# ***STRATEGIC CLICS: DIGIGAL LEARNING STRATEGIES AS PREDICTORS OF CHATGPT USE IN ESP INSTRUCTION AMONG CROATIAN STUDENTS***

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**Abstract:** The integration of Artificial Intelligence (AI) tools such as ChatGPT has enhanced self-directed and personalized learning, particularly in the context of language education. While AI's role has been examined in English as a Foreign Language (EFL) setting, its application in English for Specific Purposes (ESP) courses—especially in sports science context—remains underexplored. This study investigates whether digital language learning strategies predict university students' use of ChatGPT for academic English tasks, both in structured ESP assignments and in broader academic contexts. A total of 102 Croatian undergraduate sports science students enrolled in an ESP course participated in the study. They completed a modified version of the *Digital Natives Assessment Scale* (DNAS) and responded to two items measuring their use of ChatGPT: (1) for ESP course tasks and (2) for general academic tasks in English. Multiple regression analysis revealed that the DNAS factors "Using technology" and "Gratification and reward" significantly predicted ChatGPT use within the ESP course. In contrast, only 'Using Technology' predicted its use for general academic English tasks beyond the course. These findings suggest that students with higher digital engagement and a stronger motivation for instant digital feedback are more likely to use ChatGPT to support both structured and autonomous academic learning. By emphasizing the strength and nature of these relationships, the study underscores the value of integrating AI-based tools into ESP curricula to align with learners' digital habits, academic needs, and future professional demands in international sports environments.

**Keywords:** Artificial Intelligence (AI), ChatGPT, English for Specific Purposes (ESP), digital literacy, education innovation

## 1. Introduction

Since the mid-1990s, digital connectivity and technological advancements have significantly reshaped educational practices by

integrating digital tools and platforms into classrooms (Fletcher 2003). More recently, the growing presence of digital technologies has transformed how students engage with educational content, complete academic assignments, and develop new literacies (Vogel and Klassen 2001). This shift has contributed, as Platonova et al. (2022) explained, to the growing development of digital learning environments that are highly interactive through mobile access, social media engagement, and real-time connectivity. Within this environment, artificial intelligence (AI) tools such as ChatGPT have emerged as transformative resources for language learning due to their ability to offer instant feedback, adaptive support, and personalized instruction (Skjuve et al. 2023). In addition, studies on AI-driven language technologies have demonstrated that users significantly rely on such tools for producing and translating texts, highlighting their growing role in academic language practices (Borucinsky et al. 2025). Recent linguistic research has also examined AI-generated language beyond instructional settings, showing that chatbot interaction can also reflect complex pragmatic behaviour, including the use of politeness strategies and argumentative patterns that resemble human communication (Ivković 2024). Taken together, these findings indicate that chatbots occupy a dual position within contemporary academic contexts, functioning both as linguistic and practical tools. As such, this duality contributes to their widespread uptake, particularly given that such tools are user-friendly and easy to navigate (Mun 2024), aligning closely with the learning preferences of "digital natives"—users with high digital literacy who favour quick, interactive learning formats over traditional, linear teaching models (Zheng et al. 2025).

Despite increasing interest in the pedagogical applications of ChatGPT in English as a Foreign Language (EFL) contexts (Nguyen 2023), its use in English for Specific Purposes (ESP) remains underexplored. Huang et al. (2022) highlight this research gap, noting that while AI tools are becoming more common in general language instruction, their effectiveness, usage patterns, and learner perceptions within ESP—particularly in domain-specific contexts—are not well understood. Romanova (2020) emphasizes that digital-native learners bring distinct expectations and behaviours to language learning that warrant targeted pedagogical strategies in ESP environments. This gap is especially relevant for sports science students, who operate at the intersection of domain-specific knowledge and global communication. ESP, which refers to English instruction tailored to specific academic or professional fields (Paltridge and Starfield 2013), aims to equip learners with

specialized terminology and general communication skills required in professional contexts (Hyland 2022). In disciplines such as sports science and sports management, English is not only a tool for accessing academic literature but also a necessity for international collaboration and professional growth.

Moreover, the linguistic demands faced by students extend beyond ESP. Many European sports science programs increasingly incorporate English-Medium Instruction (EMI)—teaching academic subjects in English within non-English-speaking countries—as part of their internationalization strategy (Bowles and Murphy 2020). This shift seeks to attract international students and prepare domestic students for careers in the global marketplace (Arnó-Macià and Aguilar 2018). Thus, ESP courses provide foundational support for future EMI participation and for professional success in multilingual, multicultural settings.

