

The Role of Digital Education in Reducing School Dropout in Romania: A Student-Based Analysis

Marcela Tanasciuc¹

Abstract

The expansion of digital education has significantly reshaped how students engage with learning, raising important questions about its impact on educational continuity. In Romania, where school dropout remains a persistent challenge, the role of digital infrastructure and access to technology has become increasingly relevant, especially in the context of the post-pandemic transition toward online and hybrid learning. To explore these dynamics, the analysis combines a case study of the Romanian educational system with a quantitative investigation based on a questionnaire applied to 147 university students. The data, processed using Microsoft Excel, provide insight into how students perceive digital learning environments and the factors that influence their academic engagement. The results point to a strong connection between the quality of digital infrastructure and students' ability to remain actively involved in their studies. While improved access to technology can support flexibility and facilitate participation, the findings also reveal persistent disparities between socio-economic groups. In such contexts, insufficient access to digital resources may contribute to disengagement and increase the likelihood of dropout. These observations underline the need for a more coordinated approach to digital education, where technological investments are supported by pedagogical adaptation and targeted measures for vulnerable students. The Romanian case illustrates how digitalization can either support inclusion or reinforce existing inequalities, depending on how it is implemented.

Keywords: digital education, school dropout, digital infrastructure, higher education, Romania

JEL Classification: I21, I24, O33.

DOI: 10.24818/REJ/2026/92/12

1. Introduction

The rapid expansion of digital technologies has significantly transformed the educational landscape, reshaping both teaching practices and learning experiences. In recent years, and particularly after the COVID-19 pandemic, digital education has become an essential component of higher education systems worldwide.

In Romania, this transition has revealed both opportunities and structural weaknesses. While digital tools have increased access to educational resources and enabled more flexible learning environments, they have also exposed disparities

¹ PhD candidate, Bucharest University of Economic Studies, Bucharest, Romania; tanasciuc marcela@gmail.com

related to infrastructure, digital competencies, and socio-economic background. These factors are particularly relevant in the context of school dropout, which remains a persistent challenge within the Romanian educational system.

Despite increasing attention to digitalization in education, there is still limited empirical evidence regarding how students perceive its impact on their academic experience and continuity of studies. Understanding these perceptions is essential for designing effective educational policies and interventions.

In this context, the aim of this paper is to analyse the relationship between digital education and school dropout, based on students' perspectives. The study focuses on identifying key factors that influence educational engagement and evaluating the extent to which digitalization can contribute to reducing dropout rates.

2. Review of the scientific literature

School dropout represents one of the most persistent challenges of the Romanian educational system, with significant implications for social inclusion, economic development, and long-term sustainability. According to reports issued by the European Commission, Romania continues to register one of the highest early school leaving rates within the European Union, with 16.6% of young people aged 18–24 leaving education early in 2023, increasing to 16.8% in 2024 (European Commission, 2024).

Early school leaving is closely linked to structural and socio-economic factors, including poverty, limited access to education in rural areas, and low levels of parental education. Similar inequalities have also been highlighted in UNICEF reports on Romania, which emphasize the vulnerability of students from disadvantaged socio-economic backgrounds and rural areas (UNICEF, 2021).

In this context, the process of disengagement from education is not sudden, but rather the result of a gradual weakening of students' connection to the academic environment. As highlighted by Tinto (1993), students' persistence in higher education is strongly influenced by their level of academic and social integration, suggesting that dropout is often the outcome of insufficient engagement rather than purely individual choice.

The concept of the digital divide has evolved significantly, moving beyond simple access to technology towards more complex forms of inequality. According to van

Deursen and van Dijk (2019), digital inequalities are less about access and more about how effectively technology is used.

In Romania, these disparities are particularly visible between urban and rural areas, where reliable internet and proper devices are not equally available. This situation affects students' capacity to fully participate in digital learning environments and limits their educational opportunities. Reports published during the COVID-19 period also pointed to important limitations related to internet access and the availability of digital devices within the Romanian educational system (World Bank, 2020).

