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Digital Transformation in Romanian Higher Education: Policy-Driven Strategies and Institutional Governance

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Abstract: *This paper examines the digitalization of higher education in Romania by analyzing the digital strategies of four major universities: Babeș-Bolyai University, the University of Bucharest, Alexandru Ioan Cuza University of Iași, and the Western University of Timișoara. Using qualitative content analysis of institutional strategic documents, the study explores how digitalization is framed and implemented. The findings show that digitalization efforts during the COVID-19 pandemic were primarily driven by top-down pressures from the European Union's policy framework and funding mechanisms, particularly the Next Generation EU program. Due to limited expertise and institutional capacity at the national and university levels, many initiatives were reactive and limited in scope. The study contributes empirical evidence on digital transformation in Romanian higher education, a topic that remains underexplored in the literature.*

Keywords: *Digitalization; Higher Education; Romania; University Strategies; EU Policy; COVID-19 Pandemic; Institutional Capacity*

INTRODUCTION

The digitalization of higher education has assumed a prominent position in universities' strategic agendas amid the COVID-19 pandemic, compelling educational institutions to rethink teaching and learning processes. Although universities physically closed their campuses, they continued to operate online and were required to ensure the delivery of quality education to their students. This transition proved particularly challenging for universities in Central and Eastern Europe, many of which were developing digitalization plans for the first time. A significant number of these institutions entered the pandemic with limited experience in digital transformation, constrained financial resources, low levels of digital literacy among both students and academic staff, and insufficient government support.

With the digital transformation of universities and the digitalization of teaching and learning, issues that received limited attention prior to the COVID-19 pandemic but gained increased prominence following the European Union's prioritization of digital policy and its commitment to transforming higher education institutions, it has become especially relevant to examine how universities have responded to these developments, particularly by focusing on the drivers behind these processes.

Romania represents a pertinent case for examination. The relevance of this research lies in the fact that, although a substantial body of scholarly literature addresses the digitalization of higher education, empirical evidence from Central and Eastern European universities remains limited. While recent studies have begun to explore the Romanian case, highlighting the critical role of the pandemic in accelerating digital transformation through the rapid adoption of digital

tools for teaching, learning, and administration, which have continued to be used in the post-pandemic context (Hudrea et al. 2023, 60), little attention has been paid to how universities articulate their digitalization strategies.

This article addresses this gap by examining the digitalization strategies of four of Romania's most prominent universities. It raises two research questions: What factors have contributed to the digitalization of higher education at Romanian universities? Furthermore, given that the primary mission of higher education institutions is teaching and research, how have universities articulated teaching and learning within their digitalization blueprints? The paper advances the argument that the digitalization of universities is primarily driven by a top-down regulatory approach, notably shaped by the European Union. The proliferation of initiatives in the education sector under the EU's digital transformation policies has had a significant impact on higher education. By contrast, pressure from the national government remains relatively low, as the Romanian state lacks experience in digitalization policies and has failed to establish a coherent agenda for digitalizing education. Universities themselves also remain relatively inexperienced in this area, with issues related to teaching and learning addressed only superficially.

Existing research on digitalization in higher education highlights the interplay between top-down factors, such as national and supranational pressures, and bottom-up drivers, as well as the roles played by academic leadership, teaching staff, and student engagement. Building on this body of scholarship, the paper draws on the theoretical framework developed by Tømte et al. (2019) and tests two hypotheses:

H1: European Union policies and funding initiatives have accelerated digitalization in Romanian higher education institutions (HEIs).

H2: National policies exert a weaker influence than EU-level drivers, and the initiatives of university leadership are limited.

This paper makes an empirical contribution to the literature on the digitalization of higher education institutions by examining the Romanian case, focusing on the internal and external processes that have shaped this transformation. The article is structured as follows. The next section reviews the existing academic literature on the drivers of digitalization, emphasising both top-down and bottom-up initiatives. The subsequent section presents the theoretical framework, drawing on Tømte et al. (2019), and conceptualises the digitalization of higher education institutions as the outcome of both external and internal processes. The final sections discuss the main findings and their implications for the digitalization of teaching and learning in Romanian higher education institutions.

LITERATURE REVIEW

Conceptual Clarifications: Digitization, Digitalization, and Digital Transformation

In examining scholarly debates on digitalization and the factors contributing to its spread in higher education, clarification of terms is necessary. Scholars of digitalization argue that several concepts are often used interchangeably, including digitisation, digitalization, and digital transformation (Kopp et al., 2019, 1449), which can create conceptual confusion and

therefore require greater clarity. Digitisation refers to the process of shifting from analogue to digital formats (Kopp et al., 2019, 1449) or to the creation of a digital replica of physical objects or attributes (Sen Gupta 2020). For example, during the COVID-19 pandemic, university libraries digitised teaching materials such as textbooks and academic journal articles in order to provide students with access to learning resources as teaching moved online and physical libraries were closed. Digitisation can therefore be understood primarily as a technical process.

