information Technology and Data Related Research* (pp. 302–308). <https://doi.org/10.15308/Sinteza-2022-302-308>
- Vesela, K. (2012). *Teaching English in new environments: CA-CLIL*. ASPA.
- Vukčević Lacković, B., & Sinadinović, D. (2020). A blended elective medical English course: Practical implications. In B. Čubrović (Ed.), *Belgrade English Language and Literature Studies (BELLS90) Proceedings* (Vol. 1, pp. 407–422). Faculty of Philology, University of Belgrade. <https://doi.org/10.18485/bells90.2020.1.ch24>
- Yu-Chih, D. S., & Cifuentes, L. (2001). One tale of how and why to teach online internationally. *TechTrends*, 45(6), 8–17.
- Živković, S. (2016). The ESP technology-supported learning environment. *European Journal of Social Sciences*, 3(1), 154-162. <http://dx.doi.org/10.26417/ejser.v6i1.p154-162>

**Danka Sinadinović
Sofija Mičić Kandijaš**

**USPOSTAVLJANJE RAVNOTEŽE IZMEĐU NASTAVE POSREDSTVOM
TEHNOLOGIJE I TRADICIONALNE NASTAVE U ENGLESKOM JEZIKU
ZA MEDICINSKE AKADEMSKE SVRHE**

Rezime

Ovaj rad istražuje integrisanje nastave posredstvom tehnologije u tradicionalnu nastavu na primeru obaveznog predmeta iz oblasti engleskog jezika za medicinske akademske svrhe Medicinskog fakulteta, Univerziteta u Beogradu. Porede se tri tipa pristupa izvođenju nastave iz ovog predmeta (tradicionalni, onlajn i hibridni) sa osvrtom na potencijal koji svaki od njih ima u razvijanju jezičkih veština kod studenata, poboljšanju usvajanja gramatike i leksike, i efikasnoj pripremi za završni ispit, a istražuje se i uticaj uvođenja onlajn i hibridnih segmenata nastave na sveukupan uspeh studenata na završnom ispitu, kao i na uspeh u dva segmenta ispita (gramatičko-leksičkom i razumevanju pročitanoog teksta). Dobijeni rezultati ukazuju na značaj integrisanja nastave posredstvom tehnologije koja može doprineti postizanju većeg angažovanja studenata na nastavi, poboljšanju ishoda učenja i prevazilaženju izazova karakterističnih za izvođenje nastave u velikim grupama.

Ključne reči: engleski jezik za medicinske akademske svrhe, informaciono-komunikacione tehnologije (IKT), tradicionalna nastava, kombinovana nastava, obrnuta učionica, engleski jezik za posebne namene