CALL IN ESP — STUDENTS' COGNITIVE, BEHAVIOURAL AND AFFECTIVE ATTITUDES TOWARDS ICT

IZVORNI ZNANSTVENI RAD / ORIGINAL SCIENTIFIC PAPER

Tihana Banko
Algebra Bernays University, Zagreb, Croatia
tihana.banko@algebra.hr

Martina Stadnik
Algebra Bernays University, Zagreb, Croatia
martina.stadnik@algebra.hr

Ana Lokas Ćošković
Algebra Bernays University, Zagreb, Croatia
ana.lokascoskovic@algebra.hr

Abstract

In the modern world of information and computer technology (ICT), computer-assisted language learning (CALL) represents a norm rather than a choice, as technology is gradually becoming fully integrated into the teaching, learning and research of English as a Foreign Language (EFL), as well as a subset of EFL — English for Specific Purposes (ESP). The integration of ICT into language teaching has three components: (1) cognitive, which refers to knowledge, perceptions or ideas tied to technology use; (2) behavioural, which is the expression of the intention or actions associated with ICT in ESP; and (3) affective, which relates to emotions, or evaluations tied to the integration of ICT into ESP. This research aims to examine students' cognitive, behavioural, and affective attitudes towards integrating ICT in ESP classes in the context of Croatian tertiary education. To this end, we have posed the following research question: "What are students' attitudes towards the use of ICT in ESP classes?" Data were collected using a valid and reliable questionnaire as a measurement tool, designed by Nguyen & Habok (2022). The questionnaire, distributed to graduate and postgraduate ESP students at Algebra University via Google Forms, is a self-report measurement tool that examines the attitude of language students towards ICT in language learning through internal and external factors, categorized into three components: cognitive, behavioural, and affective. The internal factors measured include ICT importance, affective attitude, and metacognitive strategies, whereas the external factors are external learning activities, the use of ICT tools in learning, and ICT facility/material limitations. The research findings reveal that although students' cognitive and affective attitudes are moderate, the behavioural attitudes towards the use of ICT in ESP classrooms are the most positive, thereby providing a foundation for the enhanced integration of ICT into ESP courses in tertiary education.

Keywords: CALL, cognitive, behavioural and affective attitude components, ESP, students' attitudes towards the use of ICT, tertiary education

1. INTRODUCTION

Garrett (2009) defines the term computer-assisted language learning (CALL) as a dynamic relationship in which technology, theory, and pedagogy are inextricably intertwined. CALL technologies help language teachers improve teaching quality by utilizing the computer as the primary medium, in the form of text displayed on the screen, visual images, sound, scoring, achievement control, storage, and other functions (Liu et al., 2002). However, CALL technologies are not limited to using computers in class but include all digital technologies in and outside of class with the aim of language learning. This brings CALL closer to the notion of normalization (Bax, 2003), whereby technology is gradually becoming fully integrated into the teaching, learning, and research of English as a Foreign Language (EFL), as well as a subset of EFL — English for Specific Purposes (ESP). In the ESP context, ICT-based approaches are particularly significant because they not only support general language acquisition but also provide access to domain-specific terminology, authentic professional discourse, and task-based simulations that reflect real-world professional communication needs. The added layer of specialization distinguishes CALL in ESP from CALL in general EFL settings. Here, learner and teacher attitudes towards the use of digital technologies directly influence the extent to which these affordances are successfully adopted. Attitudes play a crucial role in the teaching and learning of foreign languages, as positive attitudes have been shown to enhance learner motivation, engagement, and ultimately, language achievement (Özer, 2020). In the context of CALL and EFL, research has shown that learners' and teachers' attitudes towards technology integration significantly influence the effectiveness of digital tools in language acquisition (see Ayres, 2002; Kopinska, 2020; Maushak & Simonson, 2001; Nagy & Habók, 2018; Svenningsson et al., 2022; Wiebe & Kabata, 2010). Some studies reflect that ICT is also recognized as beneficial for specialized language instruction and professional skill development in ESP contexts (see Fatnalaila & Ciptaningrum, 2024; Kavaliauskienė & Kaminskienė, 2010; Rosmayanti et al., 2024). Although these studies show positive attitudes toward ICT in ESP at both student and institutional levels, they do not systematically address the role of attitudes in CALL normalisation within ESP. Thus, examining attitudes towards ICT in ESP teaching and learning is crucial, as they mediate between the technological affordances of CALL tools and the pedagogical or professional goals unique to ESP. Articulating and addressing this relationship offers a foundation for interpreting how CALL technologies become normalized within specialized language education, and positions the current research within the broader ESP literature as a necessary contribution to an underexplored field.