This study addresses the research gap by examining how digital learning behaviours, measured using the *Digital Natives Assessment Scale* (DNAS) (Teo 2013), relate to ChatGPT use in a sports-specific ESP course. It investigates both the frequency and the context of ChatGPT use—whether for structured ESP tasks or broader academic assignments in English. By focusing on sports science students—an often-overlooked group in AI-supported language learning—this study contributes to the integration of emerging technologies in ESP pedagogy and aims to inform teaching practices that are responsive to digital-native learners.

Based on these aims, two research questions were formulated:

RQ1: To what extent do DNAS factors predict the frequency of ChatGPT use for structured, course-based learning tasks within a sports science ESP course?

RQ2: To what extent do DNAS factors predict students' use of ChatGPT for academic tasks delivered in English beyond the ESP course?

## 2. Literature review

### 2.1. ChatGPT in ESP and the sports science context

Recent developments in Artificial Intelligence (AI), with ChatGPT as one of the most innovative examples, have significantly reshaped approaches to language teaching and learning. Since its release in November 2022, ChatGPT—a Large Language Model (LLM)—has rapidly gained popularity, surpassing 100 million users and becoming a leading educational tool (Peachey 2023). Although not the first or only AI-powered chatbot, the integration of ChatGPT into pedagogical settings has had a notable impact on language education (Adeshola and Adepoju 2023).

In general English as a Foreign Language (EFL) context, research confirms ChatGPT's potential to support learner autonomy (Yang 2024) and learner-centred instruction (Rudolph et al. 2023). Baidoo-Anu and Owusu Ansah (2023) describe ChatGPT as a personalized tutor and translation aid, offering interactive and adaptive learning experiences that align with digital natives' preferences for self-regulated learning. Additionally, ChatGPT has been shown to enhance overall language proficiency (Tran 2024), assist students in developing writing skills and mastering writing mechanics such as spelling, punctuation, capitalization and grammar (Zirar 2023), and improve tone and formality (Hellstrom 2024).

ChatGPT also supports English language teachers. Abraham et al. (2022) report its usefulness in evaluating written assignments, while Koraishi (2023) notes its ability to help educators design comprehensive lesson plans, adapt materials appropriately, and generate placement tests with diagnostic feedback. Despite these advances, its integration into English for Specific Purposes (ESP) instruction remains under-researched. Huang et al. (2022) emphasize the lack of studies on AI tool usage in discipline-specific language contexts. Existing ESP research primarily focuses on fields like medicine (Skelton and Richards 2021), engineering (Arnó-Macià et al. 2020), and business (Vázquez-Amador and Lario-de-Oñate 2022), while performance-oriented disciplines such as sports science are largely overlooked. Nevertheless, promising developments exist. Özçelik and Ekşi (2024) found that ChatGPT facilitates vocabulary acquisition and supports task-based discourse simulations. Ayman et al. (2023) observed that it aids instructors in designing customized materials. Chaikovska et al. (2024) demonstrated its usefulness in writing technical reports and providing individual tutoring, while Assassi (2024) noted its role in conducting needs analyses. López (2024) illustrated how students critically evaluated AI-generated and human-authored abstracts. However, ethical concerns persist. Scholars caution that ChatGPT may encourage plagiarism, reduce originality, and hinder critical thinking (Darwin et al. 2024), while also presenting challenges in maintaining academic integrity (Cotton et al. 2024). These issues underscore the need for strategic, guided implementation of ChatGPT in educational settings.

In response to these gaps, the present study investigates how students in performance-focused fields—such as sports science—use ChatGPT in ESP contexts. Since ESP instruction often serves as a foundation for English-Medium Instruction (EMI) in sports programs,

understanding student engagement with digital tools at this stage is essential.

### 2.2. Digital learning behaviours and the DNAS framework

The use of AI tools like ChatGPT must be understood within the broader framework of digital learning behaviours, particularly among students frequently described as ″digital natives″ (Prensky 2001). These learners, raised in technology-rich environments, often prefer multitasking, visual engagement, and immediate feedback (Helsper and Eynon 2010). Such preferences influence how they approach academic tasks and use digital tools for language learning. Language learning strategies (LLS)—specific techniques used to enhance language acquisition—are crucial for effective learning (Alrashidi 2022). Embi (2000) defines LLS as individualized approaches that support language development. Oxford's (1990) taxonomy divides them into direct strategies (e.g., memory and cognitive strategies) and indirect strategies (e.g., metacognitive and social strategies), with a focus on assisting learners who lack confidence or skill in language acquisition.

