CONSTRUCTING A DIGITAL COMPETENCE INTEGRATION MATRIX FOR TEACHING HIGH SCHOOL LITERATURE: SOLUTIONS TO SUPPORT TEACHING AND ASSESSMENT UNDER THE 2018 GENERAL EDUCATION CURRICULUM

XÂY DỰNG KHUNG MA TRẬN TÍCH HỢP NĂNG LỰC SỐ TRONG DẠY HỌC MÔN NGỮ VĂN CẤP TRUNG HỌC PHỔ THÔNG: GIẢI PHÁP HỖ TRỢ DẠY HỌC VÀ ĐÁNH GIÁ THEO CHƯƠNG TRÌNH GIÁO DỤC PHỔ THÔNG 2018

Le Thi Thanh Tinh, Ho Tran Ngoc Oanh*, Nguyen Vu Anh Thy, Nguyen Ngoc Ha Chi, Nguyen Bao Hoang, Phung Nguyen Mai Trinh, Nguyen Bao Uyen

The University of Danang - University of Science and Education, Vietnam

*Corresponding author: htnoanh@ued.udn.vn

(Received: March 19, 2026; Revised: May 02, 2026; Accepted: June 30, 2026)

DOI: 10.31130/ud-jst.2026.24(8).162

Abstract - This article focuses on constructing a digital competence integration matrix for teaching Literature at the upper secondary level. In the context of educational digital transformation, digital competence is no longer limited to technical skills but has become an essential learning competence closely associated with students' reading, writing, speaking, and listening activities. The study employs document analysis and comparative methods to examine the alignment between the required learning outcomes specified in the 2018 General Education Curriculum and the components of the Vietnam Digital Competence Framework for Learners 2025. Based on this analysis, the study proposes an integration matrix that systematizes behavioral indicators of digital competence in Literature teaching. The findings contribute to providing a pedagogical tool to support teachers in designing learning activities, developing assessment criteria, and implementing competency-based assessment in a digital learning environment.

Key words - Digital competence; Integration matrix framework; High school literature teaching; Competency-based assessment; Educational digital transformation.

Tóm tắt - Bài báo tập trung xây dựng khung ma trận tích hợp năng lực số trong dạy học môn Ngữ văn ở cấp trung học phổ thông. Trong bối cảnh chuyển đổi số giáo dục, năng lực số không chỉ là kĩ năng sử dụng công nghệ mà còn là năng lực học tập thiết yếu, gắn với hoạt động đọc, viết, nói và nghe của học sinh. Nghiên cứu sử dụng phương pháp phân tích tài liệu và đối chiếu giữa yêu cầu cần đạt của Chương trình Giáo dục phổ thông 2018 với các thành tố của Khung năng lực số Việt Nam 2025. Trên cơ sở đó, bài báo đề xuất một khung ma trận tích hợp nhằm hệ thống hóa các chỉ báo hành vi năng lực số trong dạy học Ngữ văn. Kết quả nghiên cứu góp phần cung cấp công cụ hỗ trợ giáo viên thiết kế hoạt động dạy học, xây dựng tiêu chí đánh giá và tổ chức kiểm tra theo định hướng phát triển năng lực trong môi trường số.

Từ khóa - Năng lực số; Khung ma trận tích hợp; Dạy học Ngữ văn THPT; Đánh giá năng lực; Chuyển đổi số giáo dục.

1. Introduction

The rapid shift of teaching and learning activities to digital platforms over the past decade has made digital competence a fundamental learning condition rather than merely an optional supporting skill. As most of students' activities related to information searching, reading comprehension, and the creation of learning products are associated with devices and online environments, schools are responsible for equipping them with the ability to learn and work effectively in digital spaces [1]. The 2018 General Education Curriculum also shifts its focus from knowledge transmission to the development of qualities and competencies, in which competencies related to the exploitation and use of technology are regarded as part of educational objectives [2]. In the same direction, policy documents on digital transformation issued by the Government and the education sector consider the promotion of technology application and the development of learners' digital competence as a central task in the national education system [3], [4].