1.1. The multicomponent model of attitude

The structure of attitude towards CALL has typically been viewed as multidimensional. Therefore, it is only fitting to use the multicomponent model of attitude to examine the attitudes of EFL learners towards the integration of ICT into language acquisition.

This model proposes that attitude is based on three main domains: (1) cognitive, (2) behavioural, and (3) affective domain (Fishbein & Ajzen, 1975; Kiesler, Collins & Miller, 1969; Mantle-Bromley, 1995; Mantle-Bromley & Miller, 1991, according to Tafazoli et al., 2019). The cognitive component refers to knowledge, perceptions, or ideas related to technology use. The affective component relates to emotions or evaluations associated with the integration of ICT into education. The behavioural component is the expression of intention or actions related to teaching technology (Nguyen & Habok, 2022). Maushak & Simonson (2001) elaborate that in the field of study of CALL, each component of attitude refers to a specific property. Thus, the cognitive component relates to computer literacy, the behavioural component refers to the experience of the language teacher or learner in applying technologies in language teaching and learning, and the affective component deals with feelings or emotions that are associated with an attitude object. However, not all components of attitudes are identical; they are interwoven, meaning they have a synergistic relationship (Breckler, 1984).

It should be noted that the three components of attitudes towards CALL noted above (cognition, behaviour, and affection) have been widely applied in different studies (Tafazoli et al., 2019; Teo, 2006) and generally viewed as the classical structure of attitude towards CALL.

1.2. Literature review

Attitude, which is among the most significant factors affecting the perception and use of CALL in language learning, is a much-researched aspect (Erdem et al., 2018). Therefore, a considerable amount of research focuses on attitudes towards CALL (Ayres, 2002; Kopinska, 2020; Tafazoli et al., 2020; Teo, 2006; Wiebe & Kabata, 2010). The beginning of the 21st century was marked by prolific research on all aspects of CALL, including the investigation of attitudes and perception, which is the focus of our present study. Ayres (2002) examined student attitudes towards the use of CALL and investigated how learners perceive its relevance and usefulness in language education. The key finding of Ayers' study (2002) is that most students viewed CALL positively, appreciating its significance, effectiveness, and supportive learning environment. They valued its interactive and flexible features, which increased motivation and reduced anxiety. The study concludes that positive attitudes depend on perceived usefulness and ease of use, but practical implementation requires addressing technical and training challenges. On the other hand, Wiebe & Kabata (2010) explored both students' and instructors' attitudes towards the use of CALL and found significant discrepancies between their respective perceptions regarding the goals, usefulness, and usage of CALL technologies, with instructors' behaviours influencing students' actual use patterns. By comparing the attitudes and perceptions of both groups, the

research highlights the importance of aligning instructor intentions with student experiences to improve the effectiveness of CALL in language teaching.

More recently, Tafazoli et al. (2020) compared the attitudes of Iranian and Spanish language students towards CALL in a cross-cultural study. Both groups generally held positive attitudes, recognizing their strengths in providing diverse tools, resources, and opportunities for more efficient and effective language learning, real communication with native speakers, and reduced anxiety and stress. Although previous research has consistently shown that students have generally positive attitudes towards CALL, a study conducted by Kopinska (2020) in the form of an 18-month ICT-based intervention in the Spanish EFL classroom indicates that positive attitudes are beyond the possible "novelty effect", as ICT is already an integrated part of students' daily academic life.

Teo (2006) concludes that attitude is the key construct in predicting technology acceptance for future use. However, studies of attitudes towards technology education have primarily focused on the affective component of attitudes. A Swedish study (Svenningsson et al., 2022) suggests that interconnected affective, cognitive, and behavioural components shape students' attitudes towards technology. The findings of the study show that a key factor for the participating students' attitudinal relations was interest (affective component) in technology education. An individual's interest in technology education was related to both the cognitive component and behavioural intention.

Research on attitudes towards ICT in the ESP context remains limited. Several empirical studies have nonetheless investigated this area. Fatnalaila and Ciptaningrum (2024) surveyed Indonesian ESP students and found generally positive perceptions of ICT's usefulness and ease of use, alongside strong motivation to continue its application. Kavaliauskienė and Kaminskienė (2010) explored Lithuanian ESP students' attitudes toward e-portfolios, blogs, and online collaboration, reporting favorable views and emphasizing ICT's role in lifelong learning. Rosmayanti et al. (2024) studied Indonesian ESP teachers' opinions on ICT integration, noting positive attitudes despite resource and training limitations.

