

Contemporary challenges in foreign language learning in higher education: rethinking the interactions between digital tools, cultural intelligence and cognitive load for a balanced active pedagogy.

Abstract

The use of digital tools in foreign language learning in higher education raises many pedagogical challenges, particularly in terms of the skills to be developed, vital for society and the labour world, while simultaneously managing the cognitive load of students. Based on the results of experiments carried out with undergraduate Media Studies students at the *Escola Superior de Educação de Viseu* (Portugal), the paper questions the effects of applying active pedagogies using digital tools upon the acquisition of these competences, with particular focus on cultural intelligence, while keeping students' cognitive load balanced. Results show that pedagogical activation can favour the development of diverse competences and cognitive processes, but presents risks, namely overload in the case of poorly planned activities. The article aims to contribute to the design of balanced, rich and cognitively sustainable pedagogical devices, contributing to an active pedagogy with the integration of the digital tools.

Keywords: active pedagogies, foreign languages for specific purposes, digital environments, cognitive load, diversified competences.

Introduction:

One of the missions of higher education (HE) is to train excellent professionals and responsible, conscientious citizens, thereby contributing to the social, economic and sustainable development of the country (United Nations, 2015). HE is a strategic space for developing key competences for professional integration and career progression (Eurydice, 2025), and for stimulating critical, reflective thinking, innovation, promotion of sustainable practices and civic participation. It prepares professionals to face global challenges and seeks to build a just and cohesive society respecting cultural and social diversity (van Laar et al., 2020).

In view of today's growing internationalisation, mastering foreign languages (FL) has become a strategic issue for students, as well as for higher education institutions and employers (Costa Lopes, 2018). While the evolution of active pedagogical practices and technology is radically transforming teaching and learning methods (Carvalho et al., 2021), the ready availability of digital tools on the internet has also exploded. These techno-pedagogical environments provide an extraordinary opportunity to develop complex skills, such as cultural intelligence (CI), which is essential in a globalised intercultural context (Byram, 1997).

Digital resources allow for a richer and more diverse exposure to content and realities within the classroom, but they can also increase mental fatigue, known as cognitive load (CL) due to the simultaneous mobilisation of concentration, memory, technical skills, etc. Poorly managed activities will constitute a serious obstacle to learning, particularly the development of complex skills (Erdoğan & Kurt, 2024).

The question of how to promote learning is increasingly topical in this reality: what will be asked or suggested of students for more active, student-centered learning? To what extent do digital tools support the development of various competences (hard and soft skills) without generating a CL in students? Teachers face several challenges, questions and problems on this journey.

In this context, the article combines theoretical contributions with empirical studies carried out at the *Escola Superior de Educação de Viseu* (ESEV, Portugal) in recent academic years. The aim is twofold. On the one hand, it aims to analyse the effect, from both students' and teachers' point of view, of the reasonable use of active pedagogical strategies, namely digital tools, towards the enhancement of FL competence within the scope of learning Languages for Specific Purposes at HE level. On the other hand, it

outlines pedagogical proposals that make it possible to manage work assignments more effectively in and out of the classroom.

The first hypothesis is that implementing active pedagogy strategies, with diversified activities, using digital tools, makes it possible to develop a variety of skills by students, particularly CI. The second is that following an appropriate work plan in this context facilitates the learning of FL, ensuring a balance between the acquisition of knowledge and skills and CL, thus maintaining motivation of students and teachers alike.

After clarifying the competences that can be developed throughout the FL learning process, we detail the concept of CL within the context of pedagogical activation and the use of digital tools. Grounded in experimental processes, we outline the paths followed, with clues for planning activities based on active pedagogies, focusing on the advantages and difficulties identified in the form of a SWOT analysis. Finally, we discuss the hypotheses.

Evolution of competences developed in the learning of FL in HE; the CI:

The evolution of FL learning in HE reflects a complex interaction brought about by social, professional, pedagogical and technological progress. The integration of innovative pedagogies, focus on communication for specific purposes, use of bridge technologies and social and professional challenges are all factors in the paradigm shift within the research and field work pertaining to FL teaching and learning.

