SYSTEMATIC ANALYSIS OF STUDIES ON THE RELATIONSHIP BETWEEN SCHOOL DROPOUT AND TECHNOLOGY USE

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Abstract: *This paper proposes a systematic analysis of the specialized literature on the complex relationship between school dropout and the use of technology in the educational process. The study highlights that school dropout is a multidimensional phenomenon determined by the interaction of individual, school-related, family, and contextual factors, all of which have significant implications for the personal and social development of young people. In the context of the digital era, technology emerges as a double-edged instrument: a valuable learning resource and, simultaneously, a potential risk factor when used inappropriately. The reviewed research emphasizes the importance of the conscious and responsible integration of technology in education through early prevention programs, the development of digital competences, and the strengthening of the school–family–community partnership. The study concludes that educational success in the age of digitalization depends on maintaining a balance between technological skill development and socio-emotional competences—fundamental elements for active and sustainable participation in the educational process.*

Keywords: *school dropout; educational technology; inclusion; digital competences; modern education.*

Introduction

In a world that is continuously changing, people must learn to demonstrate resilience in order to successfully cope with the challenging and stressful situations we frequently encounter in everyday life (Olărescu & Cristescu, 2023). The American Psychological Association defines resilience as "the process of satisfactory adaptation in the face of adversity, trauma, tragedy, threats, or significant sources of stress" (Denckla et al., 2020).

School dropout is a complex and multidimensional phenomenon, a pressing issue that requires concrete solutions capable of gradually reducing the rate of this indicator among pupils, high school students, and university students alike.

School dropout is not determined by a single cause but by a cumulative interaction of factors, as follows: individual factors (UNICEF & Institute of Educational Sciences, 2012; Ionuț Șerban, 2020), related to personal characteristics and personality traits; school-related factors (Adrian Hatos, 2009), referring to the institution in which the individual prepares for life and the interpersonal relationships established within it; family factors, connected to the specific dynamics transmitted within the family environment; and contextual factors, depending on the broader situational and societal context in which the individual is located.

The interaction of these factors leads to school dropout—a decision adopted by many young people—that in time generates consequences such as delinquency, increased unemployment rates, deterioration of physical and mental health (Freudenberg & Ruglis; Lansford et al., 2007), and ultimately social marginalization or exclusion. At first glance, these effects may seem trivial, but a thorough analysis reveals that today's society is fundamentally shaped by the educational foundations we establish—foundations that must harmoniously combine formal, nonformal, and informal education. A society shaken by the effects of school dropout will not evolve as desired, but will instead generate repercussions that, if left unaddressed now, will become increasingly difficult to resolve appropriately in the future.

Absenteeism

Absenteeism is a phenomenon frequently encountered in Romanian schools and represents one of the early indicators and precursors of school dropout. Over the past decades, this phenomenon has undergone a significant transformation, becoming simultaneously one of the most important predictors of negative behaviours such as drug use, violence, and delinquency among students.

Parents are not always aware whether their children attend school or not, while students often provide plausible and well-structured explanations to justify their absences on certain days. The meaning of such behaviour is later understood by teachers and parents alike; therefore, it is crucial to pay close attention to every change that may occur in a young person's conduct (Decean & Șevciuc, 2019).

According to Monica Decean, school anxiety reveals a refusal-based behaviour that stems from an individual's anxiety in a given situation and is directly correlated with school dropout and absenteeism

(Decean, 2021). Low self-image and, consequently, anxiety led to negative, avoidance-oriented behaviours and school disengagement (Uncu & Penu, 2011). A lack of belongingness is another psychological factor with direct resonance when addressing the phenomenon of school dropout.

Socio-educational research, including that within behavioural psychology and social development, has shown that the development of digital skills represents an essential factor in improving school outcomes, particularly in the context of the daily use of the Internet by all educational agents (students, teachers, and even parents). However, contradictory opinions persist in this field, and there is still a lack of specialized studies exploring how digital technology can be used to optimize academic performance (Cosma, 2024).