By contrast, digitalization is more challenging to define and requires a more unified conceptualisation (Bloomberg 2018). Mark Sen Gupta highlights the distinction between digitalization and digital transformation, arguing that digitalization refers to integrating digital technologies to enhance existing processes without necessarily leading to fundamental change. Digital transformation, on the other hand, denotes change that is triggered by both digitalization and digitisation (Sen Gupta 2020). Benavides et al. further clarify this relationship by noting that digitalization constitutes a component of digital transformation.

According to a systematic literature review and inventory of existing definitions, digital transformation can be described as an accelerated process of evolution or revolution involving the innovative use of new technologies to introduce new services, as well as the adaptation of processes, procedures, and organizational capabilities in order to exploit the opportunities created by these technologies, often referred to as digital disruption (Benavides et al., 2020, 8). A more comprehensive definition additionally emphasizes that digital transformation encompasses changes in people, processes, strategies, organisational structures, and competitive dynamics (Wade 2015, 4). In conclusion, digital transformation implies cross-sector organisational change (Bloomberg 2018).

Bottom-Up and Top-Down Drivers of Digitalization

The academic literature identifies both bottom-up and top-down factors that drive the digitalization of higher education institutions. Much of the literature on the digitalization of teaching and learning emphasizes bottom-up drivers, particularly the crucial role of students who increasingly seek more flexible learning opportunities supported by digital technologies (Schuetze et al. 2024, 8).

Faculty engagement is another key factor. Scholars have examined instructors' attitudes toward integrating digital technologies into teaching and the transition from face-to-face to online education. Their findings indicate that the availability of adequate infrastructure, such as learning management systems or smartboards, and access to technical support significantly shape faculty attitudes toward online education (Glushenkova and Zagato 2023, 13). Such support helps ensure that instructors do not feel isolated in the digitalization process. Addressing these challenges through staff training and peer exchange has been identified as a key solution, as it enables educators to share experiences and learn from one another (European University Association 2022, 5).

In addition, instructors' prior experience with technology, teaching styles, and levels of digital competence influence their willingness to embrace or resist digitalization. Other factors, such as increased workload, can also act as deterrents (Jensen et al. 2020). These challenges became particularly evident during the COVID-19 pandemic, when faculty were required to adapt rapidly to new educational realities. Instructors had to devote additional time to creating

digital teaching materials, learning to use new digital tools, and developing pedagogical approaches suitable for online environments. At the same time, academic leadership plays a critical role in advancing digitalization. The effective design and implementation of digitalization strategies are prerequisites for universities to succeed in this process (Kopp et al. 2019, 1451). For such strategies to be effective, they must be supported by both faculty and administrative staff, as this support is essential for building confidence and trust in those leading the change (Khalid et al. 2018, 269). Moreover, digitalization strategies must go beyond purely technical considerations; otherwise, they risk failing to generate meaningful digital transformation (Kopp et al. 2019, 1452). Finally, in an increasingly competitive higher education environment, the need to remain digitally relevant and to be recognized as digital leaders constitutes an additional incentive for universities to pursue digitalization (Islam et al., 2018).

At the macro level, digitalization is shaped by broader political, economic, and technological contexts. Demographic changes (Klemenčič and Ashwin 2015) require universities to adapt their offerings in order to attract non-traditional and international students through hybrid or online programs. Global trends, such as the expansion of digital education and the opportunities created by massive open online courses (MOOCs) (Vázquez García 2015), further motivate universities to adapt and strengthen the internationalization of their academic activities. In addition, national and European legal frameworks, including the availability of European Union funding (European University Association 2022, 5), contribute to this dynamic. Finally, labor market pressures and the growing demand for digital skills represent further explanatory factors shaping the digitalization of higher education institutions (Robertsone and Lapina 2022, 156).

THEORETICAL APPROACH

External and Internal Processes

The paper draws on the theoretical framework developed by Tømte et al. (2019), which examined the digitalization of higher education through the cases of the Danish and Norwegian educational systems. The authors conceptualize digitalization as the interaction between external and internal processes. External processes include variables such as international trends or governmental actions, while internal processes emphasize the role of administrative and academic leadership (Tømte et al. 2019, 102).

Building on this framework, the present study adapts it to the current research context. The analysis focuses on two external drivers: the European Union and the national government. Among internal factors, the role of academic leadership is examined. While Tømte et al. (2019) also mention "institutional academic enthusiasts" or pedagogical innovators as part of internal mechanisms (Tømte et al. 2019, 102), this paper excludes them for several reasons. First, the study focuses on institutional dynamics rather than micro-level analysis. Second, given that Romanian universities are traditionally oriented toward teaching, learning, and research, these bottom-up initiatives are likely to remain limited and have minimal impact.