A significant portion of CALL research in Croatia focuses on teacher attitudes towards integrating ICT tools into language classes, as well as the need for more comprehensive teacher training in ICT to support the effective and innovative use of technology in the classroom. Rogošić et al. (2021) conducted empirical research on the use of ICT in vocational high schools in Zagreb and Zagreb County. The findings indicate that while teachers utilize ICT almost daily, traditional teaching methods continue to dominate. Teachers identified key barriers to effective ICT use as inadequate school technology, outdated curricula, insufficient formal and ongoing teacher training, lack of time, and low salaries, all of which reduce motivation for

more complex ICT integration. A study by Krušić et al. (2022) on teacher attitudes and experiences in the CALL context found that teachers believe the use of ICT in teaching has a positive impact on language learning and instruction. They frequently use ICT in their classes, especially tools for creating quizzes and learning materials. At the same time, the results confirm the need for further teacher training in the use of ICT through various forms of (online) workshops. Similarly, Duka & Hrešćan (2024) found that foreign-language teachers at universities generally have positive attitudes towards using ICT in their teaching, acknowledging its necessity and the unique demands of online instruction. Teachers also identified specific competencies required for effective distance teaching and emphasized the importance of adapting to the particularities of online education.

While these studies delve into attitudinal aspects of EFL learning in Croatia, research specifically examining the cognitive, affective, and behavioural components of students' attitudes towards CALL, particularly among Croatian ESP learners, appears to be limited. This suggests an opportunity for future research to explore how Croatian learners perceive ICT and engage with it in language acquisition, considering the multidimensional structure of attitudes towards CALL. Such research could provide valuable insights into the integration of technology in language education and inform strategies to enhance learning outcomes. The reviewed literature concludes that students' attitudes towards CALL tend to be generally positive. Although extensive research has been conducted into motivation, attitudes, and aspirations related to EFL in general in Croatia, no recent studies have been found regarding ESP learners' attitudes towards CALL; hence, the opportunity for this paper presented itself.

2. METHODOLOGY

2.1. Research aim and hypothesis

This research aims to examine the distribution of cognitive, affective, and behavioural components of attitude for integrating ICT in three different ESP courses taught at the university level. To this end, the following research question was posed: *What are students' attitudes towards the use of ICT in ESP classes?* Based on the conducted literature review, the following hypothesis was proposed: *There are no statistically significant differences between students' cognitive, behavioural, and affective attitude components towards the use of ICT in ESP classes.* In practical terms, the hypothesis posits that students generally think about, behave toward, and feel about the use of ICT in ESP classes in similar ways, with no single attitude component being significantly more pronounced than the others.

2.2. Participants and measurement instrument

The participants in this study were first-year undergraduate students at Algebra University, enrolled in the following ESP courses: English for IT, English for the Media, and Business English. These ESP courses are a compulsory part of the curriculum for the undergraduate study programmes of Software Engineering, Cyber Security, Multimedia Production, Digital Marketing, Market Communication Design, and Economics of Digital Business at Algebra University.

The study included 181 participants. Most participants (60.2%) were male, and the most represented age group was those aged 18-21 years (86.7%). Regarding the field of study, the most significant percentage of participants were studying Software Engineering (29.3%) and Design (22.7%). For most participants (98.3%), Croatian was their native language, and 80.1% of participants started learning English in the first grade of primary school. The most significant percentage of participants self-assessed their English language proficiency at level B2 (38.1%) or level C1 (33.1%). The remaining participants self-assessed their language proficiency at level A1 (2.8%), A2 (2.2%), B1 (14.4%), and C2 (9.4%).

Quantitative data were collected using a questionnaire as a measurement instrument, which was designed and distributed to the students using the Google Forms tool. The questionnaire is a reliable and valid measurement instrument that assesses EFL learners' attitudes towards the integration of ICT into language education, first developed by Nagy and Habok (2018) as an eight-factor questionnaire to evaluate students' attitudes towards ICT in the Hungarian EFL context and later adapted to the Vietnamese EFL context (Nguyen & Habok, 2022). Nguyen and Habok's (2022) study of the six-factor instrument provides evidence for the reliability and validity of this tool in assessing EFL learners' attitudes towards the integration of technology into language education. The said questionnaire was adapted and used as a measurement instrument for the present study. Firstly, the English version was translated into Croatian and then back-translated into English. The two versions were compared for similarities and differences to check that all the items in the two English-language versions of the questionnaire were consistent.

