

Unveiling the Digital Horizon: Leveraging Organizational Learning, User Adaptation, and Slack Resources for Enhanced Higher Education Performance

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Abstract

The Organizational performance of the higher education sector in the era of industrialization is becoming a hot issue. Being a direct talent supplier of the business world, higher education institutions are striving to keep pace by implying several unique models. This study proposes that digital transformation initiatives are the center of debate in modern research concerning organizational performance. By adopting digital transformation, organizational learning increases leading to higher user adaptation ultimately leading to organizational performance. This study collected data from 245 employees from higher education institutions in China who are directly engaged in the digital transformation process. The data were assessed using SmartPLS (4.0) and partial least square structured equation modeling. The findings revealed that digital transformation initiatives directly positively affect organizational performance. Also, organizational learning and user adaptation act as serial mediators concerning organizational performance. This study also found that unobserved slack (unused resources in items of talent potential) assisted the process of digital transformation initiatives and organizational learning. While on the following mechanism, observed slack (measurable and visible difference between the potential output) positively affects the relationships between organizational learning, user adaptation, and organizational performance. This study provides a comprehensive model for enhancing organizational performance by optimizing organizational learning, user adaptation, and slack resources. This study offers theoretical contributions and practical implications for both higher education institutions and policymakers to enhance organizational performance using digital transformation initiatives.

Keywords: organizational learning, user adaptation, Digital transformation initiatives, organizational performance, slack resources

1. Introduction

The pursuit of organizational excellence has become crucial in the current higher education landscape due to the rapid improvements brought about by the digital age [1]. Since universities are the main sources of talent for the corporate world, there has been a lot of focus on their organizational effectiveness. The introduction of digital transformation programs has become a central topic of conversation when it comes to corporate effectiveness. In the context of higher education, this study intends to explore the relationship between organizational learning, user adaptation, digital transformation, and organizational performance. Digital transformation efforts aim to radically change the way institutions function by integrating digital technologies into a variety of organizational functions [2]. This transition affects company culture, structure, and procedures; it is more than just a technological improvement. To increase overall operational efficiency, reduce administrative procedures, and expand their instructional offerings, higher education institutions are progressively implementing digital tools and platforms. These programs are seen to be necessary to stay relevant and competitive in an educational environment that is changing quickly [3].

The research holds significance as it can shed light on the mechanisms by which digital transformation initiatives might stimulate organizational learning and user adaptability, leading to an improvement in organizational performance. The procedures via which organizations gather, share, and apply knowledge to enhance their operations and adjust to shifts are referred to as organizational learning [3]. Organizational learning is essential to the digital transformation of an institution since it helps them to reinvent their methods and successfully integrate new technology. In contrast, user adaptation refers to an organization's ability for individuals to become accustomed to new procedures and systems, guaranteeing that the full potential of the digital transformation is fulfilled [1].

Maintaining competitiveness and relevance in the educational landscape requires an awareness of how efforts involving digital technologies affect organizational dynamics, given the growing dependence on these tools [4]. Institutions of higher learning are always under pressure to change and adapt to the shifting needs of the market and technological breakthroughs. This research offers significant insights into how organizations may adjust to these changes and improve their performance by examining the effects of digital transformation on organizational learning and user adaptation [2].

"How do digital transformation initiatives influence organizational learning, user adaptation, and ultimately organizational performance within higher education institutions?"

This is the main research question that directs this investigation [1]. By concentrating on the connections between user adaptation, learning processes, digital transformation, and overall performance, this inquiry tackles the central theme of the research. The study intends to provide a thorough understanding of how digital efforts might be used to attain organizational excellence by examining these dynamics [4].

By offering a thorough model that clarifies the complex interactions between digital transformation, organizational learning, user adaptation, and organizational success, answering this question closes a significant gap in the body of current work. While these factors have frequently been the subject of separate studies in the past, this study unifies them into a coherent framework [2]. Through the identification of the mechanisms by which these factors interact, this research provides new insights that can help higher education institutions make strategic decisions and formulate policies that will help them on their path to improved organizational performance in the digital age [4].

