

Personal and Institutional Barriers Perceived by Staff of Latvian Higher Educational Institutions in the Process of Digital Transformation: Pilot Survey Results

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Abstract

The research goal is to evaluate personal and institutional barriers towards digital transformation (DT) as perceived by different groups of staff at Latvian higher educational institutions (HEIs). Initially, a comprehensive literature review was conducted, followed by a survey, using the research instrument (questionnaire) developed by the authors. Academic and administrative staff members from Latvian HEIs participated in the survey. For the purpose of evaluation, data were processed by means of frequency analysis and procedures of comparing independent samples. From the viewpoint of staff, the most significant institutional barriers to digital transformation are a lack of financial resources, a lack of time (lack of human resource capacity or overloading with existing tasks), and employees' motivation in general. In turn, a lack of time, a lack of management support, and a lack of IT skills were identified as the most significant personal barriers. The research is limited by the sample size. However, this pilot study was aimed at technical testing of the measurement scale and preliminary testing of some hypotheses. Managers of higher educational institutions could use the results of the presented research to facilitate the digital transformation process and develop DT-related strategies. This research distinguishes itself from other research by the context (field of higher education) and localisation (there are a limited number of studies in the field of DT in Latvia).

Key words

higher education institution; digital transformation; barriers.

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Introduction

The urgent need for digital transformation (DT) in education arose during the COVID-19 pandemic, when most educational institutions were forced to switch to remote learning (Tadesse, S. & Muluye, 2020; Pokhrel & Chhetri, 2021; Algahtani et al., 2023; Bates, 2023; Carroll & Constantinou, 2023).

The focus in this research is on higher education (HE). There is a wide range of papers and reports devoted to the issues of DT specifically in the HE fields (Bond et al., 2018; Benavides et al., 2020; Gaebel & Morrisroe, 2023; Antonopoulou et al., 2023). Barriers to implementing digital transformation in organisations have also been discussed by many researchers (Egala et al., 2024; Trenerry et al., 2021). However, there are a limited number of studies in the field of DT in Latvia. Most studies conducted by Latvian researchers or containing information about Latvia highlight the issues of DT in secondary education. The most frequently debated topics are the professional development of teachers, digital competences, and digital inclusive education (OECD, 2023; Laganovska, 2021). Higher education is not a priority topic and is covered in a small number of articles (Rubene et al., 2021; Nimante, 2019). The latest report available on the webpage of the Latvian Ministry of Education and Science about the digitalisation of Latvian higher education dates from 2020 (PWC, 2020).

The research goal is to evaluate personal and institutional barriers towards digital transformation (DT) as perceived by different groups of staff at Latvian higher educational institutions (HEIs). The authors used a bespoke questionnaire. The list of barriers was substantiated during a previous study (Uzule & Verina, 2023).

The research is limited by sample size: only 42 representatives of six Latvian HEIs (both private and public) participated in the survey. However, this pilot study was aimed technically at testing the measurement scale and the preliminary testing of some hypotheses. The plan was to conduct a cross-country study and investigate the impact of respondent profile on perceptions of barriers.

At the initial stage, the research revealed that the most significant institutional barriers to digital transformation are a lack of financial resources/lack of investment in digital transformation, a lack of time (a lack of human resource capacity or overloading with existing tasks), and employees' motivation in general. In turn, a lack of time, a lack of management support, and a lack of IT skills were identified as the most significant personal barriers.

The paper contains five main parts. The Introduction is followed by the Literature Review, which provides a theoretical background on digital transformation in higher education, as well as examining institutional and personal barriers identified by other researchers. The Methodology part describes the research instrument and provides the results of the internal consistency test. The research hypotheses are also formulated in the Methodology section. The Results section summarises the key outcomes of the survey, indicating the most significant barriers to digital transformation as perceived by the staff of Latvian HEIs. The Conclusion part discusses the practical implications of the research and directions for further investigation.