It is within our power to contribute to stopping this phenomenon, as society needs educated individuals—people who will later become examples for future generations. If we teach today's youth to use technology in a balanced and responsible manner, the future will undoubtedly look brighter. As agents of change, we bear the responsibility to help today's children develop a correct attitude toward technology. Proper use of technology can assist us in many ways; what truly matters is that we employ the tools available to us responsibly and purposefully.

The Use of New Technologies in the Educational Field

Technology, an important factor driving change in contemporary society, was introduced on a large scale into Romanian schools during the COVID-19 pandemic, with the aim of ensuring the continuity of learning. During that period, a decline was observed in the number of students participating in digital learning, a gap caused primarily by the lack of technological resources—an issue that, in some cases, led directly to school dropout. Today, the student population continues to suffer from disparities generated by poverty, lack of parental support, demotivation, low self-esteem, and other factors that, sooner or later, result in dropping out of school.

Although it may seem like a personal decision taken by numerous students, the consequences of school dropout are, in fact, severe for society as a whole. Therefore, we must all contribute to eradicating this phenomenon. While at first glance one might consider school dropout to be a personal issue, in reality, it is a collective problem that should concern us all—because we are part of a community, part of a society in which we all aspire to thrive.

In today's informational and technological era, education has become an extremely dynamic and challenging field (Pop & Stiegelbauer,

2024). The ultimate challenge now is to eliminate—or at least significantly reduce—the phenomenon of school dropout and to cultivate an appropriate attitude toward technology among students.

At present, technology has become an indispensable component of the educational process, being perceived as a powerful means to attract and engage students in their own learning. It is essential to adapt and to account for the progress achieved in the field of new technologies, while remaining aware of the benefits they can generate. Children need support from adults and teachers, as they spend considerable amounts of time in front of screens, often without obtaining tangible learning outcomes. The primary school stage is particularly critical, as it is the period when children gradually begin to use new technologies more intensively—sometimes with proper guidance, sometimes without it.

It is therefore imperative to take a firm stance on this growing phenomenon. Enhancing self-esteem among learners across all educational levels is a necessity—a *must-have* for every person who aspires to become a valuable member of society in the future. By acting in this direction, we can also support individuals who suffer from marginalization, poverty, or the negative effects of migration, and we can provide positive role models for those surrounded by unfavourable examples. School dropout is not an individual problem; it is a collective one. Only by working together can we generate positive and lasting changes in the medium and long term.

Causes of School Dropout

School dropout often leads to risky behaviours, which in many cases can even result in premature mortality. Thus, the phenomenon of school dropout becomes both a social and a public health issue within society.

Eliminating the primary causes—such as low socio-economic status, lack of parental support, and insufficient family involvement—is essential. Parents are, or rather should be, partners in the educational process, regardless of the schooling level in question. It is therefore indispensable to create and maintain strong partnerships among teachers, students, and families. Low academic motivation must also be addressed, as fostering motivation generates a sense of well-being among learners. This requires teachers to build meaningful connections with their students on a daily basis.

Learning difficulties—although common—can be overcome through consistent, responsible work. Negative relationships with teachers must be replaced by constructive, partnership-based interactions in which teachers are perceived as collaborators in the learning process. Practices such as labelling or maintaining a hostile school climate

should be eliminated, as they can demotivate students and push them further toward disengagement and dropout.

It is crucial to identify and implement early prevention programs against school dropout and to build sustainable, high-quality partnerships that connect the school–family–community triad so that the central actor—the student—feels appreciated, valued, and significant in his or her developmental journey.

Furthermore, it is imperative that educational policies be based on inclusion and on psychological support for those who are preparing today for the challenges of tomorrow.

School engagement is recognized as an essential predictor of academic achievement and student retention (Fredricks & Blumenfeld, 2004). This highly complex construct encompasses three main dimensions: behavioural, cognitive, and emotional engagement—each exerting a significant influence on students' academic attainment and, simultaneously, on their risk of dropping out of school.