In practice, the level of information technology application in general education schools has improved significantly in recent years, especially after the period of large-scale online teaching. However, in Literature teaching in particular, technology is still largely used as a means of presentation, information retrieval, or learning material sharing, and is rarely designed in connection with specific competency objectives for students. Therefore, the gap between the orientation of the curriculum and classroom implementation remains quite evident. Alongside this, the rapid popularization of artificial intelligence (AI) has given rise to a new challenge: students may be able to produce learning products with the help of digital tools without necessarily developing the corresponding thinking competence. This may be referred to as a state of "pseudo-digital competence", in which learners depend on technology but lack the ability to verify information, engage in critical reasoning, and assume academic responsibility. Therefore, the integration of digital competence into Literature teaching should not be viewed purely as a technical issue, but also as a

pedagogical and academic ethics issue in the digital environment.

From the above analysis, integrating digital competence into teaching has become a requirement that can hardly be delayed. On the one hand, technology is changing the way students access knowledge and participate in learning activities; therefore, if schools are slow to adapt, teaching methods and educational quality may easily fall behind the demands of society. On the other hand, digital transformation is regarded as a driving force for improving the quality of human resources and promoting a knowledge society [1]. At the general education level, developing digital competence not only helps students effectively exploit knowledge resources in the digital environment but also supports the development of self-learning, communication, and problem-solving competencies - core competencies in modern social life.

Based on these requirements, this article aims to construct a digital competence integration matrix for teaching Literature at the upper secondary level by comparing the required learning outcomes of the 2018 General Education Curriculum with the components of the Digital Competence Framework for Learners. The objective is to systematize behavioral manifestations of digital competence according to the reading, writing, speaking, and listening skill strands specific to Literature, while also providing teachers with a tool for designing teaching activities and developing criteria for assessing students' competence in digital learning environments.

2. Research approach and methods

2.1. Research approach

The study was conducted based on several major approaches in order to ensure the scientific foundation, policy relevance, and practical applicability of the digital competence integration matrix in teaching Literature at the upper secondary level.

Theoretical approach: The study draws on perspectives on competency-based education, digital competence, and integrated teaching to establish the scientific foundation for integrating digital competence into Literature. Based on a synthesis of related studies, the article clarifies the relationship between the components of digital competence and reading, writing, speaking, and listening activities.

Educational policy approach: The study compares the required learning outcomes of the 2018 General Education Curriculum for Literature with the Digital Competence Framework for Learners issued under Circular No. 02/2025/TT-BGDĐT, with a view to concretizing orientations for digital competence development into behavioral manifestations associated with the characteristics of the subject.

Teaching practice approach: The study situates the issue of integrating digital competence within the current context of Literature teaching in general education schools, where digital technology is increasingly used in learning but has not yet been systematically integrated into competency development objectives.

Subject competency strand approach: The matrix is constructed based on the four core competency strands of Literature, namely reading, writing, speaking, and listening, in order to ensure that the integration of digital competence is aligned with the subject-specific competency structure.

2.2. Research objectives and questions

2.2.1. Research objectives

The study aims to construct a digital competence integration matrix for teaching Literature at the upper secondary level in order to support teachers in designing teaching activities and conducting competency-based assessment. Specifically, it aims to:

- Systematize the theoretical foundations of digital competence and the integration of digital competence into Literature teaching.

- Identify the intersections between the required learning outcomes of the 2018 General Education Curriculum for Literature and the components of the Digital Competence Framework for Learners.

- Develop a digital competence integration matrix according to the reading, writing, speaking, and listening skill strands, accompanied by behavioral indicators.

- Propose orientations for applying the matrix in designing teaching activities and assessing students.

2.2.2. Research questions

- What intersections between the required learning outcomes of upper secondary Literature and the components of the Digital Competence Framework for Learners can serve as a basis for integration in teaching?

- How should the digital competence integration matrix in teaching upper secondary Literature be structured to ensure scientific validity and practical applicability?

2.3. Research methods

The study employs theoretical analysis and synthesis in combination with analysis and comparison of educational policy documents in order to identify the intersections between the required learning outcomes of Literature and the components of digital competence.

In addition, the study is conducted from the perspective of developmental research at the conceptual level, in which the product is a digital competence integration matrix developed through the following steps: (1) analyzing the theoretical and policy foundations; (2) comparing them with the subject curriculum; (3) modeling them into a system of behavioral indicators; and (4) examining their reasonableness through typical teaching situations.

Due to the limited scope of the study, no pedagogical experiment has been conducted. Instead, the study focuses on constructing a theoretical framework as a basis for future validation studies.