As educational contexts increasingly adopt digital platforms, technological fluency has become essential (Mollick and Mollick 2023). Research shows that digital natives exhibit distinct learning styles characterized by autonomy, visual processing, and interactivity (Bennett et al. 2008). Prensky (2001) even argues that prolonged digital exposure has influenced the neurological development of this generation.

To better understand these learners, Teo (2013) developed the *Digital Natives Assessment Scale* (DNAS), a self-report instrument assessing digital learning tendencies. Maqbool et al. (2020) adapted the DNAS for use in English language education. The scale evaluates four dimensions: (1) use of technology in learning, (2) digital multitasking, (3) visual/graphic communication, and (4) preference for instant gratification and digital rewards. These dimensions offer a valuable framework for examining how learners interact with AI tools like ChatGPT. However, empirical studies linking digital learning behaviours to AI usage in ESP remain scarce. This study addresses that gap by using the DNAS to explore whether digital learning tendencies predict students' use of ChatGPT for structured ESP coursework and broader academic English tasks.

## 3. Methodology

### 3.1. Study design and participants

This study employed a cross-sectional, correlational design to examine the relationship between students' digital learning behaviours

and their use of ChatGPT for academic English tasks, both within an ESP course and in broader academic contexts. The sample comprised 102 undergraduate sports science students (n=49 male, n=53 female; *M* age = 21.1 ± 1.9) from a public university in Croatia. Two participants who selected the 'prefer not to say' option for gender were excluded from the analysis.

Inclusion criteria required participants to have completed 12 years of formal English instruction throughout primary and secondary education. All students were enrolled in a compulsory English for Specific Purposes (ESP) course as part of their sports science curriculum. The course is a part of their second-year undergraduate study program and comprises 45 teaching hours.

The required sample size was determined via a priori power analysis using G*Power software (version 3.1.9.7, Düsseldorf, Germany). The analysis indicated that a minimum of 84 participants was needed to detect a medium effect size ($f^2 = 0.15$) with four predictors, at a significance level of $\alpha = 0.05$ and a power of 0.80 ($\beta = 0.20$).

Participants' demographic and linguistic backgrounds are presented in Table 1.

Table 1. Educational and linguistics background of participants

| Item | Percentage (%) |
|---|---|
| *Type of secondary school* | |
| Grammar secondary school | 67.1 % |
| Vocational secondary school | 32.9 % |
| *Level of English taken at final state exam (FSE)* | |
| Higher level | 73.7 % |
| Lower level | 26.3 % |
| *Knowledge of additional foreign languages* | |
| Yes | 65.8 % |
| No | 34.2 % |

These background characteristics serve to contextualize participants' language learning experiences and provided a foundation for interpreting patterns of ChatGPT use.

### 3.2. Instrument and data collection

Data for this study were collected via an online questionnaire comprising three sections: (1) demographic and educational

background; (2) the adapted *Digital Natives Assessment Scale* (DNAS); and (3) two custom-designed items assessing ChatGPT use for ESP and general academic purposes.

The DNAS was originally developed by Teo (2013) and later adapted for language learning contexts by Maqbool et al. (2020). The adapted version used in this study measured four dimensions: ″Use of technology in learning″ (five items), ″Multitasking ability in digital contexts″ (six items), ″Use of visual/graphic communication strategies″ (five items), and ″Preference for instant gratification and digital rewards″ (five items). The internal consistency of the scale was confirmed through Cronbach's alpha, which yielded a total reliability score of 0.85, indicating strong reliability.

Two original items were created to evaluate ChatGPT use: (1) ″I regularly use ChatGPT (at least once a week) to support my language learning tasks in the ESP course focused on sports science,″ and (2) ″I use ChatGPT to help me complete academic tasks in English that are not part of the ESP course.″ The first item measured the habitual nature and frequency of ChatGPT use within structured instruction. Structured instruction refers to a formal, curriculum-based ESP course designed to build students' academic English proficiency within the sports science domain. This includes targeted vocabulary acquisition, engagement with discipline-specific genres (e.g., reports, presentations), and development of communication skills relevant to the sports context. The second item assessed ChatGPT use for broader academic purposes beyond the ESP course. This includes tasks such as reading, interpreting, paraphrasing, or summarizing scientific or technical texts that are not directly part of the ESP curriculum but are assigned as supplementary readings in other subject-specific courses.