Technology can no longer be avoided; today, more than ever, it forms part of our societal evolution. The proper integration of technology into the learning process can generate positive effects on students' abilities to learn and self-learn—competences that are indispensable for lifelong education.

In the current context, young people are increasingly using new technologies, often against the backdrop of insecure parental attachment formed during childhood. Today's children spend long periods of time navigating different online platforms in search of a sense of secure attachment. However, the attachment developed in the virtual environment can lead to social maladaptation, as the child loses the ability to distinguish between real life and the digital one (Rădăcină, 2018).

The younger generation has diverse needs that we must carefully analyse and address to prevent irreversible effects. Technology can indeed be a valuable ally, yet it's irresponsible use generates outcomes that we should strive to avoid in the lives of young people at the beginning of their personal development.

In contemporary times, the concept of "play" has expanded to cover a wide range of human activities that, on one hand, do not involve hard labour, and on the other, offer enjoyment and satisfaction. Play today represents a free and pleasurable expression of the human spirit. It constitutes one of the essential modes of human manifestation—a complex anthropological phenomenon that appears, in specific forms and contents, across all ages and civilizations (Banu, Irina & Mâță, 2022).

Studies on social exclusion and poverty have shown that a person's level of education is directly correlated with their level of well-being. More specifically, if a child lacks the necessary resources to continue their studies, it is unrealistic to expect them to achieve a high level of well-being in adulthood—except in rare, exceptional cases. According to human capital theory, education is the most valuable investment an individual can make, one that yields significant long-term benefits and income (Găgăuz, Buciucianu-Vrabie & Pahomii, 2017).

If we invest in children today, tomorrow's society will be more prosperous and distinct. Conversely, a lack of investment in education inevitably leads, sooner or later, to school dropout. Without adequate support, a child cannot continue their studies; therefore, students at risk must be assisted through various targeted measures.

As shown by the reviewed literature, the research addressing school dropout and technology use is still at an early stage, even though the number of studies has increased in recent years.

Initially, the use of new technologies was envisioned as an element that would bring medium- and long-term benefits. However, specialized literature reveals that, at present, teachers and policymakers are gradually—but steadily—contributing to the development of appropriate attitudes among students, ensuring that technology is used responsibly.

The literature highlights a series of benefits that education brings to younger generations, which can be categorized as monetary and non-monetary, or as personal/private and social benefits (Găgăuz, Buciucianu-Vrabie & Pahomii, 2017). The attention invested in education manifests its effects over time. If we fail to work consistently toward the well-being and development of younger generations, it would be unrealistic to maintain high expectations for the future.

In the era of digitalization, school dropout entails both social and economic costs that directly impact society: increased pressure on healthcare systems, decreased social cohesion, and the emergence of social fragmentation. Additionally, productivity and income decline, which in turn leads to a rise in social welfare expenditures (Gyönös, 2011).

Although Romania has been struggling with school dropout for a long time, even today we continue to witness young people leaving school prematurely—later facing poverty, unemployment, and marginalization (Bonea, 2019).

In Romania, the Ministry of Education, Research, and Innovation implemented a series of programs in 2009 aimed at preventing school dropout. These include "Second Chance", "After School", and "Functional Literacy." The main objective of these initiatives was to

increase the number of children participating in education and to facilitate their subsequent transition to the labour market.

Each year, decision-makers at the Ministry seek concrete solutions to prevent and reduce school dropout. These programs have served as foundational instruments, providing timely responses to the social challenges that have emerged over time (Șerban, 2011).

A society in continuous transformation, marked by the emergence of new technologies, has experienced profound changes in the ways we learn, work, and communicate. Today, technology dependence is increasingly analysed through the lens of its negative consequences at both individual and social levels (Tîrziman, 2021). Therefore, it is imperative to remain aware of the extent to which we use technology—ensuring that it remains our tool, not our master.