1. Literature review

1.1 *Digital transformation in higher education*

Digital transformation involves the evolutionary process driven by digital technologies, reshaping organisations both internally and externally to create new pathways for value creation (Vial, 2019). This organisational change, facilitated by digital technologies, has the potential to reshape every aspect of an organisation to fully leverage its core competencies (Antonopoulou et al., 2023) through more effective decision-making (Hassan et al., in press) and enhanced governance (Niu et al., 2023). Digital transformation is required for the rapid adaptation to market changes to sustain a competitive advantage at individual, business and system levels (Chen et al., 2024), thus improving profitability and asset quality (Chao et al., 2024). Businesses embracing digital transformation boost their capacity to create innovations (Chen et al., 2023; Niu et al., 2023), which results in new products and services

consistent with the latest customer preferences (Uzule & Verina, 2023). The shift towards digital transformation requires strategic change and management of all organisational operations (Hess et al., 2016).

Higher education institutions (henceforth HEIs) are no exception (Gobble, 2018). Digital transformation at HEIs typically aims to improve three areas of operations – teaching, learning and administrative processes (Gilch et al., 2020), which, consistent with the findings of Wang, Hong, et al. (2023), could be translated into three key drivers of digital transformation: curriculum development and adaptation, the integration of digital technologies for widespread educational use, and the utilisation of cloud computing. Digital transformation in HEIs entails integrating various business activities, processes, and employee competencies with system applications and information technology (Benavides et al., 2020). As part of their digital transformation strategy, HEIs aim to attract top talents across different roles, including researchers, academic staff, office administrators, and students (Elliot et al., 2016). Another aspect of digital transformation strategy focuses on enhancing relationships, both internally and externally, through HEI setups. This setup fosters stronger connections with stakeholders and enables more efficient interaction channels, aligning with the evolving practices in experience management (Seres et al., 2018). The ongoing transformation of technology infrastructure and stakeholder management approaches in HEIs significantly shapes outcomes and organisational culture, affecting the use of technologies in teaching and learning processes (Sandkuhl & Lehmann, 2017).

Research on digital transformation in higher education has unveiled diverse dimensions. Overall, four distinct categories could be identified. Firstly, studies focusing on educational technology and usage, such as those by Bond et al. (2018) and McKnight et al. (2016), shed light on how technology is utilized by both educators and students to enhance learning experiences and outcomes. The second dimension focuses on digital transformation processes and outcomes, as investigated by Licka and Gautschi (2017), who surveyed the transformation within higher education institutions, revealing its impact on universities, the labour market, and the economy. Furthermore, Selwyn (2016) contributes to understanding stakeholder views and experiences, offering insights into the varied perspectives on digital transformation and student perceptions of technology use. Finally, KPMG (2018) examines sectoral disparities, highlighting differences between the education sector and other economic sectors in their digital transformation efforts. Collectively, these dimensions provide a comprehensive understanding of the multifaceted nature of digital transformation in higher education.

Thus, implementing digital transformation in HEIs presents challenges linked to the constraints of educational services (Benavides et al., 2020). Nevertheless, HEIs pursue digital transformation despite various challenges (Antonopoulou et al., 2023; PwC, 2018) due to the promise of enhanced organizational efficiency and effectiveness (Benavides et al., 2020). HEIs cannot avoid digital transformation, given the imperative of preparing students with qualifications and skill sets relevant to digital or hybrid environments (Wang, Li, et al., 2023). Consequently, many HEIs are actively developing digital strategies to navigate the complexities of the transformation process and leverage its potential benefits (Wang, Li, et al., 2023).

1.2 Barriers to digital transformation in higher education institutions

Digital transformation, a phenomenon altering business operations (Chen et al., 2024), is associated with various issues and risks across various industries (Hassan et al., in press; Wang et al., 2024) and is accompanied by both positive and negative attitudes, resulting in barriers to digital transformation implementation. Such barriers, generating uncertainty (Chen et al., 2024) throughout organizational activities, can be categorized as institutional and personal.

