

Integrating AI into Foreign Language Instruction: Insights from Romanian In-Service Teachers

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Abstract

This study investigates the willingness of in-service foreign language teachers in Romania to integrate artificial intelligence (AI) tools into their instructional practices. Participants were asked to assess their overall digital competencies, self-evaluate their willingness to integrate AI technologies, and reflect on the benefits and concerns of incorporating AI in the classroom. A mixed-methods approach was employed, and data were collected through a survey. A total of 85 respondents were included in the study. Findings reveal diverse attitudes toward AI, ranging from enthusiasm about its potential to enhance student engagement, reduce administrative workload, and personalize learning, to concerns over technical challenges, pedagogical value, and data privacy. This research contributes to ongoing discussions on foreign language teachers' level of digital competence and readiness to include AI tools into foreign language education.

Keywords:

foreign language teaching; AI; digital competence; in-service teachers; readiness; willingness; benefits; challenges

1. Introduction

Artificial intelligence (AI) technologies have a significant global impact today as they have been integrated into numerous areas of research and diverse aspects of our lives. In the field of education, researchers have found applicability for AI from early childhood to tertiary levels (Holmes et al., 2023; Luckin George & Cukurova, 2022; Touretzky et al., 2023; Wegerif & Major, 2024). As the educational system undergoes rapid changes, there are numerous challenges that AI technologies pose to traditional education in terms of access to information, data privacy and ways of assessing knowledge. Therefore, it is salient for educators to understand when, how, and more importantly, why AI technologies are meaningful for students. According to Wegerif and Major, the relationship between education and technology should be guided by the types of “relationships and dialogic encounters which will enable students to respond and be drawn into participation in educational dialogues” (2024, p. 10). Thus, if generative AI language assistants excel at accomplishing students' written tasks, then other ways of assessing writing skills should be taken into consideration. Despite these challenges, AI-driven tools have demonstrated effectiveness in enhancing cognitive and metacognitive skills, monitoring student progress, and improving learning outcomes (Jin et al., 2023). Additionally, natural language processing and machine learning driven by AI, such as Duolingo,

ChatGPT or DeepL, have been successfully integrated into general learning environments (Hwang & Chang, 2023; Io & Lee, 2017) as well as in foreign language instruction (Chuah & Kabilan, 2021). In this case, AI becomes a valuable tool to offer a tailored educational path that takes into consideration one's learning abilities and individual pace.

In light of the recent developments in AI that are “set to challenge existing practices in education” (Wegerif & Major 2024, p. 8), in-service teachers need to demonstrate AI literacy as they represent important stakeholders in shaping tomorrow's educational system. They address their courses to students who are probably already using various digital tools and AI technologies to improve their learning strategies and academic achievements. These students are likely to be Alpha generation students who prefer multimodal, interactive and game-based learning materials, who favour collaborative tasks and expect immediate gratification and feedback (Cimene et al., 2024; Höfrová et al., 2024; Kowalczyk-Kroenke 2024; Swargiary, 2024). Thus, the integration of AI technologies also stems from a need to align teaching practices to educational realities. However, some teachers rarely use AI educational tools because they lack training or cannot afford subscription fees (Choi et al., 2023).



Moving beyond the general view of the ubiquity of AI in our daily lives, there is limited research on teachers' attitudes toward developing AI literacy (Sperling et al., 2024). Studies indicate that willingness to integrate new technologies in teaching is largely influenced by perceived usefulness (Sanusi et al., 2024) and user acceptance (Kelly et al. 2023; Scherer et al. 2019). Another key factor is readiness, defined as "teachers' psychological and practical preparedness to integrate AI into their teaching practices" (Granström & Oppi 2025, p. 2). Our study aims to explore in-service foreign language teachers' willingness and preparedness to integrate AI into their teaching practice. It examines their views on the benefits and challenges of including AI tools in the language classroom, contributing to understanding educators' readiness to teach in AI-enhanced environments.