To ensure clarity and contextual relevance, the instrument was reviewed by two experienced ESP teachers and piloted with a group of 12 sports science students. Items with quantitative response options were measured on a seven-point Likert scale ranging from 1 (Strongly disagree) to 7 (Strongly agree).

The final questionnaire was administered in English via Google Forms during the first academic semester of 2024–2025 (November–December 2024). Participants accessed the form through a QR code and were informed about the anonymity of their responses and the voluntary nature of participation. No time limits were imposed. All procedures adhered to ethical standards consistent with the Declaration of Helsinki. The research has been approved by the Institutional Ethics Committee (official number: 2181-205-02-05-25-0038).

### 3.3. Data analysis

Descriptive statistics—including means, standard deviations, minimum and maximum values, and frequencies—were calculated for all DNAS factors and ChatGPT use measures (see Table 2).

To examine the predictive power of DNAS factors on ChatGPT use, multiple regression analyses were conducted. Regression diagnostics confirmed that all key assumptions for multiple regression were met.

The overall model predicting ChatGPT use within the ESP course was statistically significant: $F(4, 97) = 5.63$, $p < 0.001$, with $R^2 = 0.21$ and adjusted $R^2 = 0.18$. This indicates that 21% of the variance in ChatGPT use was explained by the predictor variables. The effect size was calculated as $f^2 = 0.27$, indicating a medium effect according to Cohen's (1988) conventions. Variance Inflation Factor (VIF) values were all below 2.13, indicating the absence of multicollinearity.

The dependent variable was students' self-reported frequency of ChatGPT use, while the independent variables were the four DNAS factors. All statistical analyses were conducted using the Statistics 14.1.0.8 software package (Cloud Software Group, Inc., 2023).

### 3.4. Limitations

This study relied exclusively on self-reported data to assess both digital learning behaviours and ChatGPT usage, which introduces certain limitations, including potential discrepancies between reported and actual behaviours due to factors such as social desirability bias and imperfect memory recall. Moreover, the lack of qualitative data limits the depth of interpretation regarding students' underlying attitudes, motivations, and context-specific experiences. While subjective measures are commonly used in exploratory educational research, future studies could benefit from adopting mixed-methods designs and incorporating objective data sources—such as app usage logs, wearable activity trackers, or in-depth interviews—to provide a more reliable understanding of student behaviour and enhance the validity of the findings. In addition, the use of more comparable methodologies and standardized data collection techniques would enable more comprehensive national and cross-country analyses.

## 4. Research results

This section summarises the descriptive statistics and regression analyses examining how students' digital learning behaviours—captured by the four DNAS factors—relate to their self-reported use of

ChatGPT in the ESP course in sports science and in wider academic English tasks.

Table 2 displays the descriptive statistics for the four DNAS factors and the two ChatGPT-related items. These results provide an initial overview of students' digital learning behaviours as well as their reported use of ChatGPT for both structured ESP coursework and wider academic tasks in English.

Table 2. Descriptive statistics of DNAS factors and ChatGPT use

| Item | Mean ± SD | Median | Minimum | Maximum |
|---|---|---|---|---|
| ″Using technology″ | 5.06 ± 1.26 | 5.25 | 2.00 | 7.00 |
| ″Multitasking″ | 5.34 ± 1.43 | 5.50 | 1.33 | 7.00 |
| ″Graphic communication″ | 4.12 ± 1.38 | 4.25 | 1.00 | 7.00 |
| ″Gratification and reward″ | 4.79 ± 1.02 | 4.80 | 1.00 | 7.00 |
| ″ChatGPT use in English tasks beyond ESP″ | 3.91 ± 2.05 | 4.00 | 1.00 | 7.00 |
| ″ChatGPT use in ESP course″ | 5.33 ± 1.73 | 6.00 | 1.00 | 7.00 |

Legend. ″Using technology″ – Refers to the use of technology in learning. ″Multitasking″ – Indicates multitasking ability in a digital context. ″Graphic communication″ – Denotes the use of visual/graphic communication strategies. ″Gratification and reward″ – Refers to the preference for instant gratification and digital rewards. SD – Standard deviation. ″ChatGPT use in ESP course″ – Refers to the item measuring students' dimension ″I regularly use ChatGPT (at least once a week) to support my language learning tasks in the ESP course focused on sports science.″ ″ChatGPT Use in English tasks beyond ESP″ – Refers to the item measuring students' dimension ″I use ChatGPT to help me complete academic tasks in English that are not part of the ESP course.″

