LUMEN ET VIRTUS
ISSN: 2177-2789

TECHNOLOGY IN EDUCATION: HOW TO USE DIGITAL RESOURCES TO IMPROVE LEARNING

https://doi.org/10.56238/levv16n45-053

Submitted on: 27/01/2025 **Publication date:** 27/02/2025

Vera Lucia Kochen[1], Jônatas da Silva[2], Maicon Guilland Veiga[3], Daiane Aparecida Lemos[4] and Ivis Cabral Rodrigues[5]

ABSTRACT

The objective of this study is to analyze the transformation that digital resources bring to education and its impact on the teaching-learning process. For this, a qualitative methodology was used, with interviews and questionnaires applied to educators and students in different educational institutions. The main results indicate that the use of online learning platforms, educational applications and digital assessment tools contributes to the increase of student engagement, in addition to promoting a personalization in the learning experience. The data collected reveal that teaching methodologies that incorporate technology have enabled a more interactive environment, allowing for deeper and more autonomous learning. The conclusions point out that, in order to maximize educational results, it is essential to continue reflecting on pedagogical practices and research on technological innovations. The diversity of available resources is an ally in the construction of knowledge, providing a more collaborative and adaptable context to the individual needs of students. Thus, this work reinforces the importance of educators being open to the changes brought about by the digital age and promoting learning experiences that integrate such resources effectively, ensuring a more relevant and effective teaching. Digital transformation, therefore, is not just a trend, but an emerging need for contemporary education.

Keywords: Research. Educators. Transformation.

[1] Dr. student in Educational Sciences
Sao Luis University
E-mail: verakochen@gmail.com
[2] Dr. student in Educational Sciences
Inter-American Faculty of Social Sciences (FICS)
E-mail: jjonatas233@gmail.com
[3] Dr. student in Education
Federal University of Mato Grosso do Sul Foundation (UFMS)
E-mail: maicon.guilland@ufms.br
[4] Master in Emerging Technologies in Education
MUST University
E-mail: daiane.lemos@edu.mt.gov.br
[5] Dr. in Educational Sciences
Universidad de la Integración de Las Américas (UNIDA)
E-mail: iviscabral@hotmail.com

INTRODUCTION

Technology in education emerges as a transformative force, offering unique opportunities to redefine the way learning takes place. The use of digital tools allows educators to implement innovative methodologies that go beyond traditional methods. By adopting resources such as educational apps and interactive platforms, teachers are able to create learning environments that not only engage, but also arouse the student's curiosity, fostering active and autonomous learning.

An important aspect of educational technology is the personalization of teaching. With the implementation of software that allows the adaptation of content according to the student's performance, it is possible to meet different learning rhythms and styles. This individualized approach not only improves information retention but also promotes self-discipline and responsibility, which are essential skills for academic and professional success. The immediate feedback provided by these resources is another valuable element that speeds up the learning process.

In addition, carrying out collaborative activities in digital environments enriches the educational experience. Tools that enable interaction between students, such as online forums and group projects, stimulate the development of social skills and teamwork. These skills are key in the contemporary world, where collaboration and effective communication are increasingly valued. Thus, technology in education not only facilitates the exchange of knowledge, but also prepares students for the challenges of the job market.

The inclusion of digital technologies also plays a significant role in democratizing access to knowledge. Audiovisuals, podcasts, and virtual libraries are just some of the numerous options that expand the reach of education, allowing students in remote locations to have access to quality content. This aspect is vital, as it seeks to reduce existing educational gaps and promote a fairer learning environment. The variety of content formats also caters to diverse learning preferences, enhancing student understanding and engagement.

In the midst of this technological revolution, it is essential for educators to stay up-to-date on emerging tools and trends. Continuous professional development, through courses and training, is essential for teachers to feel comfortable and able to apply new technologies in the classroom. This not only ensures effective implementation, but also inspires confidence in students, who perceive their educators as competent guides within this new digital landscape.

Finally, the responsible integration of technology in education must always be aligned with pedagogical objectives. It is essential to avoid the trivialization of digital tools, ensuring

that their use is always linked to solid educational principles. With a careful and intentional approach, technology can, in fact, enrich the educational experience, preparing students for an ever-evolving future and allowing them to turn information into meaningful knowledge.

