CLIL AND ESP AT THE NEXUS OF SECONDARY AND TERTIARY EDUCATION: LESSONS LEARNED FROM A MUSEUM SETTING

STRUČNI RAD / PROFESSIONAL PAPER

Maja Ivanović
Dr. Franjo Tuđman Defense and Security University (SOIS FT), Zagreb, Croatia
maja.ivanovic@sois-ft.hr

Silvana Kokan
Dr. Franjo Tuđman Defense and Security University (SOIS FT), Split, Croatia
silvana.kokan@sois-ft.hr

Abstract

Foreign language teaching and learning in higher education, particularly in the context of English for Specific Purposes (ESP) and Content and Language Integrated Learning (CLIL), has received significant academic attention, especially with the growing importance of English proficiency. Both ESP and CLIL frameworks are often embedded into university curricula, providing opportunities to explore effective teaching methodologies and enhance students' language skills and motivation. However, less attention has been given to collaborative practices that involve both secondary and tertiary education stakeholders in ESP contexts. This paper examines lessons learned from an ongoing project that involves university and high school students, museum curators, and English teachers in a collaborative English for Specific Purposes (ESP) learning environment. The project, set in a museum, unfolds in several phases: the preparatory phase, where university students collaborate with curators and English teachers to prepare museum exhibit presentations in English, followed by university students delivering presentations to high school students assuming the role of curators. The next phase introduces high school students to state-of-the-art virtual reality (VR) technology in a museum setting, with brief explanations provided by museum curators, allowing students an opportunity for an immersive learning experience. Finally, all participants complete a self-reflective assessment to evaluate their understanding of the subject matter and their preferences regarding different presentation modes. This study contributes to the growing body of research on ESP and CLIL by emphasizing the value of cross-institutional collaboration among high schools, higher education institutions, and heritage institutions, as well as the integration of statistical methodologies in language learning.

Keywords: CLIL, ESP, higher education, immersive learning, secondary education

1. INTRODUCTION

Nowadays, education is undergoing radical changes worldwide, driven by the application of novel methods enabled by advancements in digital technologies, curricula designed to meet the needs of modern learners, and a growing awareness of the importance of learning in environments that extend beyond the traditional classroom.

One of the goals of this paper is to present a project conducted at the Croatian Maritime Museum in Split (n.d.), which is an effort to enhance the traditional approach in teaching by combining it with modern approaches aimed at fostering communication, independent study, and collaboration through interconnectedness with various institutions.

The project, ongoing since 2021, involves several actors: the museum curators, cadets from the Integrated Undergraduate and Graduate University Study Program in Naval Studies at the Dr. Franjo Tuđman Defense and Security University (participating on a voluntary basis), high school students as well as high school and university-level English teachers.

In the initial phase of the project, the cadets, assisted by the museum curators, prepared presentations in English on a chosen museum artifact and submitted the presentation to their English teacher for correction. In the next phase, cadets delivered presentations to high school students in a museum setting, after which high school students were invited to explore the underwater archaeological sites in the museum's Virtual Reality (VR) Room. Finally, high school students were asked to fill out feedback forms related to both types of presentation modes.

Another goal of this paper is to present the data obtained by analyzing students' feedback forms gathered during the museum visit in January 2025 by using online digital tools. The feedback was collected to evaluate their experience in both non-formal environments. Finally, the findings are discussed considering the broader aim of connecting secondary and tertiary educational phases, enabling high school students to gain insight into possible future study and career paths, but it also offers cadets the opportunity to expand their collaborative and communicative competencies.

1.1. Theoretical framework: intersection of ESP, CLIL, museum-pedagogical approaches and learning beyond classroom

The integration of English for Specific Purposes (ESP) and Content and Language Integrated Learning (CLIL) into higher education curricula has become an area of growing academic interest, especially considering the omnipresence of the English language as a *lingua franca* in academic, professional, and everyday settings.