As shown in Table 2, students reported consistently high engagement across all digital learning strategies. ″Multitasking″ recorded the highest mean score (M = 5.34), followed by ″Using technology″ (M = 5.06) and ″Gratification and reward″ (M = 4.79), reflecting frequent engagement with digital tools and a preference for immediate feedback. 'Graphic communication' had the lowest score (M = 4.12), indicating a relatively lower use of visual or emoji-based communication strategies.

Regarding ChatGPT use, students reported more frequent use for ESP course tasks (M = 5.33) than for general academic tasks in English

outside the ESP course (M = 3.91). These results suggest that ChatGPT is primarily used as a support tool for structured, course-specific academic purposes.

Table 3 presents the results of the multiple regression analysis examining the extent to which the four DNAS factors predict students' frequency of ChatGPT use within the ESP course. The dependent variable in this analysis was: ″I regularly use ChatGPT (at least once a week) to support my language learning tasks in the ESP course focused on sports science.″

Table 3. Multiple regression results: predictors of ChatGPT use within the ESP Course

| Item | b* | Std. Err. | b | Std. Err. | t (71) | *p* |
|---|---|---|---|---|---|---|
| Intercept | | | 0.65 | 0.97 | 0.67 | 0.50 |
| ″Using technology″ | 0.37 | 0.12 | 0.51 | 0.17 | 3.02 | 0.00 |
| ″Multitasking″ | 0.06 | 0.12 | 0.07 | 0.15 | 0.47 | 0.64 |
| ″Graphic communication″ | -0.16 | 0.11 | -0.20 | 0.14 | -1.50 | 0.14 |
| ″Gratification and reward″ | 0.31 | 0.11 | 0.53 | 0.19 | 2.81 | 0.01 |

Legend. $R = 0.56$; $R^2 = 0.32$; Adjusted $R^2 = 0.28$; $F(4, 97) = 8.32$; $p < 0.001$; Standard Error = 1.46. ″Using technology″ – Denotes the use of technology in learning. ″Multitasking″ – Refers to multitasking ability in a digital context. ″Graphic communication″ – Addresses the use of visual/graphic communication strategies. ″Gratification and reward″ – Indicates the preference for instant gratification and digital rewards.

The regression results presented in Table 3 indicate that among the four predictors, ″Using technology″ and ″Gratification and reward″ are significant predictors of students' ChatGPT use for completing tasks within the ESP course. Students who frequently engage with digital technology in their learning are more likely to use ChatGPT regularly and for ESP-specific academic purposes. Moreover, students motivated by immediate feedback or digital rewards tend to engage with ChatGPT habitually, although not necessarily for tasks requiring higher-order cognitive skills. In contrast, ″Multitasking″ and ″Graphic communication″ did not significantly predict ChatGPT use in this context.

Table 4 presents the results of a separate multiple regression analysis examining the extent to which the same four digital learning strategy factors predict students' use of ChatGPT for completing academic tasks in English beyond the ESP course. The dependent

variable was: ″I use ChatGPT to help me complete academic tasks in English that are not part of the ESP course.″

Table 4. Multiple regression predicting ChatGPT use for general academic English tasks based on DNAS factors

| Item | b* | Std. Err. | b | Std. Err. | t (71) | p-value |
|---|---|---|---|---|---|---|
| Intercept | | | -1.88 | 1.16 | -1.62 | 0.11 |
| ″Using technology″ | 0.42 | 0.13 | 0.69 | 0.20 | 3.34 | 0.00 |
| ″Multitasking″ | -0.01 | 013 | -0.01 | 0.18 | -0.05 | 0.96 |
| ″Graphic communication″ | 0.07 | 0.11 | 0.11 | 0.16 | 0.68 | 0.50 |
| ″Gratification and reward″ | 0.19 | 0.11 | 0.40 | 0.23 | 1.77 | 0.08 |

Legend. $R = 0.54$; $R^2 = 0.30$; Adjusted $R^2 = 0.26$; $F(4, 97) = 7.45$; $p < 0.001$; Standard Error = 1.76.