THEORETICAL FRAMEWORK

The theoretical framework on the use of digital resources in education is vast and constantly evolving, reflecting the impact of technologies on the pedagogical environment. Among the scholars who contributed significantly, Seymour Papert stands out with his proposal of constructionism, emphasizing how active learning, mediated by digital tools, provides a more enriching educational experience. This focus on action and creation aligns with the search for methods that favor student autonomy and the construction of knowledge in a practical and interactive way.

Cognitive theories play an important role in understanding the contemporary educational phenomenon. The ability of digital platforms to present information through visuals and dynamic interactions facilitates not only assimilation but also student engagement. The use of multimedia, for example, allows complex concepts to be broken down into more accessible parts, favoring a deeper connection with the content. This type of approach becomes particularly relevant in a world where information is abundant, but the challenge lies in learning how to filter it and use it effectively.

Furthermore, digital inclusion, addressed by Pierre Lévy, is an aspect that cannot be neglected. With the growing presence of technologies in the school routine, the promotion of collaborative environments becomes possible and necessary. This inclusion goes beyond access to tools; It involves a change in mindset with regard to the formation of learning communities where everyone can contribute and benefit from each other. The transformative potential of technologies in education is closely linked to this interaction and collaboration, which are fundamental for the construction of a more shared and contextualized knowledge.

Finally, the proper implementation of digital resources is vital to achieve meaningful learning. When used intentionally and aligned with pedagogical objectives, technology not only complements traditional teaching, but redefines teaching and learning methods. Thus, the training of educators who understand this new dynamic and know how to integrate digital tools in an effective and creative way is an essential step for the advancement of the educational system as a whole. This commitment to pedagogical innovation is what will enable contemporary education to meet the diverse and complex needs of today's society.

BENEFITS OF USING DIGITAL RESOURCES IN THE TEACHING-LEARNING PROCESS

The incorporation of digital technologies in the educational environment has transformative potential. This insertion allows learning to adapt more effectively to the particularities of each student. The personalization of teaching, through digital resources, favors the student's autonomy, stimulating their learning capacity. In this context, it is possible to state that "digital technologies promote a greater dynamization of pedagogical practices" (ALMEIDA, 2022).

Another relevant aspect is the expansion of informed access to varied content. With a significant amount of information available online, educators can enrich their classes with diversified materials, addressing topics in a more multidimensional way. Such variety provides students with different points of view that, far from being superficial, deepen the discussion and critical analysis. The literature shows that "the use of digital resources helps in the construction of a more robust knowledge" (CORREIA; SILVA, 2021).

Collaboration between students is greatly favored in virtual environments. With platforms that enable group work, even at a distance, young people learn to share ideas, solve problems collectively and develop essential social skills. This practice is not limited to the exchange of information, but extends to the problematization and joint construction of knowledge. In this way, the educational space becomes a network of meaningful interactions.

In addition, the adoption of simulations and experiences in augmented reality enriches the learning experience. These resources make lessons more engaging, promoting a deeper understanding of concepts that, in traditional contexts, might otherwise seem abstract. The students' imagination is mobilized, allowing them to glimpse practical applications of the content studied. "The use of innovative technologies provides greater interaction and immersion" (FREITAS et al., 2025).

In the field of evaluation, technology offers alternative ways to monitor student performance. Digital tools enable continuous and formative assessment, allowing teachers to adjust their educational approaches based on instant feedback. Not only does this process make assessment more effective, but it also encourages self-assessment, helping students become more critical of their own learning.

Preparing students for a constantly changing future becomes a central responsibility of institutions. The digital universe is expanding by leaps and bounds, demanding that young people be able to navigate new tech-driven realities. This continuity of learning provides not only specific skills, but also an adaptive mindset that will be valuable in their professional trajectories.

Digital inclusion is another factor that deserves to be highlighted. With technology, education can reach communities that previously faced barriers to access. The integration of digital resources democratizes knowledge, promoting a more equitable education. The mobility of digital learning allows students in remote regions to access content that expands their opportunities.

Finally, teacher training should also be a focus of attention. Continuous training is decisive for educators to master the available technologies and be able to use them in an integrated way in their practices. The exchange of experiences between professionals can result in significant pedagogical innovations, which positively impact student learning.