Furthermore, executives and policymakers in higher education will find the study's conclusions useful. Creating more successful technology integration plans can be aided by having a better understanding of how digital transformation promotes organizational learning and user adaptation [5]. Additionally, it can help with the creation of training curricula that improve user adaptation, guaranteeing that teachers and staff are prepared to use new technology. The report also emphasizes the significance of developing an innovative and supportive corporate culture, both of which are essential for the effective execution of digital transformation projects [6].

In summary, by examining the effects of digital transformation on organizational learning, user adaptation, and organizational performance, this research seeks to add to the body of knowledge about higher education. The research aims to provide higher

education institutions with actionable insights to assist them leverage the potential of digital technology to achieve increased efficiency, effectiveness, and excellence by offering a complete examination of these dynamics.

2. Theoretical Foundation and Hypotheses Development

Theoretical Underpinning

Organizational Learning Theory provides a theoretical framework that supports this study by emphasizing the importance of knowledge acquisition, dissemination, and utilization within organizations [7]. In the context of higher education institutions undergoing digital transformation, this theory elucidates how organizational learning processes contribute to enhanced performance. The key variables of digital transformation initiatives, organizational learning, user adaptation, and organizational performance are all intricately linked within this theoretical perspective. Organizational Learning Theory posits that as organizations acquire new knowledge through digital transformation initiatives, they undergo learning processes that enable them to adapt their practices and behaviors, ultimately leading to improved performance outcomes [8]. Thus, this theory provides a robust foundation for understanding the mechanisms through which digital transformation influences organizational dynamics in the higher education sector.

2.2. Hypotheses Propositions

Digital Transformation Initiatives

Initiatives for digital transformation are the deliberate attempts made by companies to incorporate digital technology and procedures into many facets of their services and operations [9]. To fully utilize the potential of digital breakthroughs, these projects entail not only the adoption of new technologies but also a comprehensive rethinking of organizational structures, processes, and cultures. Studies show that by encouraging the gathering and exchange of knowledge, digital transformation programs offer substantial chances for organizational learning [6]. Organizations can foster creativity, cooperation, and knowledge generation using digital platforms and tools, which will enhance learning procedures. Implementing customer relationship management (CRM) software, enterprise resource planning (ERP) systems, and other digital tools, for example, facilitates smooth information flow between departments and improves the organization's capacity to learn from its surroundings and activities. Real-

time data analysis is made possible by these tools, which can help with strategic planning and decision-making, eventually promoting organizational learning [9]. Additionally, implementing collaborative platforms like wikis, social media, and intranets which facilitate employee ideas and information sharing is a common part of digital transformation [4]. Through these platforms, staff members can access priceless materials that can improve their skills and competencies, discuss best practices, and record lessons learned. Therefore, efforts to implement digital transformation can foster an environment where learning and development are ongoing within the company [9]. Initiatives aimed at digital transformation can also stimulate creativity by giving staff members the means and means to try out novel concepts and methods [6]. Artificial intelligence and sophisticated analytics, for instance, can reveal previously undiscovered insights, enabling businesses to innovate in ways that were previously impractical. As new information is created and shared throughout the business, this innovation in turn contributes to the process of organizational learning [9]. Thus, we propose that:

H1^a: Digital transformation positively affects organizational learning.