Globalisation has boosted the acquisition of language skills, as shown by the update of the Common European Framework of References for Languages (CEFR) (Council of Europe, 2021). By offering a structured, flexibly applicable and universally recognised document for assessing and promoting FL, the CEFR focuses on communicative competences for more effective written and oral communication in real-life contexts and

more autonomy on the part of the student, who must achieve goals. One limitation is due to the wide cultural variation among the student population, levels set being thus subjective depending on the cultural and educational context in question.

FL learning in HE allows for a wide range of skills to be developed, in addition to language skills, in the cognitive, social (e.g. behavioural, emotional) and cultural dimensions, which are valued in the labour market (Schwab & Zahidi, 2020). At the linguistic level, the skills are the well-known ones of oral and written comprehension and production. Concerning cognitive and metacognitive skills, we can highlight the development of critical thinking, ability to learn how to learn, acquisition of autonomy and effective problem-solving competences. Regarding social skills, learning a language facilitates interaction between people, also from various backgrounds and in a variety of contexts, for example, during collaborative work. Social interaction also involves developing empathy and adaptability. Thus, we address aspects of culture and interculturality. HE should reinforce cultural awareness and sensitivity, as well as flexibility and adaptation to multicultural environments.

CI refers to understanding, respecting and adapting to different cultures and multicultural environments (Earley & Ang, 2003). It involves various competences, such as cultural awareness and empathy, intercultural communication, cultural curiosity and sensitivity, flexibility and adaptability, as mentioned above. The components of Ang and Van Dyne's model (Ang et al., 2007) are metacognitive (awareness of and reflection on one's own process of cultural adaptation), cognitive (knowledge about cultures), motivational (interest in and perseverance towards acceptance of other cultures) and behavioural (adoption of appropriate behaviour in the presence of other cultures). Reflective observation during international missions would be reinforced by cognitive and metacognitive CI. CI improves linguistic understanding, avoids stereotyping and

culture clashes, encourages tolerance and empathy and develops greater communicative competence.

In addition to technological skills using digital tools and the boost to creativity favoured by the extraordinary functionalities of platforms, not necessarily dedicated to education, the learning of FL makes it possible to acquire competitive skills for the labour market and society in general (Delplancq et al., 2024a).

Active pedagogies, digital tools and CL:

The key principle of active pedagogies is to place the student at the centre of the learning process, aiming to develop higher cognitive skills, such as critical thinking, creativity and collaboration. Students play an active role in their progress (Baepler et al., 2023). Well-known examples are problem-based learning, project-based learning, the flipped classroom, peer learning, enquiry learning, gamification, etc. Digital tools can become allies, but also enemies, when improperly regulated (Delplancq et al., 2024a).

Constructivist and socio-constructivist theories of learning represent a solid basis for understanding and developing active, student-centered pedagogies, particularly in the context of FL learning, CI and critical literacy (Kharroubi & ElMediouni, 2024), besides underpinning the importance of collaboration, scaffolding, and situated learning. According to Mezirow (2018), transformative learning is the process through which individuals critically examine assumptions, beliefs, and experiences, likely leading the way to a fundamental shift in their worldview. This is particularly relevant in FL education where learners encounter not only new linguistic structures but also unfamiliar cultural perspectives and values. It highlights the role of reflexive thinking in reshaping perspectives, a key aspect of CI development. The framework proposed by Martínez-Bravo et al. (2022) offers a subtle and pedagogically relevant approach to

understanding digital literacies not just as technical competencies, but as complex, socially placed practices that intersect with identity, communication, ethics, and power. Digital literacy must be understood as multidimensional, requiring not only operational skills (how to use digital tools), but also critical, communicative, and creative capacities that allow learners to involve themselves responsibly and reflectively in digital environments. Baybayon (2021) examines how the Universal Design for Learning (UDL) framework has been used in empirical studies of teaching and learning and offers tools for addressing the variability of student engagement and ensuring inclusive access to learning experiences.

Digital technologies are varied and often used together. They can facilitate or hinder the development of educational activities. Learning management platforms, interactive applications, multimedia, simulation or gamification environments provide for classroom openness and can encourage student motivation and commitment. However, overuse or weakness of reasonable programming can represent an overload concerning students' cognition, favour counter productiveness, lack of interest and student fatigue (Beetham & Sharpe, 2019; Mayer, 2019).