Articles – School Dropout, Educational Engagement and Digitalization

Author(s), Year	Objectives	Participants	Research Method	Main Results / Conclusions	Relevance for Research
Alexa, S., & Baciu, E.-L. (2021)	Examination of trends and risk factors for dropout/early school leaving in Romania.	Secondary data from Romania.	Policy and official data analysis.	Maps risk factors (socio-economic, school-related, individual); aligned with SDG4.	Conceptual model for variable operationalization.
Article (2019) – Prevention ages 12–14	Highlighting the critical window (ages 12–14) for preventing risk behaviors.	Pre-adolescents (ages 12–14).	Narrative/empirical analysis.	The 12–14 age transition is optimal for extended socio-emotional and curricular interventions.	Identifies the critical timing for anti-dropout interventions.
Balog, A. (2009) – RRIOC	Presentation of theoretical models (TRA, TPB, TAM, UTAUT) for technology adoption.	—	Theoretical synthesis.	Adoption of new technologies depends on perceived usefulness, ease of use, social norms, and perceived behavioral control.	Conceptual tools for digitalization and AI-related sections.
Ban, R. A., & Costin, A. (2025)	Narrative review of recent literature on school dropout.	21–25 articles (2024–2025).	Narrative review (transparent criteria).	Integrated policies and early interventions are most effective; focus on inclusion.	Updates the "state of the art" for the thesis introduction.
Bonea, G. V. (2019)	Analysis of school dropout in Romania by grade level, environment, gender, and contributing factors.	National data.	Policy and statistical data analysis.	Dropout is a process; solutions include social inclusion and equal opportunities; highlights role of social workers and vocational schools.	Integrates social and educational policies.
Bonilla-Jurado, D., et al. (2023)	Identification of causes and effects of university	—	Hermeneutic/narrative synthesis (≈60 articles).	Causes: financial conditions, low family support, insufficient	Provides a global framework for higher education dropout; useful

	dropout internationally.			institutional attention; recommends corrective institutional measures.	for comparison with the Romanian context.
Caranfil, N. G. (2021) – Thesis abstract	Psychosocial determinants of engagement and their effects on performance.	Romanian adolescents.	Psychological questionnaires; predictive modeling.	Engagement increases performance and reduces boredom/absence; recommends fostering student agency.	Variables for predictive models in the thesis.
Caranfil, N. G., & Robu, V. (2019)	Identification of predictors of school engagement (motivation, climate).	298 Romanian high school students.	Correlational study; psychological questionnaires.	Intrinsic motivation, peer support, and positive classroom climate predict engagement; amotivation decreases it.	Operational variables for dropout prediction models.
Cosma, M.-L. (2024)	Relationship between digital divide (first–third order) and academic outcomes in adolescents.	Adolescent students from Bihor, Romania.	Mixed sociological study (quantitative/qualitative).	Inequalities in access, competences, and outcomes amplify educational gaps.	Highlights digital equity as a determinant of participation.
Cristei, M. (2018)	Evaluation of educational software effectiveness in vocational training.	≈80 students (USM).	Pedagogical experiment (computer-assisted teaching–consolidation–assessment).	Educational software enhances professional skill development.	Supports technology use in higher education; relevant for transition to the labor market.
Decean, M. (2021) – PhD Thesis, UBB	Design and validation of a psycho-pedagogical program against absenteeism in high school.	High school students (experimental/control group).	Pedagogical experiment (pre–post; validated instruments).	Significant reduction in absenteeism; increased motivation and participation, including parental/teacher involvement.	Replicable model for interventions in secondary schools.
Decean, M., & Șevciuc, M. (2019)	Mapping international approaches to absenteeism.	—	Narrative comparative review.	Absenteeism correlated with juvenile delinquency, drug use, and dropout; presents best practices (e.g., Japan).	Foundation for school-level and policy-level anti-absenteeism measures.
Florian, B., & Țoc, S. (2020)	Educational responses to the COVID-19 crisis in Romania.	Students/teachers/policymakers (secondary data).	Policy note (rapid policy analysis).	Insufficient infrastructure, unequal digital skills; outlines short-, medium-, and long-term measures.	Basis for the chapter on pandemic and digital inequalities.
Freudenberg, N., & Ruglis, J. (2007)	Reframing school dropout as a public health issue and identifying intervention pathways.	—	Theoretical review + U.S. population data.	Education correlated with lower mortality and better health; proposes school-based health services to increase graduation rates.	Extends the analytical paradigm toward public health.
Frunză, E. (2020)	Exploration of how new	—	Theoretical/essay-based analysis.	Technology transforms	Humanistic anchor for the

