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# Digital Competence and Innovation in Language Teaching and Learning: A pre-GenAI Perspective

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**Abstract**

*Artificial Intelligence (AI), and more recently generative AI (GenAI) have profoundly transformed the digital landscape of language education [12] [11]. New tools have emerged rapidly, and future language teachers are increasingly expected not only to be familiar with and use digital technologies, but also to be able to critically evaluate and integrate them into their teaching with pedagogical awareness [19]. However, the growing availability of digital tools does not necessarily imply a corresponding ability to translate their potential into meaningful teaching practices. What if some of the challenges currently associated with AI-supported language teaching were not new at all? This proposal takes a step back to 2023, shortly before generative AI became a widespread feature of educational discourse and practice. It draws on data from an intervention-based case study employing both quantitative and qualitative methods aimed at exploring the digital competences of pre-service teachers of modern foreign languages (English, French, Spanish) for secondary schools in Germany, as well as their perceived abilities, expectations and needs regarding the integration of digital media into teacher education. The results paint an interesting picture, in light of which a broader question emerges: to what extent are the challenges currently associated with generative AI genuinely new, and to what extent do they reflect pre-existing challenges related to digital pedagogical competence? Building on the areas explored in the study, the presentation invites reflection on what 'digital competence' [6] should mean today. It will then move from theory to practice, offering examples of innovative digital language-learning activities based on the integration of films [8], videos and interactive elements [15].*

**Keywords:** *Generative AI, digital competence, foreign languages teacher training, digital tools, videos, films*

## 1. Introduction

In today's increasingly audiovisual and digitised information society, the ability to navigate digital dimensions has become a prerequisite for active socio-cultural and political participation. Consequently, educational authorities have consistently emphasised the necessity of equipping learners with robust digital competences to ensure their effective engagement in this landscape. These requirements have been operationalised through various frameworks: at the European level, *DigComp* [7] and *DigCompEdu* [18] provide essential guidelines for both learners and educators, while in Germany, national-federal strategies such as *Education in the Digital World* [9] and *Teaching and Learning in the Digital World* [10] have sought to integrate these competences into school curricula. However, a critical gap persists in the transition from theoretical frameworks to classroom reality: the mere availability of digital tools does not inherently ensure that teachers possess the pedagogical expertise required for meaningful integration, nor does student access guarantee the pedagogically sound use of such technologies. In Foreign Language Teaching (FLT), this challenge is particularly acute, as effective integration requires not only technical proficiency but also a careful alignment of linguistic-communicative and intercultural objectives. This complexity is currently being further challenged by the rapid emergence of GenAI, which threatens to shift the discourse from the integration of digital tools to the fundamental reconfiguration of pedagogical agency. By establishing a benchmark from the year 2023, this study provides a longitudinal perspective to distinguish between these long-standing pedagogical challenges and the novel, transformative demands introduced by the proliferation of GenAI.

## *2. From Digital Competence to Pedagogical Innovation in Foreign Language Teaching*

The conceptualisation of digital competence has undergone a significant paradigm shift, moving from a focus on "media competence" [1] toward a more holistic understanding of digital agency. While earlier media educational discourses already extended beyond the functional use of media to encompass critical-reflective, communicative and productive dimensions [2], contemporary educational frameworks

build on and recontextualise these skills within increasingly complex digital ecosystems, placing greater emphasis on individuals' capacity to critically engage with, evaluate, participate in, and actively shape such environments [19]. In the context of FLT, this evolution can be understood in connection with the concept of "multiliteracies" [5], where digital tools are not merely conceived as supplements to language learning but as essential mediators for the co-construction of meaning in multimodal contexts. To examine the extent to which digital technologies are integrated into teaching practices, this study employs the SAMR model [17] [18] as a critical lens. The model categorises the use of technology along a continuum, ranging from substitution (using digital tools to replace analogue tasks without functional change) and augmentation (adding functional improvements) to the transformative stages of modification and redefinition (creating new tasks that were previously inconceivable). A central tension in current teacher education is the tendency for practitioners to remain at the levels of substitution or augmentation, thereby failing to reach the transformative stages of pedagogical innovation. However, meaningful technology integration in educational contexts is not an intrinsic property of the tool itself; rather, it emerges from the intentionality and strategic application of the educator [12]. To understand this tendency, this study also draws upon the Technological Pedagogical Content Knowledge (TPACK) framework [14]. TPACK posits that effective technology-enhanced teaching requires a complex interplay between technological, pedagogical, and content knowledge. Crucially, this requires a mastery of Pedagogical Content Knowledge (PCK), which allows teachers to transform subject-specific content into teachable, digitally supported formats. From this perspective, the discrepancy often observed in educational settings, where technical proficiency is not translated into classroom effectiveness, can be understood as a lack of integrated TPACK. This is particularly relevant for pre-service teachers, for whom the transition from being "digital natives" (possessing fluency) to "digital professionals" (possessing pedagogical agency) remains a main obstacle.