In addition to examining external and internal drivers, the analysis also considers how universities conceptualize teaching and learning within their digitalization strategies. This aligns with the paper's second research question, as teaching and learning are central to all strategic

digital transformation agendas. These strategies aim to identify challenges in the teaching and learning process. To capture this dimension, the paper applies the classification by Benavides et al. (2020), based on their systematic literature review of the teaching component. This classification encompasses digital infrastructure, such as learning management system platforms, digital literacy and skills, and innovative pedagogical methodologies (Benavides et al. 2020, 14). Figure 1 illustrates the conceptual model, adapted from Tømte et al. (2019) and Benavides et al. (2020).

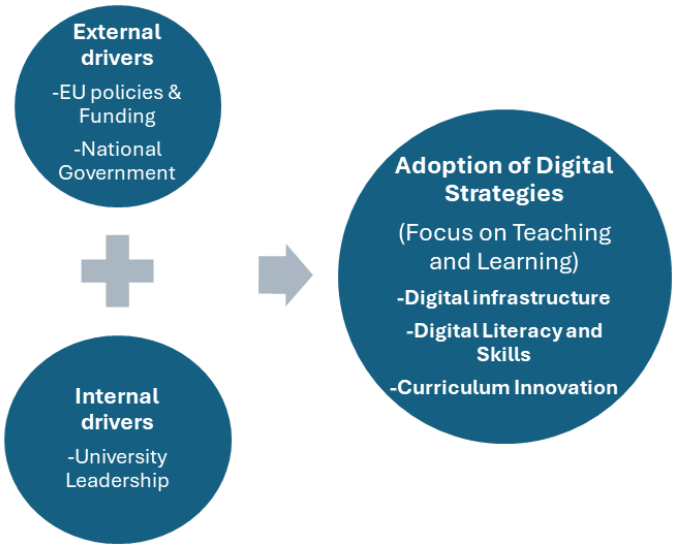


Figure 1: Conceptual Model of Digitalization Drivers
(Source: Author's depiction, adapted from Tømte et al. 2019; Benavides et al. 2020)

From this framework, two hypotheses are derived:

H1: European Union policies and funding initiatives have accelerated digitalization in Romanian higher education institutions (HEIs).

H2: National policies exert a weaker influence than EU-level drivers, and the initiatives of university leadership are limited.

METHODOLOGY

This study uses a qualitative comparative case study to examine digitalization in Romania's largest and top-ranked public universities: Babeș-Bolyai University (UBB), the University of Bucharest (UB), the University of Iași (UAIC), and the Western University of Timișoara (UVT). These universities were selected based on their year of establishment, national rankings, quality of teaching and research, regional representation, and their role as benchmark institutions in shaping higher education policy. All four first implemented digitalization strategies in response to the COVID-19 pandemic.

Data Collection and Analysis

The primary data sources consist of the official digitalization strategies and related policy documents, namely, university strategic plans and the three rounds of reports on the state of university affairs released by the Rector's Office (published by the four universities between 2020 and 2022). This timeframe was selected because these years marked the adoption of the first generation of digitalization strategies, all developed under similar circumstances due to external pressures. Documents were chosen for their strategic significance, as the digitalization strategies articulate the philosophy guiding the digitalization process, outline its objectives, and include other initiatives that support the broader digital transformation process.

The document analysis follows a two-step approach. First, the digitalization strategies are evaluated against both internal and external drivers, using the analytical framework of Tømte et al. (2019) to assess the influence of EU initiatives and the role of national governments. The university documents are examined using qualitative content analysis, with thematic coding applied according to the predefined categories. In the second stage, the strategies are further analyzed with respect to how they conceptualize teaching and learning. Additional insights are gained by examining the chapter on the state of digitalization, a critical section of the Rector's annual reports. Following Benavides et al., the analysis seeks to determine whether the digitalization of teaching and learning is framed predominantly in technical terms, focusing on aspects such as digital infrastructure (e.g., digital platforms), or whether it is more closely linked to pedagogical innovation and curriculum development, as reflected in EU educational initiatives.

RESULTS

External Processes: The Influence of External Drivers

The Role of the European Union

The EU benefits from supporting competencies in education and, as such, must rely on non-binding legislation to complement Member States' policies in this area. Over the past 20 years, the EU has adopted several strategies and soft law instruments to address various educational challenges, including school dropout rates and improving educational quality. This has led to substantial experience and expertise in education. One of the most prominent initiatives within the EU was the Bologna Process, developed through the Open Method of Coordination, which led to the creation of the European Higher Education Area.