Based on the multiple regression analysis (Table 4), only the ″Using technology″ factor was a statistically significant predictor of students' ChatGPT use beyond the ESP course ($p = 0.00$). This suggests that students who frequently engage with digital technology are more likely to utilize ChatGPT for broader academic English tasks. The ″Gratification and reward″ factor demonstrated a weak, non-significant trend ($p = 0.08$), indicating a slight tendency among reward-motivated students to use ChatGPT in general academic contexts. In contrast, neither ″Multitasking″ ($p = 0.96$) nor ″Graphic communication″ ($p = 0.50$) significantly predicted ChatGPT use, implying that tendencies toward multitasking or visual communication do not substantially influence students' engagement with this AI tool.

Overall, the findings suggest that regular technology use and sensitivity to digital rewards are associated with increased ChatGPT engagement across both formal (ESP-specific) and informal academic contexts. Conversely, typical digital-native behaviours such as multitasking and visual communication preferences do not appear to support meaningful or consistent adoption of AI tools for academic language learning purposes.

## 5. Discussion

The findings of this study offer several important insights into how students' digital learning behaviours relate to their habitual use of ChatGPT, both within English for Specific Purposes (ESP) courses in sports science and for broader academic tasks conducted in English.

The first focal point was students' digital learning behaviours, measured by the four factors of the *Digital Natives Assessment Scale* (DNAS). Among these, 'Multitasking' was the most frequently employed strategy. Participants reported that they often engaged in simultaneous digital tasks—such as browsing the internet, reading emails, and communicating with peers—reflecting a habitual behavioural pattern characteristic of contemporary learners. These findings align with prior research linking digital multitasking to technology dependence and, in some cases, to signs of technology addiction (Al Seghayer 2025). In the ESP context, such multitasking behaviour suggests that students may facilitate fluid transitions across platforms and tasks, such as watching or recording lectures, collaborating on learning materials, and completing language assignments. However, this digital fluency has raises certain pedagogical concerns. Mark (2022) notes that constant refocusing between multiple digital stimuli may lead to cognitive overload and fragmented learning—particularly problematic in linguistically and cognitively demanding contexts. Indeed, although multitasking correlates with digital engagement, it does not consistently enhance academic performance, cognitive processing, or social-emotional competencies such as empathy and emotional awareness (Romanova 2020). Thus, while multitasking behaviour reflects sports science students' digital readiness, it also underscores the importance of instructional design that fosters focus, metacognitive awareness, and international engagement with AI-supported tools like ChatGPT. Therefore, educators might, for example, set limits on task-switching, manage cognitive load, and integrate digital tools in ways that align with students' learning goals and language proficiency levels.

In addition, students also reported high engagement with ″Using technology″ and ″Gratification and reward″ factors. Despite their frequent use, neither of these two factors emerged as statistically significant predictors of ChatGPT use in this particular study. This discrepancy suggests that while students may be generally confident in navigating digital tools and motivated by instant feedback or digital rewards, these behaviours alone may not directly translate into the purposeful or strategic use of AI tools like ChatGPT within academic contexts. This aligns with earlier research indicating that although digital fluency is widespread among digital natives, it does not inherently guarantee meaningful academic engagement with educational technologies (Helsper and Eynon 2010). The factor ″Gratification and reward,″ in particular, may reflect students' preference for tools that provide immediate answers or reinforcement. However, when not

embedded within structured pedagogical frameworks, such as for instance ESP course, such preferences might encourage surface-level learning rather than deeper engagement with language content (Huang et al. 2022). In contrast, the factor ”Graphic communication” emerged as the least-used strategy, likely due to the text-heavy and domain-specific nature of both ESP tasks and ChatGPT interactions. This suggests that students in this ESP context may be less inclined to rely on visual-symbolic communication modes—such as emojis, diagrams, or infographics—when engaging with English academic content. Such a finding is particularly relevant given the text-based nature of both ChatGPT and ESP sports course materials, which typically emphasize verbal, written, and domain-specific discourse over multimodal expression. This may indicate a potential gap in students' digital communication repertoires or a preference for more traditional linguistic input and output modes in academic contexts. For ESP course teachers, this presents an opportunity to either reinforce students' strengths in textual communication or introduce scaffolding that expands their multimodal literacy in ways that enhance learning outcomes.