## *3. An Empirical Investigation of Pre-Service Modern Language Teachers' Digital Competence*

### *3.1 Research Design*

Adopting a retrospective perspective, this study examines the German educational landscape in 2023 to establish a temporal reference point prior to the widespread integration of GenAI. By capturing this 'pre-proliferation' phase, the research seeks to distinguish between long-standing digital pedagogical challenges, such as infrastructural and instructional adaptation, and the novel demands introduced by GenAI. Ultimately, the study investigates whether the current technological shift represents a fundamental discontinuity in teacher education or a heightened manifestation of pre-existing professional gaps. This study adopted an intervention-based case study [21] employing both quantitative and qualitative methods to investigate pre-service language teachers' digital competences and their pedagogical use of digital and audiovisual media. Data were triangulated through pre- and post-intervention questionnaires, classroom observations and field notes [16], as well as semi-structured group interviews and an analysis of participants' digital products.

### *3.2 Context and Participants*

The study was conducted across two educational settings at the University of Rostock (Mecklenburg-Vorpommern) to capture variation in instructional contexts rather than to achieve statistical representativeness. While the settings shared comparable learning objectives, they differed in their temporal organisation: the first was an intensive extracurricular certification course (4 sessions, 14.5h total), while the second was a university-based elective course (10 sessions of 90 min, 15h total). The final sample consisted of 25 pre-service teachers (N=25): 10 from the intensive course and 15 from the university elective. The participants, studying between their 1st and 9th semesters (predominantly 5th-8th), represented English, French, and Spanish disciplines. Most had previous teaching experience through school placements (n=11) or supervised internships (n=13), while two reported no prior experience.

**Table 1.** Participants across two Educational Contexts

| Characteristic | Certification Course | University Elective | Total |
|---|---|---|---|
| Participants | 10 | 15 | 25 |
| Female | 6 | 12 | 18 |
| Male | 4 | 3 | 7 |

| | | | |
|---|---|---|---|
| Format | Intensive extracurricular | University Elective | - |
| Duration | 4 sessions / 14.5 h | 10 × 90 min / 15 h | - |
| Languages | English, French, Spanish | English | - |

### *3.3 Instruments for Data Elicitation, Collection and Analysis*

Three complementary instruments were used to capture the multidimensional nature of digital-pedagogical competence. First, a questionnaire (10 items on a 5-point scale) assessed self-perceived digital proficiency, confidence in pedagogical application, and future intentions. Second, classroom observations and field notes documented real-time engagement with digital tools and the transition from technical exploration to pedagogical use. Third, semi-structured group interviews provided qualitative depth regarding participants' experiences, challenges, and reflections. Data analysis followed a dual approach: quantitative questionnaire data were analysed descriptively using frequencies and percentages to identify trends in self-perception. Qualitative data, including interviews, field notes, and digital products, were analysed thematically [3] to identify patterns of competence development and practical application.

Data collection was organised in successive stages aligned with the intervention's progression. Initially, a pre-course questionnaire established a reference value for participants' self-perceived competences, prior experience, and pedagogical needs. During the instructional phase, classroom observations and field notes documented their progress as participants engaged in the practical application of digital and audiovisual tools. Participants also developed digital products (e.g. adapted audiovisual resources and original materials) which served as tangible evidence of their evolving competence. Following the intervention, a post-course questionnaire was administered, while semi-structured group interviews allowed for a retrospective reflection on the challenges, affordances, and the overall learning process.