Despite the success of the Bologna Process, as measured by the growing number of countries that have joined since its establishment in 2004, and the impact of digital technologies on contemporary society, it is surprising that the Bologna Process has remained without a digital component. Experts in higher education digitalization also emphasize this issue and highlight the need for a structured integration of the digital dimension in education policy (Orr et al. 2020). However, with the EU's digital transformation and digital policy becoming a key priority under the first Von der Leyen Commission (2019–2024), the digitalization of education has entered the European Commission's agenda more systematically, with a focus on higher

education. The adoption of the Digital Decade Programme 2030, which guides the EU's digital actions, carries significant implications for higher education institutions across Member States.

Several arguments support this claim. First, the EU has set an ambitious digitalization agenda by framing the Digital Decade as "everyone has the skills to use everyday technology… where no one is left behind" (European Commission 2023). In alignment with this vision, the EU has established clear targets to achieve digitally competent citizens, including the objective of at least 80% of Europeans acquiring basic digital skills by 2030 (European Commission 2023b).

These goals have direct implications for education, as universities must prepare a digitally skilled workforce and promote digital citizenship, enabling EU citizens to participate in democratic life and exercise fundamental rights, such as freedom of expression, in the online environment. The urgency of this initiative is underscored by the potential for the digital divide to exclude citizens from accessing public services, employment opportunities, educational programs, or participating as engaged digital citizens. Consequently, universities play a critical role in bridging the digital skills gap and empowering citizens to exercise their digital rights.

Second, the EU's adoption of the Declaration on Digital Rights and Principles in 2022 recognizes the right to digital education, which represents an extension of the right to education enshrined in the EU Charter of Fundamental Rights. The inclusion of this right is expected to pressure EU Member States and universities to formulate and implement policies that integrate digital technologies into teaching and learning. Together with the Digital Education Action Plan for 2021–2027, this marks a new turning point for the EU in supporting the digital transformation of higher education institutions.

Accordingly, it is not surprising that the European Commission took the next logical step by adopting an EU Strategy for Universities, aimed at reinforcing transnational cooperation among European universities. The Strategy serves multiple purposes: developing a genuine European dimension of education, supporting universities in adapting to changing conditions to thrive, and contributing to post-pandemic recovery (European Commission 2022a, 6).

Funding Instruments as Catalysts

EU objectives are supported through financial programs, including the Digital Europe Programme, Horizon Europe, Erasmus+, and, most notably, the Next Generation EU mechanism.

Additionally, through the Strategy for Universities, the EU is prepared to allocate €80 billion in funding (European Commission 2022a, 11). This represents a significant opportunity for Central and Eastern European universities to join transnational alliances aimed at closing the digital gap. Such collaborations are expected to connect universities from new Member States, including Romania and Bulgaria, where teaching and research quality have not yet reached the standards of Western institutions. This will help improve teaching and research programs. Furthermore, it can drive change by transforming universities into more digitally aware institutions through the exchange of best practices with more technologically advanced higher education institutions.

Moreover, these initiatives have the potential to foster innovation by encouraging the creation of joint transnational programs and significantly impacting students and teaching staff through the integration of digital technologies in teaching and learning. They will equip students with essential digital competencies and support the professionalization of teaching

staff, who require additional training in both technology use and new pedagogical approaches that incorporate digital tools.

The level of funding is also noteworthy, as Romanian universities have long suffered from chronic underfunding, and digitalization has not received consistent attention since the COVID-19 pandemic. This presents an opportunity for Eastern European universities to become more competitive, adapt to emerging dynamics, enhance the quality of their teaching and research programs, and increase the attractiveness of higher education.

For Romanian universities, the Next Generation EU framework and the National Resilience and Recovery Plans (NRRP) have been transformative. Under the NRRP, which prioritizes digitalization in higher education, €234 million has been allocated to support sixty Romanian universities in continuously developing their teaching and learning programs and establishing "innovative technology centers to develop the skills of the future" (Ministerul Investițiilor și Proiectelor Europene 2022, 4).

However, these opportunities have also exposed institutional weaknesses. Universities were required to demonstrate the existence of digital transformation strategies to access funding, and many had to draft such strategies within days (Mărcuț 2022). This compressed timeline left little room for stakeholder consultations, despite the disruptive nature of digital transformation. Additionally, it discouraged in-depth reforms, leading to a fragmented approach and only a superficial impact on digital transformation. As highlighted by scholarly research, digital transformation involves structural change; it requires time, and "impulsive action" can have negative consequences (Kopp et al. 2019, 1451).

National-Level Initiatives

In contrast, national-level initiatives in Romania have been limited in scope and impact. The country has developed a lagging reputation in this field and began the digitalization process relatively late compared to other EU Member States. A turning point came with the launch of Educated Romania in 2018, an initiative of the Klaus Iohannis Presidential Administration, which brought the issue of digitalizing education onto the national policy agenda.

