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Teaching creativity with emerging digital tools: A systematic review

La enseñanza de la creatividad con herramientas digitales emergentes: una revisión sistemática

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Abstract

This systematic review explores the most recent studies, published between 2021 and 2025, on teaching creativity in Lima classrooms using emerging digital tools. The PRISMA method was applied to rigorously identify, filter, and select 22 key scientific articles from recognized databases such as Scopus, Web of Science, ScienceDirect, and complementary sources. The findings reveal that innovative tools such as gamification, virtual environments, artificial intelligence, augmented reality, and makerspaces significantly activate creative thinking, increase motivation, and foster active student engagement. These impacts are amplified when integrated with dynamic pedagogical methodologies, such as design thinking or project-based learning, which encourage students to experiment, collaborate, and solve real-world problems. Furthermore, the success of these initiatives depends largely on teachers' strong digital skills and institutional policies committed to digital transformation, which pave the way for truly innovative educational practices adapted to the local context. Even so, significant challenges arise that cannot be ignored: the digital divide limits equitable access, teacher training remains insufficient in many cases, and the methodological heterogeneity of the reviewed studies complicates comparisons. Essentially, the pedagogical integration of these technologies not only promotes the full development of educational creativity but also emerges as an essential strategic axis for renewing and enhancing educational processes in the 21st century.

Keywords: creativity, emerging digital tools, education, active methodologies, digital transformation.

Resumen

Esta revisión sistemática explora los estudios más recientes, publicados entre 2021 y 2025, sobre la enseñanza de la creatividad en las aulas de Lima mediante herramientas digitales emergentes. Se aplicó el método PRISMA para identificar, filtrar y seleccionar con rigor 22 artículos científicos clave de bases de datos reconocidas como Scopus, Web of Science, ScienceDirect y fuentes complementarias. Los hallazgos revelan que herramientas innovadoras como la gamificación, entornos virtuales, inteligencia artificial, realidad aumentada y *makerspaces* activan de manera notable el pensamiento creativo, elevan la motivación y fomentan la implicación activa de los estudiantes. Estos impactos se intensifican al integrarlas con metodologías pedagógicas dinámicas, como el *design thinking* o el aprendizaje basado en proyectos, que invitan a los alumnos a experimentar, colaborar y resolver problemas reales. Además, el éxito de estas iniciativas depende en gran medida de las competencias digitales sólidas de los docentes y de políticas institucionales comprometidas con la transformación digital, las cuales pavimentan el camino hacia prácticas educativas verdaderamente innovadoras y adaptadas al contexto local. Aun así, surgen desafíos significativos que no pueden ignorarse: la brecha digital limita el acceso equitativo, la formación docente aún resulta insuficiente en muchos casos y la heterogeneidad metodológica de los estudios revisados complica las comparaciones. En esencia, la integración pedagógica de estas tecnologías no solo promueve el desarrollo pleno de la creatividad educativa, sino que emerge como un eje estratégico esencial para renovar y potenciar los procesos formativos en el siglo XXI.

Palabras clave: creatividad, herramientas digitales emergentes, educación, metodologías activas, transformación digital.

Introduction

The interplay between creativity and digital tools has become a central concern in today's demanding educational contexts, where these technologies not only provide access to a vast universe of resources but also invite students to experiment, design, and construct innovative solutions within interactive and dynamic environments. For instance, design experiences supported by digital tools —such as tablets, 3D printers, or design applications— have been shown to foster design thinking and creativity from childhood by promoting hands-on experimentation and rapid prototyping (Kolesnyk et al., 2025). Likewise, the introduction of gamified digital methodologies has proven to significantly boost motivation and divergent thinking, consolidating these approaches as valid means of nurturing creativity within active learning experiences (Sailer & Homner, 2020).

On a global scale, the integration of emerging digital tools is affirmed as one of the most powerful pathways for enhancing creativity in educational settings. In this vein, recent research highlights how digital gamification, implemented through virtual platforms, not only increases motivation but also activates key cognitive processes underlying creative thought (Lee, 2023). Similarly, the international literature underscores that the development of educational artificial intelligence transforms how students generate ideas, select problem solutions, or explore new creative languages, thereby introducing a technological mediation that positions teachers in a more active and facilitative role (Cerný, 2023).

Active digital methodologies thus contribute notably to deep learning and the cultivation of creative competencies. This observation is reinforced by López et al. (2024) in their systematic review, where they note that creativity stands as a pivotal element in technology-based pedagogical models for sustainable development, driving active inquiry, critical analysis, and educational innovation. Along the same lines, Clemente and Jacques (2022) identify a robust connection between digitally gamified environments and constructivist frameworks, which enable students to generate original solutions through design, simulation, and practical application activities.