Despite their origins—ESP emerging in the 1960s and CLIL being introduced in 1994—both methodological approaches continue to hold strong pedagogical

relevance. Moreover, since its inception, CLIL has gained traction worldwide, with its implementation at the pre-elementary, elementary, secondary, and even tertiary levels of education (see Coyle et al., 2010, as cited in Jiménez et al., 2014). Some scholars have also noted a shift at numerous universities from traditional ESP to CLIL programs or subjects, particularly in light of the latest trends of offering both programs and subjects in English, not just in Europe but worldwide (Arnó-Macià & Mancho-Barés, 2015; Fazzi, 2018).

To successfully implement CLIL, the so-called 4Cs framework must be adhered to, encompassing content, communication, cognition, and culture (Coyle et al., 2010). Firstly, content refers to "the subject or the CLIL theme" or "the knowledge, skills, and understanding we wish our learners to access," but it does not need to be part of a subject (e.g., history), but it can be taken from "alternative approaches to a curriculum", such as "curricular and integrated studies" (Coyle et al., 2010, p. 53).

Secondly, when it comes to communication, it does not merely include the grammar system; however, it "does not reject the essential role of grammar and lexis in language learning" (Coyle et al., 2010, p. 54). It is essential to note that CLIL places equal emphasis on both content learning and language learning. Thirdly, according to Coyle et al. (2010), CLIL as a pedagogical approach has to trigger learners to produce new knowledge and create new skill sets using reflection and involvement in higher-order and lower-order thinking by enabling them to create their own understanding.

Finally, culture takes into account the "progression towards pluricultural understanding" (Coyle et al., 2010, p. 54) since learning through vehicular language and not one's mother tongue can promote tolerance and (intercultural) understanding.

While CLIL and ESP may share common goals, principles, or approaches, their primary difference lies in the fact that in a CLIL lesson, the primary focus is placed on the content. Conversely, an ESP lesson emphasizes the language (Kováčiková, 2020). Hyland (2022, p. 203) stresses that the principal distinction between ESP and more general language lies in "a focus on particular, purposeful uses of language." According to Basturkmen (2025), when developing and revising ESP curricula and materials, one needs to implement needs analysis (Anthony, 2018; Brown, 2016; Long, 2018, as cited in Basturkmen, 2025) where teachers, lecturers or researchers gather and analyze diverse sources and types of language input that learners will need in order to "operate effectively in the work or study field in which they are currently engaged or wish to enter" (Basturkmen, 2025, p. 11).

When addressing the incorporation of ESP and CLIL frameworks outside the formal learning environment, concepts of non-formal learning, as well as Language Teaching and Learning Beyond the Classroom (LTLBC), need to be taken into consideration. The concept of learning, particularly with the advent of social media and rapid advancements in digital technologies, has gained prominence in the last few decades.

The notion that learning occurs not only in formal settings but also in informal contexts and that teachers should connect classroom teaching to their students' activities outside the traditional school environment has been studied by a growing number of scholars (see Benson and Reinders, 2011; Richards, 2015).

Other concepts strongly linked with LTLBC include learner-centredness and autonomy (Benson, 2007, 2011 as cited in Benson and Reinders, 2011), agency and identity (Benson & Reinders, 2011; Mercer, 2011; van Lier, 2007), which bridge the gap between school and beyond-the classroom settings and "place learners' interests, experiences, and development at the centre of classroom teaching" (Reinders & Benson, 2017, p. 571).

Finally, connecting heritage institutions with students from secondary and tertiary levels of education while implementing CLIL- and ESP-based frameworks of language teaching and learning has proven to be a fertile ground for various types of studies over the last few decades (see Fazzi, 2018). These pedagogical approaches offer valuable frameworks for examining effective teaching strategies while simultaneously fostering students' language development and motivation within specialized academic and professional contexts.

2. METHODS

2.1. Hypotheses

Before the museum visit in January 2025, the following hypotheses were proposed:

- H1. High School students participating in the museum-based ESP project will report higher levels of perceived engagement and will prefer the VR experience to the traditional presentations delivered by cadets.
- H2. High School students will express greater motivation and positive attitudes toward learning ESP when the lessons are conducted in a non-formal, out-of-school setting such as a museum.