Romania established, for the first time at the end of 2019, institutional structures such as the Authority for Digitalization. However, more consistent initiatives emerged in response to the COVID-19 pandemic. The education sector, in particular, adopted a Strategy for the Digitalization of Education in 2021, motivated by the urgency of the pandemic and the need to align the Romanian educational system with EU initiatives, such as the EU Digital Education Action Plan 2021–2027 (Ministerul Educației și Cercetării 2021, 5).

Despite these advances, progress has been slow, as reflected in Romania's consistently low performance in the Digital Economy and Society Index (DESI), where it ranks near the bottom among EU Member States in terms of human capital, connectivity, and digital public services.

Internal Drivers: University Responses and Digitalization Strategies

Analysis of the digitalization strategies of four major universities, Babeș-Bolyai University (UBB), University of Bucharest (UB), Alexandru Ioan Cuza University of Iași (UAIC), and Western University of Timișoara (UVT), reveals that Romanian universities' approaches to digital transformation are largely externally driven rather than bottom-up (see Table 1). All four universities adopted digitalization strategies between 2020 and 2022, primarily in response to two major external shocks: the COVID-19 pandemic and EU-driven incentives, particularly funding opportunities under the Next Generation EU and Romania's Resilience and Recovery Plan.

The pandemic is framed as both a temporary crisis and a catalyst for lasting change. It forced a rapid shift to online education and accelerated the adoption of digital tools and platforms across universities. However, leadership at universities such as UVT and UBB emphasizes that digitalization was already part of a long-term strategic vision before the pandemic, with the crisis accelerating and deepening rather than initiating these efforts. Universities recognize the pandemic as an opportunity to integrate new digital competencies and rethink educational delivery modes, moving toward hybrid and blended models. The crisis also highlighted the need for mental health support and equitable access to digital education.

Digitalization strategies explicitly align with EU norms, policies, and frameworks, including GDPR compliance, integration with European digital infrastructures (e.g., Single Sign-On systems, European Student Card), and participation in European university alliances such as UNITA (UVT), CIVIS (UB), Eutopia, and The Guild (UBB). EU funding mechanisms, including Next Generation EU, the Romanian Plan for Recovery and Resilience (PNRR), Structural Funds, and Horizon Europe, provide significant financial support for digital infrastructure, platform development, and innovation projects. These funding opportunities act as strong motivators and enablers of digital transformation efforts. Digitalization is framed as a means to align with EU digital transformation goals, including the Digital Decade and the European Education Area. Universities are positioning themselves to meet EU expectations for modernization, sustainability, internationalization, and competitiveness.

Particularly decisive were the Next Generation EU funds, which prioritize digitalization and the green transition, with universities playing a pivotal role. In 2022, sixty universities in Romania were selected for funding to implement digitalization projects, with eligibility contingent on the existence of a Digitalization Strategy. This represents the first step for public and private higher education institutions to adopt formal digitalization strategies. However, the success of such initiatives also depends on the quality of these strategies, whether they are developed through broad stakeholder consultations or informed by lessons from more digitally mature institutions. Such an approach can help reduce distrust among teaching and administrative staff regarding the potentially disruptive processes of change.

The Digitalization of Teaching and Learning

Teaching and learning are fundamental to the mission of higher education institutions and play a crucial role in shaping how digital transformation occurs within universities. Utilizing the framework proposed by Benavides et al. (2020), which identifies three key dimensions of

digitalization: digital infrastructure, digital literacy and skills, and innovative curriculum and pedagogies, this section examines how these elements are incorporated into the universities' digitalization strategies. Table 2 summarizes the primary features of each institution's approach.

All four strategies recognize the digitalization of teaching and learning as a dual challenge, involving both technical and pedagogical dimensions. The technical dimension focuses on the development and modernization of digital infrastructure, including e-learning platforms, cloud solutions, and hardware and software upgrades. The pedagogical dimension emphasizes innovation and curriculum transformation, incorporating digital tools and methods into teaching, updating curricula to include digital competencies, and training academic staff in digital skills.