Furthermore, recent international experiences confirm that technology-enhanced learning environments (TELEs) and immersive digital tools go beyond sustaining instructional processes: they amplify creativity through multimodal activities, asynchronous collaboration, and adaptive scaffolding (Dzikri et al., 2025). Qualitative and systematic studies, for example, reveal that such TELEs, oriented toward autonomy and co-creation, favor the generation of original ideas and agile prototyping (Xie et al., 2024).

In the Latin American context, Arroyo (2025) highlights that the use of digital tools to foster creativity has grown significantly over the past decade, particularly in teacher education. Saavedra and Fuentes-Vilugrón (2023) confirm this trend by documenting increased scientific production on gamification and educational technologies in the region, reflecting a growing interest in developing creative competencies through interactive platforms and digital tools. Consequently, it appears that Latin America remains in a consolidation phase with respect to designing robust creative strategies supported by ICT (Tenorio-Molina et al., 2023).

During the pandemic, countries across the region implemented various digital strategies that not only ensured learning continuity but also spurred students' creative development through virtual tools. García and Escribano (2023), for instance, demonstrated that digital gamification in humanities courses stimulates both narrative creativity and critical historical thinking. Moreover, Lizarro (2024) observes that Latin American universities are progressively incorporating digital tools for design, multimedia editing, and collaborative creation, thereby enriching the creative repertoire of both faculty and students.

Research on the integration of digital technologies in higher education points to notable advances —such as the use of platforms, collaborative tools, and gamification— though structural barriers related to infrastructure and teacher training persist. Nevertheless, resources such as Kahoot!, Jamboard, collaborative whiteboards, and other interactive tools stand out, as they facilitated creative activities and greater participation during the pandemic by enabling pedagogical practices that promote the collective and simultaneous generation of ideas (Okoye et al., 2023; Salas-Rueda et al., 2023).

In the Peruvian context, various studies highlight digital tools as key resources for enhancing students' creative thinking. In this regard, Huayllani et al. (2025) demonstrated that interactive digital resources integrated into educational programs significantly improve creative thinking among primary school students. Similarly, a review of the Spanish-language literature confirms that, in Peru, virtual spaces, digital platforms, and technology-based didactic resources have favored the development of creativity in the classroom (González & Molero, 2021).

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Besides, in higher education, a clear relationship exists between university professors' digital competencies and their capacity to promote creativity through technological tools. Contreras et al. (2022) argue that teachers with strong digital proficiency employ innovative techniques —such as multimedia content design, interactive virtual platforms, and authoring resources— to stimulate their students' creative thinking. Consequently, the development of creative thinking in Peruvian classrooms depends to a great extent on how these digital resources are pedagogically integrated.

Within this same framework, recent assessments of the digital transformation process in the Peruvian educational system reveal that the combination of tools such as hybrid platforms, virtual environments, and interactive resources constitutes a necessary condition for fostering creative practices. However, local studies emphasize that mere technological availability is insufficient: targeted teacher training and institutional policies guiding effective pedagogical use are equally required (Colina-Ysea et al., 2024; Alvarado et al., 2024).

Specifically, in Lima, applied research shows that strengthening teachers' digital competencies, along with the use of concrete tools such as collaborative whiteboards, content managers, or multimedia creation platforms, generates more creative pedagogical practices and greater student motivation (Bringas et al., 2023). Likewise, case studies and surveys conducted at universities and institutes in Lima indicate that investing in teacher training and in simple yet pedagogically well-designed tools would enhance teachers' capacity to promote creative activities (Rodríguez-Barboza et al., 2023).

In this context, the present systematic review focuses on answering the following research question: how has the teaching of creativity through emerging digital tools developed in the educational setting of Lima during the 2021–2025 period? Accordingly, the general objective consists of analyzing recent theoretical and empirical studies that address pedagogical practices, methodological approaches, limitations, and opportunities arising from the incorporation of technologies aimed at enhancing student creativity. Special emphasis is placed on creative digital platforms, virtual experimentation environments, technology-mediated teaching strategies, and contemporary trends that condition the integration of emerging tools for developing creative competencies across diverse educational contexts.

Methodology

As Hernández Sampieri and Mendoza (2018) point out, the systematic review constitutes a formal methodological process characterized by a clearly delimited sequence from conception to completion. This rigorous design involves conducting an exhaustive search for studies, meticulous selection, and synthesis of the most relevant findings. Accordingly, the present work adopts the approach of a narrative systematic review, elaborated in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines.