3. Research content

3.1. Basis for constructing the digital competence integration matrix

As mentioned above, digital competence is now regarded as a core learning competence of learners in the

digital education environment [1], [5]. This study uses the Digital Competence Framework for Learners issued together with Circular No. 02/2025/TT-BGDĐT as the core policy basis for designing the integration matrix. In addition, two international frameworks, namely the UNESCO Digital Literacy Framework and DigComp 2.2 of the European Commission, are used as theoretical reference bases to ensure the integration and international comparability of the proposed model [5], [6].

In relation to the characteristics of Literature, digital competence here is understood as students' ability to use digital tools and environments to search for, process, and share information about literature and language; comprehend electronic texts; create multimodal content; and communicate and collaborate responsibly in cyberspace. This understanding is consistent with the competency development orientation of the 2018 General Education Curriculum, which organizes Literature learning activities according to the four strands of reading, writing, speaking, and listening [2].

Teaching Literature in a digital environment also requires information competence and a sense of responsibility in using knowledge. Students need to know how to search for, select, and use appropriate digital materials; assess the reliability of online information; and respect copyright and cite sources when consulting references. These requirements correspond to the components of the Digital Competence Framework for Learners issued by the Ministry of Education and Training [4]. Thus, digital competence is not only the ability to operate technology but also includes critical thinking and academic responsibility in the digital environment. As AI is now capable of generating texts, analyses, and ideas, students increasingly need the ability to identify, evaluate, and verify AI-generated products. For this reason, digital competence should be approached as an integrated competence - including ethical dimensions, academic integrity, and learner autonomy - in order to reduce the risk of technological dependence.

From a pedagogical perspective, the integration of digital competence into Literature teaching can be implemented through the subject's core competency strands. In the reading strand, the main intersection lies in the competence to search for, select, and evaluate information in the digital environment. Reading activities in the current context are not limited to printed texts but also include electronic texts, multimodal texts, and online content. Therefore, the competence to appraise information sources becomes an important condition for developing critical reading comprehension [1].

In the writing strand, the intersection is clearly reflected in the requirement to ensure academic integrity and to use digital materials in the process of text production. Students need to know how to search for and select evidence from various sources, while complying with copyright and citation regulations when using information from the digital environment.

Meanwhile, in the speaking and listening strand, digital competence is demonstrated through communication and collaboration activities in online environments. Discussion, debate, and presentation activities are increasingly conducted on digital platforms, requiring students not only to have expressive competence but also to behave appropriately, respect differing opinions, and verify information before speaking.

These intersections provide the basis for constructing a digital competence integration matrix in Literature teaching, with the aim of systematizing behavioral manifestations of digital competence associated with the reading, writing, speaking, and listening skill strands of the subject.

3.2. Structure of the digital competence integration matrix

Based on the comparison between the required learning outcomes of the 2018 General Education Curriculum for Literature and the Digital Competence Framework for Learners [4], the study proposes a digital competence integration matrix according to the subject's core skill strands, including reading, writing, speaking, and listening.

The digital competence components in the matrix are inherited and adapted from the structure of the national digital competence framework, including five major competence groups:

(1) Exploiting and managing digital information;

(2) Communicating and collaborating in digital environments;

(3) Digital ethics, responsibility, and safety;

(4) Understanding technology and AI;

(5) Creating and presenting digital content.

Organizing the matrix according to the subject's skill strands allows for a direct connection between Literature-specific learning activities and manifestations of digital competence, while also enabling teachers to integrate technology into the teaching process in a systematic manner.

The behavioral indicators in the matrix should be noted as directional and may be flexibly adjusted according to specific teaching conditions. In the context of differences among educational institutions in terms of technological infrastructure and teachers' digital competence, the selection and implementation of indicators should prioritize feasibility. Teachers may select components appropriate to students' levels and practical conditions in order to ensure effective integration.

The digital competence integration matrix shows a clear intersection between Literature learning activities and the components of digital competence. In the reading strand, the focus of integration lies in the ability to search for, select, and evaluate information in the digital environment. This reflects the changing nature of reading activities in the context of digital education, where learners not only access printed texts but also process multiple types of multimodal texts and online information sources.

In the writing strand, digital competence components focus on exploiting digital resources, ensuring academic integrity, and creating content in the digital environment. The integration of these components helps students develop a sense of responsibility in using information and develop text production competence in the current context of digital communication.

