




Information and Communication Technology as a Valuable Tool for Enhancing Students' Performance in ESP

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Abstract: *The paper explores the attitudes of university students attending ESP classes towards the use of Information and Communication Technologies (ICT), both generally and specifically for learning English. Additionally, it measures the impact of various ICT tools and applications on the development of different aspects of English language competence. The research adopts explorative design. The results show that listening and speaking are the most positively affected skills by ICT use. The inferences also indicate that integrating various ICT tools and platforms can promote the development of all the aspects of ESP competence. Additionally, the results show that male students utilize ICT for learning English more frequently than female students. This research could serve as a guideline for teachers and instructors in deciding which tools and applications to use to enhance their students' foreign language proficiency. The study acknowledges the limitation of a small sample size, suggesting that the validity of the results could be enhanced by conducting the research with a larger number of participants.*

Keywords: *ICT, ESP competence, multinomial regression analysis*

1. INTRODUCTION AND RELATED RESEARCH

1.1. Electronic Learning and Distance Learning

Electronic learning or e-learning is commonly known as educational process which includes information and communication technologies (ICT).

There are several definitions of e-learning, often depending on the aspect considered, whether technological or pedagogical. The technological aspect emphasizes technology and defines it as follows: "E-learning is any form of learning, teaching, or education that is supported by computer technologies, particularly computer networks based on internet technology" [1]. However, the pedagogical aspect focuses on teaching and learning, defining e-learning as: "E-learning is an interactive or reciprocal process between the teacher and the student using electronic media, with an emphasis on the learning process, while the media serve as auxiliary tools to complement that process" [1].

Depending on the manner and extent of ICT application, e-learning can be categorized as [3]:

- traditional teaching,
- teaching with the use of ICT,
- blended learning, and
- online learning.

Traditional teaching or face-to-face teaching occurs in classrooms, utilizing tools such as Microsoft Word for lesson preparation. ICT-supported teaching involves technologies used as aids for traditional teaching, including presentations, websites, web-based testing programs, and email forums. Blended learning combines classroom teaching with ICT-supported teaching, utilizing Learning Management Systems (LMS) for learning management and video conferencing. Online learning is entirely technology-dependent, where students learn independently using internet-based learning methods. When teaching is conducted without any direct contact between the teacher and the student, it is referred to as distance learning.

In e-learning educational approaches, the student is in focus of the teaching process, while the teacher is a mentor who not only imparts knowledge but also supports, motivates, guides, and evaluates tasks and projects [2]. ICT has become a basic necessity and a vital component of contemporary education, while digital literacy, as a form of ICT, is one of the essential competencies that teachers must possess [4].

1.2. ICT and English language learning

With the emergence of ICT, the traditional classroom as a common learning context has been significantly affected.

Communication between language learners, as well as between teachers and students, has gained new forms of technology-mediated interaction [5]. Furthermore, foreign language (FL) students now have the opportunity to instantly access a variety of authentic language inputs. These changes have impacted overall learning and teaching methods, leading to the creation of new personalized learning models for FL learners. Additionally, the integration of ICT in English language learning can improve students' language skills, as well as inspire and motivate them to continue further studying [6]. Accordingly, this paper investigates students' viewpoints regarding how ICT influences the development of various aspects of ESP competence.

2. METHODOLOGY

2.1. Research design

This explorative research was conducted to determine whether the students of study programs (Production Management, Printing Technology, Mechanical Engineering and Informatics, and Electrical Engineering, i.e. other than Information Technology) use ICT to help them improve their ESP competence. For that purpose, we composed the following research questions:

- To what extent do students use ICT to improve different aspects of their ESP competence?
- Which ICT tools most effectively promote different aspects of ESP competence?

2.2. Research instrument and sample

To address the research questions, we designed an online Google Forms questionnaire consisting of six questions (two multiple-choice questions and four 5-point Likert-scale questions). It is based on the questionnaire referring to contemporary trends in teaching and learning English for Specific Purposes (ESP) in the field of Information Technology [7]. The survey was conducted during summer semester in 2024.

The participants were students of the Faculty of Technical Sciences Čačak at the University of Kragujevac enrolled in ESP classes within their respective study programs: Production Management, Printing Technology, Mechanical Engineering and Informatics, and Electrical Engineering. The total number of participants was 41 students.

3. RESULTS AND DISCUSSION

We used basic statistical analysis and multinomial regression analysis to analyse the answers to the survey questions.

The first question was demographical to establish the gender status of the participants.