The questionnaire used is a self-report measurement tool that examines the attitudes of language students towards ICT in language learning, considering both internal and external factors. The questionnaire comprises 27 four-point Likert-scale items ranging from disagree (value 1) to agree (value 4), categorized into cognitive, behavioural, and affective components; three internal factors (ICT importance, affective attitude, and metacognitive strategies), and three external factors (external learning activities, use of ICT tools in learning, and ICT facility/material limitation). More detailed information on the distribution of attitude components, internal and external factors, and questionnaire items is presented in Table 1.

Table 1
Distribution of Components, Factors, and Items in the Questionnaire

Component	Cognitive	Cognitive	Cognitive	Behavioural	Behavioural	Affective
Factor	internal ICT importance	external ICT facility and material limitation	internal metacognitive strategies	external learning activities	external use of ICT tools in learning	internal affective attitude
Items	9, 10, 11, 12, 13, 14	16, 19, 20	2, 3, 15, 18, 27	21, 22, 23	1, 24, 25, 26	4, 5, 6, 7, 8, 17

2.3. Data analysis

The collected data were analyzed in SPSS software using descriptive statistics to examine the sociodemographic characteristics of the participants and the basic descriptive parameters of the cognitive, behavioural, and affective components of their attitudes. The Kruskal-Wallis H test was used to statistically test for differences between individual components of students' attitudes, while the Mann-Whitney U test was used to determine which components differed significantly. According to Field (2013), both the Kruskal-Wallis and Mann-Whitney tests are non-parametric alternatives to their parametric counterparts (ANOVA and independent samples t-test, respectively). They are justified when the assumptions of normality or homogeneity of variance required for parametric tests are not met. The Kruskal-Wallis H test was selected because the attitude components (cognitive, behavioural, and affective) are measured on ordinal scales (Likert-type responses), and the assumption of normality required for parametric tests (ANOVA) may not be met. After identifying overall differences with the Kruskal-Wallis H test, the Mann-Whitney U test was used to determine which specific pairs of attitude components differed significantly.

3. RESEARCH RESULTS

The basic descriptive parameters of the cognitive component of the participants' attitudes towards the use of ICT in ESP teaching are presented in Table 2.

Table 2
Basic Descriptive Parameters of the Cognitive Component of Attitude

Item no	Cognitive component	M	SD
2	Using a computer for English learning is very important to me.	2.61	1.052
3	Using a smartphone for English learning is very important to me.	2.81	0.988
9	I can focus on English learning more if I use ICT tools.	2.81	0.967
10	I can understand the English material much more easily if I use ICT tools.	2.99	0.881
11	I can remember what I have learnt better if I use ICT tools.	2.87	0.916
12	ICT tools play an important role in my English learning process.	2.91	0.945

Item no	Cognitive component	M	SD
13	ICT tools make English learning faster for me.	3.04	0.924
14	ICT tools improve my English grades.	2.94	0.961
15	Using ICT tools is very important to me for learning English.	2.81	0.988
16	I cannot learn without using ICT tools.	2.20	1.045
18	Information is more easily available when using ICT tools than when visiting the library.	3.42	0.763
19	The English material covered does not allow for the use of ICT tools in class.	2.13	1.028
20	The English material covered does not allow for the use of ICT tools at home.	2.02	1.087
27	Teachers should incorporate the use of ICT tools into their English teaching.	3.21	0.823
	Overall	**2.75**	**0.641**