Table 1. *Matrix for integrating digital competence into High school Literature teaching*

Skill strands	Integrated digital competence components	Behavioral Manifestations / Indicators
READING	DC1.1 – Identifying information needs	Students identify the types of additional information needed to understand a text, such as historical context, author, and genre characteristics.
	DC1.2 – Searching for and collecting digital information	- Students use search engines, digital libraries, or academic databases to find materials for reading comprehension; identify information needs and select appropriate technological tools when they need to clarify a literary or social issue raised in a text. - Students collect, analyze, and clarify information to form reading comprehension ideas, while applying knowledge of Vietnamese language and knowledge of the historical, social, ideological, and aesthetic contexts of different periods to approach and interpret texts of greater complexity.
	DC1.3 – Evaluating the reliability of information	- Students recognize reliable information sources and compare information from multiple sources, including AI-generated content, before use. - Students evaluate, comment on, and select interpretations of texts based on comparison across multiple information sources, thereby developing the competence to evaluate and interpret texts.
	DC2.2 – Sharing and exchanging digital information	Students share documents, articles, or references on literary works in online learning groups; participate in exchanges to clarify information and form and develop ideas for text comprehension.
	DC4.1 – Understanding AI and digital data	Students recognize AI-generated text analysis; compare, evaluate, and verify information from AI against their personal understanding, thereby becoming aware of the difference between human-created literary language and AI-generated texts.
	DC5.1 – Using technology to receive multimodal texts	Students receive and analyze texts through various digital forms, such as ebooks, videos analyzing literary works, and literary podcasts; receive diverse text types and initially appreciate the beauty of artistic language through supporting digital media.
WRITING	DC1.2 – Searching for digital information	Students search for evidence and literary materials from the Internet or digital libraries to support argumentative writing; collect, analyze, and select information from multiple sources to construct persuasive arguments and evidence.
	DC1.4 – Organizing and managing digital information	Students know how to take notes, store, and organize digital documents for writing; organize systems of evidence and data to write argumentative texts supported by evidence from multiple sources.
	DC3.1 – Complying with intellectual property rights	Students cite sources when using information from the Internet or AI; comply with intellectual property rights and avoid plagiarism when using references in their writing.
	DC3.2 – Using technology and AI responsibly	Students may use AI to suggest ideas or support expression, but they know how to select, edit, and take responsibility for their written content, ensuring that it is appropriate to the communicative purpose and target audience.
	DC5.2 – Creating digital content	Students create writing products on digital platforms, such as blogs, illustrated articles, or illustrative infographics; present issues clearly, logically, and persuasively.
	DC5.3 – Using technology to present learning products	Students use word-processing software and digital presentation tools to complete their writing; organize content scientifically and clearly to enhance the effectiveness of academic communication.
SPEAKING AND LISTENING	DC2.1 – Interacting and communicating in digital environments	Students participate in discussions on literary issues on learning forums or in online classrooms; identify communicative purposes and select content and expression appropriate to the context and audience.
	DC2.3 – Collaborating in digital environments	Students work in online groups to prepare presentations or learning projects; collect and organize information to construct arguments when presenting literary issues.
	DC1.3 – Evaluating digital information	Students listen to presentations or watch learning videos and evaluate both the content and mode of expression of the presentation, while verifying the reliability of the information provided.
	DC5.3 – Using digital tools for presentation	Students use presentation tools, digital mind maps, or infographics when giving presentations in order to present issues confidently and persuasively.
	DC3.3 – Culture and responsibility in digital environments	Students know how to debate issues involving multiple viewpoints, demonstrate an inquisitive attitude and a cultured manner of debate, respect differing opinions, and verify information before speaking.

For the speaking and listening strand, digital competence is expressed through communication, collaboration, and debate activities on online platforms. This expands the space for practicing speaking and listening competence from the traditional classroom to the digital learning environment, while also contributing to the formation of communication culture and social responsibility in cyberspace.

Thus, the matrix not only reflects the compatibility between the requirements of the Literature curriculum and the components of digital competence but also provides a pedagogical structure that can support teachers in integrating technology into the process of teaching and assessing students in the digital education environment.

3.3. Procedure for applying the matrix in teaching and assessment

To apply the digital competence integration matrix in the practical teaching of Literature, the study proposes a procedure consisting of three basic steps: (1) examining the required learning outcomes of the curriculum; (2) designing purposeful learning tasks; and (3) assessing students' levels of attainment. This procedure ensures alignment among objectives, teaching activities, and assessment in the context of digital education.