The primary purpose is to identify advances, limitations, and determining factors in the teaching of creativity through emerging digital tools in educational processes, specifically during the 2021–2025 period. To this end, recent theoretical and empirical studies addressing the intersection between technology and creative pedagogy are analyzed.

Eligibility criteria

For inclusion in this systematic review, only those studies that simultaneously met the following characteristics were considered: scientific publications produced between 2021 and 2025; peer-reviewed articles in the fields of creativity, educational innovation, emerging digital tools, and formative processes; investigations that specifically analyzed creative digital platforms, virtual environments, interactive applications, augmented reality, gamification, artificial intelligence applied to education, or any technology related to creativity development; and studies published in English, Spanish, or Portuguese with full-text access.

Conversely, works presenting any of the following limitations were excluded: publications prior to 2021; documents without full-text access; studies with an exclusively technical-technological focus lacking connection to teaching-learning processes; or research centered on professional artistic creativity unrelated to educational settings.

Information sources

To ensure a broad and rigorous search, databases widely recognized for their academic robustness were consulted. Scopus was selected for its multidisciplinary coverage and focus on educational technology studies; ScienceDirect for its specialization in educational research, applied technologies, and cognitive sciences; Web of

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Science (WoS) due to the high impact and quality of its indexed publications; and Google Scholar as an essential complementary source for identifying recent or regional literature that might not appear in the main databases.

PRISMA study selection process

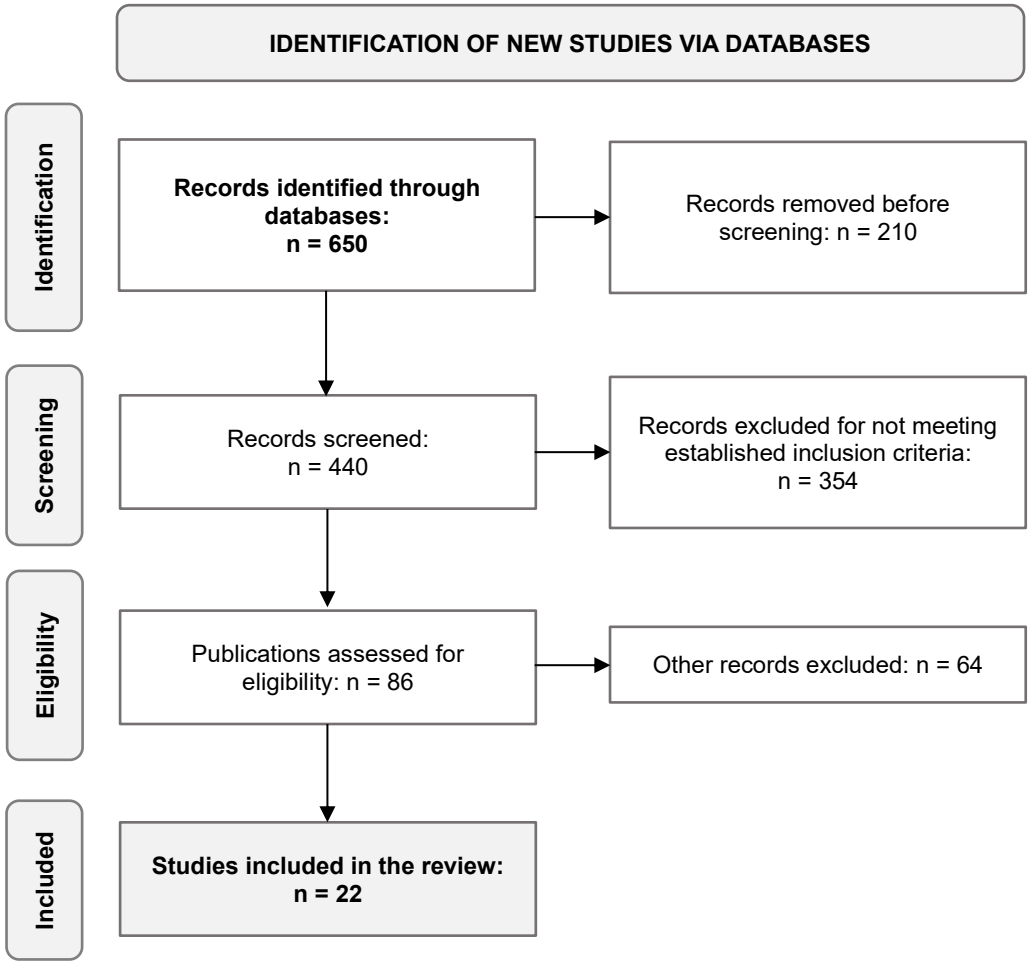
Following the PRISMA protocol, the study selection process was structured into four clearly defined phases.