2.2. Participants

This study focuses on 25 Maritime High School students and three Naval Studies cadets from the Dr. Franjo Tuđman Defense and Security University who participated in the study and were involved in the preparation and delivery of the presentations as facilitators, and did not submit the feedback forms. The high school students were enrolled in the 3rd grade and are between 17 and 18 years old, whereas the cadets were enrolled in the second year of the Integrated Undergraduate and Graduate University Study Program in Naval Studies, and are 20 or 21 years old.

2.3. Data collection

High school students were required to complete two printed feedback forms after the total of 30 minutes of cadets' presentations and 30 minutes of the exploration of underwater archeological sites in the VR room.

After being informed about the consent related to the participation in the study as well as its goals and background, the researchers highlighted the anonymity of each respondent, while also emphasizing students' contribution to the study. Furthermore, the students were informed that their participation is on a voluntary basis, after which they were given instructions how to individually complete the form.

The feedback form was not designed as a questionnaire, but consisted of two open-ended questions and it included writing short summaries of the learning experiences. It also enabled the researchers to extract additional information about the students' motivation and preferences. The feedback session lasted between 20 and 30 minutes, and the feedback forms consisted of the following prompts:

- Please write a summary of your tour guided by the Naval Studies Cadets. Which museum exhibits have they presented, and what have you learned?

  You may write either in English or in Croatian.
- Please write a summary of your visit to the Virtual Room. Which archeological sites have you visited, and what have you learned?

  You may write either in English or in Croatian.

2.4. Goals and research questions

In addition to testing the two aforementioned hypotheses, in this preliminary study the researchers aimed to answer the following research question:

- RQ1. How do high school students describe their learning experience in a museum VR Room compared to a traditional, cadet-delivered presentation?

2.5. Data analysis

All the students completed both of their feedback forms in English, which enabled the researchers to test their hypotheses, and answer the proposed research question to adjust the ongoing project despite a relatively small sample size (N=25).

In addition, the students were encouraged to state what they had learned/remembered. In order to analyze the textual input of the feedback forms, the researchers used methods of analysis and synthesis of the obtained data employing the following online digital tools: (i) Taguette, a free and open-source tool for qualitative data analysis used for manual coding of the topics/themes mentioned

in the feedback, and (ii) Julius.ai, an AI data analysis tool used for data visualization, visual summaries and word frequency counts.

The obtained forms were read through and transcribed by the researchers. Two textual files were created afterwards, containing the feedback from both learning settings. After that, each file was manually coded/tagged by the researchers utilizing Taguette, so that specific terms could be detected, e.g., terms with positive connotations (e.g. "interesting", "fun", etc.) along with terms related to learning (e.g. "learned", "explored", etc.), the content (e.g. "ships", "torpedoes", "archeological sites"), and environment (e.g. "operational problems").

After manually assigning codes to the data based on the inductive principle, it was jointly decided how the themes would be grouped. Finally, Taguette's automatic features were employed to group the themes (e.g., "nice/good/fun", "operational problems", etc.).

3. RESULTS

After having analyzed the data, one can safely state that high school students describe both learning settings in a positive manner, thus answering the proposed research question. Out of 25 respondents, only two students did not mention whether they liked the cadets' presentations. One student just listed a few artifacts: "I learned about men who invented a torpedo, and about navy …", while another student wrote that they did not pay much attention to the presentation. The rest of the students explicitly stated that they liked/enjoyed the cadet's presentations and/or that the cadets were "great" or that they "did a really good job", etc.

Eleven students answered all the questions and wrote their answers using several sentences. Conversely, 13 students answered just one question and were focused on one aspect – either what they learned or what the cadets presented. Finally, one student wrote that they did not remember much because they did not pay much attention.

Interestingly, though no question targeted the sentiment of the participants, the students often used positive adjectives, nouns, or verbs related to their enjoyment of the traditional presentations held by the cadets. For example, the students wrote comments such as: "It was interesting and cadets gave a good explanation" or "I liked the presentation and I think that the cadets did a really good job. I learned something new". In Fig. 1, each bar visualizes one code/tag from their feedback survey, which was created with Taguette. The frequency of the term/tag is expressed by the numeric label above every bar. Although one cannot assume that a tag or word frequency may have a strong emotional or educational effect without a closer and more detailed analysis, it may provide an additional insight into students' satisfaction with the out-

of-school ESP activities, and could even suggest what aspects to focus on in later research.