Research indicates that the implementation of digital transformation considerably improves user adaptability by giving users access to interactive technology and individualized learning experiences [5]. The implementation of advanced learning management systems, virtual reality, and augmented reality tools which allow users to interact with content in more immersive and interactive ways is a common component of digital transformation programs [3]. With the help of these technologies, users can customize instructional materials to match their learning requirements, moving at their speed and concentrating on areas where they need more help. Using digital resources, users can build new skills, adapt to changing circumstances, and personalize their learning pathways. To help users discover their strengths and limitations and modify their learning tactics accordingly, adaptive learning technologies, for example, leverage data analytics to deliver tailored feedback and recommendations [1]. Additionally, digital transformation makes it easier to access a multitude of online resources, including digital libraries, webinars, and online courses, which provide flexible learning opportunities that are accessible from anywhere at any time. This adaptability is essential in the fast-paced world of today, where people must always improve their abilities to be competitive. Thus, we propose the following relationship:

H1^b: Digital transformation positively affects user adaptation.

Past literature highlights how digital transformation improves organizational effectiveness [3]. Higher education institutions can improve overall efficiency and effectiveness, improve teaching and learning experiences, and streamline operations with the use of digital technologies. By automating repetitive administrative tasks, staff members can focus on more strategic projects and have less work to do. This is made possible by the integration of digital tools like CRM software, ERP systems, and learning management systems [10]. Initiatives aimed at digital transformation can also improve education quality by offering cutting-edge resources for instruction and learning. To serve a varied student body, for example, virtual classrooms, online courses, and interactive learning platforms allow universities to provide more flexible and accessible educational options. Additionally, by enabling teachers to modify lesson plans to suit the needs of each student, these technologies promote individualized learning, which raises student satisfaction and learning results [11]. Digital transformation improves educational offerings and operational efficiency, but it also fosters an innovative and continuous improvement culture within the firm. Institutions can make data-driven decisions, recognize trends, and obtain deeper insights into student performance using advanced analytics and artificial intelligence technologies [12]. By using these findings to guide curriculum creation, resource allocation, and strategic planning, educational institutions may become more competitive and effective. Also, digital change in higher education can improve communication and teamwork. Digital platforms facilitate smooth information exchange and collaboration between academic staff, students, and faculty, dismantling organizational walls and promoting a more cohesive and integrated culture. Increased organizational agility, quicker reaction times to new problems, and better decision-making can all result from this enhanced communication [13].

Research has demonstrated that universities that adopt digital transformation typically have better organizational performance levels. For instance, a study conducted in 2016 [10] showed that digital transformation programs in Taiwanese institutions significantly improved institutional performance overall, educational quality, and operational efficiency. Guo and Xu's [3] findings, which demonstrate the wider applicability of these findings across many industries, also indicated that digital transformation had a favorable impact on the performance of Chinese manufacturing enterprises [14]. In short, efforts to implement digital transformation are essential for improving higher education institutions' overall performance, educational quality, and operational effectiveness.

Through the utilization of digital technology, educational institutions may optimize workflows, elevate student experiences, encourage creativity, and bolster organizational flexibility, all of which contribute to improved performance results [13]. Thus, we propose that:

H1^c: Digital transformation positively affects organizational performance.

Organizational learning

The process through which businesses gather, produce, share, and use knowledge to enhance performance and adjust to change is known as organizational learning. For firms hoping to be flexible and competitive in a changing environment, this idea is fundamental. Organizational learning entails identifying and fixing mistakes, which improves the organization's capacity to adjust to changing conditions and obstacles. This ability to adapt is especially important given the speed at which technology is developing and the constantly changing needs of the market. Previous research indicates that organizational learning facilitates user adaptation by providing opportunities for those working within organizations to gain new competencies. Employees are empowered to stay current with the newest innovations, resources, and techniques pertinent to their roles through this process of continual learning. Employee learning activities improve users' happiness and engagement because employees are better able to comprehend and respond to changing consumer wants and preferences. For example, workshops, training courses, and cooperative learning sessions can assist staff members in gaining abilities that directly affect their capacity to provide good user service. Businesses can foster a culture that promotes innovation and knowledge sharing by implementing organizational learning. Collaborative problem-solving becomes the norm in a workplace where people are encouraged to share their experiences and insights. This knowledge-sharing culture builds the organization's general ability to adapt while also enhancing individual talents. Employees are therefore more likely to provide creative ideas that satisfy customers and rapidly adjust to changes.