The pandemic has further exposed these inequalities, as the rapid shift to online learning revealed significant gaps in both infrastructure and digital skills. Similar conclusions were emphasized by the OECD (2021), which noted that COVID-19 crisis amplified existing educational inequalities and affected students' ability to participate effectively in digital learning environments. In such contexts, students who lack adequate resources are at a higher risk of disengagement and dropout.

Digital education has the potential to enhance accessibility and flexibility, but its effectiveness largely depends on the level of student engagement. The increasing importance of technology-based learning has also been reflected in European educational policies focused on creating more inclusive and digitally prepared educational systems (European Commission, 2020).

In this regard, Bond et al. (2020) underline that the integration of educational technologies can significantly improve student engagement, provided that these tools are used in a pedagogically meaningful way. Their study shows that technology alone does not guarantee better outcomes. In practice, its value depends on how it supports interaction, collaboration, and active learning.

This perspective is particularly relevant in the context of digital education in Romania, where the mere presence of digital tools does not automatically translate into improved learning experiences.

Artificial intelligence is increasingly shaping the future of education, offering new possibilities for personalized learning, automated feedback, and adaptive educational systems. According to Luckin et al. (2016), AI technologies can support more personalized and adaptive learning experiences when integrated effectively into educational environments. However, its impact remains dependent on the broader educational context in which it is implemented.

While AI has the potential to enhance efficiency and support individualized learning paths, it also raises concerns related to over-reliance on technology and the potential decline of critical thinking skills. Therefore, its integration must be carefully balanced with pedagogical objectives and human interaction. UNESCO (2021) also emphasizes that digital transformation in education should remain strongly connected to the principles of inclusion, equity, and meaningful participation in the learning process.

The relationship between digital education and school dropout can be better understood through the lens of student engagement. As suggested by Tinto (1993), students who feel disconnected from the academic environment are more likely to abandon their studies.

Thus, digitalization should not be viewed solely as a technical solution, but as a factor that reshapes the dynamics of engagement within the educational process. Addressing school dropout in the digital era therefore requires an integrated approach that combines access to technology, development of digital competencies, and the creation of meaningful learning experiences.

Research methodology

To achieve the research objectives, a mixed-method approach was employed, combining qualitative and quantitative techniques to provide a comprehensive perspective on the analysed phenomenon.

Firstly, the case study method was used, as it allows for an in-depth analysis of complex social phenomena within their real-life context. In this research, the case study focuses on the Romanian educational system, with particular emphasis on school dropout and its relationship with digitalization, access to technology, infrastructure, and educational policies. The analysis was based on secondary sources, including official reports, statistical data, and relevant academic literature.

Secondly, a quantitative research method was applied using an online questionnaire entitled "*The Impact of Digital Education on Reducing School Dropout in Romania among Students*". The questionnaire consisted of 37 items, including single-choice questions, multiple-choice questions, Likert scale items, and linear numerical scales.

The survey was conducted on a non-probabilistic sample of 147 university students from diverse socio-demographic backgrounds (urban and rural areas, different levels of study, and income sources). The questionnaire was structured into six

sections: general information, access to technology, use of online platforms, digital competencies, school dropout, and proposed measures.

The collected data were processed using Microsoft Excel with pivot tables and graphical representations, which allowed for a clear visualization and interpretation of the responses.

The methodological approach, combining theoretical analysis with empirical investigation, enables a contextualized understanding of the Romanian educational system in relation to digital transformation and its implications for reducing school dropout.

3. Results and discussion

The analysis of the questionnaire data offers a detailed picture of how students perceive the relationship between digital education and the risk of school dropout in Romania. Rather than pointing to a single cause, the results suggest a combination of interconnected factors, ranging from access to technology and institutional capacity to individual digital competencies and socio-economic background.

Several patterns emerge from the data. First, access to digital infrastructure appears to play a central role in shaping students' ability to remain engaged in the educational process. At the same time, limitations at the institutional level and differences in access to resources highlight existing inequalities that may affect academic continuity. In addition, the way students use technology, as well as their level of digital skills, further influences their learning experience.