Note: M = mean; SD = standard deviation

The analysis of the cognitive component of students' attitudes towards the use of ICT in ESP teaching reveals a neutral orientation, with an overall mean of 2.75 (SD = 0.641). The cognitive component of students' attitudes towards ICT in ESP teaching is structured around three factors: internal ICT importance (items 9, 10, 11, 12, 13, 14), internal metacognitive strategies (items 2, 3, 15, 18, 27), and external ICT facility and material limitations (items 16, 19, 20). For internal ICT importance, students show moderate agreement that ICT helps them focus (item 9, M = 2.81, SD = 0.967), understand (item 10, M = 2.99, SD = 0.881), and remember (item 11, M = 2.87, SD = 0.916) English learning content. The strongest endorsement is for the idea that ICT tools facilitate faster learning (item 13, M = 3.04, SD = 0.924). However, students are less convinced that ICT tools directly improve their grades (item 14, M = 2.94, SD = 0.961) or play a central role in their overall learning process (item 12, M = 2.91, SD = 0.945), suggesting technology is viewed more as a helpful supplement than a fundamental driver of academic achievement. For internal metacognitive strategies, students most strongly recognize that ICT provides easier access to information (item 18, M = 3.42, SD = 0.763), highlighting a practical advantage. There is also a notable call for teachers to further incorporate ICT into their teaching (item 27, M = 3.21, SD = 0.823). However, students express less certainty about the importance of computers (item 2, M = 2.61, SD = 1.052) and smartphones (item 3, M = 2.81, SD = 0.988), with smartphones seen as only slightly more helpful. The importance of using ICT tools for learning English (item 15, M = 2.81, SD = 0.988) is also moderate, suggesting that, while students use ICT for quick access, they have not fully integrated these tools into deeper learning strategies. Regarding external ICT facility and material limitations, students display significant scepticism. They generally disagree that course materials restrict their use of ICT at home (item 20, M = 2.02, SD = 1.087) or in class (item 19, M = 2.13, SD = 0.967). Students do not feel dependent on ICT for learning (item 16, M = 2.20, SD = 1.045), which may be due to inconsistent access or insufficient training. While ICT is seen as a helpful tool,

systemic and pedagogical gaps prevent students from embracing it as a core element of their learning experience.

The next attitude component analysed is behavioural, with two underlying external factors: learning activities (items 21, 22, 23) and the use of ICT tools in learning (items 1, 24, 25, 26).

The basic descriptive parameters of the behavioural component of the participants' attitudes towards the use of ICT in ESP teaching are presented in Table 3.

Table 3

Basic Descriptive Parameters of the Behavioural Component of Attitude

Item no	Behavioural component	M	SD
1	I use a computer as part of my English learning process.	3.13	1.030
21	Teachers give us guidance on how to use ICT tools for English learning tasks to be completed at home.	3.23	0.853
22	Teachers give us guidance on how to utilize ICT tools for English learning in class.	3.26	0.791
23	Teachers support the use of ICT tools for English learning.	3.33	0.728
24	My teachers use a computer during their English classes.	3.64	0.624
25	My teachers expect me to use a computer as part of my English learning process.	2.93	0.902
26	Virtual learning environments are used in the courses I am enrolled in.	3.07	0.944
	Overall	**3.16**	**0.637**

Note: M = mean; SD = standard deviation

The analysis of the behavioural component of students' attitudes towards the use of ICT in ESP teaching reveals a generally positive orientation, with an overall mean of 3.16 (SD = 0.637). For the learning activities factor (items 21, 22, 23), students report high levels of agreement that teachers provide guidance on using ICT tools for English learning, both for tasks to be completed at home (M = 3.23, SD = 0.853) and in class (M = 3.26, SD = 0.791), as well as strong support from teachers for the use of ICT in learning (M = 3.33, SD = 0.728). These results indicate that teachers are actively involved in promoting and facilitating the use of ICT in various learning contexts. Regarding the use of ICT tools in learning (items 1, 24, 25, 26), students acknowledge frequent use of computers in their own learning process (M = 3.13, SD = 1.030), and report that teachers themselves regularly use computers during English classes (M = 3.64, SD = 0.624)—the highest mean in this component. The use of virtual learning environments is also prevalent (M = 3.07, SD = 0.944). However, the lowest mean in this group is for the item "My teachers expect me to use a computer as part of my English learning process" (M = 2.93, SD = 0.902), suggesting that while ICT is present and encouraged, there may be less explicit expectations for students' independent use of technology. These findings highlight a classroom environment where ICT is normalized and supported by teachers,

but where student-driven use of technology could be further enhanced to maximize the benefits of digital learning in ESP contexts.

The basic descriptive parameters of the affective component of the participants' attitudes towards the use of ICT in ESP teaching are presented in Table 4.