Organizational learning also makes it easier for new procedures and technology to be integrated into the company. Employees can use these innovations to enhance user experiences as they gain proficiency with new tools and systems through continuous learning. Employees who are proficient in customer relationship management software, for instance, might enhance user adaptability by offering more personalized and responsive service. The beneficial effects of organizational learning on user adaptability are corroborated by empirical research. Organizations with strong learning frameworks are better equipped

to adjust to both internal and external innovations. As a result of their increased competence and self-assurance in meeting user needs, employees' adaptability leads to increased user engagement and pleasure. Therefore, we propose that:

H2^a: Organizational learning positively affects user adaptation.

Research suggests that organizational learning enhances overall operational effectiveness, promotes creativity, and facilitates better decision-making processes, all of which have a beneficial impact on organizational performance [15]. Organizations' capacity to continuously produce, gather, share, and use information underpins their influence and gives them the ability to adapt to both internal and external changes. Businesses may create a more knowledgeable and adaptable staff through organizational learning, enabling them to make strategic decisions that improve performance. Learning-focused organizations are better able to adjust to changing surroundings. They can take advantage of opportunities and reduce risks because they can swiftly recognize market trends, technical developments, and competitive pressures [16]. This flexibility is essential to preserving a competitive advantage in the quick-paced corporate environment of today. For instance, an organization can more successfully adjust its tactics to meet the demands of the expanding market if it consistently provides training to its staff on the newest technology and trends in the business.

Furthermore, by fostering an environment that values experimentation and creativity, organizational learning promotes innovation. Employees are more likely to come up with creative solutions that improve operational efficacy and efficiency when they are given the freedom to experiment and try new things. The creation of new goods, services, and procedures that boost an organization's productivity can result from an innovative culture. According to Ferincz [15], businesses that have strong learning frameworks are more likely to promote an innovative and continuous development culture. Enhancing decision-making procedures is an additional noteworthy advantage of organizational learning [17]. Employees get increasingly skilled at information analysis, problem identification, and successful solution development as they gain more knowledge and experience. Enhanced decision-making capacity results in organizational processes that are more effective and efficient. A knowledgeable management team, for example, can make strategic choices that maximize the use of available resources, boost output, and advance overall operational efficacy [18]. The favorable correlation between organizational learning and performance is substantiated by empirical research. According to research by Hasgall and Ahituv [18], companies that

prioritize learning achieve better performance results. These companies thrive at seizing new possibilities and minimizing risks in addition to being more adept at adjusting to environmental changes. Organizations can improve their long-term performance and strengthen their strategic capabilities by cultivating a culture of continuous learning. Thus, we aim to test that:

H2^b: Organizational learning positively affects organizational performance.

User Adaptation

The ability of individuals or users inside an organization to modify their habits, inclinations, and behaviors in reaction to advancements or modifications is known as user adaptation. This capacity is critical in today's business climate when organizational change is often driven by market dynamics and technology breakthroughs. Studies reveal that by enabling the alignment of organizational systems and procedures with user requirements and preferences, user adaptation plays a critical role in improving organizational performance. Organizations can gain various performance gains when users employees or customers adapt to new technologies and processes effectively. Employees who pick up new software or procedures quickly, for example, can continue to be productive during transitions, reducing interruptions and guaranteeing ongoing operational efficiency [19]. In the same vein, clients who adjust to new product interfaces or service platforms are more likely to stay happy, which boosts retention and loyalty.