Table 1: Institutional Strategies for Digitalization in Romanian Higher Education: Internal and External Drivers (Source: Author's depiction, based on digitalization strategies)

University	Strategy Type	Timeframe	Rationale	Primary Driver	Orientation
Babeș-Bolyai University (UBB)	Digital Transformation	2020-2027	World-class and digital university by 2027.	External (COVID-19, EU funding), with some internal efficiency goals.	**Proactive** Long-term plan reflects a deeper structural approach.
University of Bucharest (UB)	Digital Transformation	2022-2027	Modern university with high-quality digital education, research and administration by 2027.	External (COVID-19, Resilience and Recovery Plan).	**Reactive** Strategy designed to align with EU-funded projects.
University of Western Timișoara (UVT)	Digitalization	2022-2025	Centre of excellence in digital services by 2027.	Mix of early internal prioritization and external incentives.	**Proactive** Started prioritizing digitalization before the pandemic; less structured Strategy.
Alexandru Ioan Cuza University (UAIC)	Digitalization	2022-2025	Develop and integrate advanced information and communication technology (ICT) resources and systems to enhance education, research, and administration.	External (COVID-19, EU funding).	**Reactive**

Digital Infrastructure: Digital Platforms

All four universities prioritize teaching and learning in their digitalization strategies, identifying the need to upgrade digital infrastructure as a primary challenge. This includes the systematic implementation of learning management systems (LMS) across all faculties and departments within the university. Before the pandemic, these tools were not used uniformly.

For example, at Babeș-Bolyai University, Moodle served as the platform for distance learning programs, but it had not been integrated into regular teaching. It was regarded as a "special tool" for online teaching, reflecting the prevailing traditional perspective on teaching in Romania's academic landscape.

Universities have either opted for free LMS platforms such as Moodle or acquired Microsoft licenses. Anecdotal evidence suggests that most teaching staff have continued to use these tools even after the return to face-to-face classes, which are now supported by digital teaching infrastructure. Those who have abandoned this method tend to be staff with limited digital skills or those who did not regularly incorporate digital tools into their teaching, for whom the COVID-19 pandemic was not a profoundly transformative learning experience.

Digital Literacy and Skills for Educators

One of the most significant barriers to the digitalization of teaching and learning is the digital literacy of teaching staff. All four strategies recognize the need to improve educators' digital skills through training opportunities, including formal training programs, workshops, and the integration of digital tools into teaching. For example, UVT's Teaching and Learning Brand program is a notable initiative that equips new academic staff with e-learning skills and pedagogical innovation training. It also plans to design training programs aligned with the European Framework for the Digital Competence of Educators (DigCompEdu) by 2025. Similarly, UB's participation in the CIVIS alliance has exposed staff to workshops and European training opportunities focused on digital transformation and innovative pedagogies. By contrast, UBB has emphasized digitalizing academic and administrative processes, particularly by focusing on training administrative staff in digital and language skills.

Universities recognize that digital literacy is a fundamental issue, especially given their status as large institutions with substantial teaching staff. Training programs must be tailored to address the diverse digital skill levels of staff, which is an asymmetrical challenge. Some teachers possess advanced skills, others have moderate skills, while some fall behind. This partly explains why universities have prioritized the digitalization of administrative services, a more technical process that is easier to implement and yields measurable outcomes. For example, all four universities have developed online admission platforms for their teaching programs and graduation processes, requiring students to register online to take final exams and defend their BA or MA theses. These administrative operations were previously available only offline through traditional brick-and-mortar services.

Innovative Curricula and Modern Pedagogies

In terms of innovative curricula and pedagogies, the results are mixed, making this one of the most challenging areas of digitalization. It involves academic, curricular, or structural innovation (Benavides et al. 2020, 14). Some universities have begun to reconceptualize teaching and learning as part of their digitalization efforts, while others remain focused primarily on technological aspects (see Table 2).

Table 2: Teaching and Learning Dimensions: Digitalization Strategies (Author's depiction, based on the rectors' annual reports 2020–2022)

University	Digital Platforms	Digital Literacy and Skills for Educators	Innovative Curricula and Pedagogies
Babeș-Bolyai University (UBB)	Microsoft Teams has been adopted as the university-wide learning management system (LMS) for courses and meetings. Continuous integration of digital tools (2021-2022). Turnitin is used for academic integrity.	Extensive training for personnel in digital competencies, recognizing a persistent gap in digital skills and addressing it through ongoing professional development.	The UBB-EON-XR Centre integrates AR/VR technology with pedagogy. Strong focus on artificial intelligence. Involved in the European Institute of Innovation and Technology (EIT). Institute in Artificial Intelligence, Virtual Reality, and Robotics.
University of Bucharest (UB)	Moodle-based educational platform for teacher training and blended learning since 2017.	Participation in European university alliances (e.g., CIVIS) offering workshops on innovative pedagogies and digital transformation in education.	Blended learning and MOOCs as strategic priorities.
University of Western Timișoara (UVT)	The Moodle platform serves as the main e-learning environment. Unita Virtual Campus: facilitates transnational learning and collaboration.	Training in e-learning technologies (Moodle 3.11 and 4.0) UVT Teaching and Learning Brand" (professional development program for new academic staff).	Implementation of flexible learning pathways. UVT coordinates the network of teaching and learning centers within the UNITA Alliance.
Alexandru Ioan Cuza University (UAIC)	Unified LMS for course management across faculties.	Integrated digitalization strategy aimed at training academic staff on new digital technologies to support educational and research activities.	Integration of Flexible and Non-Traditional Learning Modes.