To better capture these dynamics, the findings are structured around the main thematic areas covered by the questionnaire, allowing for a more nuanced interpretation of how different factors interact and contribute to the risk of educational discontinuity.

Access to technology and digital infrastructure

An important finding of the study is that 87% of respondents consider digital infrastructure to have a direct impact on the decision to continue or abandon their studies. This highlights the fundamental role of access to technology as a prerequisite for educational participation in a digitalized environment. At the same time, it suggests that limitations in infrastructure may act as structural barriers, particularly for students who already face socio-economic disadvantages. In such cases, insufficient access to reliable digital tools can gradually reduce engagement and increase the risk of educational discontinuity.

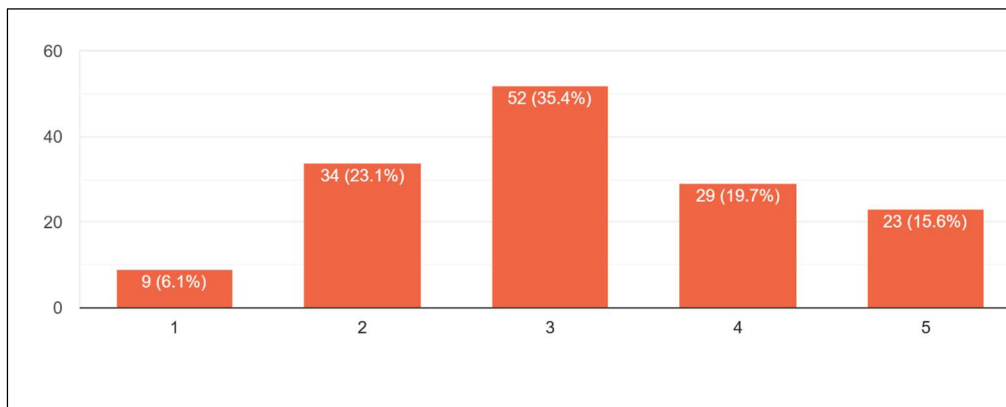


Figure 1. Students' perception regarding the level of digital infrastructure in universities (1-5 scale)

Source: data: author's own research

At the same time, 64% of respondents report that their universities are not sufficiently equipped with adequate digital infrastructure, as illustrated in Figure 1. This indicates a significant institutional gap, suggesting that higher education institutions may not be fully prepared to support the demands of digital learning. Such limitations can contribute to reduced engagement and increased dropout risks, particularly among students with limited personal resources.

Use of digital devices and platforms

The results show that the most frequently used device for academic activities is the smartphone. While this reflects a certain degree of accessibility, it also reveals structural limitations. Smartphones are not optimally suited for complex academic tasks, such as accessing advanced learning platforms or participating in interactive educational activities.

This reliance on less suitable devices suggests that students' access to education is influenced by technological constraints, which may negatively affect learning outcomes and students' ability to fully engage with digital content.

Digital competencies and learning experience

The analysis of students' self-assessed digital competencies reveals a predominantly moderate to high level of digital literacy among respondents. Specifically, 51.7% of students consider their level of digital skills to be intermediate, while a significant proportion (38.8%) perceive themselves as having advanced competencies. Only 10% of respondents identify as beginners, as presented in Figure 2. This distribution suggests that most students are generally equipped to navigate digital learning

environments, at least at a functional level. However, even a relatively small group with limited competencies may encounter difficulties in adapting to more complex digital platforms, which can affect their overall learning experience and level of engagement.