Table 4

Basic Descriptive Parameters of the Affective Component of Attitude

Item no	Affective component	M	SD
4	Using a tablet for English learning is very important to me.	1.71	0.918
5	Using a computer for English learning makes me happy.	2.77	0.992
6	Using ICT tools for learning makes me happy.	3.03	0.945
7	I use ICT tools for learning because I am very interested in IT.	2.90	1.012
8	I save time if I use a computer for English learning.	3.17	0.881
17	I save time if I use ICT tools for English learning.	3.08	0.901
	Overall	**2.76**	**0.703**

Note: M = mean; SD = standard deviation

The analysis of the affective component of students' attitudes towards the use of ICT in ESP teaching, which is represented solely by internal affective factors, reveals a mixed emotional response. Students express the lowest level of agreement with the importance of using tablets for English learning, indicating that tablets are not considered emotionally significant or engaging in this context (item 4, M = 1.71, SD = 0.918). The emotional response to using a computer for English learning is somewhat more positive, with students reporting a moderate sense of happiness when using computers (item 5, M = 2.77, SD = 0.992). Overall happiness with using ICT tools for learning is slightly higher, suggesting that students generally feel good about incorporating technology into their studies (item 6, M = 3.03, SD = 0.945). Interest in ICT as a motivator for using these tools is also moderate, as students report using ICT tools for learning partly because they are interested in information technology (item 7, M = 2.90, SD = 1.012). The strongest affective responses are related to the perception of saving time, with students agreeing that both computers (item 8, M = 3.17, SD = 0.881) and ICT tools in general (item 17, M = 3.08, SD = 0.901) help them save time in their English learning process.

Despite some positive affective responses—particularly regarding efficiency and general happiness—the overall mean for the affective component is 2.76 (SD = 0.703), which suggests a neutral to mildly negative emotional attitude towards ICT use in ESP teaching. The affective attitudes are not sufficiently positive, as the overall mean does not reach a clearly positive threshold, and some items indicate low emotional engagement with specific ICT tools.

Given the overall average scores for the cognitive component (M = 2.75, SD = 0.641), the behavioural component (M = 3.16, SD = 0.637), and the affective component (M = 2.76, SD = 0.703), it can be concluded that students' attitudes towards the use of ICT in ESP lessons are not entirely positive. To test our hypothesis (*There are no statistically significant differences between students' cognitive, behavioural, and affective attitude components towards the use of ICT in ESP classes*), the Kruskal-Wallis H test was used. The results (X^2 = 49.400, p = 0.000), as shown in Table 5, confirm a statistically significant difference between the individual components of students' attitudes toward the use of ICT in ESP lessons.

Table 5

Results of the Kruskal-Wallis H test

Component	N	Average Rank	X^2	p-value
Cognitive	181	235.43	49.400	0.000
Behavioural	181	338.78		
Affective	181	241.80		

To determine which components differ significantly, the Mann-Whitney U test was used, with the results presented in Table 6. A statistically significant difference was found between the cognitive and behavioural components (U = 9987.000, p = 0.000) and between the behavioural and affective components (U = 10687.000, p = 0.000).

Table 6

Results of the Mann-Whitney U test

Component	Average Rank	Sum of Ranks	Mann-Whitney U	p-value
Cognitive	146.18	26458.00	9987.000	0.000
Behavioural	216.82	39245.00		
Behavioural	212.95	38544.50	10687.500	0.000
Affective	150.05	27158.50		
Cognitive	180.25	32625.50	16154.500	0.820
Affective	182.75	33077.50		

These tests enabled us to obtain a clearer picture and identify statistically significant differences across the cognitive, behavioural, and affective components. The behavioural component stands out as the most positive, with the highest mean score (M = 3.16), reflecting strong institutional support and the prominent integration of ICT in teaching practices. This dominance is statistically supported by the Kruskal-Wallis H test, which confirms significant differences between the attitude components (X^2 = 49.400, p < 0.001). Furthermore, the Mann-Whitney U tests reveal that the behavioural component is significantly more positive than both the cognitive (U = 9987.000, p = 0.000) and affective (U = 10687.500, p = 0.000) components. In

contrast, the cognitive (M = 2.75) and affective (M = 2.76) components do not differ significantly from each other (U = 16154.500, p = 0.820), and both reflect moderate attitudes towards ICT use.

The original hypothesis is rejected, indicating that students' attitudes towards ICT in ESP classes differ across the cognitive, behavioural, and affective components. Specifically, the findings reveal that, although students demonstrate positive behavioural responses to ICT integration, their personal beliefs about its academic value (cognitive) and their emotional engagement (affective) are comparatively less positive. This means that the assumption of no significant differences among the three attitude components does not hold true in this context.