- **Identification:** An initial 650 records were identified from academic databases. Of these, 210 were duplicates and automatically removed, leaving 440 unique records.
- **Screening:** In this phase, titles and abstracts of the 440 records were reviewed, excluding 138 studies that did not meet the inclusion criteria, so that 302 records advanced to the next stage.
- **Eligibility:** Of the 302 identified records, 86 full texts were retrieved for detailed assessment. Of these, 64 were excluded for specific reasons (30 for lack of educational focus, 18 for publication prior to 2021, 10 for no relation to emerging digital tools, and 6 for other criteria), leaving 22 eligible studies.
- **Inclusion:** Finally, 22 studies met all eligibility criteria and were incorporated into the qualitative synthesis of this systematic review.

To visually represent these phases of identification, screening, eligibility assessment, and inclusion, the PRISMA Flow Diagram (Page et al., 2021) was prepared and is presented in Figure 1. This diagram documents the complete traceability of the process and ensures transparency in the selection of articles focused on educational creativity and the use of emerging digital tools.

Figure 1

PRISMA flow diagram of the exclusion and inclusion process



Results

The initial database search identified 650 documents addressing educational creativity driven by emerging digital tools. Table 1 shows a clear distribution: Web of Science dominates with 57% of publications, while Scopus contributes the remaining 43%. This trend underscores the growing scientific interest in the transformative power of technologies such as self-regulation platforms, collaborative applications, interactive resources, and artificial intelligence in the development of creative thinking.

Table 1

Frequencies of scientific articles per database

Database	Absolute frequency (n)	Relative frequency (n/N)	Percentage (%)
Scopus	280	0.43	43 %
Web of Science	370	0.57	57 %
Total	**650**	**1.00**	**100 %**

Note. Total published quantities include duplicate or incomplete articles. In this analysis, N represents the total number of identified articles (N = 650), while n corresponds to the number of publications per database

Table 2

Selected articles for the study

Author(s)	Title	Main definitions
Alvarado, Fernández & Meneses (2024)	*Transformation and digital challenges in Peru during the COVID-19 pandemic, in the educational sector between 2020 and 2023. Systematic review*	The review shows that accelerated digitalization transformed educational processes, driving the use of technologies that strengthen creative and adaptive competencies in teachers and students.
Arroyo (2025)	*ICTs as pedagogical tools in Latin America: a systematic review*	The study highlights that ICTs enhance active methodologies that favor creativity, especially in virtual and blended learning contexts.
Bringas, Carranza & Carrillo (2023)	*Digital competences in teachers of a public university of Peru during the COVID-19 pandemic*	Strengthening teachers' digital competences is shown to contribute to the development of innovative and creative activities in higher education.
Černý (2023)	*Artificial intelligence, creativity and education: finding a new perspective*	The author argues that artificial intelligence expands creative possibilities through tools that support divergent thinking and innovative problem-solving.
Clemente & Jacques (2022)	*Integrated gamification model in a constructivist learning environment for the promotion of creative skills*	A gamified model is proposed that stimulates creativity through constructivist and motivational dynamics.
Colina-Ysea et al. (2024)	*Implementation of hybrid education in Peruvian public universities: The challenges*	The study highlights that hybrid education demands the use of digital tools, as they foster innovation, creativity, and student autonomy.
Dzikri, Afriani & Krisnawati (2025)	*Fostering creativity through technology-enhanced learning environments*	The authors conclude that technology-enriched environments promote creative skills through dynamic and collaborative activities.
García & Escribano (2023)	*Gamification, pandemic and learning of the history of ideas*	Gamification is evidenced as an effective strategy for enhancing motivation and creativity, even in remote educational contexts.