Bearing on John Sweller's Cognitive Load Theory (CLT) (1988), the CL approach finds that memory and concentration capacity are limited, requiring that the learning process avoid overload (Sweller & Chandler, 1991). The current challenge in HE learning is to integrate digital tools into active pedagogies, reconciling the development of effective competences without unduly increasing the extrinsic load, the way in which information is presented (Javed, 2025). The intrinsic load, the difficulty inherent in the content, must be adapted to the level of the audience and the objectives of the training programmes. The strategies used should also help maximise the effort devoted to learning (germinal

load). CL, when well-managed, enhances learning; otherwise, generates frustration, fatigue and lack of interest.

Various experiments held in recent years at ESEV have made it possible to improve the methodology and working strategies.

Methodology:

Context:

The *Escola Superior de Educação de Viseu* (ESEV), within the Viseu Polytechnic Institute, provides undergraduate and graduate education in the scope of Portugal's polytechnic system. This system relies strongly on the practical application of knowledge, problem-solving, and professionalization (*Diário da República*). The ESEV is equipped with modern educational infrastructures, including wireless connectivity, multimedia-equipped classrooms, and the Moodle Learning Management System. The school fosters internationalization through mobility programs and ensures effective support to students, towards their successful integration.

The bachelor's degree in media studies was the course chosen for pedagogical innovation experiments due to its interdisciplinary and professionally oriented curriculum. The course study plan includes modules in French and English, photography, digital environments, and intercultural education, making it a suitable context for the implementation of new learning methodologies aimed at developing transversal competencies relevant for future media professionals. The groups participating in the experiments consisted of students enrolled in a 3-year bachelor's degree course, the 3rd year partly dedicated to a professional internship.

Methodological Framework:

The research and experimentation tasks described in this paper were carried out under the JASM Project (Lopes et al., 2023), which focused on developing CI through project-based and research-driven learning. The project involved 25 second-year students enrolled in the Media Studies degree. These students participated in a semester-long initiative that required direct interaction with migrant communities in Viseu.

The methodology adopted was based on active learning principles and included several key components: multidisciplinary team teaching, combining language instruction with technical skills such as photography and digital storytelling; group-based project work (each group was responsible for conducting interviews with migrants, gathering cultural narratives, and creating a digital story centered on a traditional object or practice); use of the Korsakow platform, which facilitated the creation of non-linear digital narratives and allowed for the enhancement of students' engagement with multimedia content production. Public dissemination, besides paper publications, was also accomplished through an exhibition open to the local community, seen as a means to foster civic engagement and intercultural dialogue.

With this approach, it was intended to combine FL digital literacy, cultural empathy, and creative storytelling.

Analytical Dimensions:

The evaluation was conducted using a mixed-methods approach. Semi-structured surveys and course evaluations allowed for an understanding of student perceptions, levels of engagement, and self-reported skills development. The qualitative data from interviews, reflections, and project outcomes have provided deeper insight into students' development of CI, including awareness, empathy, intercultural communication,

curiosity, and adaptability. The CEFR-aligned language assessments showed progress in French and English proficiency.

The data collected indicated high levels of motivation, creativity, collaboration, and an enhanced ability to appropriately handle multicultural contexts. Students developed not only language skills but also critical 21st-century competencies, including autonomy, problem-solving, and digital storytelling abilities.

Action Research and Iterative Design:

Building on the initial success, the teaching team expanded the model through action research (Delplancq et al., 2023). The iterative cycle involved a design of new pedagogical tools in line with SMART KPIs (Specific, Measurable, Achievable, Relevant, Time-bound), the introduction of mobile-assisted language learning (MALL) (Hoi, 2020), flipped classroom techniques, peer assessment, and gamification. The goal was to encourage students to co-create content, participate in structured peer review, and engage in playful learning tasks such as escape games, quizzes, mind maps, mood boards, and digital debates. In this way, it was intended to embed CI and critical literacy into both the content and process of FL learning, using digital tools as mediators of communication and expression (Delplancq et al., 2024b).

Evaluation and Outcomes:

Assessment was thoroughly redesigned to match the new educational framework. Ongoing evaluation took the place of conventional tests. The assessment focused on both group and personal contributions, communication abilities in interpersonal and intercultural contexts, creative interaction with material resources, and continuous development in linguistic and cultural skills.