Table 1. Participants' gender

Gender	Percentage
Male	51.3
Female	48.7

The analysis of the first-question results showed that the sample was homogenous, i.e. there was approximately equal number of male and female students participating in the survey (51.3 % of male students and 48.1% of female students) (see Table 1). This leads us to examine the distributions of ICT use, both in general and for learning the English language, in our case ESP, within the general population and by gender. We present these findings later in the paper.

The second and third questions provided answers to the survey questions regarding the frequency of using ICT in general and specifically for learning English (Figure 1).

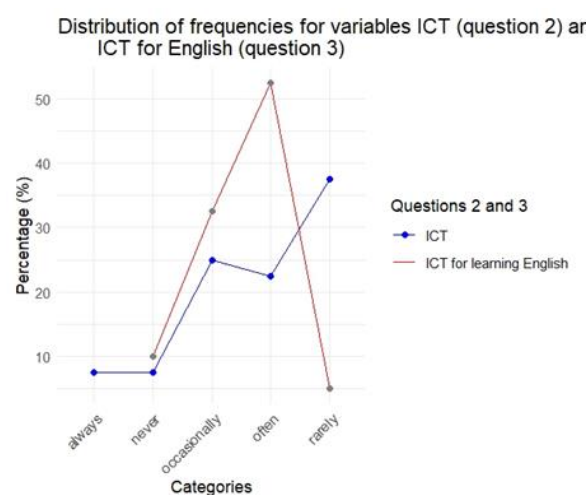


Figure 1. General use of ICT and ICT use for learning English

According to the results presented in Figure 1, approximately 35% of students rarely use ICT, while just above 5% always use ICT. This percentage is similar to those who never use ICT (5%). About 25% of students occasionally use ICT, and a roughly equal number, 23%, often use ICT. However, when comparing these results with the responses of students who use ICT to improve their English language knowledge, over 50% of those who generally use ICT also use it to learn English. Additionally, a little over 30% of students who generally use ICT admitted to using it only to improve their English. As expected, no students always used ICT solely for English language purposes. The inferences show that the largest percentage of students often use ICT for English language improvement.

These findings suggest that while general ICT usage among students is varied, a significant portion of those who do use ICT are leveraging it for educational purposes, particularly in learning English. However, the results presented reflect the distributions for these two observed variables

individually. This raises the question of how dependent these variables are on each other and what the distribution of the combined variable looks like. The new variable is represented by ordered pairs, where the first coordinate represents the response to survey question 2, the frequency of ICT usage, and the second coordinate represents the response to survey question 3, the frequency of ICT usage for learning English. The distribution of frequencies for the new variable is shown in Figure 2.

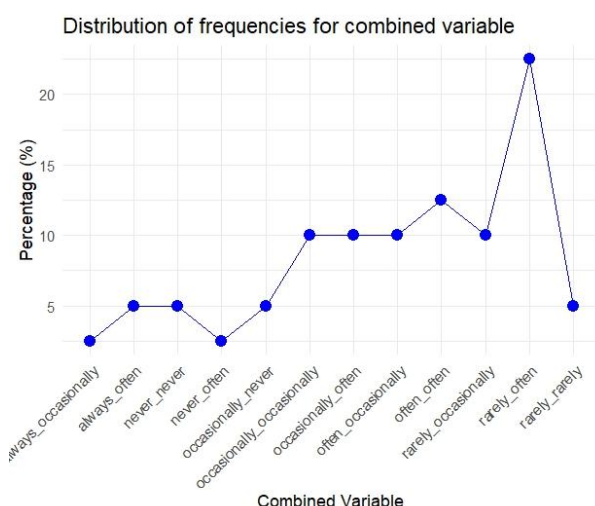


Figure 2. Ordered pairs of ICT use and ICT use for learning English

Figure 2 illustrates the distribution of frequencies for a combined variable representing ICT usage patterns, encompassing both general ICT usage and ICT usage specifically for learning English. The x-axis categorizes the combined variable, while the y-axis depicts the percentage of respondents falling into each category.

The results show a surprising peak for those who generally rarely use ICT, with the category (rarely, often) emerging with the highest percentage, slightly exceeding 20%. This category includes participants who admitted to rarely using ICT but often use it to learn English exclusively. Additionally, 12.5% of students fall into the category (often, often), indicating they frequently use ICT in both contexts. Conversely, the categories (never, often) and (always, sometimes) exhibit the lowest frequencies (less than 5%), indicating these combinations are less common among respondents.