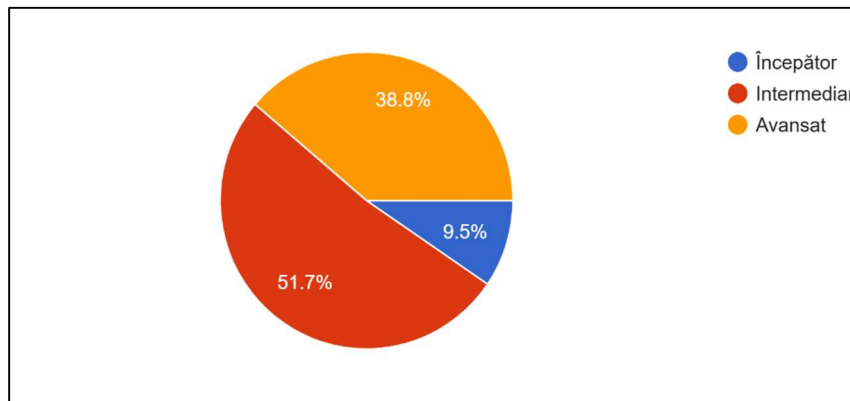


Figure 2. Self-assessment of students' digital competencies

Source: data: author's own research

These results suggest that most students possess at least a functional level of digital proficiency, which enables them to engage with online learning environments and digital educational tools. The relatively high share of students reporting advanced skills suggests an increasing familiarity with digital technologies, likely accelerated by the widespread use of online platforms during and after the COVID-19 pandemic.

However, the presence of a non-negligible proportion of students with beginner-level competencies highlights the persistence of digital inequalities. Even if this group represents a minority, it remains particularly vulnerable in the context of digital education, where insufficient skills may lead to difficulties in accessing educational resources, lower academic performance, and an increased risk of disengagement.

School dropout and perceived causes

The data clearly indicate a strong perceived relationship between digital inequalities and school dropout. Students identify lack of infrastructure, insufficient institutional support, and unequal access to resources as key factors contributing to educational discontinuity.

Moreover, the results reveal important disparities between urban and rural students. Respondents from rural areas report lower levels of access to digital tools and weaker support systems, which increases their vulnerability to dropout. These findings reinforce the idea that socio-economic background remains a critical determinant of educational outcomes.

Proposed measures and policy implications

Respondents propose several measures aimed at reducing dropout rates and improving the effectiveness of digital education. The most frequently mentioned solutions include improving institutional infrastructure, enhancing teacher training in digital competencies, integrating digital skills into the curriculum, and developing mentoring and counselling programs. These recommendations suggest that addressing school dropout requires a systemic approach, combining investments in infrastructure with pedagogical and institutional reforms.

In this context, students' perceptions regarding the benefits of improved digital infrastructure further reinforce these suggested measures. The emphasis placed on innovative teaching methods (72.8%) and improved access to educational resources (64.6%) directly supports the need for investments in institutional infrastructure and the integration of digital tools into the learning process, as depicted in Figure 3.

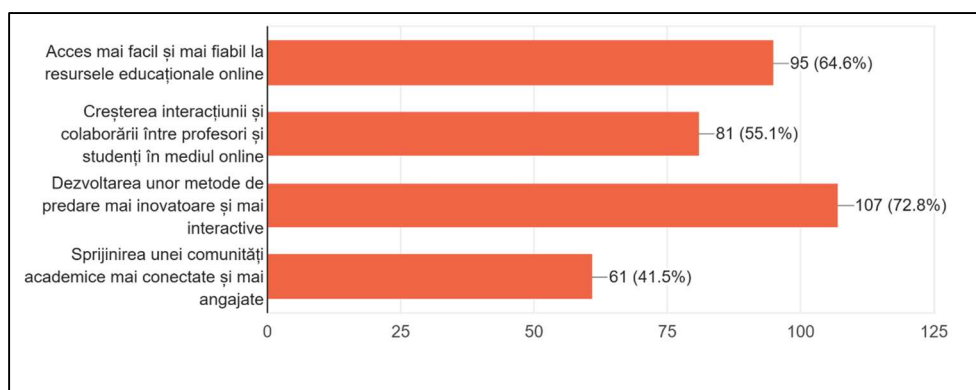


Figure 3. Students' assessment of the educational benefits of improved digital infrastructure

Source: data: author's own research

At the same time, the importance attributed to increased interaction and collaboration between students and teachers (55.1%) reinforces the necessity of enhancing teachers' digital competencies. Without adequate training, the potential of digital infrastructure to facilitate meaningful engagement and communication cannot be fully realized.