2. Theoretical foundation

Various initiatives, reports and recommendations such as *DigCompEdu* (Redecker, 2017), *Digital Education Action Plan 2021-2027* (European Commission, 2020) and *DigComp 2.2: The Digital Competence Framework for Citizens* (Vuorikari, 2022) support the development of educators' digital competence across all levels of education and aim to reset education and training for the digital age. Acknowledgment of the emergence of the digital transformation in education requires teachers to understand its benefits and challenges. All educators are encouraged to develop their digital skills to offer personalized, flexible, "high-quality and inclusive education and training for all learners" (Redecker, 2017:1). In line with these recommendations, our study contributes to ongoing discussions on foreign language teachers' level of digital competence and readiness to include AI tools in teaching foreign languages.

Previous studies on teachers' readiness to integrate AI-driven technologies in their teaching indicate that there is a moderate (Granström & Oppi, 2025) to high interest (Yim & Wegerif, 2024; Polak et al., 2022) underpinned by students' age level, availability of suitable resources and AI-related skills. For example, 53.2% of Estonian teachers reported using AI tools in their work, with higher usage rates in compulsory education compared to upper secondary levels (Granström & Oppi, 2025). Similarly, primary education teachers in China show a high willingness to integrate AI into their teaching (Yim & Wegerif, 2024). Still, teachers are wary of "young students'

cognitive development and visual health" (Yim & Wegerif, 2024, p. 335) in connection with increased screen time and exposure to data that is sometimes biased and misleading. Teachers from Bulgaria, Greece, Italy and Romania report high motivation to introduce AI-related content in their teaching (Polak et al., 2022) even if they "they have a basic level of digital skills and low AI-related skills" (Polak et al. 2022, p. 1). At the national level, other identified issues relate to the accuracy of AI models trained on Romanian which are limited by the "scarcity of large high-quality datasets in Romanian" (Museanu 2024, p. 177) compared to more widely spoken languages. Therefore, AI language learning tools might be inaccurate in translating or producing colloquial speech, identifying specialized vocabulary and idiomatic expressions in Romanian (Museanu, 2024). Pop and Marc (2025) explored pre-service teachers' willingness and readiness to include AI tools in their teaching after completing vocational training. The findings indicate moderate familiarity with AI tools due to lack of training. Nonetheless, pre-service teachers were aware of the potential of AI in terms of lesson planning, reducing workload and providing personalized instruction (Pop & Marc, 2025, p. 76). Collectively, these studies suggest that even if teachers demonstrate willingness toward integrating AI-driven tools, they need more training on effectively harnessing the power of AI and transforming it into measurable learning outcomes.

To explore in-service teachers' willingness and readiness to integrate AI-driven tools in their teaching, our investigation is grounded in the framework provided by the technological, pedagogical, and content knowledge (TPACK) model. This framework, developed by Mishra and Koehler (2006), describes the interplay between technological skills, subject, and pedagogical knowledge to ensure effective teaching in response to the opportunities and challenges of 21st-century education.

3. Research methodology

3.1 Purpose of the study

This study aims to explore the readiness of in-service foreign language teachers to incorporate AI tools into the specific context of teaching foreign languages. Another focus is to identify their level of digital competence in connection with their opinions on the prospects of an AI-infused learning environment.

3.2 Research design

The study used a mixed-method approach to collect both qualitative and quantitative data. A questionnaire was sent via Google Forms to in-service teachers who collaborated with the Department of Socio-Humanistic Sciences Didactics as mentors in the compulsory teaching practice, to former students, and with the support of the County Inspectorate, to teachers in Cluj County. The timeframe for conducting the research was the spring of 2025. The small number of respondents does not allow for generalization. However, the qualitative analysis on the benefits and challenges of integrating AI in teaching a foreign language is valuable for understanding teachers' readiness and willingness to integrate emerging technologies into their teaching practices.

3.3 Participants

A total of 85 in-service teachers were included in the study and provided valid answers. Responses were anonymous. Asked about the duration of their teaching career, 44.7% of the respondents answered that they have more than 10 years of experience, 32.9% have more than 20 years of experience, 13% have between 1-5 years of experience, and 9.4% have between 6-10 years of experience. Among them, 76.5% taught in public schools and 23.5% in private educational institutions. English was taught by 56.4% of the respondents, French by 31.8%, German by 4.7%, Norwegian by 3.5%, Italian by 2.4%, and Romanian as a foreign language by 1.2%.