Businesses that successfully facilitate user adoption can see an increase in consumer satisfaction. Users' experiences with new technologies or procedures improve as they grow more accustomed to them and are therefore more satisfied. This contentment can result in favorable recommendations, recurring revenue, and a better reputation in the marketplace, all of which boost organizational performance [20]. User adaptability also has the important benefit of increasing productivity. Employees can work more productively and efficiently when they are proficient with new tools and systems. Because of its efficiency, organizations may accomplish their goals with less time and money, which saves money and increases overall productivity. Furthermore, users who are well-adapted are more likely to adopt novel techniques, which boost output and improve operations. Another important result of successful user adoption is increased competitive advantage. Businesses that can quickly adjust to emerging technology and shifts in the market will have an advantage over rivals [21]. By keeping up with technological advancements and making sure users are comfortable using new tools,

these businesses can provide better goods and services, draw in more clients, and increase their market share. The beneficial effects of user adaptability on organizational performance are corroborated by empirical research. According to research by Reinecke and Bernstein [20], companies that have a high degree of user adaptability demonstrate superior performance measures, such as productivity, market competitiveness, and customer happiness. These results emphasize how crucial it is to fund educational and assistance initiatives that help users become more accustomed to new tools and procedures. Thus, we propose the following relationship:

H3: User adaptation positively affects organizational performance.

Mediation of Organizational Learning and User Adaptation

Research suggests that the relationship between digital transformation initiatives and organizational performance is mediated by both user adaptability and organizational learning [18]. This mediation suggests that organizational learning and user adaptation procedures greatly increase the efficacy of digital transformation programs, which by themselves are insufficient to reach optimal performance [22]. Initiatives for digital transformation encourage organizational learning by giving staff members the chance to learn new skills and information required to take advantage of cutting-edge technologies. These programs frequently entail the introduction of new tools, systems, and software, necessitating employee upskilling and training [18], [13]. Employee use of these new technologies leads to the acquisition of knowledge and skills that advance organizational learning. According to Hasgall and Ahituv [18], this ongoing learning process guarantees that the company can modify its operations and strategy to optimize the advantages of digital transformation.

Digital transformation also gives people the ability to adjust to new procedures and technologies. User adaptation is important since it dictates how well employees inside the company can use new tools and systems to improve their work. Users can incorporate new technologies into their everyday routines and increase efficiency, productivity, and job satisfaction when they successfully adapt to new technology. Training initiatives, safety nets, and an environment that values trial and error all aid in this process of adaptation [13]. Organizational performance benefits from the synergistic interaction between user adaptation and organizational learning. While user adaptation guarantees that these technologies are used effectively, organizational learning makes sure that the information and abilities needed to take advantage of new technologies are distributed throughout the

organization. Better performance outcomes, like increased operational efficiency, innovation, and competitive advantage, are the result of this dual mediation effect [23]. The mediating functions of organizational learning and user adaptability in the relationship between organizational performance and digital transformation are supported by empirical investigations. Organizations that make investments in learning and adaptation processes are better positioned to realize the full potential of digital transformation projects, according to research by [13]. These companies have demonstrated notable gains in important performance indicators, such as market share, productivity, and innovation. Thus, we propose that:

H4: Organizational learning and user adaptation positively mediate the relations between digital transformation initiatives and organizational performance.

According to earlier research, unobserved slack resources like unrealized talent potential have a significant impact on organizational learning by giving experimentation and innovation the time, space, and resources they need to succeed [24]. The term "unobserved slack" describes the unused or hidden resources that exist inside a company, such as individuals' latent skills and abilities that have not yet been completely utilized. It is possible to use these resources to assist programs that promote organizational growth and change. Businesses that have enough unobserved slack are in a better position to support learning processes and engage in digital transformation projects, which improves business performance [3]. With these untapped resources at their disposal, organizations can devote time and energy to creative experiments, experimental projects, and training and development initiatives without the immediate pressure of performance targets [4]. Because they can learn, adapt, and invent, employees may engage with digital transformation programs more deeply because of this flexibility.

