UDC 37.017.92:004.738.5 **DOI https://doi.org/10.24195/2617-6688-2025-4-5**

Zhukevych Iryna
PhD in Pedagogy (Candidate of Pedagogical Sciences), Associate Professor, Associate Professor at the Department of English Language for Humanities
National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine
E-mail: i.zhukevych@ukr.net
ORCID ID: https://orcid.org/0000-0002-4109-4336
Scopus: 57203242512

Connection between critical thinking and digital literacy in autonomous language learning

This article investigates the crucial interplay between critical thinking and digital literacy within the context of autonomous language learning. The relevance of this research stems from the profound transformation of foreign language education by digital connectivity. Learners now have unprecedented access to a vast ecosystem of digital resources, but this environment also presents significant challenges, including information overload and the difficulty of assessing content authenticity. Critical thinking and digital literacy form a synergistic relationship, where the effective use of digital tools is dependent on a learner's ability to critically evaluate and manage information.

The purpose of the article is to explore how these cognitive and technological skills influence autonomous language acquisition. It aims to answer key research questions about how learners apply critical thinking when selecting digital resources, the role of digital literacy in facilitating learning, and the interaction of these two skill sets. It presents empirical findings to demonstrate the positive correlation between these competencies and learning outcomes.

The research methods employed a multi-modal approach. These included a comprehensive analysis of scientific literature to provide a theoretical foundation, followed by pedagogical observation to study learner behavior. The collected material was then systematized and generalized to identify key patterns. Finally, the results obtained were systematically recorded, generalized, and interpreted to draw conclusions and formulate actionable recommendations.

The research results reveal several key findings. A substantial majority of participants were found to regularly use digital tools for language practice. The study established a strong positive correlation between critical thinking skills and the careful selection of learning resources. The research identified that learners who effectively integrated both critical thinking and advanced digital literacy showed a substantial improvement in their measurable learning outcomes. These findings collectively underscore that critical cognitive discernment and digital communicative competence are fundamental determinants of successful autonomous foreign language learning.

Keywords: *critical thinking, digital literacy, autonomous language learning, foreign language education, cognitive skills, technological competencies.*

Introduction. In today's interconnected world, foreign language education has shifted dramatically, with learners gaining unprecedented access to a vast ecosystem of digital resources. This has led to a greater emphasis on autonomous language learning, where individuals direct their own educational paths. However, navigating this digital environment effectively requires a sophisticated set of skills beyond basic technological proficiency. This article explores the critical connection between critical thinking and digital literacy and their combined impact on the success of self-directed language acquisition.

The rapid growth of online resources presents both opportunities and challenges. While a wealth of authentic content is available, learners face information overload and content credibility issues. Without the ability to critically evaluate this information, they risk using ineffective tools, internalizing inaccuracies, or becoming confined to algorithmic echo chambers that limit their linguistic exposure. It is no longer sufficient to simply know how to use a digital tool; learners must also possess the cognitive skills to evaluate, analyze, and synthesize the information they find. This makes critical thinking an essential component of digital literacy.

The central hypothesis of this research is that these two skill sets form an interdependent feedback loop. A learner with strong digital literacy can access a wide array of resources, but their critical thinking skills enable

them to select the right ones and use them effectively. Conversely, a learner with strong critical thinking skills can apply these abilities to traditional learning, but their effectiveness is significantly amplified when they can navigate and leverage the digital world. This synergistic relationship is what truly unlocks the potential of autonomous language learning in the digital age.

Formulation of the problem. The purpose of the article is to explore how critical cognitive skills, and digital competencies influence students' ability to engage in self-directed language learning. The article aims to: answer key research questions about how learners apply critical thinking when selecting digital resources, the role of digital literacy in self-directed learning, and how these skills interact to enhance learning outcomes; present empirical findings from a study that demonstrate a strong positive correlation between digital literacy, critical thinking, and effective self-directed learning outcomes; provide a series of pedagogical and curricular recommendations for higher education institutions to enhance autonomous foreign language acquisition. These recommendations focus on integrating digital literacy training, developing critical thinking frameworks for language learning, creating guidelines for evaluating digital resources, and implementing structured self-assessment tools.