3.3.1. Examining the required learning outcomes

In the first step, teachers compare the required learning outcomes of Literature in the 2018 General Education Curriculum with the components of digital competence in order to identify specific integration objectives. This examination helps transform subject-specific requirements into observable behavioral manifestations in the digital environment.

For example, the required learning outcome related to debating an issue involving multiple viewpoints can be integrated with the competence group of communication and conduct in the digital environment, thereby developing students' ability to participate in online discussions in a cultured manner, respect differences, and comply with communication norms.

In addition, requirements related to the use of evidence and persuasive reasoning are linked to the component of exploiting and evaluating digital information, requiring students to search for, select, and verify information from multiple sources before use. This approach is consistent with the orientation toward developing information competence and critical thinking in modern education [1].

Thus, the examination step serves as a bridge between the subject curriculum and the digital competence framework, providing a basis for designing teaching activities with clear integration objectives.

3.3.2. Designing purposeful learning tasks

Based on the identified integration objectives, teachers design learning tasks associated with each skill strand of the subject. To demonstrate the flexible integration capacity and the comprehensive coverage of the upper secondary Literature curriculum, the research team proposes a system of typical learning tasks spanning several specific knowledge areas. These tasks are organized in such a way that language activities and activities involving the use of digital technology take place simultaneously and support each other.

a. For the area of Folk Literature, including Epics/Myths – Grade 10

Learning task: After studying an epic text, students work in online groups to develop a digital mind map or infographic that models the system of characters, mythical space, and mythical time of the work. Then, group representatives present their products to the class using presentation tools.

Integrated digital competence components:

DC1.4: Organizing and managing digital information;

DC2.3: Collaborating in digital environments;

DC5.3: Using digital tools for presentation.

This task transforms the traditional activity of summarizing a text into a visual design task, helping students practice data thinking.

b. For the area of Medieval Literature, including transmitted Nom poetry / verse narratives – Grade 11

Learning task: The teacher assigns students to write an expository essay or a short research report on "Artistic style characteristics and humanitarian inspiration in medieval poetry." Students are required to use advanced search tools to retrieve materials and digital learning resources from online electronic libraries, while also accurately following citation conventions and digital footnoting procedures to demonstrate that plagiarism has not occurred.

Integrated digital competence components:

DC1.2: Searching for digital information.

DC3.1: Complying with intellectual property rights.

Here, technology helps manage academic integrity within the space of classical literature.

c. For the area of Social Argumentation and Informational Texts, Modern Period – Grade 12

Learning task: Organize a process-based online debate on the topic: "The impact of AI on literary creativity."

Implementation process: In the preparation stage, students use AI to search for opposing streams of opinion and classify digital evidence into two groups, "supporting" and "opposing", in order to build an argumentative "strategy map" at the understanding level. During the writing and speaking stage, students conduct trial rebuttals with AI, asking AI to detect logical errors in their arguments so that they can adjust their personal writing style at the application level. In the summary stage, students synthesize interaction data to create a short video or blog post expressing an independent viewpoint at the creativity level.

Integrated digital competence components:

DC1.3: Evaluating the reliability of information.

DC3.2: Using technology and AI responsibly.

DC2.1: Interacting in digital environments.

DC5.2: Creating digital content.

Designing tasks according to this process is consistent with the perspective of integrated teaching and activity-based learning, in which learners act as agents who construct knowledge through meaningful learning experiences [7]. This approach is also grounded in constructivist theory, which emphasizes learners' active role in constructing knowledge through interaction with the environment and learning activities [8], [9].

3.3.3. Assessing students' levels of attainment

Assessment is conducted based on the system of behavioral indicators of digital competence in the matrix, while also being linked to three specific cognitive levels to ensure quantifiability and feasibility in the school environment. To prevent this tool from remaining at the level of an abstract concept, the research team develops a table of criteria for quantitatively differentiating students' behaviors in relation to key indicators.