Unobserved slack resources provide a safety net to reduce the risks involved with experimentation and change. With this buffer, businesses can weather the early expenses and possible setbacks that frequently come with introducing new procedures and technologies. Because they may experiment with new ideas and approaches without worrying about facing immediate consequences, employees feel more comfortable fostering a culture of learning and continuous development thanks to this safety net [4]. Organizations can also take a more strategic approach to digital transformation when unobserved slack is present. Organizations can proactively plan and carry out digital projects that are in line with their long-term objectives rather than only responding to technological advancements [19]. The capacity to use

unobserved slack resources makes it easier to achieve this strategy alignment and guarantees that digital transformation initiatives are not only carried out but also maintained and improved over time. The mediation function of unobserved slack in the relationship between organizational learning and digital transformation projects is supported by empirical research. Organizations with more slack resources are more likely to succeed in their digital transformation initiatives, according to research by [4]. These firms demonstrate improved performance outcomes, increased creativity, and expanded learning capacities. Therefore, we propose that:

H5: Unobserved Slack mediates the relationship between digital transformation initiatives and organizational learning.

The idea that observed slack, or the quantifiable and apparent discrepancies between potential and actual outputs, has a beneficial impact on the connection between organizational learning and user adaptation is supported by the literature [9]. Observed slack is the easily recognized excess resources that exist inside an organization that can be used to support strategic efforts. Examples of these resources include extra staff, surplus funding, and idle equipment. When resources are observable, organizations may better direct their slack toward areas that improve user adaptation and organizational learning [13]. Overspending money, for example, might be used to fund extensive training and development initiatives, which are essential for giving staff members the abilities and information required to adjust to new procedures and technology. Organizations can improve overall performance and flexibility by ensuring that their personnel can use new systems efficiently through targeted training [25].

Additionally, companies can foster a continual learning culture by observing Slack. Organizations that have ample resources can afford to explore novel methodologies and cutting-edge technology without feeling the urgent need to meet performance targets [22]. Employees are encouraged to participate in learning activities that expand their knowledge and skills in this creative and supportive atmosphere. For instance, more time and personnel can be committed to beta testing new software or pilot projects, which offer invaluable learning opportunities and enable more seamless change adaptation [2]. Observable slack resources facilitate the deployment of feedback mechanisms, which are essential for organizational learning. Organizations that have more resources at their disposal can set up effective processes for tracking and assessing worker performance, getting input, and making required changes. By assisting in the identification of knowledge and skill gaps, these systems enable prompt interventions that improve user adaptation. The beneficial effects of observable

slack on the connection between organizational learning and user adaptability are highlighted by empirical research. Wu et al.'s research from 2021 shows that companies with obvious surplus resources can help staff members during changeovers and help them adjust to new procedures efficiently. Figure 1 shows the theoretical model for this study. Therefore, we propose that:

H6: Observed slack positively mediates the relationship between organizational learning and user adaptation.

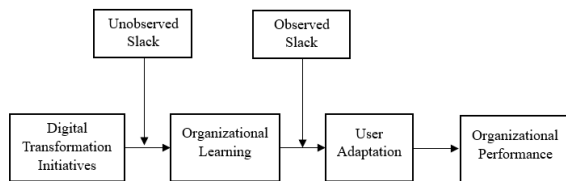


Figure 1. Theoretical Model

3. Methods

This study employed a quantitative approach to investigate the proposed relationships within Jiangsu Province, China's higher education institutions. Data was collected through an online survey utilizing scales adapted from prior research to measure the study variables. Digital transformation was measured using a six-item scale [4]. Unobserved and observed slack were measured using three items each [11]. Organizational learning was measured using 8 items, and organizational performance was measured using 10 items [25]. User adaptation was measured using nine items [2]. Convenience sampling was employed, targeting employees directly engaged in digital transformation processes. Initially distributed to 350 respondents, 245 valid responses were collected in August 2023. SmartPLS 4.0 was utilized for data analysis and hypothesis testing. This software enabled the application of partial least squares structural equation modeling (PLS-SEM), suitable for exploring complex relationships among latent variables. The use of PLS-SEM facilitated the assessment of both measurement and structural models, providing robust statistical analyses to test the proposed hypotheses and examine the mediating effects within the conceptual framework.