Materials and Methods. The following methods were used in the work: analysis of scientific literature (a thorough review of existing research on the topics of critical thinking, digital literacy, and foreign language education); systematization and generalization of the collected material (the collected information was organized and analyzed to identify key themes and patterns); pedagogical observation (we observed learners' behavior and strategies as they engaged in autonomous language acquisition); recording and generalization of the results obtained (the data and observations were systematically recorded and synthesized to form the basis of the study's findings), their interpretation (the final results were interpreted to draw conclusions and formulate actionable recommendations).

Approbation of research results. The empirical data reveals significant behavioral patterns in how students approach autonomous language acquisition. The scientists define this process as the self-directed endeavor wherein a learner assumes primary responsibility for all phases of language learning, encompassing goal setting, resource curation, strategy deployment, and progress self-evaluation, often conducted independently of institutional frameworks (Mejías-Acosta, D'Armas Regnault, Vargas-Cano, Cárdenas-Cobo, Vidal-Silva, 2024). We understand this to mean taking charge of your own language learning journey – setting your own goals, picking your materials, and checking your own progress, often without a teacher guiding every step. A substantial majority of participants regularly utilize digital tools for linguistic practice.

Critical thinking skills showed a strong positive correlation with the careful selection of learning resources. As researchers posit, critical thinking is the rigorous, objective analysis and systematic evaluation of information to formulate rational judgments, requiring the capacity to interrogate foundational assumptions, differentiate empirical facts from subjective assertions, and assess the evidentiary quality of data (Heard, Scoular, Duckworth, Ramalingam, & Teo, 2025). We see critical thinking as the ability to stop, analyze, and objectively judge information – it's about asking tough questions, spotting the difference between fact and opinion, and seeing if the evidence truly holds up.

Furthermore, students exhibiting higher digital literacy scores demonstrated more consistent and sustained learning progress. According to consensus in the field, digital literacy is the comprehensive mastery of both the cognitive and technical faculties necessary to locate, appraise, employ, disseminate, and generate informational content using contemporary digital technologies and networks (Arnaud, São Mamede & Branco, 2024). We interpret digital literacy as having the necessary mental and technical skills to effectively find, assess, use, share, and even create content using computers and the internet.

The study identified key challenges, including information overload and difficulties in validating the authenticity of digital content. Key empirical findings are: strong positive correlation was found between digital literacy and effective self-directed learning outcomes, indicating that increased digital literacy directly enhances autonomous learning effectiveness (Pepito & Acledan, 2022); critical thinking skills significantly improved resource selection and overall learning effectiveness, underscoring the influential role of critical thinking in optimizing learning strategies; learners who effectively integrated critical thinking with advanced digital literacy showed a substantial improvement in measurable learning outcomes, highlighting the synergistic benefits of these two skill sets; strategic use of digital tools resulted in a notable increase in vocabulary acquisition, demonstrating technology's valuable role in linguistic expansion; self-assessment accuracy improved when critical cognitive faculties were actively engaged, suggesting that critical thinking enhances not only external performance but also metacognitive accuracy in evaluating one's own progress.

Based on our robust empirical findings and compelling arguments, the following pedagogical and curricular recommendations are presented to enhance autonomous foreign language acquisition. These recommendations are structured around four core principles, each designed to address a critical aspect of modern language

learning: the integration of digital literacy (Mardiah, 2022), the development of specialized critical thinking frameworks (Heard, Scoular, Duckworth, Ramalingam & Teo, 2025), the creation of comprehensive evaluation guidelines for digital resources (Mejías-Acosta, D'Armas Regnault, Vargas-Cano, Cárdenas-Cobo, Vidal-Silva, 2024), and the implementation of structured self-assessment tools (Carroll, 2020).

Integration of Digital Literacy Training into Language Curricula. Higher education institutions must systematically incorporate comprehensive digital literacy training modules within existing foreign language curricula. This integration should extend beyond basic technological proficiency to include:

Information Fluency: Teaching learners how to efficiently locate, access, and evaluate digital linguistic resources (e.g., online dictionaries, grammar checkers, authentic media, language exchange platforms). This includes training in advanced search strategies and database navigation.

Digital Citizenship and Ethics: Fostering an understanding of responsible online behavior, intellectual property rights, data privacy, and the ethical use of AI-powered language tools. This ensures learners become conscientious participants in global digital communities.