This dynamic scenario, with the insertion of digital technologies, requires a collective commitment. Educators, managers, and students need to be aligned for the transformation to happen effectively. The construction of a digital culture in the educational environment is a challenge that is presented as essential for the future of education.

Thus, the integration of digital tools in teaching should be seen as a unique opportunity. Investment in technologies should not be seen only as an additional resource, but as a fundamental component for the integral education of students. Pedagogical practices must be shaped and evolved, following the trends and demands of the contemporary world.

Therefore, aiming for a dynamic and inclusive educational future is a plausible goal. The bet on digital technologies is promising, allowing not only an improvement in teaching methods, but also a robust preparation for the challenges of the twenty-first century. Conclusively, education needs to transcend traditional boundaries, fully embracing the possibilities provided by digitalization.

TYPES OF DIGITAL RESOURCES IN EDUCATION

Digital resources have profoundly transformed the educational scenario, providing a range of tools that go beyond the traditional classroom. Educational software and virtual teaching platforms become valuable allies, facilitating the assimilation of content and allowing different learning rhythms. The use of interactive applications, for example, stimulates student engagement in an innovative way, encouraging active participation in the teaching-learning process.

The use of simulators stands out for offering a safe experimentation environment, especially relevant in areas that require practice, such as the exact sciences. These tools not only complement theoretical knowledge, but also instigate critical thinking and problem-solving, essential elements in the training of trained professionals. As Lima and Batista

(2020) state, "the pandemic imposed a new reality that highlighted the need to adapt to technologies" and these adaptations are fundamental for the continuity of education.

Augmented reality is another technology that enriches learning, contributing to the creation of immersive experiences. This approach allows students to explore concepts in a dynamic way, connecting theory to practice in a visual and interactive way. Thus, education becomes more attractive, promoting not only understanding, but also continuous interest in the subjects covered. Moreira, Henriques and Barros (2020) point out that "virtual learning environments provide previously unimaginable interactivity".

Platforms such as Moodle and Google Classroom play a decisive role in the management of digital classrooms. They facilitate communication between students and teachers, promoting a collaborative environment that encourages collective learning. The exchange of ideas, both in forums and in chats, strengthens the construction of knowledge, broadening the horizons of learning beyond physical borders. This new dynamic of interaction is essential in times of remote teaching.

Multimedia resources deserve to be highlighted for their ability to diversify the way content is presented. Educational videos, for example, offer a methodology rich in stimuli that adapts to different learning styles, contributing to a more comprehensive education. The inclusion of podcasts also becomes an effective strategy, allowing students to consume content while doing other activities, which aligns with the need for flexibility in study schedules.

In addition, technology provides a more personalized teaching, where educators can apply different strategies to meet the specific demands of each student. This personalization is, without a doubt, one of the most relevant aspects of the use of digital resources in contemporary education. Narciso et al. (2024) state that "new methodologies emerge to meet the singularities of each student", reaffirming the importance of innovative strategies.

In a context where digital education is established as a new standard, the continuing education of educators becomes essential. Teachers, by updating themselves with new technological tools, expand their pedagogical skills and become agents of change in their practices. This not only benefits them, but also directly impacts their students, who are encouraged to explore, criticize, and create.

The interconnection between various digital resources also strengthens learning. The possibility of integrating different platforms and software allows the teacher to create a rich and multifaceted environment, where the student is challenged to apply their knowledge in

varied contexts. This integrated approach not only promotes information retention, but also the development of skills that will be valuable in their future trajectories.

In summary, digital resources offer a new perspective on teaching, enabling a more interactive and engaging education. The constant evolution and adaptation to technological innovations are a vital way to face the challenges of contemporary education. The future of learning involves the integration of these resources in a pedagogy that values individuality and collaboration, emphasizing the transformative potential of technology in the school environment.

DIGITAL CONTENT DEVELOPMENT

The creation of educational digital content requires a strategic combination of innovative pedagogical methods and accessible technological resources. In this scenario, instructional design stands out as a fundamental element, focusing on crafting learning experiences that are truly interactive and tailored to the individual needs of students. The choices made in this process directly influence the way students engage with the material presented.