4. Results

Table 1 presents the results of the measurement model, indicating the reliability and validity of the constructs used in the study. Cronbach's Alpha (CA), threshold values at ≥ 0.70 , composite reliability (CR), and average variance extracted (AVE), threshold values at ≥ 0.50 are provided to assess internal

consistency reliability and convergent validity [26]. For instance,

Table 1: Measurement model results

Constructs	Items	Item Loadings	CA	CR	AVE
Organizational Performance	OP1-	0.728-0.919	0.904	0.539	0.515
	OP10				
User Adaptation	UA1-UA9	0.722-0.836	0.912	0.928	0.592
Organizational Learning	OL1-OL8	0.759-0.875	0.928	0.941	0.668
Slack Resources (Unobserved)	SR1-SR3	0.881-0.892	0.848	0.908	0.768
Slack Resources (Observed)	SR4-SR6	0.902-0.918	0.906	0.941	0.841
Digital Transformation Initiatives	DT1-DT8	0.726-0.839	0.962	0.968	0.791

Notes: CA (Cronbach's Alpha), CR (Composite reliability), AVE (Average Variance Extracted)

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For instance, Organizational performance exhibits high internal consistency (CA = 0.904) and convergent validity (AVE = 0.515). User Adaptation demonstrates even stronger reliability and validity with CA = 0.912 and AVE = 0.592. Similarly, organizational learning and digital transformation initiatives display robust reliability and validity metrics. The constructs of slack resources, both unobserved and observed, also exhibit satisfactory reliability and validity values. These findings suggest that the measurement model adequately captures the latent variables under investigation, ensuring the validity and reliability of subsequent structural analyses.

Table 2 presents the results of the structural model, indicating the explanatory power and predictive relevance of the constructs in the proposed theoretical framework. Adjusted R-squared values (Adj. R²) reflect the proportion of variance explained by the model for each construct. For instance, Organizational Performance demonstrates a moderate explanatory power (Adj. R² = 0.415), while User Adaptation and Organizational Learning exhibit higher values (0.491 and 0.752, respectively). VIF values indicate the absence of multicollinearity issues, with all constructs having VIF values below the threshold of 5. Additionally, predictive relevance (Q²) values signify the model's ability to predict future outcomes, with all constructs demonstrating satisfactory values.

Table 2: Structured Model

Constructs	Adj. R ²	VIF	Q ²	f ²	SRMR
Organizational Performance	0.415	2.698	0.223	0.03	0.054
User Adaptation	0.491	2.361	0.423	0.041	
Organizational Learning	0.752	2.234	0.318	0.21	

Notes: Adj.R² (Adjusted coefficient of determination), VIF (Variance inflation factor), Q² (Predictive relevance of model), f² (Effect size), SRMR (Standardized Root Mean Square Residual).

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Table 3: Hypothesis Testing

Hypotheses	Standard		T-	P-	Decision
	Mean	Deviation	Statistics	Values	
H1a: DT → OL	0.356	0.095	3.742	0.000	Supported
H1b: DT → UA	0.345	0.055	6.422	0.000	Supported
H1c: DT → OP	0.205	0.022	2.789	0.004	Supported
H2a: OL → UA	0.277	0.059	4.712	0.000	Supported
H2b: OL → OP	0.198	0.152	2.552	0.021	Supported
H3: UA → OP	0.231	0.117	2.239	0.025	Supported
H4: DT → OL → UA → OP	0.023	0.015	2.763	0.008	Supported
H5: USR*DT → OL	0.119	0.169	2.724	0.005	Supported
H6: OSR*OL → UA	0.163	0.136	4.366	0.000	Supported

Notes: DT (Digital transformation), OL (organizational learning), UA (User adaptation), OP (Organizational performance), USR (Unobserved slack resources), OSR (Observed slack resources), p-values significant at < 0.05 (95%).