UBB demonstrates the most visible progress through its integration of augmented reality (AR) and virtual reality (VR) technologies, indicating a shift toward more experiential and interactive forms of learning.

A notable example of curriculum innovation is the introduction of specialized programs in technology-related fields, such as artificial intelligence, robotics, or big data science. This is expected to increase the number of ICT specialists in Romania, which currently lags behind the

EU average at 2.6% according to the DESI report for 2022 (European Commission 2022b, 7). UBB was the first academic institution in Romania to offer an undergraduate program in artificial intelligence, starting in September 2023. Other universities are considering introducing new specializations, including cybersecurity programs, the use of artificial intelligence as a teaching tool, gamification in teaching and learning, and virtual mobility through the UNITA alliance (UVT). UB, in turn, has prioritized blended learning and the development of MOOCs in its Strategy, signaling alignment with European digital education priorities.

Overall, while universities recognize the importance of digital transformation, pedagogical change remains at an early stage, often overshadowed by infrastructural and technical objectives. However, these examples show that Romanian universities are striving to adapt and prepare students for the future, countering the tendency to "prepare students for jobs in the past and at most in the present and less for the future" (Noja and Pânzaru 2021, 8). Romanian academia faces a modernization deficit and requires streamlining, but achieving this depends on several critical factors: transformative academic leadership, highly skilled teaching staff, and adequate financial resources.

DISCUSSION

The COVID-19 pandemic has significantly accelerated the digital transformation of higher education, fundamentally changing how universities operate. Romanian universities faced systemic weaknesses, including the absence of digital teaching infrastructure, low digital literacy among faculty and students, and limited use of digital tools in teaching and learning. To avoid "digital chaos," universities began developing digitalization or digital transformation strategies for the first time. However, as the findings show, these strategies emerged primarily in response to external pressures rather than from prior internal expertise or leadership vision. This initial phase of higher education digitalization was primarily driven by top-down pressure from the EU. This outcome aligns with Tømte et al. (2019) conceptualization of digitalization as shaped by both external and internal processes, but in the Romanian context, external drivers clearly dominated.

The findings support H1, indicating that EU policies and funding have been the main catalysts of digitalization. Although the EU relies on soft law legislation in the education sector, it has successfully advanced the digitalization of the European Higher Education Area, addressing a previously missing link in the Bologna Process.

Limited national involvement supports H2, characterized by weak, fragmented initiatives that were primarily reactive to EU frameworks rather than the result of proactive domestic planning. Romania introduced its first Strategy for the Digitalization of Education in 2021, while continuing to rank among the lowest performers in Europe in terms of digital education and infrastructure (Curaj et al. 2020). This situation aligns with broader literature on higher education in Central and Eastern Europe (CEE), which describes Romania as a "digital laggard," reliant on external pressure to initiate reforms. Consequently, government actions have primarily been responses to EU initiatives.

The university administrative leadership largely assumed a reactive role. Three of the four universities, University of Bucharest (UB), Alexandru Ioan Cuza University (UAIC), and, to a lesser extent, Western University of Timișoara (UVT), developed strategies only after EU frameworks

and funding opportunities created both pressure and incentives. These cases illustrate how institutional leadership aligns with external drivers rather than with bottom-up factors. For UAIC and UB, this framework contributed to the emergence of strategic plans.

Other universities, however, initiated digitalization efforts earlier. For example, in 2020, Babeș-Bolyai University elected a new rectorate and articulated a vision to transform the institution into a world-class university. This transformation aimed to align the university with international trends and implement digital transformation. The Rector emphasized the need to develop a Digitalization Strategy (Daniel David 2020, 19). Consequently, Babeș-Bolyai University adopted a long-term strategy in 2020, envisioning a transformation into a digital university by 2027 (Universitatea Babeș-Bolyai 2020, 8). The University of Western Timișoara was also proactive regarding the digitalization of education, as highlighted by the UVT Rector. Digitalization became a topic of interest beginning in 2017–2018. These findings reveal several patterns. They support the argument that universities often adopt digitalization impulsively and in fragmented ways (Kopp et al., 2019), driven primarily by exogenous pressures and the opportunity to establish a digitalization agenda and secure funding. At the same time, the findings challenge research emphasizing the role of bottom-up drivers, such as student demand or faculty innovation (Schuetze et al. 2024), as these factors played only a marginal role in the Romanian context.

The Digitalization of Teaching and Learning

When examined through the framework proposed by Benavides et al. (2020), which includes digital infrastructure, digital literacy, and innovative curricula and pedagogies, Romanian universities exhibit uneven progress.