	technologies influence personal development.			communication and learning but may cause addiction and isolation; balance between real and virtual needed.	psychosocial dimension of digitalization.
Găgăuz, O., Buciucianu-Vrabie, M., & Pahomii, I. (2017)	Analysis of risk factors and groups for early school leaving (Moldova).	National Bureau of Statistics data (2014–2015).	Regression analysis of national statistical data.	Higher risk among rural, poor, and low-educated families; causes include economic hardship, disinterest, and learning difficulties.	Foundation for public policies targeting vulnerable groups.
Garbatovschi, C. (2022)	Exploring the link between new technologies and sustainable development, focusing on quality education.	—	Policy analysis.	Quality education mediates technology's benefits; ethical norms must guide its use.	Introduces sustainability perspective in digitalization.
Gyönös, E. (2011)	Clarification of the causes and effects of school dropout in Romania and the EU.	—	Conceptual and historical comparative analysis.	Distinguishes between "dropout" and "early leaving"; relates dropout to unemployment and school participation; older but conceptually valuable data.	Conceptual and historical framework for Romanian/EU context.
Iancu, A. (2022)	Analysis of technology implications for education in the European context.	—	Policy/argumentative analysis.	Digitalization is a strategic necessity; digital competences form the basis for equity.	Policy background for the digitalization section.
Khurram, A., Khatun, M., & Islam, R. (2023)	Identification of dropout factors in a Bangladeshi city.	210 students.	Face-to-face interviews + questionnaires; random sampling.	Determinants: socio-economic instability, lack of parental monitoring, school quality, and location; weak extracurricular activity increases risk.	Confirms universality of factors and role of extracurricular engagement.
Kurian, A., Hossain, Z., et al. (2023)	Causes and solutions of dropout from teachers' perspectives.	Teaching staff in educational institutions.	Descriptive study (teacher questionnaires/opinions).	Causes: poverty, low family support, low motivation, teacher–student relations; solutions: mentoring, parental involvement, targeted interventions.	Validates teachers' role as key nodes in dropout prevention.
Lansford, J. E., Dodge, K. A., Pettit, G. S., & Bates, J. E. (2016)	Longitudinal analysis of risk/protective factors from age 5 to 27 related to dropout.	585 U.S. participants, followed for 22 years.	Longitudinal study; multivariate analyses.	Dropout linked to 4× higher risk of negative adult outcomes; low SES, peer rejection, and early parenting amplify risks; interventions before age 24 mitigate effects.	Justifies early and integrated school–health interventions.
Manoil, P. (2022)	Distinction between	—	Descriptive study (conference paper).	Psychological, social, and	Supports ecosystemic