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González & Molero (2021)	*Systematic review of creativity didactic tools and resources developed in Spanish*	Multiple didactic resources aimed at developing creativity are identified, highlighting their positive impact on learning.
Huayllani, Estrada & Cruz (2025)	*Effectiveness of an educative program in creative thinking development for Peruvian primary students*	The applied program shows significant improvements in creative skills, reinforcing the value of active methodologies.
Kolesnyk et al. (2025)	*Fostering Creativity in School Makerspaces*	The authors show that makerspaces promote creative thinking through design, experimentation, and problem-solving.
Lee (2023)	*Effectiveness of gamification and selection of appropriate teaching methods of creativity.*	Gamification is concluded to be highly effective for enhancing creativity, provided that methods appropriate to the student profile are used.
Lizarro (2024)	*University teaching: creativity and innovation with digital tools*	Digital tools are highlighted as enabling innovative experiences that drive creativity in higher education.
López, Vázquez & Salmerón (2024)	*The contributions of creativity to the learning process within educational approaches for sustainable development*	Creativity is presented as a core element for transformative learning oriented toward sustainable development.
Contreras et al. (2022)	*Digital skills in the development of creativity of teachers of a public university in Lima*	Mastery of digital teaching skills is shown to be directly linked to the fostering of academic creativity.
Okoye et al. (2023)	*Impact of digital technologies upon teaching and learning in higher education in Latin America*	The authors note that digital technology reduces educational barriers and strengthens innovative practices that develop student creativity.
Rodríguez-Barboza et al. (2023)	*The use of digital tools to promote motivation at the higher level*	The use of digital tools increases motivation and favors creative initiatives among university students.
Saavedra & Fuentes-Vilugrón (2023)	*Scientific production and thematic analysis of gamification in initial teacher training*	Gamification is identified as a strategy that increases creativity and participation in teacher education.
Sailer & Homner (2020)	*The gamification of learning: A meta-analysis*	The meta-analysis confirms that gamification improves creativity, motivation, and academic engagement.
Salas, Eslava & Alvarado (2023)	*Use of Kahoot! and Jamboard for creative school activities*	Interactive tools such as Kahoot! and Jamboard are shown to boost creativity and active learning.
Tenorio-Molina et al. (2023)	*Design thinking program on the Google Classroom platform on creativity in high school students*	Design thinking in digital environments notably improves creativity and problem-solving.
Xie, Gong & Bao (2024)	*Using augmented reality to support students reading emotions and engagement*	Augmented reality facilitates immersive experiences that stimulate creativity, interaction, and participation.

Source. Authors' own elaboration.

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Table 2 reveals a body of studies that delve into the impact of digital technologies, active methodologies, and innovative educational proposals on the development of creativity across all educational levels. These investigations —originating from various international contexts— converge in highlighting the relevance of integrating digitalization, gamification, artificial intelligence, makerspaces, and digital environments to genuinely enhance students' creative competencies.

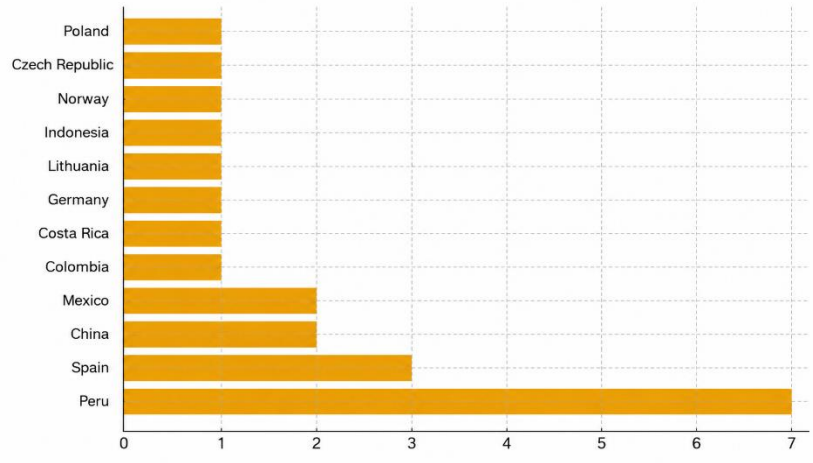
Alvarado et al. (2024) and Arroyo (2025), for instance, illustrate how rapid digitalization and the implementation of ICT during and after the pandemic transformed teaching, opening the way for more creative and participatory experiences. Along similar lines, Bringas et al. (2023), Contreras et al. (2022), and Colina-Ysea et al. (2024) demonstrate that strengthening teachers' digital competences generates innovative practices in higher education, especially by directly and effectively fostering creative thinking.

Furthermore, Clemente and Jacques (2022), Lee (2023), García and Escribano (2023), together with Sailer and Homner (2020), confirm that gamification and interactive resources significantly elevate student motivation, participation, and creativity. Dzikri et al. (2025), Kolesnyk et al. (2025), and Tenorio-Molina et al. (2023), for their part, provide evidence for the efficacy of technology-enriched environments, makerspaces, and design thinking programs in not only improving creativity but also channeling it toward innovative solutions for real-world problems.

Finally, Xie et al. (2024) and Salas-Rueda et al. (2023) highlight how emerging technologies —such as augmented reality and interactive platforms— enhance creativity through immersive and dynamic experiences that foster authentic collaboration.