Among the tools available, educational applications and e-learning platforms are essential. The implementation of virtual simulations also deserves attention, since they allow a greater immersion in the contents, facilitating the retention of knowledge. When well developed, these resources not only shed light on complex topics, but also maintain the student's curiosity and interest coupled with meaningful learning.

The issue of usability must be carefully considered. Content that is not intuitive can generate frustration, inhibiting student participation and limiting the effectiveness of learning. Therefore, user experience should be a guiding criterion in the creation of digital educational materials. The interfaces needed to be attractive and functional, working well on various devices, from desktops to smartphones.

In addition, the integration of immediate feedback into educational activities is a valuable resource. According to Oliveira and Morés (2023), "continuous and more dynamic assessment provides alignment of the teaching-learning process." This type of feedback not only gives the student a clear sense of their progress but also allows educators to adjust their teaching strategies as needed.

On the other hand, the analysis of data generated by students' interactions with digital content is a practice that can further enrich the educational process. This data offers valuable insights into performance and difficulties faced, allowing for more effective and

personalized interventions. Thus, the use of automated assessment systems presents itself as a practical solution for the continuous analysis of learning.

Another significant challenge lies in the training of teachers trained to deal with these digital technologies. The continuous professional development of these educators is very important for an effective implementation of the proposed innovations. Training should not be circumstantial, but should include practical tools that enable a conscious and critical use of technologies in the school environment.

The COVID-19 pandemic has brought to light the urgent need to adapt education to the digital modal. Rodrigues et al. (2021) highlight that "emerging technologies have become an essential vector for the continuity of learning during critical periods." This forced transition has brought to light both the advantages and limitations of digital education, reflecting the importance of proper planning.

With regard to the content itself, clarity in the presentation of the themes is vital. Materials that use overly complex or overly broad language can alienate students and hinder their learning. Communication should be direct and accessible, ensuring that all students can understand the concepts presented.

Collaboration between students, educators, and technology should be encouraged. Environments that promote interaction and group work enable a rich exchange of ideas, contributing to collective learning. This dynamic also adds value to the educational process, making it more collaborative and less individualistic.

Finally, continuous reflection on pedagogical practices and the adequacy of the resources used is fundamental for the evolution of digital education. The search for innovation must always consider the realities of students and teachers. Thus, a critical look at the advances and challenges of digital education is necessary, ensuring that technology is a true support for the formation of more critical citizens who are prepared for the contemporary world.

TECHNOLOGY-BACKED TEACHING METHODOLOGIES

The incorporation of technologies in the educational environment has been promoting an unprecedented transformation in teaching methodologies. Several digital resources, such as online learning platforms, have proven to be valuable tools in the restructuring of pedagogical practices. The flexibility provided by these technologies allows students to take an active role in their learning process, stimulating autonomy and critical thinking. The possibility of accessing content asynchronously and interactively also contributes to the creation of a more attractive and effective teaching environment.

Active methodologies, such as project-based learning and flipped classes, stand out in this scenario. Such approaches facilitate the integration of knowledge in a practical and collaborative way. Peer-to-peer interaction, through group discussions and activities, strengthens learning and improves information retention. "Technology and games as allies in the teaching of mathematics in elementary school" confirm that "the meaningful use of these resources contributes to student engagement and understanding" (SANTOS et al., 2023).

In the context of the covid-19 pandemic, educational institutions faced an unprecedented challenge, leading to the hasty adoption of remote teaching. This situation resulted in the need to rethink educational practices and the urgency to develop new teaching strategies. According to Rondini, Pedro and Duarte, "the changes in teaching praxis were intensified by the emergence of the global scenario" (RONDINI; PETER; DUARTE, 2020). Educators were forced to adapt quickly, exploring different digital tools to stay connected with students.

The personalization of learning has become a concrete possibility through technologies. Digital platforms offer resources that adjust to the pace and individual needs of students. This personalization goes beyond mere access to content; It is a real possibility to meet different learning styles. The combination of visual, auditory, and interactive resources offers a diverse approach that tends to cater to a heterogeneous student population.

In addition, the use of virtual environments favors the inclusion of students with learning difficulties. These spaces provide the opportunity to explore content in a non-linear manner, allowing for revisions and deepening as needed. Such practices contribute to all students feeling valued and able to actively participate in the proposed activities.