Table 2. ICT use for particular EFL activities

Statement	I completely disagree (%)	I disagree (%)	I am neutral (%)	I agree (%)	I completely agree (%)
They help me complete pre-examination tasks more efficiently.	/	2.40	41.50	29.30	26.80
I quickly and easily find the information I need for studying.	/	4.88	34.15	29.27	31.70
I don't have to attend classes regularly at the faculty.	41.46	/	19.51	14.63	24.40
They motivate me to study in a more interesting way.	/	4.88	9.76	58.54	26.82

In summary, the graph underscores diverse patterns of ICT usage among students. It should be noted that some categories are missing.

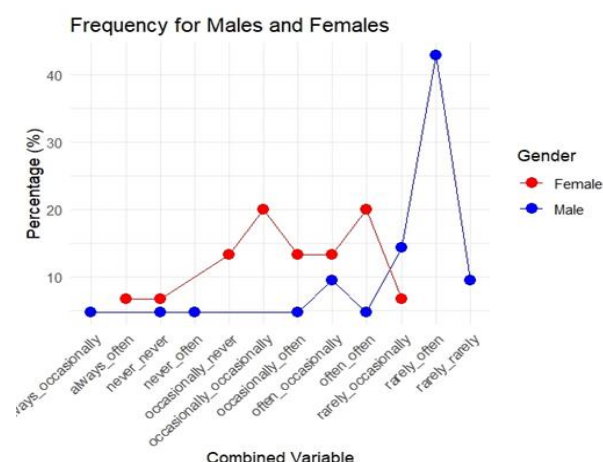


Figure 3. General ICT use and ICT use for learning English distributed among males and females

Figure 3 presents the use of ICT generally and ICT used especially for English language learning, distributed among the male and female participants. As for female students, it is noticeable that nearly the same number use ICT frequently and occasionally for both general purposes and for learning English. These groups are the largest, each making up about 20%. For male students, it is significant that they rarely use ICT for general purposes but often use it for learning English, with this group constituting around 40% of the total male student population. This suggests that male students use ICT more for learning English compared to female students. The most similar percentages for both genders are in the category where neither male nor female students ever use ICT, whether in general or for English language learning.

Table 2 presents the answers to the fourth survey question. The fourth survey question was composed to check to what extent students agree/disagree with the statements that ICT help them complete pre-examination tasks more efficiently, or that they find information necessary for learning English quickly and easily. We also wanted to check whether the possibility of not attending classes in person due to ICT usage represents a favorable condition and whether the students are motivated to study in more interesting manners when they use ICT.

The survey of the Table 2 results shows that almost half of the total number of students completely agree or agree that they do their pre-examination tasks more efficiently with the help of ICT (56.1%), while the others are either neutral, 41.5% or they disagree (2.40%) about using ICT for fulfilling pre-examination tasks. As many as 60.97 % of students agree or completely agree that they find the information necessary for studying quickly and easily, while 34.15% are neutral, and 4.88% disagree. What is interesting, the majority of students, 41.46%, completely disagree that not

attending classes at the faculty due to the existence of ICT is an advantage, whereas 39.03% agree or strongly agree that ICT facilitates not attending classes represents a favorable condition. As many as 19.51% are neutral. The majority of students completely agree or agree that ICT technology motivates them to study in more interesting ways (85.36%), whereas 9.76 % of students are neutral, and only 4.88% disagree with the statement.

Table 3 shows which tools and applications students use most frequently for English language learning.

Table 3. Frequency of using applications and tools for English language learning

Applications and tools	always (%)	often (%)	sometimes (%)	rarely (%)	never (%)
ChatGPT	19.52	9.76	36.58	17.07	17.07
Google Translate	29.27	53.66	9.76	7.31	/
Video- conference	7.31	7.31	39.02	26.83	19.53
Facebook	9.76	/	12.19	17.07	60.98
X (Twitter)	7.31	9.76	12.19	24.39	46.36
Instagram	19.51	19.51	17.07	9.76	34.15
TikTok	12.19	12.19	17.07	9.76	48.79
Films and music	34.15	21.94	34.15	4.88	4.88
Websites	21.95	37.71	17.07	2.44	20.83
Online English language teaching courses	4.88	7.32	12.19	26.83	48.78

The results presented in Table 3 show that Google translate and Films and Music are the most frequently used applications, while Facebook and Online English language teaching courses are never used for English language learning by the majority of students.

Finally, Table 4 shows what skills and competences students perceive as the most improved by ICT application.