Based on the results, four students mentioned verbs "enjoyed" or "liked" (e.g. "I learned a lot of new things about ships and I really enjoyed"), while seven students stated that the presentations were "nice" or used the adjective "good" to describe certain aspects of the presentations, such as the language, explanation, topics, etc.

The adjective "interesting" was used fourteen times in connection with the presented artifacts and/or topics, and even several times in the same form (e.g. "It was interesting to see guns used in wars (…). To me it was more interesting than virtual room").

Furthermore, four students preferred the cadets' presentations to the underwater exploration in the VR Room and six students commended their English language skills and fluency (e.g. "It was very well presented with great understandable English and researched facts"). Moreover, verbs, such as "explained" or "showed," referring to the cadets' delivery were mentioned sixteen times (e.g., "Cadets showed us and explained a few naval ships that have been used in a lot of wars"). In addition, "learned" was used 12 times; for example, "I learned about different types of ships. I also heard about torpedoes, which was my favourite part", suggesting that the students were paying attention during the presentations. What is more, 21 students explicitly mentioned what they learned (e.g. the names of the ships, historic facts, etc.). However, they might not have been as physically involved as they were while exploring the underwater archeological sites.

Also, the feedback of four students lacked clarity and was very (short) and general, such as "nice presentation". Even though one student criticized the pauses during the delivery of one presentation, they also acknowledged that the cadets "did a great job".

Overall, after combining all the positively coded terms, it can be suggested that 23 out of 25 students enjoyed the traditional presentations delivered by the cadets, as evidenced by their frequent use of positively coded language.

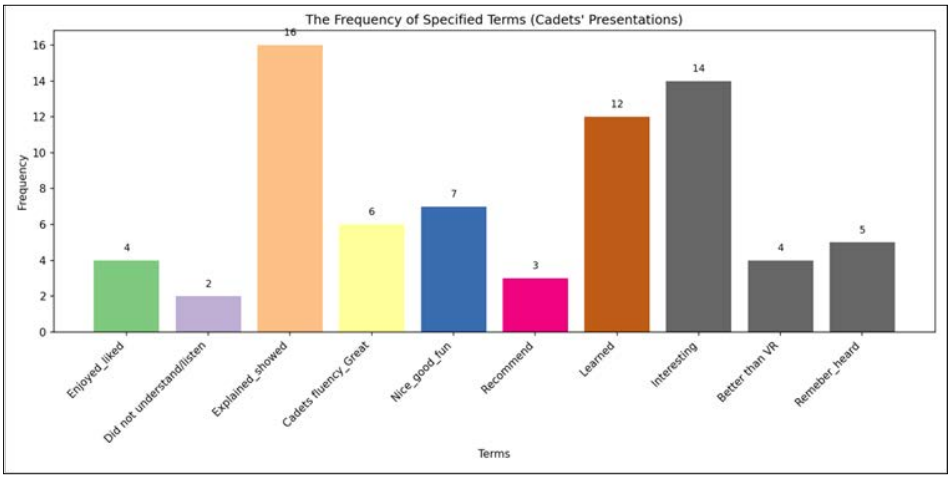

Figure 1
Frequency of Specified Terms (Cadets' Presentations)

On the other hand, when writing feedback about the exploration of underwater archaeological sites in the VR Room, seven students answered both questions, using several sentences to create a summary, while 16 students answered just one question, usually writing a few sentences about either the sites they visited or what they learned. Finally, two students did not answer any of the questions but either expressed that they liked the experience ("I visited the virtual room and I liked it a lot") or stated generally that they "visited all the sites" without any clarification.

When it comes to the frequency of the tags, several interesting notions can be observed (Fig. 2). Each bar corresponds to one of the 10 tags drawn from the feedback about the VR Room experience. Firstly, the occurrence of action verbs related to the usage of the VR equipment (tag "Visited_explored") is noticeable, suggesting the students' engagement and agency in the VR Room. It also supports a part of the first hypothesis where it is presumed that students will report higher levels of perceived engagement.