Table 2. *Quantitative assessment criteria for integrated digital competence in Literature*

Criteria / Indicators	Level 1: Recognition	Level 2: Understanding	Level 3: Application
Evaluating digital information sources Reading Strand – DC1.3	Students access only the first single source found online; they have no awareness of cross-checking and passively accept information from AI or the Internet.	Students collect information from at least two different online sources; they initially compare information and detect vague information errors or AI-generated "hallucinated" content.	Students critically evaluate and point out reasonable points and limitations in arguments from AI or online documents; they clearly distinguish between objective data and the subjective bias of online writers.
Academic integrity Writing Strand – DC3.1	Students copy verbatim online data or AI-generated texts into their writing without declaration, committing technological plagiarism.	Students know how to systematically take notes and store digital documents; they cite source names or AI tools used at the end of the writing but not yet in accordance with accepted academic conventions.	Students clearly distinguish between machine-suggested parts and personally developed parts; they accurately perform citation and digital footnoting procedures for all reference data from the Internet.
Digital communication and creation Speaking–Listening and Writing Strands – DC2.1 and DC5.2	Students only perform basic technical operations, such as logging into online learning platforms, sending short responses, or presenting plain-text slides.	Students flexibly use interactive features, such as forum discussions and Padlet; they create basic digital graphic products, such as Canva designs and digital mind maps, to support their arguments.	Students maintain their personal writing style despite machine suggestions; retrieve and process digital data in real time for online rebuttals; and create professional digital products, such as videos, podcasts, or blogs, with impactful reach.

Organizing assessment in this way is consistent with the competency-based assessment orientation of the 2018 General Education Curriculum. At the same time, it allows teachers to monitor students' development not only through final products but also through their process of participating in learning in the digital environment.

4. Conclusion

This article has proposed a digital competence integration matrix for teaching Literature at the upper secondary level, developed by comparing the required learning outcomes of the 2018 General Education Curriculum with the components of the Digital Competence Framework for Learners. The results show that the four skill strands of the subject - reading, writing, speaking, and listening - can be closely connected with core digital competence groups, most notably the competencies of information exploitation, content creation, and ethical responsibility in the digital environment.

The contribution of the matrix is that it helps reduce teachers' uncertainty regarding pedagogical orientation: it concretizes measurable behavioral indicators and is accompanied by a system of illustrative examples ranging from folk and medieval literature to modern literature. Instead of the previous fragmented use of technology, the proposed matrix creates a coherent structure, shifting technology from the role of a supporting tool to a component deeply integrated into the process of developing linguistic thinking and aesthetic competence. As a result, decisions concerning technology selection, task design, and the construction of assessment criteria are linked within a shared pedagogical logic rather than remaining separate as before.

Accordingly, the integration of digital competence reinforces the role of teachers as designers and coordinators of learning experiences, while also helping students maintain their position as thinking subjects under the pressure of AI. The accompanying system of quantitative indicators makes assessment more transparent, allowing teachers to monitor learners' competence development process rather than relying solely on final products.

In practical terms, the matrix can serve as a "navigation map" that helps teachers design lesson plans and develop relatively objective assessment rubrics. However, as this study remains at the level of constructing a conceptual framework and application model, subsequent studies need to conduct large-scale pedagogical experiments to verify its effectiveness in relation to actual learning outcomes. In addition, technical infrastructure conditions and teachers' readiness in digital competence also need to be further investigated to ensure feasibility when implemented in the current context of educational digital transformation.

REFERENCES

[1] N. Law, D. Woo, J. de la Torre, and G. Wong, "A global framework of reference on digital literacy skills," UNESCO, 2018.

[2] Ministry of Education and Training, *General Education Program in Philology (Issued with Circular No. 32/2018/TT-BGDĐT dated December 26, 2018)*, 2018.

[3] Prime Minister, *the Scheme "Strengthening the application of information technology and digital transformation in education and training for the 2022-2025 period, with a vision to 2030"*, Decision No. 131/QD-TTg dated January 25, 2022.

[4] Ministry of Education and Training, *the Digital Competency Framework for Learners*, Circular No. 02/2025/TT-BGDĐT dated January 24, 2025.

[5] UNESCO, "Digital skills critical for jobs and social inclusion," *unesdoc.unesco.org,* 2018. [Online]. Available: https://unesdoc.unesco.org/ark:/48223/pf0000262114 [Accessed March 05, 2026].

[6] R. Vuorikari, S. Kluzer, and Y. Punie, "*DigComp 2.2: The Digital Competence Framework for Citizens*," European Commission, 2022.

[7] D. H. Jonassen, "Objectivism versus constructivism: Do we need a new philosophical paradigm?," *Educational Technology Research and Development*, vol. 39, no. 3, pp. 5–14, 1991. DOI: 10.1007/BF02296434.

[8] J. Piaget, *The Psychology of the Child*. New York: Basic Books, 1972.

[9] L. S. Vygotsky, *Mind in society: The development of higher psychological processes*. Harvard University Press, 1978. DOI: 10.2307/j.ctvjf9vz4.