	"dropout" and "pushout" paradigms and their causes.			pedagogical causes; shifts responsibility from individual to school ecosystem.	approach to dropout.
Mihai, L. M. G., Vasilescu, L., Băndoi, A., & Sitnikov, C. (2024)	Systematic review of AI-based digital economic education.	60 articles.	Systematic review.	Artificial Intelligence (AI) is becoming essential in digital education; adoption depends on trust and perceived usefulness.	Relevant for AI-assisted course design.
Olărescu, V., & Cristescu, D. (2023)	Identification of school-based interventions that enhance students' resilience.	45 studies.	Systematic review.	Universal, integrative interventions (school–family–community) improve resilience and performance; reduce emotional problems.	Recommends universal preventive interventions to reduce dropout.
Pisău, A. (2018)	Inventory of modern digital technologies in education and their role in competence formation.	—	Descriptive policy/technology analysis.	Technologies (interactive boards, 3D apps, e-learning) increase motivation and efficiency; teacher training is essential.	Connects digital infrastructure with educational outcomes.
Pop & Stiegelbauer (2024)	Presentation of modern educational dimensions and post-pandemic practices.	—	Collective volume (qualitative/quantitative studies).	Modern pedagogies, hybrid technology, student retention strategies; examples of inclusive digital resources.	Practical resource for didactic design.
Ressa, T., & Andrews, A. (2022)	Analysis of high school dropout in the U.S. and reform solutions.	Secondary data from the U.S.	Comparative/documentary analysis.	High dropout among vulnerable groups; high social costs; advocates reforms promoting equity.	Provides international comparative perspective.
Rădăcină, O.-E. (2018)	Impact of computer/internet use on youth social development (identity, networks, cyberbullying).	Romanian youth/students.	Theoretical analysis + qualitative research (interviews/online observation).	Benefits (resources, autonomy) vs. risks (isolation, cyberbullying); online environment shapes university preparation.	Delineates psychosocial effects of excessive technology use.
Sandovici, A., Robu, V., & Robu, I.-E. (2016)	Investigation of gender differences in adolescent school engagement.	1,168 Romanian high school students.	Standardized questionnaires (Student Engagement in School – Four-Dimensional Scale).	Girls scored higher on cognitive and behavioral engagement (d≈0.30–0.41); confirms multidimensionality of engagement.	Key variable "engagement" as predictor of performance and retention; gender-sensitive implications.
Sandovici, A., Robu, V., & Robu, I.-E. (2016) – AA.pdf	Same study – analysis of gender differences in school engagement.	1,168 high school students.	Standardized questionnaires.	Girls display higher levels of engagement compared to boys, particularly in the cognitive and behavioral dimensions.	Confirms the need for gender-differentiated interventions in promoting student engagement.

Şerban, C. (2011)	Evaluation of how online environments support dropout prevention through social marketing and community involvement.	Students and parents (local sample).	Applied study using questionnaires and perception analysis.		
Tîrziman, E. (2021)	Analysis of the advantages and disadvantages of digital technology use.	—	Sociocultural critical essay.	Benefits include access, communication, and resources; risks involve dependence, alienation, and cognitive superficiality; defines the "digital citizen."	Clarifies opportunities and risks of digitalization for the thesis's digital component.
Uncu, V., & Penu, M. (2011)	Psychological approach to school dropout.	—	Theoretical analysis / case study.	Distinguishes visible and invisible aspects of dropout; highlights the role of the educational team in intervention.	Provides a psychological framework for school-level interventions.
UNICEF Romania & Institute of Educational Sciences (2012)	Measurement of participation and dropout (primary and lower secondary levels) and identification of out-of-school children.	National administrative datasets; cohort analysis.	UNICEF/UNESCO methodology: entry–exit, cohort-based analysis.	Identifies multiple risk factors (individual, socio-economic, school-related); offers recommendations within the zone of proximal development.	Policy foundation for large-scale systemic interventions.
Conference Volume (2022) – Diversity of Educational Sciences	Compilation of applied studies on dropout, violence, school–family partnership, and e-learning.	—	Collection of quantitative/qualitative research articles.	Presents teaching strategies, project examples, and practices focused on student retention and supportive school climates.	Practical resource for designing evidence-based educational interventions.

Discussions

School Dropout as a Systemic Phenomenon

The specialized literature supports the idea that leaving school is not a singular event but rather the outcome of a cumulative process involving the interaction of multiple factors—individual (low motivation, learning difficulties, anxiety), school-related (educational climate, teacher–student relationships, labelling), family (parental support, socio-economic status), and contextual (policy frameworks, community, labour market).

Both Romanian and international synthesis studies repeatedly indicate poverty, rural residence, low parental education, and marginalization as major determinants of dropout risk (Bonea, 2019; Alexa & Baciu, 2021; Găgăuz, Buciucianu-Vrabie & Pahomii, 2017; Ban & Costin, 2025). Recent literature also proposes the distinction between *"drop-*

out" and *"push-out"*—that is, voluntary leaving versus de facto exclusion caused by academic failure, punitive practices, or hostile school climates—thus shifting the emphasis from the "culpable student" to the school ecosystem (Manoil, 2022).