4. DISCUSSION

The research reveals that students' attitudes towards the use of ICT in ESP lessons are nuanced and vary significantly across cognitive, behavioural, and affective components. The Kruskal-Wallis H test reveals statistically significant differences between these components. Namely, the cognitive component reflects how students perceive the practical utility of ICT tools in learning English. Students' cognitive attitudes towards ICT in ESP teaching are moderate (M = 2.75, SD = 0.641). Students moderately agree that ICT helps them focus, understand, and remember English content, and strongly value ICT for making information more accessible and facilitating faster learning (M = 3.42). These findings align with Ayres (2002), who concluded that attitudes depend on perceived usefulness and ease of use, as well as with Tafazoli et al. (2020), who found that students value ICT tools as opportunities for more efficient and effective language learning. Similarly, studies by Fatnalaila and Ciptaningrum (2024) and Kavaliauskienė and Kaminskienė (2010) show generally positive cognitive perceptions of ICT in ESP, highlighting its importance in developing academic, professional, and lifelong language skills.

Furthermore, as shown in this study, students are less convinced that ICT directly improves academic performance or is essential for learning and see it more as a supportive tool than a core element of their educational experience. There is also a noted perception of limited applicability of ICT tools for coursework, both in class (M = 2.13) and at home (M = 2.02). In other words, while students recognize the value of ICT tools in accessing information, the perceived lack of full ICT integration into English coursework highlights the need for better alignment of learning materials with CALL approaches. There is also scepticism about the necessity of ICT and the extent to which course materials support its use, indicating that systemic and pedagogical barriers remain, as previously identified by Rogošić et al. (2021).

The behavioural component (M = 3.16, SD = 0.637) reflects students' actual use of ICT tools and their instructors' encouragement of technology in learning. The highest score (M = 3.64) indicates that teachers use ICT strongly during lessons. This finding aligns with previous studies, which have demonstrated that language teachers hold positive attitudes towards CALL and strive to incorporate ICT into their classes (see Krušić et al., 2022; Duka & Hrešćan, 2024). Teachers' consistent use of ICT as a positive indicator of integration aligns with Wiebe and Kabata's (2010) findings that instructors' behaviours shape students' usage patterns. Fatnalaila and Ciptaningrum (2024) also emphasize the important role of teacher encouragement in motivating ICT adoption in ESP contexts. This highlights the need for instructor intentions to be aligned with student experiences to enhance the effectiveness of CALL in language teaching. Our study reveals that there is a lower expectation for students' independent use of ICT (M = 2.93), suggesting that while the environment is supportive, student-driven engagement with ICT tools in ESP classes could be further enhanced.

The most surprising result in our research is that students' affective attitudes scored the lowest (M = 2.76, SD = 0.703). The strongest emotional responses are linked to the time-saving aspect of ICT (M = 3.17), while emotional engagement with specific devices, such as tablets, is low (M = 1.71). A possible reason for this could be that ICT tools are already a routine part of students' daily lives and are beyond the possible "novelty effect" (Kopinska, 2020), which makes the use of ICT tools less exciting or emotionally stimulating.

As previously mentioned, Svenningsson et al. (2022) concluded that a key factor in forming students' attitudes towards CALL is the affective component (interest in ICT), which is then related to both the cognitive component and behavioural intention. The results of this study indicate quite the contrary—students' affective responses lack strong emotional engagement with ICT in ESP lessons. It is the behavioural component that leads the way, as it has scored significantly higher than both cognitive and affective components. This suggests that while students may have mixed perceptions (cognitive) or moderate enthusiasm (affective) for ICT use, their actual behaviours are influenced positively by institutional practices, particularly teachers' adoption of ICT tools. High behavioural scores related to teachers' ICT use in class (M = 3.64) highlight their pivotal role in promoting technology. However, the relatively low score for teachers' expectations of students to use ICT independently (M = 2.93) indicates an opportunity to set higher standards and encourage student autonomy in ICT use.

5. CONCLUSION

This study reveals that university students enrolled in ESP courses at Algebra University hold moderately positive attitudes towards the use of ICT in their language learning, with notable differences across cognitive, behavioural, and affective components.

The behavioural component—reflecting actual use and institutional support—scored significantly higher than the cognitive (perceived usefulness) and affective (emotional engagement) components. While students recognize the practical advantages of ICT, such as easier access to information and time-saving benefits, they also perceive limited integration of technology into English coursework, both in class and at home. Students primarily value ICT for its efficiency and practical benefits, rather than as a transformative educational tool.