Figure 1

Number of studies per country

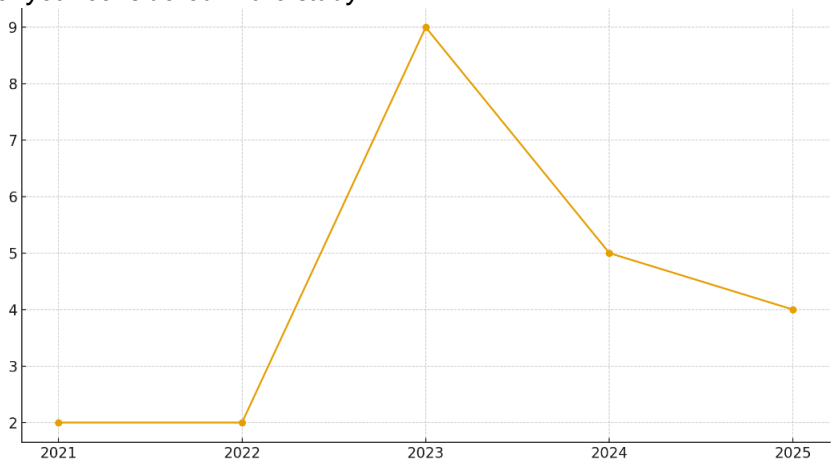


Source. Authors' own elaboration

The figure reveals that Peru leads with 7 studies, evidencing growing national interest in exploring the intersection between creativity and emerging digital tools. Spain follows with 3 publications, while China and Mexico tie for second place with 2 studies each; the remaining countries contribute a single investigation (n = 1). This heterogeneous distribution, with a predominance of Latin American and European contributions but notable input from Asia and Nordic countries, confirms the global dimension of the phenomenon.

Figure 2

Number of articles per year considered in the study



Source. Authors' own elaboration

The figure confirms a clear increase in research on creativity and emerging digital tools beginning in 2023, when it reaches its historical peak. While scientific production remained low and steady in 2021 and 2022, the years 2024 and 2025 show a slight decline, though they still surpass initial levels. Thus, 2023 consolidates as the year of greatest research activity on this topic.

Discussion

This systematic review (2021–2025) demonstrates that creativity and emerging digital tools have become essential pillars of educational processes, driven to a large extent by the technological acceleration during COVID-19. Various studies concur that digital technologies, active methodologies, and interactive resources not only transformed teaching-learning dynamics but also elevated creative, motivational, and collaborative competencies across all educational levels.

Among the most prominent contributions, gamification stands out as a key catalyst for creativity. García and Escribano (2023), Lee (2023), and Sailer and Homner (2020) confirm that this strategy significantly increases motivation, creative thinking, and student engagement. In this line, Clemente and Jacques (2022) propose gamified models from a constructivist perspective that effectively stimulate divergent thinking.

On the other hand, Bringas et al. (2023), Contreras et al. (2022), and Colina-Ysea et al. (2024) underscore that teacher training in digital competencies is fundamental for generating innovative environments that directly impact student creativity. Moreover, the digitalization initiated by the pandemic has evolved into consolidated practices that integrate virtual platforms, multimedia resources, and hybrid strategies.

Likewise, Dzikri et al. (2025), Kolesnyk et al. (2025), and Tenorio-Molina et al. (2023) demonstrate that emerging technologies such as makerspaces, collaborative environments, design thinking, and project-based learning produce notable improvements in creativity by promoting experimentation, solution design, and authentic problem-solving.

Finally, advanced technologies such as artificial intelligence (Cerný, 2023) and augmented reality (Xie et al., 2024) reveal transformative potential by offering immersive experiences that enhance divergent thinking. Taken together, these findings delineate a twenty-first-century educational model in which creativity is inextricably intertwined with emerging digital tools.

Limitations

This systematic review presents several limitations that should be considered when interpreting its results. First, the methodological heterogeneity of the analyzed studies represents a significant challenge: while most adopt experimental designs, others employ qualitative or descriptive approaches, making direct comparisons between findings difficult and limiting the synthesis of results.

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Furthermore, the low representation of studies from Latin America and Peru, in contrast to the abundance of European and Asian research, restricts the capacity to extrapolate conclusions to local contexts, reducing the direct applicability of the findings to the Lima educational setting.

On another note, conceptual confusion surrounding creativity is observable, with the construct predominantly addressed from a cognitive perspective, though it also appears from technological, pedagogical, or socio-emotional angles. This diversity of definitions complicates the construction of a unified theoretical model that integrates all dimensions of creativity in digital contexts.

Finally, the absence of open data and the limited number of studies with practical applied methodologies restrict both the scope of the analysis and the robustness of the research corpus, thereby constraining opportunities for external validation and replicability of the findings.