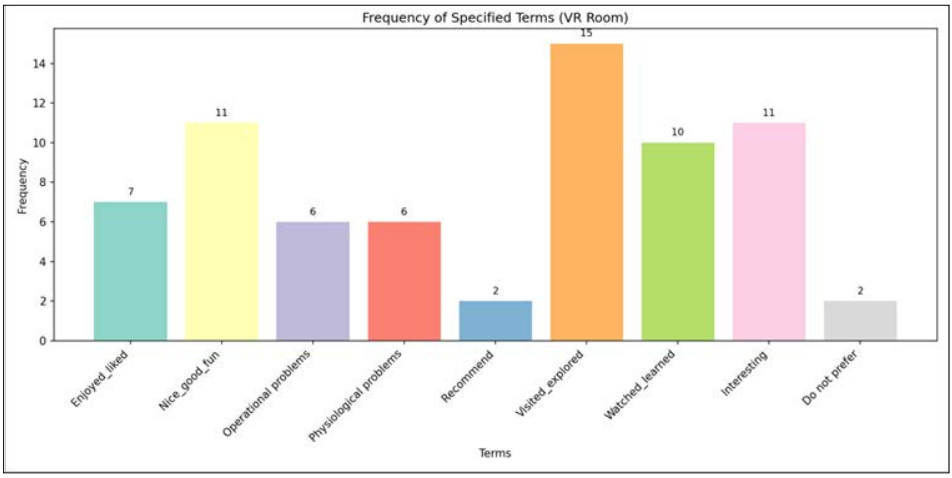

Figure 2
Frequency of Specified Terms (VR Room)

The occurrence of positively associated terms represented by tags "Nice_good_fun" and "Interesting" was reported 11 times (see Fig. 2), indicating that the students found the learning experience to be appealing both in the VR Room and during traditional presentations. Furthermore, other terms based on positive feelings ("Enjoyed_liked") were mentioned seven times, supporting this idea.

Unlike the cadets' presentations, six students reported various operational problems they dealt with in the VR Room regarding the use of the VR equipment, such as goggles, joystick, etc. (Fig. 2). However, in the same feedback, the students expressed that despite liking the tour, they experienced specific challenges with the equipment's handling (for instance, "My personal experience in the Virtual room was complicated at first but once I got the controls, it was very enjoyable"). Similarly, six students mentioned physiological problems they experienced in the VR Room while navigating the underwater sites, including dizziness, headache, motion sickness, and difficulties.

4. DISCUSSION AND CONCLUSION

The two hypotheses aimed to be tested through data collection and analysis in this study entailed assessing if the high school students participating in the museum-based ESP project will report higher levels of perceived engagement, if they will prefer the VR experience to the traditional presentations delivered by cadets and if they will express greater motivation and positive attitudes toward learning ESP when the lessons are conducted in a non-formal, out-of-school setting such as a museum.

After having combined and compared positive feedback tags for both activities with a detailed observation of the transcribed feedback, it can be deduced that 23 out of 25 cadets used positively coded language both when describing the VR-Room experience and the traditional cadet-led presentations. The results supported the first part of the first hypothesis, asserting that high school students participating in the museum-based ESP project will report higher levels of perceived engagement in the VR Room (due to a higher number of occurrences of students' engagement and agency in the feedback when reporting about the experience in the VR Room vs. listening to traditional presentations). The second part of the hypothesis indicated that students will prefer the VR experience to the traditional presentations. However, both formats were reported as almost equally appealing.

An unexpected finding was that six cadets exhibited symptoms of physiological distress, such as dizziness, motion sickness, and headaches, while exploring the underwater archaeological sites using the headset and joystick. Similar symptoms have been well-documented in other surveys related to the use of VR and augmented reality technology in museum settings (see Saredakis et al., 2020).