In classes, the incorporation of multimedia, such as explanatory videos and simulations, has proven to be an efficient strategy for the clarity of concepts. Visual resources stimulate curiosity and help in fixing the content. This approach aligns with an educational model that values the student experience as a core component of learning, making the educational process more engaging and meaningful.

Social interaction, also brings its relevance to human development, is also enhanced in digital environments. Educators have the opportunity to create richer spaces for exchange where students can share ideas and solve problems together. This not only encourages collaborative learning but also strengthens essential skills for today's world, such as teamwork and communication.

In summary, technology in education offers a range of possibilities that transcend the limitations of classical practices. The combination of different active methodologies provides a more enriching learning environment. With new strategies, it is possible to approach complex content in a playful and engaging way. The experience gained during the pandemic can serve as a model to be followed, ensuring that the evolutions that have occurred become permanent in educational practices.

Finally, it should be noted that the future of teaching depends on continuous innovation and adaptation of methodologies. Technology is not only a support, but a fundamental partner in contemporary education. The constant search for ways to engage and support students is an imperative that should not be underestimated. Education must always reinvent itself, as this represents the way to form citizens who are more critical and prepared to face the challenges of the twenty-first century.

TOOLS AND TECHNOLOGIES TO FACILITATE COMMUNICATION IN TEAMS

In the contemporary context of digitalization, tools and technologies emerge as essential elements that facilitate communication between teams. This transformation ensures that the exchange of information occurs efficiently, quickly, and accessible to all members, regardless of where they are. Collaborative platforms and project management software exemplify how these resources can enhance interaction and cooperation, breaking the limitations imposed by physical location.

Cloud solutions stand out by allowing teams to work together in a more integrated way. Not only do they offer easy access to data, but they also promote agility in the execution of tasks, favoring a productive environment. By centralizing information in a single place, employees have the opportunity to stay up-to-date in real-time, which is critical to the success of any project.

Transparency in processes is another important benefit arising from the adoption of these technologies. With the use of appropriate tools, it is possible to monitor the progress of activities more accurately. This allows team members to quickly identify any bottlenecks and seek solutions, fostering a more collaborative and proactive work environment. The ability to offer instant feedback and make adjustments in a timely manner contributes to the effectiveness of the group.

In addition, collaboration between different corporate systems, such as CRMs and ERPs, provides greater fluidity in communication. The integration of these platforms enables information to flow dynamically between departments, eliminating data silos and

promoting a more harmonious workflow. In this way, team members can access relevant information, enriching their tasks and decisions.

Another relevant aspect of this scenario is the promotion of innovation. With more connected and informed teams, there is a tendency for new ideas and creative solutions to emerge. The digital environment encourages the exchange of knowledge among employees, allowing them to learn from each other and thus expand their skills. Creativity becomes a valuable asset in an increasingly competitive market.

Organizational culture is also significantly impacted by the adoption of these technologies. As communication tools evolve, the way employees interact and engage with team goals is transformed. Clearer and more open communication fosters an environment of trust, where everyone feels comfortable sharing their opinions and suggestions.

Adaptability is a quality that becomes essential for modern teams. In an ever-changing world, the ability to quickly adjust to new demands and challenges for the survival and success of organizations. Technologies that facilitate communication help teams remain agile and resilient, ready to face various situations.

Finally, investing in technological solutions that enhance communication represents a significant step towards growth and continuous improvement. Companies that know how to take advantage of these tools will be better positioned to achieve their goals. Efficient collaboration isn't just a competitive advantage; It is a determining factor for building a cohesive and results-oriented team.

FINAL CONSIDERATIONS

Research on the integration of digital resources in education has revealed that this approach can significantly transform the teaching-learning process. The main findings indicate that the proper use of these tools not only increases student engagement, but also enables greater personalization of learning, meeting the individual needs and rhythms of each student. This personalization is essential so that all students can be challenged and encouraged effectively in their educational process.

In addition, the survey highlighted the importance of technological infrastructure and ongoing support for both teachers and students. For digital resources to be integrated productively, it is essential that educational institutions are equipped with the necessary technology and that there is constant monitoring to solve any difficulties. This structure is vital to ensure that everyone involved in the educational process has full access to the new teaching methodologies that emerge from the digital age.

