

# The Complementary Role of Digital Tools in Higher Education: The Importance of Integration and Digital Maturity

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## Introduction

The shift toward digital education has accelerated, particularly in the context of the COVID-19 pandemic [1], prompting a deeper exploration into hybrid learning models in higher education. In this paper, we discuss the importance of the integration of third-party digital platforms with traditional learning environments and evaluate their effectiveness from a student engagement perspective. Based on our prior study [2], we argue that while students generally view their digital learning experiences positively, significant challenges related to platform integration and digital literacy persist. Notably, the assumption that younger adults are inherently digitally proficient is challenged, highlighting the diversity in digital skills among the student population. The study suggests that hybrid learning environments can enhance educational delivery but require careful implementation to address integration issues and support diverse learning needs. Recommendations are made for educational institutions to adopt more user-friendly digital tools and for a collaborative approach with digital platform providers to ensure seamless integration to enrich the learning experience. This paper contributes to the ongoing discourse on digital transformation in education, proposing a framework based on digital maturity and advocating for strategies that prioritize both technological and pedagogical efficacy.

## The Digital Transformation Discourse

Upon preliminary review of the literature concerning teaching and learning innovations, the discourse around hybrid education emerges predominantly. This discourse suggests that the future

of education, particularly higher education, will increasingly rely on a combination of traditional face-to-face interactions and digital, online methods, whether synchronous or asynchronous. Hybrid or blended learning systems offer numerous advantages [3] but also face significant challenges, including constraints related to time and cost. Implementing a hybrid approach requires a thorough assessment of learning needs followed by careful planning in terms of design, delivery, and evaluation. In this context, universities must meet the quality assurance expectations of various stakeholders, with students increasingly recognized as key participants [2,4]. Consequently, the development and implementation of hybrid teaching and learning strategies must encompass the full spectrum of the learning cycle, from needs assessment through to evaluation. Gaining a deeper understanding of students' perceptions and experiences with online learning platforms is necessary. Moreover, the digital maturity of both students and educational institutions should be carefully considered to ensure effective engagement and the optimal use of these educational tools.

## Third-Party Providers

Utilizing third-party products can help alleviate the cost and time pressures associated with hybrid teaching and learning. These products often provide superior quality and significant value for their price. In the current climate, publishers and content developers are enhancing their traditional textbooks with digital resources and learning solutions, aiming to meet the growing demand of universities to expand online learning options for their

increasing student populations. While these tools are marketed as integrated learning solutions, it is somewhat misleading; they are, more accurately, distinct platforms that at best, have partial integration with university virtual learning environments (VLEs). The effectiveness of these platforms is greatly influenced by how much students trust and are satisfied with the products, which in turn affects their overall learning experience and their identification with the social aspects of learning [2,5].

### Engaging the Digitally Native Generation

The intended audience, students, is often viewed as digitally native, accustomed to navigating digital environments as part of their learning experience. However, the digital spaces that are second nature to them might not align with the perceptions traditionally held by older generations. Research indicates that these younger, digitally adept individuals often favor learning through concise, non-linear segments [2,3]. In contrast, the structure of textbooks, their online supplementary materials, and university virtual learning environments typically adhere to a more sequential, linear format.

A detailed examination of the expanding body of literature reveals an increasing focus on optimizing incentives and engagement for students in hybrid learning environments. This research primarily centers on how students interact with integrated learning solutions and university virtual learning environments. Efforts to boost student engagement often rely on incentives, with less emphasis on genuinely inspiring interest and enthusiasm. This approach is often clouded by the tendency to equate engagement directly with academic performance, which is typically inferred from metrics like logins, usage rates, and grades.

We adopt the definition of engagement as outlined by Argyriou et al.'s [6], drawing on Newmann et al.'s (1992, p.12) framework, which describes engagement as the "... student psychological investment in an effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work intends to promote". This concept is echoed by other scholars who view engagement as encompassing behavioral, emotional, and cognitive dimensions [7]. For instance, Hapke et al. [7] applied a comprehensive approach to studying student engagement with online learning systems, considering all these dimensions. In their study, cognitive engagement in large classes (800 students) was gauged through exams or similar tasks that test recall of information. This method primarily motivates specific learning behaviors rather than inspiring students to genuinely engage and excel beyond the confines of structured assessments. The researchers categorized emotional engagement as the students' feelings and attitudes towards the learning environment; behavioral engagement as the extent of the students' participation and task completion; and cognitive engagement as the intellectual effort invested in understanding and mastering the academic material.