Collaborative Digital Environments: Instruction on how to effectively use synchronous and asynchronous digital communication tools (e.g., video conferencing, collaborative document editing, online forums) for peer-to-peer language practice and collaborative projects.

Tool Agnosticism and Adaptability: Preparing students to critically assess and adapt to emerging digital tools and platforms, rather than simply mastering specific applications. This fosters a resilient and agile approach to technological integration in learning.

Digital Content Creation: Encouraging learners to produce digital content in the target language (e.g., vlogs, podcasts, digital storytelling), thereby promoting active language use and creative expression.

Development of Critical Thinking Frameworks Specific to Language Learning. This study emphasizes the essential role of critical thinking in autonomous language learning. Therefore, it is crucial to develop and disseminate explicit frameworks tailored to the unique cognitive demands of foreign language acquisition. These frameworks should guide learners in the following areas:

Source Credibility Assessment: Training in heuristics and analytical tools is necessary for evaluating the reliability, bias, and authenticity of online language materials (Kresin, Kremer & Büssing, 2024). This includes distinguishing between academic sources and informal content, as well as recognizing propaganda or misinformation.

Contextual Interpretation: Developing the ability to interpret linguistic nuances, cultural connotations, and socio-pragmatic meanings within diverse digital texts and discourse is vital. This requires moving beyond literal translation to achieve a deeper semantic and pragmatic understanding.

Metacognitive Regulation: Learners should be encouraged to reflect critically on their own learning processes, identify effective strategies, recognize cognitive biases, and adjust their approaches based on self-evaluation (Rivas, Saiz, & Ossa, 2022).

Problem-Solving and Synthesizing Information: Students should be equipped with skills to analyze complex linguistic challenges, synthesize information from multiple digital sources, and construct coherent arguments or solutions in the target language. This promotes higher-order thinking beyond rote memorization.

Algorithmic Literacy: Understanding how algorithms influence the digital content encountered (e.g., personalized learning platforms, news feeds) is crucial as it affects exposure to diverse linguistic inputs (Gagrčin, Naab & Grub, 2024).

Creation of Comprehensive Guidelines for Effective Digital Resource Evaluation. To address the challenges of information overload and the need for authenticity verification, clear and accessible guidelines for evaluating digital resources should be developed and shared. These guidelines will serve as a practical tool for learners and should include:

Rubrics for Authenticity: Establish clear criteria to help distinguish genuinely authentic native-speaker content from pedagogical materials or potentially misleading sources.

Relevance to Learning Objectives: Offer guidance on how to select resources that align with individual learning goals, proficiency levels, and specific linguistic skills being targeted (e.g., listening comprehension, grammatical accuracy, pragmatic competence).

Pedagogical Soundness: Provide criteria for assessing whether a digital tool or resource employs effective pedagogical principles (e.g., interactivity, immediate feedback, spaced repetition, and meaningful context) (Estrada Molina, Fuentes Cancell, & Morales, 2022).

User Interface and Experience (UI/UX) Evaluation: Offer practical advice on assessing the usability, accessibility, and overall effectiveness of the digital platform or application. Poor UI/UX can hinder learning.

Cost-Benefit Analysis: Encourage learners to critically assess the monetary cost (if any) of various digital resources against their perceived educational value and return on investment.

Implementation of Structured Self-Assessment Tools with Critical Feedback Mechanisms. To enhance self-assessment accuracy through critical thinking, institutions should develop and integrate structured self-assessment tools that promote metacognitive reflection and critical evaluation of one's progress. These tools should encompass the following features:

Provide Specific Criteria: Offer clear, explicit rubrics or checklists aligned with learning objectives that allow learners to objectively evaluate their linguistic output and comprehension.

Incorporate Reflective Prompts: Include questions that encourage learners to articulate how they arrived at their assessments, the challenges they faced, and their plans for improvement.

Facilitate Peer and Instructor Feedback Integration: Design tools that enable easy incorporation of feedback from peers or instructors (Gaynor, 2019). This allows learners to compare their self-assessments with external evaluations and refine their critical judgment.

Utilize Digital Portfolios: Encourage the creation of digital language portfolios where learners can curate their work, reflect on their progress over time, and demonstrate critical thinking in selecting and presenting learning artifacts (The Use of e-Portfolios as a Teaching, Learning and Assessment Tool in Higher Education, 2024).