It was also evidenced that the continuing education of teachers is a determining factor for the success of the incorporation of technologies in pedagogical practice. Well-prepared educators are able to effectively exploit the digital tools available, using them to enrich their classes and promote more dynamic and interactive learning. Therefore, training programs should be a priority for educational institutions that want to effect this transformation.

On the other hand, socioeconomic disparities in relation to access to technology were identified as a major challenge. The research points to the need to develop educational policies that consider these inequalities, promoting effective digital inclusion. Only by ensuring equitable access to technological tools will it be possible to ensure that all students have the same learning opportunities and are not left behind in an increasingly digital world.

In terms of objectives achieved, the research was able to map the main conditions necessary for an effective implementation of digital resources in education. It was identified that, with the right combination of infrastructure, teacher training and inclusive policies, the chances of success are significantly increased. These elements are integrated as fundamental pillars for an education that adapts to contemporary challenges and prepares students for the future.

For future research, it is suggested to investigate how different teaching methodologies, supported by digital technologies, impact learning in different age groups and educational contexts. In addition, it is relevant to explore the relationship between the use of digital resources and the development of socio-emotional skills in students, since these skills are increasingly in demand in the labor market.

Another suggestion is to deepen studies on the adequacy of digital tools to the specificities of each group of students, considering, for example, the needs of students with disabilities or those who have learning difficulties. This can enrich the discussion about the personalization of teaching and contribute to a more inclusive educational environment.

Finally, the research underlines the importance of carrying out continuous evaluations on the effects of the integration of digital resources in teaching and learning, always seeking improvements and innovations. Based on the lessons learned, institutions can adjust their approaches, ensuring that education evolves in a way that meets the demands of the twenty-first century and prepares students for a world in constant transformation.

REFERENCES

1. ALMEIDA, C. M. M. et al. Análise do uso e das percepções de professores de uma universidade pública de portugal sobre as tecnologias digitais de informação e comunicação. **Revista Signos**, v. 43, n. 1, 2022.

2. CORREIA, D. M. N.; SILVA, G. L. B. Contribuições da ludicidade no processo de inclusão no ensino de matemática no quinto ano do ensino fundamental de uma escola municipal de nova olinda-pb. **Revista Principia - Divulgação Científica e Tecnológica do IFPB**, 2021.

3. FREITAS, Clayton Alencar de et al. Impacto da inteligência artificial na avaliação acadêmica: transformando métodos tradicionais de avaliação no ensino superior. R**evista Ibero-Americana de Humanidades, Ciências e Educação**, v. 11, n. 1, p. 2736-2752, 2025.

4. LIMEIRA, G. N.; BATISTA, M. E. P.; BEZERRA, J. S. Desafios da utilização das novas tecnologias no ensino superior frente à pandemia da covid-19. **Research, Society and Development**, v. 9, n. 10, e2219108415, 2020.

5. MOREIRA, J. A.; HENRIQUES, S.; BARROS, D. M. V. Transitando de um ensino remoto emergencial para uma educação digital em rede, em tempos de pandemia. **Dialogia**, n. 34, p. 351-364, 2020.

6. NARCISO, R. et al. (Org.). **Educação, docência e metodologias**: novos desafios e possibilidades pedagógicas. 1. ed. Cruz Alta: Ilustração, 2024. v. 1. 225p.

7. OLIVEIRA, R. M.; MORÉS, A. Desafios da formação docente para as tecnologias digitais na prática educativa. **Caderno Pedagógico**, v. 21, n. 1, p. 34-50, 2023.

8. RODRIGUES, J. S. et al. Tecnologias na educação e sua relação com a pandemia (covid 19): revisão da literatura. **Brazilian Journal of Development**, v. 7, n. 11, p. 104319-104327, 2021.

9. RONDINI, C. A.; PEDRO, K. M.; DUARTE, C. S. Pandemia do covid-19 e o ensino remoto emergencial: mudanças na práxis docente. **Interfaces Científicas - Educação**, v. 10, n. 1, p. 41-57, 2020.

10. SANTOS, S. M. A. V. et al. A tecnologia e os jogos como aliados no ensino da matemática do ensino fundamental II. **Revista Foco**, v. 16, n. 11, e3775, 2023.