The Public Health Perspective

Longitudinal studies show that school dropout is associated with substantial risks in adulthood, including poorer health, higher mortality, and increased engagement in risk behaviours. These effects are more pronounced among youth from low socio-economic backgrounds, those rejected by peers, or those with a history of socio-emotional difficulties (Freudenberg & Ruglis, 2007; Lansford, Dodge, Pettit & Bates, 2016).

This perspective justifies the implementation of early, intersectoral interventions that integrate education, health, and social assistance, as well as universal preventive measures within schools.

School Engagement – The Key Mechanism Variable

From a psycho-pedagogical standpoint, school engagement—cognitive, affective, behavioral, and agentic—consistently appears as a predictor of performance, persistence, and reduced absenteeism (Sandovici, Robu & Robu, 2016; Caranfil & Robu, 2019). Evidence also points to gender differences: girls tend to display higher levels of cognitive and behavioural engagement, suggesting that support strategies should be gender-sensitive (Sandovici et al., 2016).

Predictors such as intrinsic motivation, peer support, and a positive classroom climate increase engagement, while amotivation undermines it (Caranfil & Robu, 2019). Interventions focused on resilience—universal and integrating the school–family–community triad—have demonstrated beneficial effects on well-being and participation (Olărescu & Cristescu, 2023).

At a practical level, an experimentally validated psycho-pedagogical program implemented in high schools has proven effective in reducing absenteeism and increasing both motivation and parental involvement (Decean, 2021). Furthermore, the literature identifies a critical window between ages 12 and 14, during which school and identity transitions make socio-emotional interventions particularly effective—an insight supported by studies on preadolescence.

Digitalization: Opportunity and Risk

Educational technologies can enhance access, motivation, interactivity, and learner autonomy (Pisău, 2018; Cristei, 2018; Iancu, 2022). However, the specialized literature also warns against digital

dependence, social isolation, and cognitive superficiality (Tîrziman, 2021; Frunză, 2020; Rădăcină, 2018).

The COVID-19 pandemic clearly revealed the *digital divide* across three levels: access (first order), skills and usage practices (second order), and learning outcomes (third order)—all of which are correlated with participation and academic success (Florian & Țoc, 2020; Cosma, 2024).

In terms of technology and AI adoption, theoretical models such as TRA, TPB, TAM, and UTAUT indicate that the intention to use technology depends on perceived usefulness, ease of use, social norms, and perceived behavioral control (Balog & Cristescu, 2009).

A recent systematic review (Mihai, Mănescu, Vasilescu, Băndoi & Sitnikov, 2024) shows that Artificial Intelligence becomes truly infrastructural in education when embedded in pedagogy, quality, and trust frameworks, while simultaneously raising ethical concerns about transparency, bias, and data protection.

Romanian Context and International Comparisons

National and regional studies (Bonea, 2019; Alexa & Baciu, 2021; Găgăuz et al., 2017) align with international findings (Ressa & Andrews, 2022; Khurram, Khatun & Islam, 2023), revealing similar risk profiles—poverty, limited parental support, and school quality—alongside context-specific policy needs such as inclusion, the presence of social workers in schools, and the development of vocational pathways.

Recent collective volumes document post-pandemic educational practices—hybrid pedagogies, student retention strategies, and learner-cantered design—providing valuable insights for translating research evidence into effective teaching models (Pop & Stiegelbauer, 2024).

Conclusions

School dropout is a multifactorial and multisectoral phenomenon. Effective prevention requires integrated approaches that connect school, family, community, and health sectors—beginning early and continuing throughout all educational transitions.

School engagement functions as a proximal mechanism linking contextual factors to educational outcomes. It must be cultivated through a supportive climate, learner autonomy, formative feedback, high-quality teacher–student relationships, and peer support networks.

Resilience and socio-emotional competences act as protective factors; universal and integrative interventions have been shown to produce the most robust effects in the reviewed literature.