Implications and future research directions

From a theoretical standpoint, this review offers an integrative view of the intersection between creativity, emerging digital tools, and active methodologies, laying the groundwork for future conceptual models that examine the impact of technology on creative development across different educational levels.

In practical terms, these results provide valuable tools for teachers, educational administrators, and curriculum designers. They may serve as a foundation for strengthening innovative pedagogical strategies, optimizing technological integration in the classroom, and designing specific activities that stimulate students' creative thinking. Likewise, educational institutions will find clear guidance for implementing ongoing teacher training processes and updating institutional policies regarding the strategic incorporation of emerging technologies.

For future research, several priority approaches are recommended: comparative experimental studies across countries to contextualize findings; analyses of the impact of generative artificial intelligence tools; investigations exploring the relationship between teacher digital literacy and the development of student creativity; evaluations of the effect of active methodologies in specific Latin American contexts; and explorations of the role of immersive environments in sustainable and scalable educational models.

Conclusions

This systematic review documents a progressive and sustained increase in scientific production on creativity and emerging digital tools between 2021 and 2025. It appears evident that the educational digitalization accelerated by the COVID-19 pandemic catalyzed innovative methodologies that combine emerging technology with creative processes, generating lasting academic interest in how these tools enhance creative thinking across diverse educational settings.

The 22 studies analyzed converge in indicating that emerging digital tools exert a direct positive impact on students' creative development. They favor active experimentation, divergent thinking, creative problem-solving, and intrinsic motivation, configuring what is recognized as authentic creative learning.

Furthermore, the teacher's role emerges as a determining factor: solid digital competencies and mastery of technology-mediated active methodologies prove essential for maximizing creative potential. This conclusion is supported by research from Peru, Spain, Colombia, Mexico, Indonesia, and other countries, which concur that teacher training constitutes an indispensable condition for transforming digitalization into genuine creative processes in the classroom.

Creativity is also significantly enhanced when digital tools are integrated with pedagogies such as design thinking, project-based learning, gamification, and immersive experiences. These approaches, present in the majority of studies, shift traditional educational dynamics toward models centered on active participation, play, and student agency. In Latin American contexts, digitalization further contributes to reducing gaps in access and participation, promoting greater inclusion, dynamism, and autonomy in learning.

Nevertheless, various studies warn of persistent obstacles such as limitations in connectivity, teacher training, and technological availability, which condition equitable access to these innovative practices. Although the methodological heterogeneity of the reviewed research precludes the formulation of a single model for the technological impact on creativity, the consistency of results allows for the confident assertion that the pedagogical integration of interactive technologies stands as a cornerstone for promoting creativity and educational innovation in the twenty-first century.

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References

Alvarado, A., Fernández, J., & Meneses, B. (2024). Transformation and digital challenges in Peru during the COVID-19 pandemic, in the educational sector between 2020 and 2023: Systematic review. *Data & Metadata, 3*. https://doi.org/10.56294/dm2024232

Arroyo Cabeza, L. E. (2026). Las TIC como herramientas pedagógicas en Latinoamérica: una revisión sistemática. *Revista InveCom, 6*(1). 1-7. https://zenodo.org/records/15542468

Bringas, A., Carranza, R., & Carrillo, L. (2023). Digital competences in teachers of a public university of Peru during the COVID-19 pandemic. *LACCEI Proceedings, 5*(1). https://doi.org/10.18687/LACCEI2023.1.1.211

Černý, M. (2023). Artificial intelligence, creativity and education: finding a new perspective. *Journal of Applied Technical and Educational Sciences*, *13*(3), Artículo 353. https://doi.org/10.24368/jates353

Clemente, X., & Jacques, F. (2022). Integrated gamification model in a constructivist learning environment for the promotion of creative skills. *Creativity. Theories–Research–Applications, 9*(1), 15–29. https://doi.org/10.2478/ctra-2022-0001

Colina-Ysea, F., Pantigoso-Leython, N., Abad-Lezama, I., Calla-Vásquez, K., Chávez-Campó, S., Sanabria-Boudri, F. M., & Soto-Rivera, C. (2024). Implementation of hybrid education in Peruvian public universities: The challenges. *Education Sciences, 14*(4), 419. https://doi.org/10.3390/educsci14040419

Contreras Moreno, G., Santa María Relaiza, H., Ganoza Salazar, K., & Toribio Alejo, L. (2022). Digital skills in the development of creativity of teachers of a public university in Lima. *International Journal of Health Sciences, 6*(S7), 604–619. https://doi.org/10.53730/ijhs.v6nS7.11210

Dzikri, A., Afriani, G., & Krisnawati, N. (2025). Fostering creativity through technology-enhanced learning environments. *Global Education Journal, 3*(2), 455–462. https://journal.civiliza.org/index.php/gej/article/download/675/649/3447