Table 3 presents the results of hypothesis testing, indicating the significance of the relationships between the study variables. Each hypothesis is evaluated based on the mean, standard deviation, t-statistics, and p-values. For instance, H1a, which examines the relationship between digital transformation and organizational learning, is supported with a mean of 0.356, t-statistics of 3.742, and a p-value of 0.000, indicating a significant positive effect. Similarly, H1b and H1c, concerning the effects of digital transformation on user adaptation and organizational performance, respectively, are also supported with low p-values (0.000). Additionally, the mediated hypothesis H4, which explores the sequential mediation of organizational learning and user adaptation in the relationship between digital transformation and organizational performance, is supported with a significant p-value of 0.008. These findings provide empirical evidence for the hypothesized relationships in the conceptual framework. Thus, all the hypotheses proposed were supported by the research findings.

5. Discussion

The study findings validate the positive influence of digital transformation initiatives on organizational learning, user adaptation, and organizational performance in higher education institutions [3]. These results align with prior research highlighting the transformative potential of digital technologies [6]. Additionally, the mediating roles of organizational learning and user adaptation in the relationship between digital transformation and organizational performance are supported. Moreover, the significant mediation effects of unobserved and observed slack resources underscore their crucial contribution to enhancing organizational learning and user adaptation [11]. Precisely, these findings offer valuable insights for practitioners and policymakers

seeking to leverage digital transformation for improved performance in the higher education sector.

5.1. Theoretical Implication

The theoretical implications of this study extend our understanding of organizational dynamics in the context of digital transformation within higher education [18]. By confirming the significant influence of digital transformation initiatives on organizational learning, user adaptation, and organizational performance, this research enriches Organizational Learning Theory and Resource-Based View literature. Additionally, the identification of organizational learning and user adaptation as mediating mechanisms elucidates the pathways through which digital transformation initiatives impact organizational performance. These findings contribute to theoretical advancements by highlighting the interplay between digital technologies, organizational learning processes, and resource utilization strategies [9]. Furthermore, the validation of unobserved and observed slack resources as critical facilitators of organizational learning and user adaptation reinforces the importance of resource availability in fostering organizational resilience and agility in the digital age.

5.2. Practical Implications

Practically, this study offers actionable insights for higher education institutions and policymakers to optimize digital transformation strategies. By recognizing the pivotal role of digital initiatives in enhancing organizational learning and user adaptation, institutions can prioritize investments in technology integration and training programs. Moreover, understanding the mediating effects of organizational learning and user adaptation underscores the importance of fostering a culture of continuous learning and adaptability. Additionally, acknowledging the significance of slack resources in facilitating organizational change highlights the need for effective resource allocation and management practices. Implementing these insights can empower institutions to navigate the digital landscape effectively and drive sustainable performance improvements.

5.3. Limitations and Future Research Direction

Limitations of this study include the use of convenience sampling and data collected from a specific geographic region, which may limit generalizability. Future research could employ diverse sampling methods and expand the study to encompass a broader range of higher education institutions globally. Additionally, longitudinal

studies could explore the long-term impact of digital transformation initiatives on organizational performance and further investigate the role of contextual factors in shaping these relationships.

6. Conclusion

In conclusion, this study underscores the transformative potential of digital transformation initiatives in higher education, elucidating their significant influence on organizational learning, user adaptation, and ultimately organizational performance. By validating the proposed theoretical framework, this research advances our understanding of the complex interplay between digital technologies and organizational dynamics. The findings highlight the importance of fostering a culture of continuous learning and adaptability within higher education institutions to leverage digital advancements effectively. Moreover, the identification of slack resources as critical facilitators of organizational change underscores the importance of resource management strategies. Overall, this study provides valuable insights for practitioners and policymakers navigating the digital landscape in higher education.

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