Thus, it is understandable that behavioral engagement has been linked to academic success, as highlighted by Argyriou et al. [6], particularly because this aspect is often the most encouraged and rewarded. Orji et al. [8] also explored this in their study by measuring the time students spent on courses and their activity completion rates. In our observations and the findings of our study [2], deeper cognitive engagement is more effectively achieved through direct interactions, either online or in class, facilitated by instructors, rather than through asynchronous methods.

We propose a more nuanced approach to understanding the relationship between engagement and academic achievement. This approach requires educational institutions to foster close collaborations and trustful relationships to enhance the design and integration of virtual learning environments. These environments should aim to inspire and motivate students, not merely push them towards superficial engagement that is often seen with incentives limited to performing well in online quizzes and multiple-choice questions. While these behavioral incentives may suffice for surface learning, Annansingh's [9] research suggests that encouraging deeper learning and practical application through cognitive and emotional engagement would be far more effective. This would involve a range of strategies that extend beyond the conventional reliance on automated systems to stimulate genuine interest and engagement among students.

### Satisfying our Curiosity

In 2022 we conducted a mixed-methods study [2], engaging 33 first-year undergraduate Business Management students from an Organizational Behavior module. The selection of participants was purposive, aiming to obtain insights from students experiencing both traditional and digital learning environments. Data collection involved a detailed survey and focus groups. The survey was designed to capture quantitative data on students' engagement and perceptions, while the focus groups aimed to gather in-depth qualitative insights. Statistical analysis of survey data included frequency distribution and cross-tabulation, providing an understanding of the quantitative aspects of student engagement.

The results highlighted a nuanced engagement with the digital platform, with significant findings on behavioral, emotional, and cognitive engagement dimensions. Compared to existing literature suggesting digital natives are inherently proficient with new technologies [10], our findings challenged this notion, revealing varied digital competencies among students. This discrepancy underscores the importance of tailored digital education strategies that accommodate diverse student needs and capabilities. Additionally, the mixed experiences and lack of embedded integration features between the third-party platform and the institution's virtual learning environment suggests areas for improvement in seamless digital transformation to enhance user experience and engagement.

There is a demand for variety not only in the presentation of activities and overall infrastructure but also in the methods used to distribute information. More engaging and interactive approaches are favored over plain text or complex designs. The read-aloud feature was highly valued, echoing Levy and Michael's [10] observation that students are prone to multitasking, which might lead to distraction during tasks. Therefore, it's important to moderate the use of varied dynamic elements to ensure that students remain focused on the activities at hand rather than being overwhelmed by choices.

Our study also sought to examine student experiences and perceptions of learning environments where traditional incentives linked to weekly activities and assessments were absent (such incentives have been extensively studied, for example by Argyriou et al. [6]). We found that when the learning environment's infrastructure and design are cumbersome, and direct connections to assessments are lacking, students tend to disengage over time. Feedback from focus groups indicated that ease and enjoyment in using learning activities are important; difficulties in transitioning between systems can lead to a lack of interest and, ultimately, disengagement.

Furthermore, both the VLE and third-party systems were found to be structured linearly, like textbooks, which does not satisfy students' desires for novelty and variety. Studies like those by Hargitai et al. [3] have highlighted the effectiveness of delivering content in small, engaging 'Instagram-style' bursts that capture attention and encourage deeper engagement. However, without foundational skills such as time management, discipline, and communication, these engaging learning snippets may not translate into meaningful educational outcomes. A cohesive, story-like structure is necessary, with synchronous sessions that guide students through the learning content as if they were narrative episodes.

A significant issue highlighted was students' dissatisfaction with the cumbersome navigation and the multiple stages required to access content on the online platforms. While the 'rule of three clicks' is widely regarded as optimal for user experience design, current VLEs and online platforms often require more extensive navigation, reflecting traditional linear academic structures. This could be partly due to the need to integrate these platforms into established educational frameworks, which are influenced by institutional norms and bureaucratic inertia, as previously discussed in another research [11]. These factors necessitate a more flexible approach to digital learning design to meet modern educational needs effectively.