3.4. Research Instruments

The questionnaire comprised 19 items with a mix of close-ended (multiple choice, checkboxes or Likert scale) and open-ended questions organized into four main sections: Section 1 - Respondents' profile (years of teaching experience, subject taught, institution); Section 2 - Self-evaluation of digital skills (familiarity with digital tools used in teaching, readiness to incorporate digital tools); Section 3 - AI awareness and understanding (familiarity with AI tools; readiness to integrate AI tools); Section 4 - Perceived benefits and challenges (limitations of AI, motivation, confidence in using AI; willingness to increase the use of AI tools). The quantitative data obtained were analysed through descriptive statistics using Google Forms' built-in tools and Jamovi® software, version 2.3.21. The qualitative data were processed using content analysis provided by Voyant Tools (www.voyant.org). The questionnaire was formulated in English. The statistics for the Likert scale data (ranging from 1 - strongly disagree to 5 - strongly

agree) determined that Cronbach's Alpha =.85, which indicates that the research instrument is reliable and has a relevant internal consistency. Qualitative data underwent content analysis, and coding was performed by Voyant Tools (www.voyant.org).

3.5 Research questions

The study aims to answer the following research questions:

1. How many in-service foreign language teachers use AI tools in teaching?
2. How does their teaching experience influence their readiness to use AI tools?

What are in-service foreign language teachers' perceptions on the benefits and challenges of incorporating AI tools in teaching a foreign language?

4. Results

4.1 Quantitative data

Results indicate that most respondents have an advanced (61.2%) or an intermediate level (32.9%) in digital competence. In terms of frequency, respondents *often* (65.9%) and *always* (24.7%) integrate digital tools into their teaching practice. Asked to self-valuate their mastery of using digital tools, respondents' answers ranged between *good* (38.8%), *very good* (48.2%) and *excellent* (10.6%). Table 1 below indicates the statistics for the respondents' ability to use digital tools.

Tabel 1
Familiarity with digital tools

	How often do you use digital tools or technology in your teaching?	How would you rate your ability to integrate digital tools into your teaching practice?	How often do you explore and experiment with new digital tools for teaching?
N	85	85	85
Mean	4.15	3.67	3.65
Standard deviation	0.567	0.697	0.685
Skewness	0.0202	0.120	0.359

The findings indicate a general tendency ($M=4.15$, $M=3.67$, $M=3.65$) (Likert scale value 1 – the lowest, 5 – the highest level) toward agreeing that respondents can integrate digital tools in their teaching practice. The remaining items in section two of the questionnaire addressed respondents' readiness to use digital tools to enhance their teaching skills (Table 2).

The findings indicate a general tendency (M=4.33, M=3.99, M=4.36, M=4.14) toward readiness to integrate digital tools into teaching. Concerning the digital tools used, respondents indicated that they use online collaborative tools (Padlet, Google Docs etc.) (80%), assessment tools (Kahoot, Menti etc.) (80%), multimedia tools (Canva, Napkin etc.) (62.4%), video conferencing (74.1%), learning management systems (Moodle, Google Classroom etc.), (56.5%) or gamification and online games (43.5%). This was a checkbox option and therefore the percentages exceed 100%.

Table 2
Readiness to integrate digital tools into teaching

	I feel confident using digital tools to enhance my teaching	I feel comfortable teaching students how to use digital tools	I believe digital skills are essential for modern teaching	I have access to adequate resources and support for improving my digital skills.
N	85	85	85	85
Mean	4.33	3.99	4.36	4.14
Standard deviation	0.777	0.970	0.884	0.819

Table 3
Comparison between the use of digital tools vs. AI tools

	How often do you use digital tools or technology in your teaching?	How often do you use AI tools or applications in your teaching?
N	85	85
Mean	4.15	2.94
Median	4	3
Standard deviation	0.567	0.864

The next section of the questionnaire is intended to explore respondents' frequency of using AI-driven learning tools. The context for using AI-driven learning tools is relevant because it provides a perspective on how in-service teachers relate to using AI in different educational contexts. Respondents use AI tools to varying degrees: sometimes (36.5%), often (30.6%), rarely (29.4%) or never (3.5%). They are moderately (52.9%) familiar with AI tools and use AI writing assistants (ChatGPT, etc.) (65.9%), AI-generated content (lesson plans, quizzes etc.) (63.5%) or AI-powered grammar checkers (Grammarly, etc.)