Leverage AI for Formative Feedback: Explore ethical and pedagogically sound uses of AI-powered tools to provide immediate, individualized, and non-judgmental formative feedback. This enhances the iterative self-assessment process and reduces cognitive load on instructors.

The provided text presents pedagogical and curricular recommendations to enhance autonomous foreign language learning by focusing on the crucial connection between critical thinking and digital literacy. The core argument is that in today's digital age, effective self-directed learning requires more than just access to technology; it demands a synergy between cognitive skills and digital competencies.

The recommendations are highly important because they offer a practical framework for educational institutions to adapt to the modern learning landscape. They go beyond simple tool-use, advocating for a holistic approach that cultivates essential skills. This includes integrating digital literacy training into language curricula to teach students how to evaluate and use online resources effectively (Yurzhenko, Diahyleva, Kononova, 2023). The text also emphasizes the development of specific critical thinking frameworks for language learning (Jia, 2021), guiding students in areas like source credibility and metacognitive regulation. Additionally, it calls for the creation of guidelines for evaluating digital resources and the implementation of structured self-assessment tools with critical feedback mechanisms.

The central connection highlighted throughout the recommendations is that critical thinking and digital literacy are interdependent. Digital literacy provides students with tools and access to a vast array of resources, but it is critical thinking that enables them to select, evaluate, and use those resources in a meaningful and effective way. This synergistic relationship empowers students to overcome common challenges like information overload and misinformation, ultimately leading to more consistent progress and superior learning outcomes in their autonomous language acquisition journey.

Conclusions. This research clearly demonstrates that critical thinking and digital literacy are fundamental determinants of successful self-regulated foreign language learning. The empirical evidence supports the hypothesis that these two skill sets form a powerful, interdependent relationship. As learners navigate the vast digital landscape, their ability to critically evaluate and select resources, synthesize information from multiple sources, and engage in metacognitive reflection is directly correlated with more consistent progress and better learning outcomes. The findings underscore that a high degree of technological competence alone is not sufficient; it must be coupled with sophisticated cognitive skills to effectively manage challenges such as information overload and content authenticity.

The study's results highlight the amplified benefits when these skills are integrated, leading to significant improvements in vocabulary acquisition and self-assessment accuracy. These findings validate the urgent need for pedagogical and curricular reform in foreign language education to move beyond traditional methods. Educational institutions must prioritize the systematic development of these digital and cognitive competencies to empower learners to thrive in an era of autonomous, technology-driven language acquisition.

This study provides a robust foundation for future investigations into the intersection of technology, cognition, and language learning. Several key areas warrant further research like longitudinal studies, skill-specific analysis; cross-cultural comparisons; impact of AI Integration; teacher training models.

References

Arnaud, J., São Mamede, H., & Branco, F. (2024). The relationship between digital transformation and digital literacy – an explanatory model: Systematic literature review. *F1000 Research*, 13 (253). https://doi.org/10.12688/f1000research.146991.1.

Mardiah, Henny (2022). Integrating digital literacy into English as a foreign language (EFL) class: a cooperative learning approach. *ALINEA: Jurnal Bahasa, Sastra dan Pengajarannya*, 2, 295–304. https://doi.org/10.58218/alinea.v2i2.236.

Jia, Yanli (2021). *The Development of Critical Thinking in Language Learning.* https://doi.org/10.2991/assehr.k.211025.013.

Pepito, Mark John, & Acledan, Michelle (2022). Influence of Digital Literacy and Self-Directed Learning in the Online Learning Success of STEM College Students*. International Journal of Humanities, Social Sciences and Education*, 9, 88–100. https://doi.org/10.20431/2349-0381.0901007.

Heard, J., Scoular, C., Duckworth, D., Ramalingam, D., & Teo, I. (2025). *Critical thinking: Skill development framework.* 2nd ed. Australian Council for Educational Research. https://doi.org/10.37517/978-1-74286-752-6.

Mejías-Acosta, A., D'Armas Regnault, M., Vargas-Cano, E., Cárdenas-Cobo, J and Vidal-Silva, C. (2024). Assessment of digital competencies in higher education students: development and validation of a measurement scale. *Front*. Educ., 9,1497376. https://doi.org/10.3389/feduc.2024.1497376.