Comparably, six students experienced some form of inadequate handling of the VR equipment at the beginning of the session. Despite being digital natives, six students struggled with the VR equipment. Consequently, it can be deduced that familiarity with technology does not mean that students will be well-versed with immersive digital tools, especially when they require fine motor coordination and a certain level of familiarity with the equipment. In spite of these issues, the same students described the VR tour as "interesting" or they expressed their intent to move on with the experience in the VR-Room despite the perceived challenges.

The results suggest that the traditional presentations and the VR tour in the out-of-classroom environment both serve as effective teaching methods, complementing traditional classroom settings. Namely, it can be stated that the cadets' traditional presentations offer a structured and interactive format that appeal to students, especially as the "teaching" occurs not in school and is provided by university students, whereas the VR-Room experience provides visually attractive immersive experience, which allows the students to be more actively engaged during the learning process.

Another finding includes the occurrence of the term "recommend" in the students' feedback, especially as it was not mentioned in the prompt. It can be perceived as another mode in which some students expressed their satisfaction with participating in English classes in an out-of-school environment. However, it may also show a tendency toward evaluating and comparing different experiences, which might be influenced by the students' online digital experiences, where reviews have become part of everyday online communication.

To sum up, the data suggest that while both methods are effective teaching tools, according to the feedback, one can deduce that they complement each other rather than one being strictly superior. Furthermore, the students' overall positive experience of having out-of-school classes aligns with similar studies conducted worldwide. For instance, studies by Fazzi (2018) and Kostova (2022), found that non-formal educational settings like museums enhance motivation and curiosity, especially when linked with real-world applications. Our findings are in line with this view, which supports our second hypothesis.

Future research and organized museum visits might consider the operational and physiological problems some students experienced while exploring content via immersive technology. One approach to address the aforementioned challenges could include design-oriented improvements (e.g., shorter sessions).

As the researchers are fully aware that the present study has a limited sample size, several variations of the study could be implemented for further research, such as a larger and more diverse sample of respondents that may be assessed using questionnaires and focus groups to gain a better understanding related to the students' preferences and possible challenges. Another possibility could involve conducting recall tests to measure retention and recall of the two presentation modes. Also, similar (international) projects could explore cross-institutional collaboration connecting high schools with higher education and cultural institutions, thus enhancing the institutions' visibility and exploring non-formal learning environments.

References

Arnó-Macià, E., & Mancho-Barés, G. (2015). The role of content and language in content and language integrated learning (CLIL) at university: Challenges and implications for ESP. *English for Specific Purposes*, *37*, 63–73. https://doi.org/10.1016/j.esp.2014.06.007

Basturkmen, H. (2025). Core concepts in English for specific purposes. *Elements in Language Teaching*. Cambridge University Press. https://doi.org/10.1017/9781009376723

Benson, P., Reinders, H. (Eds.) (2011). *Beyond the language classroom*. Palgrave Macmillan.

Coyle, D., Hood, P., & Marsh, D. (2010). *CLIL: Content and language integrated learning*. Cambridge University Press.

Croatian Maritime Museum Split. (n.d.) *Protecting underwater heritage through its digitalization and valorisation as a novel touristic offer*. WRECKS4ALL (EU-funded project: Interreg IPA CBC Croatia-Bosnia and Herzegovina-Montenegro). https://hpms.hr/en/

Fazzi, F. (2018). Museum learning through a foreign language: The impact of internationalisation. In E. Ballarin, A. Bier, & M. C. Coonan (Eds.), *La didattica delle lingue nel nuovo millennio Le sfide dell'internazionalizzazione*. Università Ca' Foscari di Venezia. http://doi.org/10.30687/978-88-6969-227-7

Hyland, K. (2022). English for specific purposes: What is it and where is it taking us? *ESP Today: Journal of English for Specific Purposes at Tertiary Level, 10*(2), 202–220. https://doi.org/10.18485/esptoday.2022.10.2.1

Kostova, K. (2022). Museum-based approach to teaching English for specific purposes for tourism. *Cultural and Historical Heritage: Preservation, Presentation, Digitalization (KIN Journal)*, *8*(1), 174–187. https://www.doi.org/10.55630/KINJ.2022.080115

Kováčiková, E. (2020). *English for specific purposes in higher education through content and language integrated learning.* Cambridge Scholars Publishing.