First, all four universities have made substantial advances in developing their digital infrastructure, particularly through the expansion of LMS platforms (e.g., Moodle or Microsoft Teams) and the transformation of traditional administrative services into digital formats. These improvements, initiated during the COVID-19 pandemic, have continued to evolve, contributing to a deeper level of digital transformation.

Second, while digital literacy and the enhancement of academic staff's digital skills have become formal priorities on strategic agendas, an analysis of the Rectors' reports on digital affairs shows that, although large-scale initiatives such as certified training courses on e-learning platforms have been organized, there remains a pressing need to go beyond teaching staff how to use the LMS. Attention should also focus on digital pedagogies.

Finally, curricular and pedagogical innovation remains the least developed aspect. While UBB's implementation of AR/VR technologies and AI-focused curricula represents promising progress, there is a need to embed digital competencies across disciplines. This requires translating innovative pedagogies at the Faculty level, improving blended and experiential learning models, and addressing the persistence of traditional teaching practices. The European Union's objective of creating "meta-universities" through transnational alliances offers significant potential to transform teaching and learning by emphasizing and embedding digitalization. All four universities participate in alliances funded by the European Commission, making teaching a central element of their digitalization strategies. The University of Western Timișoara has implemented virtual mobilities that allow students to take courses in partner

university consortia and has taken a leadership role in coordinating digital services and developing a virtual campus within the UNITA alliance. UBB and UB are also active participants, following closely within the Eutopia and Civis alliances.

These practices contribute to the internationalization of universities by enabling joint teaching programs, increasing student satisfaction, and fostering the development of new pedagogical approaches. They also offer important learning opportunities for the institutions themselves. Among the four universities, the University of Western Timișoara appears to be the most advanced, having implemented digitalization initiatives prior to the COVID-19 pandemic. Research on UVT indicates that this digital transformation represented an organizational change characterized by the adoption of a "digital way of thinking" (Grosseck et al. 2020, 568).

CONCLUSION

This paper has explored the digital transformation of higher education in Romania, focusing on both external and internal processes as key explanatory variables. By analyzing the digitalization strategies of four of Romania's leading universities, the study demonstrates that external influences, particularly from the European Union (policies and funding mechanisms), predominantly drive digital transformation. In contrast, national initiatives play a marginal and reactive role. The findings indicate that the EU has been the principal driver, providing financial resources to support digital investments and offering policy guidelines to help universities conceptualize digital transformation. National authorities, meanwhile, have exerted limited pressure compared to those in other EU countries, and Romania has yet to develop a robust national digitalization agenda, with only embryonic initiatives. The government has primarily acted as a policy-taker, translating EU actions without establishing a comprehensive digital education framework.

At the institutional level, universities have mainly responded reactively, setting digitalization agendas in response to the COVID-19 pandemic and the availability of EU funding opportunities. The strategies examined in this study emphasize developing digital infrastructure and improving administrative efficiency, while the transformation of teaching and learning practices, although highlighted as a strategic priority, remains less significant in practice. This supports the idea that, before the COVID-19 pandemic, Romanian universities essentially functioned as traditional brick-and-mortar institutions. The changes prompted by the pandemic required substantial resources, leading technology to be viewed primarily as an investment tool rather than as a means to fundamentally rethink educational philosophy and pedagogy.

The findings support the model proposed by Tømte et al. (2019) while highlighting Romania's reliance on external influences, particularly EU educational initiatives and financial incentives, coupled with a lack of entrepreneurial digital leadership. By incorporating the pedagogical perspective of Benavides et al. (2020), the study provides deeper insights into the development of digitalization within universities, framing it not only as a structural transformation but also as a transformation in teaching and learning practices.

From a policy perspective, these findings carry significant implications for other Central and Eastern European (CEE) universities undergoing similar transitions. Institutional leadership should move beyond compliance-oriented digitalization to take ownership of the digital agenda. This involves promoting participatory governance in the development of digital

strategies by engaging administrators and educators, integrating pedagogical innovation alongside technological investments, and strengthening the exchange of best practices within European university alliances, while drawing on insights from more digitally mature institutions. Such initiatives would foster a more balanced approach to digital transformation, one that harmonizes external alignment with internal agency and sustainability.

While the paper makes a solid contribution, it is not without limitations. It relies primarily on strategic documents, such as digital transformation strategies and annual reports, which may not fully capture the realities of digital transformation. It also does not include the perspectives of key academic stakeholders, such as administrators responsible for implementing digitalization strategies and department-level faculty members, who could shed light on the interplay between top-down and bottom-up factors. Future research should address these gaps. Additionally, examining the strategies employed by private universities would help contextualize differences between public and private institutions, as well as between higher-ranked and lower-ranked educational establishments.

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