Our study underscored the critical nature of first impressions in user engagement with digital learning platforms. Effective digital education requires not just technological integration but also a keen understanding of the pedagogical implications of such tools. Practically, institutions should consider step-by-step guides for both faculty and students to navigate new platforms,

emphasizing ease of use and access. This would require a trust-based collaboration between educational institutions and digital content providers to ensure that digital tools are effectively integrated and truly augment the learning experience. More research is needed in this respect, using larger and diverse samples to validate these findings and explore the impact of digital competencies on learning outcomes.

### Proposition - The Maturity Spectrum

Kane et al. [11] have introduced a concept of a digital DNA maturity spectrum, an essential framework for advancing the digital transformation of higher education. This spectrum assesses the current maturity level of users and organizational structures and outlines a four-stage maturation process: exploration, doing, becoming, and finally, achieving digital maturity. To successfully navigate these stages, three critical dimensions must be addressed: organize, operate, and behave.

Organize refers to optimizing the physical space, structure, and capabilities that facilitate or limit activities. A crucial aspect of this is the ability to 'be present' digitally, transcending physical and geographic limitations. Operating involves the technology, processes, talent, and governance that drive transformation. This stage encourages innovation and a departure from conventional methods. Behave focuses on the rewards, leadership, policies, and performance metrics that influence digital conduct. Traditional methods of assessment, when combined with innovative digital tools, may hinder the adoption of digital behaviors by both students and institutions.

Organizational Human Capital: The integration of third-party online learning platforms using a learner-content approach is significantly more effective when paired with synchronous learning that fosters interaction between instructors and students. While digital tools enhance the learning process, they are not a substitute for traditional methods. Furthermore, the training needs of students and staff in managing these platforms are important and should not be underestimated [3].

Operational Structural Capital: The infrastructure and its integration within the educational system require careful examination. If students can effortlessly navigate complex digital environments may lead to inefficiencies; if any digital element requires more than three clicks from the starting point, it should be reevaluated for accessibility. Close integration with third-party vendors, underpinned by a trust-based partnership focused on quality assurance and intellectual property rights, is essential [4].

Relational Capital Behavior: The entire organizational and operational effort aims to cultivate a conducive digital behavior. Educational institutions must address and overcome the rigidity-innovation dichotomy by dismantling barriers that impede digital transformation, such as outdated regulations and restrictive policies [10].

Our study's [2] findings and their implications discussed in this paper highlight and support Kane et al.'s [11] three foundational elements—organize, operate, and behave. We aimed to investigate student engagement with a hybrid learning model that incorporates third-party tools, which were integrated into the university's virtual learning environment through hyperlinks due to copyright restrictions. We sought to understand how these tools impact student learning and engagement without direct assessment incentives. Further research is necessary to involve all stakeholders and deepen our understanding of the effectiveness and potential improvements in hybrid and blended learning environments in higher education. A collaborative approach with publishers and content developers, based on mutual trust and cooperation, is necessary for fostering beneficial growth and innovation.

### Conclusion

In conclusion, the transition to hybrid learning models facilitated by third-party digital platforms presents both significant opportunities and challenges for higher education. Our exploration into these models has revealed that while digital tools can significantly enhance educational delivery, their integration must be handled with precision to cater effectively to the diverse digital capabilities of students and meet educational goals.

This paper underscores the necessity for educational institutions to not only embrace technological innovations but also fundamentally rethink their pedagogical strategies to ensure that digital education is both effective and inclusive. By adopting user-friendly digital tools and fostering robust collaborations with digital platform providers, universities can create more seamless and engaging learning experiences for all students.

Moreover, our findings highlight the critical role of digital maturity in the success of hybrid learning environments. As education continues to evolve, a strategic focus on developing the digital competencies of both educators and learners will be crucial. This involves reevaluating traditional teaching methods and assessment strategies to better align with the dynamic, interactive nature of digital learning.

In moving forward, it is essential for future research to continue examining the nuances of student engagement in hybrid environments and to expand the scope of investigations to include larger and more diverse populations. This will provide a richer understanding of how digital transformation impacts learning outcomes and student satisfaction.

Ultimately, by addressing the challenges head-on and leveraging the strengths of digital education, we can ensure that higher education remains responsive to the needs of today's learners and prepared for the demands of tomorrow's educational landscape. This commitment to continuous improvement and adaptation is what will drive the success of hybrid learning models in the years to come.

### Conflict of Interest

The authors declare that no economic interest or any conflict of interests exist in the production and publication of this paper.

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