(35.3%). They use AI tools to generate teaching materials (81.25%), to plan their lessons (38.8%), to enhance student engagement (47.1%) and to offer feedback (12.9%). Respondents' answers were gathered through a checkbox item, and therefore, they exceed 100%.

Next, we intended to compare the data on the use of digital tools and AI-driven learning tools (see Table 3). Findings indicate that fewer respondents (M=2.94) use AI tools compared to digital tools.

Table 4 below shows that teachers with fewer years of teaching experience tend to have a higher rate (M=3.40, M=3.25) for using AI-driven learning tools. In light of this finding, we considered it relevant to enquire if in-service teachers' years of experience (independent variable) might correlate with the frequency of using AI-driven learning tools.

Table 4
In-service teachers' years of experience vs. the use of AI tools

	Years of experience	How often do you use AI tools or applications in your teaching?
Mean	1-5 years	3.40
	6-10 years	3.25
	more than 10 years	2.70
	more than 20 years	2.97

However, no statistical relationship could be established between the years of teaching experience and the use of AI tools ($F(3, 96) = 1.56, p = 0.204$). Possible reasons might be the small sample size in some groups and AI usage may depend on other factors such as training or personal interest. Additionally, we extended the ANOVA analysis to examine the link between other variables in section 3 and in-service teachers' years of experience. These are:

1. AI tools save time in lesson preparation.
2. AI tools improve the quality of feedback provided to students.
3. AI tools enhance student engagement and motivation.
4. AI tools help personalize learning for students.
5. AI tools are reliable for assessing student performance.
6. AI tools are easy to integrate into my teaching practice.

When asked to indicate a keyword to define the relationship between AI and teaching, respondents indicated various examples. We provide in a word cloud an overview of their responses (Figure 1). The keywords showcased align with the benefits and challenges already identified by respondents and stem from the interconnectedness between AI tools and teaching foreign languages.

5. Discussions

The first research question aimed to determine the extent to which in-service foreign language teachers integrate AI-driven tools into their classroom practices. The findings suggest a moderate overall level of use, with responses distributed across three categories: low frequency (29.4%), moderate use (36.5%), and frequent use (30.6%). The results indicate a correlation between usage and familiarity with AI technologies. Notably, only 52.9% of respondents reported being familiar with AI tools, indicating that limited awareness may act as a barrier to broader integration in teaching practice. Similar to other international research (Polak et al. 2022), participants have a high level of willingness to integrate AI tools. The majority of teachers are likely (49.4%) to include AI tools in their future courses, 28.2% are very likely to do so, while some are undecided (17.6%) or do not consider AI tools as an option (4.7%).

The second research question explored potential correlations between participants' years of experience and their self-perceived readiness to use AI tools. The findings indicate that early-career teachers (1-5 years of experience, $M=3.40$) and mid-career teachers (6-10 years of experience, $M=3.25$) report higher self-ratings of AI use compared to more experienced teachers ($M=2.70$; $M=2.97$). However, no statistically significant relationship was established between teaching experience and the current use of AI tools, indicating that experience alone is not a predictor of integration. To further explore influencing factors, the study examined teachers' perceptions of the usefulness of AI tools in relation to their teaching experience. A significant positive correlation was observed among mid-career teachers (6-10 years) who more frequently agreed that AI tools have the potential to support personalized instruction. Additionally, a low correlation was obtained for mid-career teachers who argue that AI technologies are easier to integrate compared to teachers with more than 20 years of experience. A positive correlation was identified for the likelihood of increasing AI use. Thus, early-career (1-5 years of experience) and mid-career teachers (6-

10 years of experience) are more likely to use AI tools in the future compared to those who have more than 10 years of experience. These findings align with previous literature (e.g., Polak et al., 2022; Yim & Wegerif, 2024), which highlights generational differences in digital adoption and emphasizes the importance of ongoing professional development in AI literacy.

Overall, while teaching experience does not directly determine AI integration, it intersects with perceptions of usefulness and readiness. Teachers newer to the profession appear more inclined toward future use, potentially due to more advanced digital skills. This underscores the need for targeted AI training across all career stages, especially for more experienced educators who may require additional support to build confidence and practical skills for implementing AI technologies in language teaching.