Institutional barriers to digital transformation in higher education encompass a range of challenges rooted in organizational dynamics and resource constraints. These barriers are multifaceted and impact various aspects of the digital transformation process. One set of institutional barriers pertains to the lack of adequate technological infrastructure and tools essential for effective operations in digital spaces, which includes issues such as limited access to diverse digital platforms

and insufficient workplace equipment, internet infrastructure deficiencies and insufficient reliability in connectivity (Boychuk et al., 2022; Mall & Haupt, 2022; Mikheev et al., 2021). Additionally, digital security concerns pose a notable barrier to digital transformation efforts (Wang et al., 2024).

Another set of constraints include insufficient financial resources for technological investment (Hassan et al., in press; Wang et al., 2024) and comprehensive digital training essential for enhancing digital competencies among academic and administrative staff (Mall & Haupt, 2022). Academic staff should be able to effectively use digital tools and co-create educational content with digital solutions to enhance the quality of education and learning experience. Considering continuous upgrades in technologies as well as the lack of relevant digital competences of staff, HEIs encounter the issue of continuous investment into their staff training. Without institutional support, digital experience and relevant methodology, poor digital skills of staff would not reach a necessary level soon (Boychuk et al., 2022; Hassan et al., in press) especially considering a digital divide between younger more digitally savvy students and more experienced but less digitally advanced staff (Henderson et al., 2015; Wilms et al., 2017).

Institutional barriers to digital transformation in higher education also encompass organizational, communication, and collaboration impediments (Boychuk et al., 2022; Wang et al., 2024). These barriers manifest as deficiencies in organizing study processes, such as inadequacies in creating conducive exam environments and maintaining bidirectional and continuous communication channels with students, which is why students may experience detachment from the learning process, impacting their engagement and academic outcomes (Boychuk et al., 2022; Jamah et al., 2022). Addressing these organizational and communication challenges is crucial for fostering a supportive and interactive learning environment conducive to effective digital transformation in higher education.

Other constraints include regulatory and market demands. Regulatory and policy barriers further complicate digital transformation efforts, often due to the fragmentation of policies, leading to uncertainty regarding compliance and implementation (Hassan et al., in press). Market risks, job losses among staff, and evolving customer demands pose significant challenges, particularly in higher education, where resistance to user-friendly and efficient digital solutions can impede progress (Hassan et al., in press; Wang et al., 2024). This resistance underscores the importance of enhancing the quality of technologies, methodologies, and competencies among academic and administrative staff to meet market expectations.

The success of digital transformation initiatives in education is closely tied to heads of institutions (Cheng & Wang, 2023), specifically, their vision and leadership styles. The leadership's commitment to innovation and adaptation is crucial for overcoming resistance to change and driving digital integration efforts forward. This perspective aligns with the innovation diffusion theory, which posits that the adoption of innovation, including digital transformation, is influenced by social norms and organizational structures (Wang, Hong, et al., 2023). As such, effective leadership plays a pivotal role in shaping the organizational culture and facilitating the diffusion of digital technologies throughout HEIs over time.

Personal barriers pertaining to digital transformation encompass individual factors such as employee and student knowledge, skills, attitudes, and behaviour affecting their engagement with digital transformation initiatives within the workplace. Personal barriers stem from insufficient digital skills of staff (Hassan et al., in press) and their inexperience in digital spaces (Boychuk et al., 2022) as well as attitudinal and behavioural resistance (Mikheev et al., 2021), having roots in fear of job loss (Hassan et al., in press), poor digital literacy and lack of opportunities to develop digital competencies. In HEIs, academic and administrative staff and students might have various levels of digital skills at the onset and during digital transformation as well as various levels of capacity to advance their digital competences due to generational differences (Englund et al., 2017; Scott et al., 2017).