García Fernández, G. A., & Escribano Roca, R. (2023). Gamificación, pandemia y aprendizaje de la historia de las ideas. Experimentos en el contexto Core Currículum. *RIED-Revista Iberoamericana de Educación a Distancia, 26*(2), 69–87. https://doi.org/10.5944/ried.26.2.36246

González, A., & Molero, M. (2021). Systematic review of creativity didactic tools and resources developed in Spanish. *Revista Digital de Investigación en Docencia Universitaria, 15*(2), 426–446. https://doi.org/10.19083/ridu.2021.1440

Hernández Sampieri, R., & Mendoza Torres, C. (2018). Metodología de la investigación: las rutas cuantitativa, cualitativa y mixta. McGraw-Hill Education. https://virtual.cuautitlan.unam.mx/rudics/?p=2612

Huayllani Palomino, V. J. de D., Estrada-Araoz, E. G., & Cruz-Laricano, E. O. (2025). Effectiveness of an educational program in the development of creative thinking in Peruvian primary school students. *Sapienza: International Journal of Interdisciplinary Studies*, *6*(2), e25028. https://doi.org/10.51798/sijis.v6i2.1018

Kolesnyk, L., Olafsson, B., Groth, C., & Lutnæs, E. (2025). Fostering creativity in school makerspaces: Principles and a framework for assessing creativity-supportive design. *Design and Technology Education: An International Journal*, *30*(2), 49-64. https://doi.org/10.24377/DTEIJ.article3367

Lee, K-W. (2023). Effectiveness of gamification and selection of appropriate teaching methods of creativity. *Heliyon, 9*(10), e20420. https://doi.org/10.1016/j.heliyon.2023.e20420

Lizarro Guzmán, N. (2024). University teaching: creativity and innovation with digital tools. *Pensamiento Americano*, *15*(29), 15-29. https://doi.org/10.21803/penamer.15.29.446

López, U. H., Vázquez-Vílchez, M., & Salmerón-Vílchez, P. (2024). The contributions of creativity to the learning process within educational approaches for sustainable development and/or ecosocial perspectives: A systematic review. *Education Sciences*, *14*(8), 824. https://doi.org/10.3390/educsci14080824

Okoye, K., Hussein, H., Arrona, A., Quintero, H., Peña, L., López, A., Arias, E., Escamilla, J., & Hosseini, S. (2023). Impact of digital technologies upon teaching and learning in higher education in Latin America: An outlook on the reach, barriers, and bottlenecks. *Education and Information Technologies, 28*, 2291–2360. https://doi.org/10.1007/s10639-022-11214-1

Page, M.J., McKenzie, J.E., Bossuyt, P.M. *et al.* (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *Systematic Reviews, 10*(89). https://doi.org/10.1186/s13643-021-01626-4

Rodríguez-Barboza, J. R., Pablo-Huamani, R., Rey-Sánchez, S. P., & Vergara-Calderón, R. S. (2023). El uso de las herramientas digitales para fomentar la motivación en el nivel superior. *Scientific Research Journal CIDI, 3*(5), 42–56. https://srjournalcidi.org/index.php/ojs/article/view/12

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Saavedra, E., & Fuentes-Vilugrón, G. (2023). Producción científica y análisis temático sobre gamificación en la formación inicial docente (2015-2023). *e-Ciencias de la Información, 13*(2), e436. https://doi.org/10.15517/1whb0w10

Sailer, M., & Homner, L. (2020). The gamification of learning: A meta-analysis. *Educational Psychology Review, 32*, 77–112. https://doi.org/10.1007/s10648-019-09498-w

Salas-Rueda, R.-A., Eslava-Cervantes, A.-L., & Alvarado-Zamorano, C. (2023). Use of Kahoot! and Jamboard for the realization and organization of creative school activities during the COVID-19 pandemic. *Creativity Studies, 16*(2), 784–804. https://doi.org/10.3846/cs.2023.15875

Tenorio-Molina, G., Medina-Altamirano, N., Enriquez-Gavilan, N., Quispe-Solano, M., Lopez-Curasma, A., & Cochachi-Quispe, A. (2023). Design thinking program on the google classroom platform on creativity in high school students. *EAI Endorsed Transactions on Scalable Information Systems, 10*(6). https://publications.eai.eu/index.php/sis/article/view/4024

Xie, X., Gong, M., & Bao, F. (2024). Using augmented reality to support students reading emotions and engagement. *Creative Education, 15*(7), 1256–1268. https://doi.org/10.4236/ce.2024.157076