Students' prior educational and linguistic backgrounds also proved relevant. We assumed that understanding students' linguistic and educational prior experience might provide us with background knowledge of their language experience that is essential for interpreting their interaction with digital tools, as these foundational factors shape not only their language proficiency but also their confidence, autonomy, and readiness to adopt new technologies for academic purposes (Al-Khresheh 2024). To that extent, most participants (67.1%) had attended grammar schools, while 32.9% came from vocational schools. Grammar school students in Croatia generally received more intensive English instruction—four to five weekly lessons—often supplemented by Latin and an additional foreign language. This exposure typically results in B1–B2 CEFR proficiency (Council of Europe 2020), which fosters both metalinguistic awareness and confidence in academic English. These competencies likely enhance their readiness to use AI-based tools like ChatGPT, aligning with the Technology Acceptance Model (TAM), which emphasizes perceived usefulness and ease of use as key factors in technology adoption (Davis 1989). In contrast, vocational school students in Croatia, who had less extensive English instruction and fewer opportunities to study other languages, typically attained lower proficiency levels (A2–B1), making academic tasks more demanding. These patterns align with Croatian national education trends (Drljača Margić and Vodopija-Krstanović 2018) and broader global

developments positioning English as a key academic lingua franca in higher education (Hyland 2022). In the Croatian context, however, English cannot be viewed solely as a traditional foreign language but rather as what Prćić (2014) conceptualises as a nativized foreign language, shaped by local educational practices, functional needs, and sustained institutional use. Notably, many students reported proficiency in at least one additional foreign language, which further supports the view that multilingual learning environments enhances metalinguistic awareness, cognitive flexibility, and problem-solving skills (Kuralbayeva et al. 2025). Such competencies are especially beneficial in digital and academic settings. As Ratheeswari (2018) notes, engaging students with emerging digital technologies equips them not only with 21st-century skills but also with tools essential for future professional contexts. This is echoed by González-Pérez and Ramírez-Montoya (2022), who emphasize the importance of digital and linguistic literacy for professionals in multicultural environments, such as those in sports science.

Regression analysis revealed that among the four DNAS factors, only ″Using technology″ significantly predicted the frequent ChatGPT use in both ESP and general academic contexts.

This finding can be attributed to several interrelated factors. Participants, as digital natives have grown up in digitally rich environments that support rapid adaptation to new technologies. Huang et al. (2022) emphasize that sustained digital exposure fosters literacy conducive to adopting advanced learning technologies. Likewise, Bennett et al. (2008) argue that younger learners possess higher technological competence, making them well-positioned to maximize AI's educational benefits. With a mean age of 21, students in this study belong to a demographic especially open to incorporating ChatGPT into their routines. These findings reflect pedagogical shifts toward learner-centred, tech-integrated instruction (Klimova et al. 2023). Prior studies confirm that digital natives are responsive to technology-enhanced learning environments (Maqbool et al. 2020), with strategic technology use fostering autonomy, motivation (Nazim et al. 2024), and improved language performance (Zhang et al. 2025). Therefore, aligning ESP curricula with learners' digital habits can enhance language engagement and learning outcomes.

The study also found that the factor ″Gratification and reward″ significantly predicted ChatGPT use in the ESP course but not in broader contexts. This suggests that students motivated by immediate feedback and digital gratification are more likely to integrate ChatGPT into their

learning routines when those tasks are structured and curriculum-aligned. This supports findings by Yaşar and Karagücük (2024), who observed that AI familiarity can boost learning motivation. However, its lack of predictive value outside the ESP context highlights the need to design tasks that promote transferability. ESP instructors should equip students with metacognitive strategies that support autonomous, critical use of AI tools across learning environments.

Meanwhile, ″Multitasking″ and ″Graphic communication″ were not detected as significant predictors of ChatGPT use in either learning settings. This may indicate that even as students show comfort with simultaneous digital stimuli and visual media, these characteristics are not necessarily directly involved in the effective use of AI applications to achieve academic English competency. These findings are consistent with the results obtained in earlier research, that passive use within online settings does not necessarily provide students with the required strategies to utilize AI in learning contexts (Helsper and Eynon 2010).

Students also reported more frequent ChatGPT use in structured ESP tasks than in broader academic contexts, likely due to increased confidence when teacher support is available. These findings are consistent with research in EFL and ESP settings, which suggests that institutional support strengthens students' trust in and readiness to use AI tools (Özçelik and Ekşi 2024). For teachers, this underlines the importance of embedding AI tools into course design to promote effective engagement and learning.