Teachers play a crucial role in modelling ICT use, as evidenced by high scores for their use of technology in lessons. Institutional and teacher support are vital drivers of positive attitudes towards ICT, but this does not automatically translate into strong personal or emotional engagement among students. Systemic and curricular barriers persist, as students do not perceive ICT as indispensable or fully embedded in their learning materials and processes. Furthermore, students' personal and affective engagement with ICT remains limited, highlighting a need for strategies that foster deeper integration and emotional connection with technology in learning. In other words, students' independent use of ICT and their emotional engagement with a range of digital tools remain only moderate, indicating room for improvement in both curriculum design and motivational strategies.

However, this research has some notable limitations. To begin with, the sample is primarily composed of young students between the ages of 18 and 21 (86.7%), mainly from fields such as software engineering and design. As a result, our findings may not accurately reflect the perspectives of students from the humanities, arts, other non-technical disciplines, older age brackets, or those from different backgrounds. Additionally, since the study was conducted at a single institution within a single country, the results may not be generalizable to students from various cultural or educational contexts. Another limitation is the reliance on self-reported data regarding the participants' attitudes towards ICT tools, which may be subject to biases such as over- or underestimation of their abilities and engagement. The study also focuses primarily on widely used ICT tools, such as computers, projectors, and software, without examining newer technologies like artificial intelligence, augmented reality, or virtual reality, potentially missing out on recent advancements in educational technology. Addressing these limitations would require future research to include a broader and more diverse participant pool, investigate the role of emerging technologies in education, conduct longitudinal studies to observe changes over time, and examine obstacles to ICT adoption in greater detail to recommend practical solutions.

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RAČUNALNO POTPOMOGNUTO UČENJE JEZIKA U PODUČAVANJU ENGLESKOGA JEZIKA STRUKE – KOGNITIVNI, AFEKTIVNI I BIHEVIORALNI STAVOVI STUDENATA PREMA INFORMACIJSKIM I KOMUNIKACIJSKIM TEHNOLOGIJAMA

U suvremenom svijetu informacijske i komunikacijske tehnologije (IKT) računalno potpomognuto učenje jezika predstavlja normu, a ne izbor, budući da se tehnologija postupno u potpunosti integrira u podučavanje, učenje i istraživanje engleskoga kao stranog jezika, kao i njegove podskupine – engleskog jezika struke. Integracija IKT-a u podučavanje jezika ima tri komponente: (1) kognitivnu, koja se odnosi na znanje, percepcije ili ideje povezane s upotrebom tehnologije; (2) bihevioralnu, koja predstavlja izražavanje namjere ili radnji povezanih s IKT-om u nastavi engleskog jezika struke i (3) afektivnu, koja se odnosi na emocije ili procjene povezane s integracijom IKT-a u nastavu engleskog jezika struke. Cilj ovoga istraživanja jest ispitati kognitivne, bihevioralne i afektivne stavove studenata prema integraciji IKT-a u nastavu engleskog jezika struke u kontekstu hrvatskog visokog obrazovanja. U tu svrhu postavljeno je sljedeće istraživačko pitanje: „Kakvi su stavovi studenata o upotrebi IKT-a u nastavi engleskoga jezika struke?" Podaci su prikupljeni s pomoću valjanog i pouzdanog upitnika kao mjernog instrumenta koji su osmislili Nguyen i Habok (2022). Upitnik, koji je studentima prijediplomskih i diplomskih studija Sveučilišta Algebra podijeljen putem Google obrasca u okviru nastave engleskog jezika struke, predstavlja alat za samoprocjenu kojim se ispituju stavovi studenata prema IKT-u u učenju jezika s obzirom na unutarnje i vanjske čimbenike, kategorizirane u tri komponente: kognitivnu, bihevioralnu i afektivnu. Mjereni su unutarnji čimbenici važnost IKT-a, afektivni stav i metakognitivne strategije, a vanjski su čimbenici vanjske aktivnosti učenja, upotreba alata IKT-a u učenju i ograničenja povezana s opremom /materijalima IKT-a. Rezultati istraživanja pokazuju da su kognitivni i afektivni stavovi studenata umjereni, dok su bihevioralni stavovi prema upotrebi IKT-a u nastavi engleskog jezika struke najpozitivniji, čime se stvara osnova za povećanu integraciju IKT-a u kolegije engleskog jezika struke u visokom obrazovanju.

Ključne riječi: engleski jezik struke, kognitivne, bihevioralne i afektivne komponente stava, računalno potpomognuto učenje jezika, stavovi studenata prema upotrebi IKT-a, visoko obrazovanje