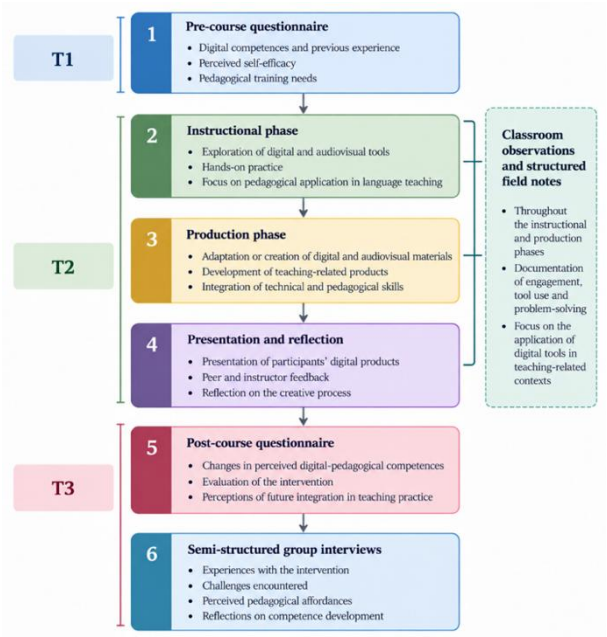



**Fig. 1.** Data Collection Procedure across the Intervention

## 4. Results

To provide a coherent and integrated analysis, the findings are presented according to the dimensions of competence and pedagogical application. Preliminary descriptive analyses were conducted separately for the two educational settings to examine whether the observed patterns differed substantially. As no marked differences in the overall trends were observed, the data from both settings were combined for the final report, representing the full main-study sample.

### *4.1 Student Questionnaires*

To examine changes in participants' self-perceived digital-pedagogical competence over the course of the study, questionnaire responses were analysed descriptively. While pre-intervention profiles showed significant heterogeneity, post-intervention results indicated a robust upward trend in perceived proficiency.

**Table 2.** Pre- and Post-Intervention Questionnaire Results (n= 25)

| Dimension | Pre-intervention profile | Post-intervention profile |
|---|---|---|
| Digital-pedagogical competence | Heterogeneous; uncertainty regarding critical/productive uses | 100% reported perceived competence improvement (52% SA; 48% A) |
| Material Development | Limited confidence in creating digital teaching materials | Improved pedagogical, methodological, and technical skills |
| Interactive video-based teaching | 66.7% D regarding familiarity with applications and tools for interactive video work | Post-course responses indicated positive perceived competence development |
| Learner activation | 100% D regarding the ability to encourage active learner participation in interactive video activities | Marked improvement in perceived ability. |
| Pedagogical value | 100% rated films and interactive videos as highly/very highly effective for differentiated instruction | 100% SA that addressing films, videos and digital tools was valuable |
| Future classroom integration | Low confidence in practical implementation | 93.3% SA; 6.7% A envisage classroom integration |
| Further professional development | Practical training needs were evident | 86.7% SA; 13.3% A wanted to learn more |

(Note: SA = Strongly agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly disagree)

### *4.2 Semi-structured Interviews*

Thematic analysis of the group interviews revealed five interconnected themes regarding the evolution of competence (see Table 3). The quotations were translated from the original German into English for the purposes of this article.

**Table 3.** Themes and Illustrative Examples from the Semi-Structured Interviews

| Theme | Key Finding | Illustrative Example |
|---|---|---|
| 1. Challenges and constraints | Participants identified technical, infrastructural, and pedagogical barriers to the effective use of digital and audiovisual media. | *"Because of the problems, challenges and the amount of time required to produce two-minute material, I currently find digital tools demanding and challenging, even though I think they are cool and really great" (Cert. Course/S1)*<br><br>*"Teachers need to know the tools well in order to configure everything properly" (Univ. Elective/S5)* |
| 2. Pedagogical affordances | Digital and audiovisual resources were perceived as offering opportunities for motivation, engagement, and multimodal language learning. | *"I rate their effectiveness very highly because of repetition and the combination of visual, auditory and dynamic elements" (Cert. Course/S5)*<br><br>*"They offer an interesting alternative to conventional teaching that is closer to students' lifeworld" (Univ. Elective/S2)* |

| | | |
|---|---|---|
| 3. Experiential learning | Participants emphasised hands-on experimentation as particularly important for developing confidence and digital-pedagogical competence. | *"I was happy that we were able to try out and test all the tools during the course" (Cert. Course/S2)*<br><br>*"I can now understand what it means to use digital media in a pedagogically meaningful way" (Univ. Elective/S8)* |
| 4. Social-affective dimensions | Collaborative work and peer support facilitated experimentation and helped participants address practical difficulties. | *"What I particularly liked was the exchange about the different videos and the difficulties we encountered" (Cert. Course/S9)*<br><br>*"I appreciated the helpfulness and the opportunity to try out all the tools together" (Univ. Elective/S7)* |
| 5. Teacher education | Participants expressed a need for more systematic opportunities to develop digital-pedagogical competence within teacher education. | *"I would like courses on digital media and tools in modern foreign language teaching to be included in the university curriculum" (Cert. Course/S6)*<br><br>*"These contents should definitely be introduced for everyone in a compulsory course during their teacher training programme" (Univ. Elective/S10)* |

### *4.3 Analysis of Digital Products and Classroom Observation*

The analysis of digital products and field notes corroborated the questionnaire findings. Observations revealed a developmental trajectory: participants initially focused on isolated technical functionalities and required significant support. However, as the intervention progressed, their engagement shifted toward pedagogical intentionality. The resulting products, ranging from adapted sequences of "The Chronicles of Narnia" (2010) and "Bluey" (2018) to original tasks involving "Young Sheldon" (2017), demonstrated a movement from functional tool use toward the design of multimodal, language-learning activities. This shift from "technical exploration" to "pedagogical design" confirms the transition from digital fluency toward professional agency.