The qualitative analysis provided insights into the third research question, which explored in-service foreign language teachers' perceptions of the benefits and challenges associated with integrating AI tools into their teaching practices. Thus, a thematic analysis of the perceived benefits of AI includes: enhanced time efficiency, personalized learning, increased student engagement, and rapid access to information. These themes reflect teachers' recognition of AI's potential to support differentiated instruction. In terms of challenges, respondents expressed concerns about the over-reliance on AI, particularly in relation to writing assignments and searching for information, which could hinder the development of critical thinking. Additional concerns included restricted access to AI tools due to financial barriers, ethical concerns surrounding data use, and the perceived lack of human interaction and health issues. These findings underscore the importance of balancing AI integration with traditional teaching practices to ensure the emotional connection and human interaction that are fundamental to effective education.

Limitations and further considerations

The limited sample size ($N=85$) in this study does not allow findings to be generalized. A larger and more diverse sample in terms of gender, foreign language taught, and training experience with AI could enhance the depth and reliability of the study. Furthermore, the study's reliance on self-reported data in the quantitative analysis section can be subject to desirability bias. Respondents can provide answers that align with the educational system's expectations and not with the reality of the classroom. Future research could explore contextual factors that

influence the use of AI in education, such as institutional support and curricular constraints. A longitudinal study could also offer deeper insights into how teachers' attitudes and the integration of AI evolve within educational systems.

6. Conclusions

This study investigated in-service foreign language teachers' readiness and willingness to integrate AI-driven tools into their classroom practices. The results indicate a moderate overall level of AI usage, with familiarity and perceived usefulness emerging as key factors influencing integration. In terms of readiness, the findings report that fewer respondents ($M=2.94$) use AI tools compared to digital tools ($M=4.15$). In terms of willingness, 77.6% of the respondents indicated a likelihood of incorporating AI tools into their future classroom practices. While teaching experience alone does not directly predict usage, early-career and mid-career teachers show greater enthusiasm and openness to adopting AI technologies due to higher levels of digital skills.

Teachers highlighted several benefits of AI integration, including time efficiency, personalized learning, enhanced student engagement, and rapid access to information. These responses affirm the potential of AI to support more dynamic and learner-centered pedagogies. However, participants also identified significant challenges, such as over-reliance on AI, restricted access to AI tools, ethical concerns, and the perceived loss of human interaction. The findings suggest that ongoing professional development is essential, particularly for more experienced educators who are not so confident and aware of using AI tools effectively. Tailored training focused on the practical classroom integration of AI across the curriculum, transdisciplinary and age-appropriate, is crucial for ensuring that AI has an efficient role rather than replacing traditional teaching practices. Longitudinal studies could also provide a clearer understanding of how attitudes and practices evolve as AI tools become increasingly integrated into educational systems. Consequently, investigating teachers' AI readiness constitutes a priority in aligning foreign language education with the demands and opportunities of the digital age.

Authors note: Authors contributed equally to this paper.

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References

- Cimene F.T. et al. (2024). Generation Alpha Students' Behavior as Digital Natives and Their Learning Engagement. *Psychology and Education. A Multidisciplinary Journal*, vol 27(3): 258-273. <https://doi.org/10.5281/zenodo.14007254>.
- Choi, S., Jang, Y., & Kim, H. (2023). Influence of pedagogical beliefs and perceived trust on teachers' acceptance of educational artificial intelligence tools. *International Journal of Human-Computer Interaction*, 39(4), 910-922. <https://doi.org/10.1080/10447318.2022.2049145>
- Chuah, K. M., & Kabilan, M. K. (2021). Teachers' views on the use of chatbots to support English language teaching in a mobile environment. *International Journal*