Every student progressed to, at least, the next CEFR level in their FL skills by the semester's end. Nonetheless, a small group were shown to be uncomfortable regarding the unconventional format, mentioning a desire for tasks with clear boundaries and expectations linked to traditional teaching and assessment approaches. This feedback emphasizes the need to balance innovation and flexibility (by using adaptive pacing, incorporating low-stakes tasks, and facilitating structured collective reflection) to reduce cognitive overload and promote inclusive learning experiences (Delplancq et al., 2025).

Discussion:

Fostering learner autonomy is essential in 21st-century education. However, autonomy must rest upon structured guidance to ensure students can organize their learning and engage meaningfully with the learning process. Encouraging students to step out of their comfort zones, to face real-world problems, embrace failure and ambiguity, is a pedagogical necessity but not always welcomed. Similarly, on the teaching side, promoting autonomy while designing collaborative, inclusive, and personalized learning paths presents significant challenges.

Student attitudes toward active pedagogies and digital tools in FL learning vary widely, not only within the same class groups and colleagues but also across academic years and among teaching staff. These attitudes are strongly shaped by former educational experiences, digital literacy, institutional culture, and the degree of support provided. While some students show motivation, commitment, creativity, and a willingness to collaborate, others display, absent-mindedness, frustration, resistance to change, or over-reliance on technology. A subset of learners is beginning to explore AI tools, but often with limited critical awareness, skipping essential processes such as reading instructions carefully or conducting research.

These mixed reactions reveal a deeper tension: the opportunities of active and digital pedagogy are evident (authentic skill development, inclusive group work, and the acknowledgment of student output) yet they coexist with risks, including digital inequality, emotional isolation, superficial engagement, and cognitive overload. Stereotypes and negative emotions linked to past experiences with language learning can further worsen resistance. Additionally, fatigue resulting from imbalanced approaches to critical literacy, especially when unsupported by emotional assistance or reflective dialogue, can undermine student engagement.

Despite these challenges, FL learning remains a powerful context for developing the CI, a key transversal skill in today's interconnected labor market and society. Carefully designed tasks such as comparing media representations of global issues, analysing intercultural misunderstandings, conducting interviews, or reflecting on cultural practices provide rich opportunities for CI development. These activities also support other key competencies such as empathy, adaptability, communication, and critical thinking.

To boost the potential of this pedagogical model, teachers must continuously negotiate pedagogical and scientific goals with students, in line with authentic, achievable challenges. This requires detailed activity planning (including assessment strategies and real-world tasks) while managing the cognitive and emotional demands placed on learners. Positive communication strategies (e.g., active listening, constructive feedback, collaborative dialogue) can support this process and foster a supportive learning climate.

Conclusion:

The implementation of active pedagogies supported by digital resources presents meaningful opportunities to develop complex competencies such as CI and critical literacy within the FL classroom. However, the success of such approaches depends on the pedagogical design and the guidance and feedback provided by teachers. These factors are to be seen as cornerstones for helping students navigate unfamiliar, interdisciplinary, and often demanding learning landscapes.

To encourage and keep up student motivation, engagement, and cognitive focus, it is essential to design progressive and well supported activities, alternating with moments of peer interaction, collective reflection, and shared meaning-making. These shared pedagogical experiences contribute not only to deeper learning but also to the development of interpersonal and intercultural communication skills.

Moreover, the intentional and wise selection of digital tools is critical. Choosing accessible and pedagogically relevant technologies helps minimize unnecessary extrinsic CL, allowing learners to concentrate on language acquisition, intercultural understanding, and content creation rather than on technical mastery. A balanced, integrated approach (that combines digital literacies, FL learning, and transversal competencies) is therefore key to achieving lasting and transferable learning outcomes.

Looking ahead, future research should further explore the measurement and development of CI and CL in this context. The application of the CI Scale (Ang et al., 2015) and emerging tools for assessing CL (e.g., Krieglstein et al., 2023) may provide valuable insights into the durability and transferability of the skills acquired. Longitudinal studies could also assess how such competencies evolve over time and across diverse cultural and educational settings.

Ultimately, the combination between active pedagogies, digital resources, and FL education, when guided by inclusive frameworks such as UDL and informed by

empirical evidence, has the potential to stimulate learners who are not only linguistically competent but also digitally literate, interculturally aware, and critically engaged global citizens.

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