## 5. Pedagogical Implementation: Multimodal Integration in Digital FLT

The mere incorporation of digital media into FLT does not constitute pedagogical innovation; rather, innovation resides in the purposeful integration of audiovisual and multimodal affordances into a coherent, objective-driven design. Audiovisual formats offer profound potential by synthesising language, imagery, and paralinguistic cues (such as gesture and intonation) within concrete communicative contexts. This supports not only linguistic comprehension and production but also fosters learner autonomy through features like adjustable playback and promotes engagement through the narrative and emotional dimensions of film. In this approach, film analysis and the holistic aesthetic experience are complementary, treating the film as a multifaceted cultural phenomenon rather than a mere "container" of linguistic elements. In the two educational contexts of this study, audiovisual work followed a structured progression: audiovisual input → interactive engagement → digital production. To illustrate this, a sequence from the Netflix series "Wednesday" (2022) will be presented. The sequence, "Wednesday Addams - Hobbies and Extracurricular Activities", depicts the protagonist exploring various school activities. This setting provides a rich communicative context for adolescent learners to practice expressing preferences, abilities, and interests. From a linguistic point of view, the scene supports audiovisual comprehension and vocabulary acquisition while allowing learners to connect language input with facial expressions and situational cues. To operationalise this, the sequence was embedded into Edpuzzle, transforming a receptive task into an active process of noticing and responding. Through strategically placed interactive questions, learners could replay segments, verify comprehension, and

receive immediate feedback. Crucially, this approach is highly feasible for classroom practice: Edpuzzle is a cost-free, cross-platform tool that ensures seamless integration across smartphones, tablets, and laptops. Furthermore, the preparation and implementation of such sequences require minimal temporal investment, approximately 10 minutes, including professional pedagogical curation. This demonstrates that the effectiveness of the method is not derived from the tool itself, but from the professional expertise of the educator, who curates the digital content to align with specific pedagogical requirements.

## 6. Implications for Teacher Professionalisation in the Age of GenAI

The findings of this study suggest that the challenges associated with GenAI in foreign language education (FLE) are not a radical departure from existing issues, but rather a profound intensification of them. As the presence of AI in educational contexts grows, the focus is shifting from whether teachers engage with digital technologies to how they use them professionally [4]. This confirms that the "digital-pedagogical competence" required in modern teaching is undergoing a qualitative reconfiguration. The emergence of GenAI does not diminish the importance of teacher professionalisation; instead, it elevates the necessity for professional expertise. As AI takes on increasingly complex functions in FLE, the role of the teacher becomes even more critical, requiring a heightened capacity for pedagogical judgement and cultural sensitivity [19]. Consequently, the professional challenges previously identified, such as the need for systematic, integrated training, are amplified by the requirement to navigate the complex interplay between technological affordances and professional responsibility.

## 7. Conclusion and Looking Ahead

This study has established a temporal benchmark that distinguishes between long-standing digital pedagogical gaps and the transformative demands of the GenAI era. By triangulating self-reported competences with practical digital products, the research demonstrates that the primary obstacle in digital teacher education is the transition from mere technical proficiency to meaningful pedagogical agency. In light of these findings, teacher education and ongoing professional development must undergo a fundamental paradigm shift. Rather than focusing on tool-specific training, which is subject to rapid obsolescence, curricula should prioritise the cultivation of transferable, high-level digital-pedagogical competences. This necessitates a move toward a more systemic approach where the ability to critically evaluate and integrate emerging technologies is treated as a core professional requirement [13]. Specifically, training must empower educators to move beyond functional operation and toward the development of "evaluative agency", the capacity to judge the linguistic, ethical, and pedagogical implications of AI-generated content. Furthermore, this professionalisation must be deeply embedded within subject-specific contexts to ensure that digital expertise is directly applicable to the unique communicative demands of foreign language teaching. In conclusion, the rise of GenAI does not diminish the importance of the teacher; rather, it redefines the essence of the profession. As the boundary between human and machine-generated content continues to blur, the educator's role must evolve into that of a critical architect of learning environments, ensuring that technological capabilities are always subordinated to the fundamental, human-centred goals of meaningful language education.

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