Table 4. Skills and competences improved by ICT use

reading	4.8%
writing	12.2%
listening	31.7%
speaking	24.4%
vocabulary	17.1%
grammar	9.8%

Regarding the results presented in Table 4, we can see that 31.7% of students regard listening skill as the most improved one, closely followed by speaking skill, 24.4%. As many as 17.1% of students consider that ICT use has improved their vocabulary. Writing has been improved by ICT use, according to 12.2% of students, followed by grammar at 9.8%, while the least promoted skill is reading, with only 4.8% of respondents

These answers were subsequently analysed by multinomial regression analysis. The obtained results indicate the specific impacts of various activities on the development of language skills for the students who declared that they used ICT for the English language learning.

All the coefficients that will be mentioned are statistically significant ($p < 0.05$), indicating their impact on the development of respective language skills. The interpretation of the results shows that different activities can have varying effects on different aspects of language development, emphasizing the need for specific approaches in educational strategies that integrate modern technology.

As far as speaking is concerned, Facebook shows the greatest positive influence (coefficient = 40.24), while Instagram has a notably negative impact on speaking (coefficient = -33.27). Google Translate also contributes positively (coefficient = 23.84). Additionally, Google Translate has significant impact on the development of grammar knowledge (coefficient 13.63, $p < 0.05$), while other activities, e.g. those that are supported by Video-conferences have negative influence on the development of grammar knowledge, while Facebook has a minor positive influence. When we consider writing, the influence of Facebook on writing skill is -39.92, while the impact of Video-conferences is 13.47, which shows quite opposite values, with Video-conferences affecting substantially the development of the writing skill. When listening skill is regarded, the results show that Instagram (coefficient 41.15) and Video-conferences (coefficient 19.47) have positive impact on their development. What is interesting, the vocabulary is improved by using Video-conferences (coefficient 34.07) and negatively affected by visiting websites (coefficient-19.58).

4. CONCLUSION

This research was conducted provide the answers to the research questions concerned about the extent to which students use ICT to improve different aspects of their ESP competence and which ICT tools most effectively promote different aspects of ESP competence. As far as the first research question in regarded, the analysis show that students rarely use ICT for general purposes. However, if they use ICT, they predominantly use them to learn English. It is interesting that male students use ICT for learning English more often than female students. The answers to the second research question provide some interesting implications. The respondents of the research find ICT useful for improvement of different aspects of EFL competence. They regard listening and speaking as the most positively affected skills by the impact of ICT. On top of this, the results suggest that while social media platforms like Facebook and Instagram can significantly affect language proficiency, the type of activity and technological tool used also play crucial roles. While Facebook positively enhances speaking skills and Instagram shows a notable negative impact, Google Translate contributes positively to both speaking and grammar skills. The mixed effects of video-conferences indicate their potential for improving grammar and listening skills but special attention should be paid when their exclusive use for vocabulary development compared to web-based activities is concerned.

The research results implicate that integrating various ICT tools and platforms can promote the development of all the aspects of ESP competence. Future studies could be based on investigating a larger sample of students in order to enable more reliable inferences. Also, the attitudes of students on different levels of education could be investigated to compare with the results obtained in this study.

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APPEDIX**The role of ICT in learning English for specific purposes**

1. Specify your gender:
 - male
 - female
2. How often do you use ICT generally?
 - Always
 - Often
 - Sometimes
 - Rarely
 - Never
3. How often do you use ICT for learning English?
 - Always
 - Often
 - Sometimes
 - Rarely
 - Never
4. In your opinion, how much do ICT help you in studying English for curricular activities? (Choose the appropriate number: 1 - strongly disagree, 2 - disagree, 3 - unsure, 4 - agree, and 5 - strongly agree)
 - Choose an item. ICT help me to better fulfil pre-exam obligations.
 - Choose an item. I easily and quickly find necessary information for learning.
 - Choose an item. I don't have to attend classes regularly at university.
 - Choose an item. They motivate me to learn in a more interesting way.
5. Which of the mentioned ICT tools do you use for learning English language and how frequently? (Insert the appropriate number by each tool: 1- never, 2-rarely, 3-sometimes 4- often, and 5- always)
 - Choose an item. Chat GPT
 - Choose an item. Google Translate
 - Choose an item. Video conference
 - Choose an item. Facebook
 - Choose an item. X (Twitter)
 - Choose an item. Instagram
 - Choose an item. Tik Tok
 - Choose an item. Films and music
 - Choose an item. Websites
 - Choose an item. Online English language courses
6. Which skills and competencies do you believe you have most improved through the use of ICT? (Multiple answers are possible).
 - Reading
 - Writing
 - Listening
 - Speaking
 - Vocabulary
 - Grammar