Digitalization offers major opportunities for access, personalization, and collaboration. However, without quality governance and digital equity, it can amplify disparities. Sustainable adoption depends on perceived usefulness, competence, social norms, and trust. The 12–14 age range represents a strategic window for preventive action, while in high school, structured programs—such as the one validated by Decean (2021)—can reduce absenteeism and increase motivation.

In the Romanian context, inclusion-oriented policies—such as the presence of social workers in schools, the development of vocational pathways, and strengthened school–family partnerships—along with teacher training in digital and socio-emotional competences, represent essential levers for change.

The systematic analysis conducted reveals that school dropout remains an extremely complex challenge influenced by multiple interrelated factors: individual, school-related, family, and contextual. These factors are mutually conditioning and interact dynamically.

In the digital era, technology emerges as an ambivalent element: on one hand, it serves as a valuable educational resource capable of enhancing students' engagement, motivation, and performance; on the other, uncontrolled or excessive technology use can lead to disengagement, digital dependence, and social maladaptation.

The analysed studies demonstrate that technology, in itself, is not the primary cause of school dropout. Rather, it is the *manner* in which technology is integrated into the educational process and into young people's lives that may influence the likelihood of dropout. Therefore, a balanced approach is urgently required—one that promotes both digital competence and socio-emotional development among students.

Strengthening partnerships among schools, families, and communities; training teachers in the responsible use of technology; and implementing early prevention programs are key strategic directions for reducing and combating school dropout.

In conclusion, modern education must harmoniously integrate the human and technological dimensions so that technology becomes a genuine support for inclusion, participation, and academic success—not a risk factor. Only through conscious, learning-oriented use can technology contribute to shaping a resilient, autonomous generation capable of meeting the challenges of contemporary society.

Future Research Directions

Future studies should include multi-level longitudinal research that links trajectories of technology or AI use with student engagement and outcomes (e.g., absenteeism, grades, graduation), while controlling for

socio-economic status, environment, and school characteristics (Lansford et al., 2016).

Impact evaluations—whether randomized controlled trials (RCTs) or quasi-experimental designs—should assess the effectiveness of universal resilience and engagement interventions, as well as integrated school–family–community programs (Olărescu & Cristescu, 2023; Decean, 2021). These studies should also measure implementation fidelity and dosage in anti-absenteeism programs, analysing mediating factors (e.g., changes in teacher–student relationships) and moderating variables such as gender and rural/urban setting.

Future research should also operationalize the concept of the *digital divide* across three levels—access, competences/practices, and outcomes—and test causal chains linking these dimensions to school persistence (Cosma, 2024; Florian & Țoc, 2020).

Studies focused on technology and AI adoption among students and teachers should be grounded in theoretical frameworks such as TAM and UTAUT, modelling intention to use as a function of perceived usefulness, ease of use, social norms, and behavioural control (Balog & Cristescu, 2009; Mihai et al., 2024).

Qualitative investigations involving at-risk students, parents, and teachers are necessary to understand the micro-mechanisms of *"push-out"* processes (e.g., stigmatization, punitive practices, lack of curricular relevance) and to co-design student-cantered solutions (Manoil, 2022).

Additional research is needed on gender differences in engagement and on students' agency, testing differentiated adaptations such as mentoring, feedback, and project-based tasks to reduce existing gaps (Sandovici et al., 2016).

Integrating administrative data (attendance, performance, educational transitions) with psychological indicators (motivation, well-being, peer relationships) could enable the creation of *explainable predictive models* of dropout risk—provided that these models are governed by strong ethical data protocols.

Cost–benefit evaluations of dropout prevention interventions from a public health perspective should also be prioritized, quantifying benefits in terms of improved health, employment, and reduced social expenditures (Freudenberg & Ruglis, 2007), thus providing the empirical basis for sustainable policy development.

Implementation studies in disadvantaged schools (rural or minority communities) are equally important, including co-creation with stakeholders and culturally adapted versions of validated programs, with attention to scalability and sustainability.

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