Furthermore, although the development of a more connected and engaged academic community received a comparatively lower percentage (41.5%), it remains closely linked to the need for mentoring and counselling programs. These support mechanisms play a crucial role in fostering student engagement, particularly for those at risk of disengagement or dropout.

4. Conclusions

Taken together, the findings of this study highlight the central role of digitalization in shaping students' educational experiences and influencing school dropout dynamics in Romania. The results show that digital infrastructure, access to technology, and digital competencies are key factors that condition students' ability to effectively participate in the academic process.

The analysis confirms that digitalization cannot be treated as an isolated solution, but rather as part of a broader educational framework. Its effectiveness in reducing school dropout depends on the interaction between technological resources, teaching practices, and institutional support mechanisms. In this regard, the study underlines the importance of aligning investments in infrastructure with pedagogical innovation and targeted support for vulnerable groups.

At the same time, the results reveal that digitalization has a dual impact. While it facilitates access to educational resources and supports more flexible learning environments, it may also amplify existing inequalities in the absence of adequate support. This is particularly evident in the case of students from disadvantaged backgrounds, who face greater difficulties in accessing digital tools and adapting to online learning requirements.

From a policy perspective, the findings suggest that efforts to reduce school dropout should focus on a combination of measures, including improving digital infrastructure, strengthening teachers' digital competencies, integrating digital skills into the curriculum, and expanding mentoring and counselling services. Such an approach would contribute to creating a more inclusive and resilient educational system.

The main limitation of this research is related to the use of a non-probabilistic sample, which may affect the generalization of the results. In addition, the study is based on students' self-reported perceptions, which may introduce a degree of subjectivity.

Future research could extend the analysis by including a larger and more diverse sample, as well as by incorporating the perspectives of other stakeholders, such as teachers and policymakers. Moreover, the use of more advanced statistical methods could provide deeper insights into the relationship between digitalization and school dropout.

In conclusion, the transition towards digital education in Romania represents both an opportunity and a challenge. Ensuring that this transition leads to greater inclusion rather than increased inequality requires coordinated efforts at institutional and policy levels.

References

- Bond, M., Buntins, K., Bedenlier, S., Zawacki-Richter, O., & Kerres, M., 2020. Mapping research in student engagement and educational technology in higher education: A systematic evidence map. *International Journal of Educational Technology in Higher Education*, 17(1), pp. 1-30.
- European Commission, 2020. *Digital Education Action Plan (2021-2027): Resetting education and training for the digital age*. Brussels: European Commission. Available at: <https://education.ec.europa.eu> [Accessed 10 April 2026].
- European Commission, 2024. *Education and Training Monitor 2024: Romania*. Luxembourg: Publications Office of the European Union. Available at: <https://education.ec.europa.eu> [Accessed 27 April 2026].
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L.B., 2016. *Intelligence Unleashed: An Argument for AI in Education*. London: Pearson Education.
- OECD, 2021. *The State of School Education: One Year into the COVID Pandemic*. Paris: OECD Publishing. Available at: <https://www.oecd.org> [Accessed 10 April 2026].
- Tinto, V., 1993. *Leaving College: Rethinking the Causes and Cures of Student Attrition*. Chicago: University of Chicago Press.
- UNESCO, 2021. *Reimagining Our Futures Together: A New Social Contract for Education*. Paris: UNESCO Publishing. Available at: <https://www.unesco.org> [Accessed 20 April 2026].
- UNICEF, 2021. *The State of Children in Romania: Education and Inequalities*. Bucharest: UNICEF Romania. Available at: <https://www.unicef.org/romania> [Accessed 10 April 2026].
- van Deursen, A.J.A.M., & van Dijk, J.A.G.M., 2019. The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media & Society*, 21(2), pp. 354-375.
- World Bank, 2020. *Remote Learning and COVID-19: The Use of Educational Technologies in Romania*. Washington, D.C.: World Bank. Available at: <https://www.worldbank.org> [Accessed 20 April 2026].