- of *Emerging Technologies in Learning*, 16(20), 223–237. <https://doi.org/10.3991/ijet.v16i20.24917>
- European Commission (2020). *Digital Education Action Plan 2021-2027*. Brussels. Retrieved from <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0624>, June 8, 2025.
- Granström, M. & Oppi, P. (2025) Assessing teachers' readiness and perceived usefulness of AI in education: an Estonian perspective. *Frontiers in Education*, 1–10. <https://doi.org/10.3389/feduc.2025.1622240>.
- Höfrová A., Balidemaj, V., & Small M.A. (2024). A systematic literature review of education for Generation Alpha. *Discover Education* 3(1): 1-20. <https://doi.org/10.1007/s44217-024-00218-3>
- Holmes, W., Bialik, M., & Fadel, C. (2023). Artificial intelligence in education. *Globethics Publications*, 621–653. <https://doi.org/10.58863/20.500.12424/4276068>
- Hwang, G. J., & Chang, C. Y. (2023). A review of opportunities and challenges of chatbots in education. *Interactive Learning Environments*, 31(7), 4099–4112. <https://doi.org/10.1080/10494820.2021.1952615>
- Io, H. N., & Lee, C. B. (2017). Chatbots and conversational agents: A bibliometric analysis. *International Conference on Industrial Engineering and Engineering Management (IEEM)*, 215–219. <https://doi.org/10.1109/IEEM.2017.8289883>
- Jin, S.-H., Im, K., Yoo, M., Roll, I., & Seo, K. (2023). Supporting students' self-regulated learning in online learning using artificial intelligence applications. *Int. J. Educ. Technol. High. Educ.* 20, 37. <https://doi.org/10.1186/s41239-023-00406-5>
- Kelly, S., Kaye, S. A., & Oviedo-Trespalacios, O. (2023). What factors contribute to the acceptance of artificial intelligence? A systematic review. *Telematics and Informatics*, 77, 101925. <https://doi.org/10.1016/j.tele.2022.101925>
- Kowalczyk-Kroenke, A. (2024). The Generation of the Future. How Can Generation Alpha Change the Labour Market? *Humanitas University's Research Papers Management*, 25 (3), 29–39. <https://doi.org/10.5604/01.3001.0054.7765>
- Luckin, R., George, K., & Cukurova, M. (2022). *AI for school teachers*. Boca Raton: CRC Press.
- Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for integrating technology in teachers' knowledge. *Teachers College Record*, 108(6), 1017–1054
- Polak, S., Schiavo, G. & Zancanaro, M. (2022). Teachers' Perspective on Artificial Intelligence Education: an Initial Investigation. In *Extended Abstracts of the 2022 CHI Conference on Human Factors in Computing Systems (CHI EA '22)*. Association for Computing Machinery, New York, USA, Article 431, 1–7. <https://doi.org/10.1145/3491101.3519866>
- Pop, R. & Marc, A. (2025). AI's (Re)Place in Pre-Service Teacher Training. A Case Study on Teaching and Learning Foreign Languages. *Journal of Studies in Language, Culture and Society*, 8 (1), 67–78.
- Redecker, C. (2017). *European Framework for the Digital Competence of Educators: DigCompEdu*, EUR 28775 EN, Publications Office of the European Union, Luxembourg. <https://doi.org/10.2760/178382> (print), <https://doi.org/10.2760/159770> (online), JRC107466.
- Sanusi, I. T., Ayanwale, M. A., & Chiu, T. K. F. (2024). Investigating the moderating effects of social good and confidence on teachers' intention to prepare school students for artificial intelligence education. *Educ. Inform. Technol.* 29, 273–295. <https://doi.org/10.1007/s10639-023-12250-1>
- Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. *Computers and Education*, 128, 13–35. <https://doi.org/10.1016/j.compedu.2018.09.009>
- Sperling, K., Stenberg, C. J., McGrath, C., Åkerfeldt, A., Heintz, F., & Stenliden, L. (2024). In search of artificial intelligence (AI) literacy in teacher education: A scoping review. *Computers and Education Open*, 6, 100169. <https://doi.org/10.1016/j.caeo.2024.100169>
- Swargiary, K. (2024). *Teaching the Future: Strategies for Educating Generation Alpha and Beta in the Age of AI*. Germany: Lambert Academic Publishing
- Touretzky, D., Gardner-McCune, C., & Seehorn, D. (2023). Machine learning and the five big ideas in AI. *International Journal of Artificial Intelligence in Education*, 33(2): 233–266. <https://doi.org/10.1007/s40593-022-00314-1>
- Vuorikari, R., Kluzer, S. & Punie, Y. (2022). *DigComp 2.2: The Digital Competence Framework for Citizens - With new examples of knowledge, skills and attitudes*, EUR 31006 EN, Publications Office of the European Union, Luxembourg, <https://doi.org/10.2760/115376>
- Wegerif, R., & Major, L. (2024). *The theory of educational technology: Towards a dialogic foundation for design*. London, New York: Taylor and Francis.