Mercer, S. (2011). Understanding learner agency as a complex dynamic system. *System*, *39*(4), 427–436, https://doi.org/10.1016/j.system.2011.08.001

Rampin, R., Rampin, V., & DeMott, S. (2021). *Taguette* (Version 1.0.0) [Computer software]. https://www.taguette.org/

Reinders, H., & Benson P. (2017). Research agenda: Language learning beyond the classroom. *Language Teaching*. *50*(4), 561–578. https:// doi.org/10.1017/S0261444817000192

Richards, J. C. (2015). The changing face of language learning: Learning beyond the classroom. *RELC Journal*, *46*(1), 5–22. https://doi.org/10.1177/0033688214561621

Saredakis, D., Szpak, A., Birckhead, B., Keage, H. A., Rizzo, A., & Loetscher, T. (2020). Factors associated with virtual reality sickness in head-mounted displays: A systematic review and meta-analysis. *Frontiers in Human Neuroscience*, *14*(96). https://doi.org/10.3389/fnhum.2020.00096

Sonwalker, R. (2022). *Julius AI*. [Computer software]. https://julius.ai/

Van Lier, L. (2007). Action-based teaching, autonomy and identity. *Innovation in Language Learning and Teaching, 1*(1), 46–65. https://doi.org/10.2167/illt42.0

CLIL I ESP NA SJECIŠTU SREDNJOŠKOLSKOG I VISOKOŠKOLSKOG OBRAZOVANJA: NAUČENE LEKCIJE IZ MUZEJSKOG OKRUŽENJA

Poučavanje i učenje stranih jezika u visokom obrazovanju, osobito u kontekstu engleskog jezika struke (*English for Specific Purposes, ESP*) i integriranog učenja jezika i sadržaja (*Content and Language Integrated learning, CLIL*), dobilo je značajnu akademsku pažnju, posebice s obzirom na rastuću važnost poznavanja engleskog jezika. *ESP* i *CLIL* često su integrirani u sveučilišne kurikulume, a što pruža razne mogućnosti za istraživanje učinkovitih metoda poučavanja te poboljšanja jezičnih vještina i motivacije učenika i studenata. Međutim, manje se pažnje posvećuje suradničkim praksama koje uključuju dionike iz srednjoškolskog i visokoškolskog obrazovanja u ESP kontekstu. Ovaj rad istražuje naučene lekcije iz projekta koji je u tijeku, a koji uključuje studente sveučilišta i učenike srednjih škola, muzejske kustose i nastavnike engleskog jezika u suradničkom okruženju u kontekstu engleskog jezika struke. Projekt je smješten u muzeju te se odvija u nekoliko faza. Pripremna faza uključuje suradnju studenata i kustosa s nastavnicima engleskog jezika na pripremi prezentacija o muzejskim izlošcima na engleskom jeziku, a nakon čega studenti drže prezentacije učenicima srednjih škola preuzimajući ulogu muzejskih kustosa. Sljedeća faza uključuje upoznavanje učenika sa suvremenom tehnologijom virtualne stvarnosti (*virtual reality, VR*) u muzejskom okruženju, uz kratka objašnjenja kustosa, a što učenicima omogućuje imerzivno iskustvo učenja uz pomoć tehnologija virtualne stvarnosti. Nakon toga, svi sudionici ispunjavaju evaluaciju kako bi procijenili svoje razumijevanje teme i preferencije vezano za dva navedena načinima poučavanja. Ova studija doprinosi sve većem korpusu istraživanja o engleskom jeziku struke i integriranom učenju jezika i sadržaja naglašavajući vrijednost međuinstitucionalne suradnje između srednjih škola, visokoškolskih obrazovnih institucija te kulturnih institucija kao i integraciju kvalitativnih metoda pri učenju jezika.

Ključne riječi: CLIL metoda, engleski jezik struke, imerzivno učenje, srednjoškolsko obrazovanje, visokoškolsko obrazovanje