In conclusion, these findings contribute to ongoing discussions about AI's role in language education. Using tools like the DNAS to assess students' digital profiles can help teachers develop more responsive, personalized instruction. Moreover, the study offers indirect evidence of students' preparedness for English-Medium Instruction (EMI) in future academic settings. Although not yet enrolled in EMI courses, sports science students' strategic use of ChatGPT reflects growing autonomy and competence. ESP, therefore, serves not only as a platform for language development but also as a foundation for successful future EMI engagement. By integrating AI tools purposefully, ESP courses can better support students in achieving academic and professional success in multilingual, globalized environments.

## 7. Conclusion and Pedagogical Implications

This study examined the relationship between digital learning behaviours and ChatGPT use among sports science students enrolled in an English for Specific Purposes (ESP) course. Using the *Digital Natives Assessment Scale* (DNAS), it identified two key predictors of ChatGPT

use: frequent engagement with digital technology and a preference for instant gratification. These factors significantly influenced students' use of ChatGPT both within structured ESP coursework and for general academic tasks conducted in English. Students who regularly utilized digital tools were more likely to engage with ChatGPT to support both course-specific and broader academic activities. In contrast, multitasking and visual communication behaviours showed limited predictive value, suggesting that not all aspects of digital nativeness contribute equally to AI-assisted learning.

These findings have several important pedagogical implications for educators and curriculum designers. Integrating tools like ChatGPT into ESP instruction—particularly for activities such as vocabulary development, genre-based writing, or drafting academic texts—can enhance engagement and improve learning outcomes. However, structured implementation and pedagogical scaffolding are essential to uphold academic integrity. Institutions should also provide training that promotes the ethical and critical use of AI tools to mitigate risks of overreliance or misuse. The observed correlation between digital engagement and AI use underscores the potential of personalized, technology-driven instruction. Instruments like the DNAS can help educators identify learner profiles and tailor support accordingly.

Therefore, embedding AI practices within ESP courses can prepare students for future English-Medium Instruction (EMI) and international professional environments—particularly relevant in applied fields such as sports science. Overall, this study highlights the value of learner-centred, digitally responsive ESP pedagogy that aligns with students' technological habits and evolving academic and professional demands.

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## SAŽETAK: STRATEŠKI KLIKOVI: DIGITALNE STRATEGIJE UČENJA KAO PREDIKTORI KORIŠTENJA CHATGPT-A U NASTAVI ENGLESKOG JEZIKA STRUKE MEĐU HRVATSKIM STUDENTIMA

Integracija alata umjetne inteligencije (UI), poput ChatGPT-a, potaknula je samostalno i personalizirano učenje, osobito u nastavi jezika. Iako je uloga UI-e već istraživana u kontekstu učenja engleskog kao stranog jezika (EJS), njezina primjena u engleskom jeziku struke (EJS), posebno u području kineziologije, još je nedovoljno proučena. Ovim se istraživanjem ispituje mogu li digitalne strategije učenja predvidjeti korištenje ChatGPT-a među studentima kineziologije u akademskim zadacima na engleskom jeziku – kako u okviru EJS kolegija, tako i u širem akademskom kontekstu. U istraživanju su sudjelovala 102 studenta kineziološkog fakulteta koji su ispunili prilagođenu verziju ljestvice

*Digital Natives Assessment Scale* (DNAS) i odgovorili na dva pitanja o korištenju ChatGPT-a: (1) za zadatke u okviru EJS kolegija i (2) za opće akademske zadatke na engleskom jeziku. Rezultati višestruke regresijske analize pokazali su da faktori „Korištenje tehnologije" i „Zadovoljstvo i nagrada" značajno predviđaju upotrebu ChatGPT-a u okviru EJS kolegija, dok samo „Korištenje tehnologije" predviđa njegovu uporabu u širim akademskim zadacima. Zaključno, studenti s većim digitalnim angažmanom i izraženijom motivacijom za brzu digitalnu povratnu informaciju češće koriste ChatGPT za podršku strukturiranom i samostalnom učenju. Rezultati upućuju na važnost uključivanja UI alata u nastavu EJS kako bi se bolje uskladila s digitalnim navikama i budućim profesionalnim potrebama studenata u međunarodnom sportskom okruženju.

**Ključne riječi**: Umjetna inteligencija (UI), ChatGPT, engleski jezik struke (EJS), digitalna pismenost, inovacije u obrazovanju