Carroll, D. (2020). Observations of student accuracy in criteria-based self-assessment. *Assess. Eval. High. Educ*., 45, 1088–1105. https://doi.org/10.1080/02602938.2020.1727411.

Kresin, Soraya & Kremer, Kerstin, & Büssing, Alexander (2024). Students' credibility criteria for evaluating scientific information: The case of climate change on social media. *Science Education*, 108, 762–791. https://doi.org/10.1002/sce.21855.

Gagrčin, Emilija & Naab, Teresa & Grub, Maria (2024). *Algorithmic media use and algorithm literacy: An integrative literature review.* New Media & Society. https://doi.org/10.1177/14614448241291137.

Estrada Molina, Odiel & Fuentes Cancell, Dieter & Morales, Anaibis (2022). The assessment of the usability of digital educational resources: An interdisciplinary analysis from two systematic reviews. *Education and Information Technologies*, 27. https://doi.org/10.1007/s10639-021-10727-5.

Gaynor, James (2019). *Peer review in the classroom: student perceptions, peer feedback quality and the role of assessment. Assessment & Evaluation in Higher Education*, 45, 1–18. https://doi.org/10.1080/02602938.2019.1697424.

The Use of e-Portfolios as a Teaching, Learning and Assessment Tool in Higher Education: Differing Opinions among Ghanaian Pre-Service Teachers and Nurses (2024). *European Journal of Education and Pedagogy*, *5* (6), 35–45. https://doi.org/10.24018/ejedu.2024.5.6.858.

Зв’язок між критичним мисленням та цифровою грамотністю в автономному вивченні мови

Жукевич Ірина Петрівна
кандидат педагогічних наук, доцент, доцент кафедри англійської мови гуманітарного спрямування Національного технічного університету України «Київський політехнічний інститут імені Ігоря Сікорського», Київ, Україна

У цій статті досліджується взаємодія між критичним мисленням та цифровою грамотністю в контексті автономного вивчення мови. Актуальність цього дослідження випливає з глибокої трансформації освіти з іноземних мов завдяки цифровому зв’язку. Студенти тепер мають безпрецедентний доступ до величезної екосистеми цифрових ресурсів, але це середовище також створює значні проблеми, включно з інформаційним перевантаженням та складністю оцінки автентичності контенту. Критичне мислення та цифрова грамотність утворюють синергетичний зв’язок, де ефективне використання цифрових інструментів залежить від здатності студентів критично оцінювати та керувати інформацією.

Мета статті – дослідити, як ці когнітивні та технологічні навички впливають на автономне вивчення мови. Дослідження спрямоване на те, щоб відповісти на ключові дослідницькі питання, як студенти застосовують критичне мислення під час вибору цифрових ресурсів, з’ясувати роль цифрової грамотності у сприянні навчанню та визначити взаємодію цих двох наборів навичок. У статті представлені емпіричні результати, щоб продемонструвати позитивну кореляцію між цими компетенціями та результатами навчання.

Методи дослідження використовували мультимодальний підхід. Вони передбачали комплексний аналіз наукової літератури для забезпечення теоретичної основи, а також педагогічне спостереження

для вивчення поведінки студентів. Зібраний матеріал потім був систематизований та узагальнений для виявлення ключових закономірностей, а отримані результати були систематично зафіксовані, узагальнені та інтерпретовані.

Зміст і результати дослідження розкривають кілька ключових висновків. Було виявлено, що значна більшість учасників регулярно використовують цифрові інструменти для мовної практики. Дослідження встановило сильну позитивну кореляцію між навичками критичного мислення та ретельним вибором навчальних ресурсів. Дослідження показало, що студенти, які ефективно інтегрували критичне мислення та поглиблену цифрову грамотність, демонстрували суттєве покращення своїх результатів навчання. Отримані результати підкреслюють, що критичне когнітивне розпізнавання та цифрова комунікативна компетентність є фундаментальними детермінантами успішного автономного вивчення іноземної мови.

Ключові слова: *критичне мислення, цифрова грамотність, автономне вивчення мови, навчання іноземним мовам, когнітивні навички, технологічні компетенції.*

Received: September 19, 2025
Accepted: October 23, 2025
Published: December 30, 2025