Some barriers to digital transformation simultaneously impact both institutional and personal levels, as highlighted in recent research (Chen et al., 2023; Hassan et al., in press; Wang et al., 2024). A lack of data, entrenched corporate traditions, and cultural norms contribute to a limited understanding of how digital tools can positively impact business processes, which hinders the implementation of digital transformation activities (Hassan et al., in press). Finally, effective digital transformation strategies for education hinge upon three key pillars: investment in technology, transformation of people, and enhancement of processes (Lakshmi et al., 2023). The success of these strategies relies heavily on the quality of data analytics, which affects the overall customer experience. An organization's ability to overcome barriers to digital transformation is intricately linked to various cross-structural and cross-capacity factors, encompassing the adoption of new technologies, the digital competencies of employees, and the efficacy of decision-making processes (Uzule & Verina, 2023). The integration of innovative technologies with digital transformation has the potential to improve the quality of education, fostering new educational models that prioritize innovation and foster heightened levels of student engagement (Wang, Hong, et al., 2023).

2. Materials and methods

To achieve the research goal, the authors conducted a survey among staff of Latvian HEIs. Theoretical background for the development of the research instrument (questionnaire) was provided in Uzule and Verina (2023). The structure of the questionnaire is reflected in Table 1.

Table 1. Structure of the questionnaire.

Part	Question	Type of the question; responses
A	Respondent profile	Age, gender, education level, HEI, position, work experience
B	Institutional barriers	22 barriers. Evaluation scale: level of agreement (1 – absolutely disagree; 5 – absolutely agree)
C	Personal barriers	18 barriers. Evaluation scale: level of agreement 1 – absolutely disagree; 5 – absolutely agree)

Source: Authors' developed.

The respondents were offered to evaluate each barrier by using a five-point scale (1 – completely disagree; 5 – completely agree). Before data processing, the instrument (B and C measurement scales) was tested for internal consistency using Cronbach's alpha (Table 2).

Table 2. Internal consistency of B scale.

B scale. Labels	Cronbach's Alpha if Item Deleted	C scale. Labels	Cronbach's Alpha if Item Deleted
IT knowledge	0.944	Cybersecurity	0.909
Information	0.943	External control	0.901
Understanding DT processes	0.942	Job loss	0.905
Infrastructure	0.941	Income reduction	0.906
Data security	0.945	IT skills	0.900
Traditions	0.944	Learning-teaching activities	0.908
Vision	0.945	Management support	0.906
Digital culture	0.941	Family support	0.903
Financial risk	0.948	Self-efficacy	0.902
Risk of failure	0.946	Openness to change	0.902
Fear	0.944	Time	0.905
Understanding about DT potential	0.942	Anxiety	0.904
Financial resources	0.943	Motivation	0.905
Time	0.943	Willingness	0.905
Management engagement	0.942	Limitations	0.905
Training programs	0.942	Financial barriers	0.906
Motivation	0.943	Technical support	0.905
Communication	0.942	Traditions	0.907

Coordination	0.942
Understanding of purpose	0.941
Staff resistance	0.943
DT standards	0.941

Source: Compiled by the authors.

The value of Cronbach's Alpha for the whole B and C scales was 0.945 and 0.909 respectively, what points to the very high internal reliability. The analysis of the measure "alpha if item deleted" pointed to good relevance of all statements.

Survey data was processed by means of frequency analysis. The only the answers "4" (agree) and "5" (completely agree) have been analysed by the authors in order to rank the statements in the scales.

Two specific hypotheses have been formulated to test the difference in evaluations of institutional and personal barriers by different groups of staff members representing higher education institutions. First hypothesis was formulated based on the results of Eurobarometer (European Commission, 2017), which revealed "...large differences in perceptions ... across countries, and between people of different age groups and educational backgrounds", and the findings of Swiss researchers (Seifert, & Charness, 2022) who discovered that "...perceived ease of use is related to age, socioeconomic status, health, and interest in technology". Four age groups were defined: 1) < 25 years old; 2) 26-41; 3) 42-58; 4) over 59 years old.

H1: There is a difference in perception of digital transformation barriers by staff members representing different age groups.

In formulation of the second hypothesis, the authors based mostly on their subjective viewpoint about perception of changes, incl. digital transformation, in higher education institutions within different groups of staff:

H2: There is a difference in perception of digital transformation barriers by administrative and academic staff members.

However, this hypothesis can be supported also by findings of other researchers. For instance, Schraeder et al. (2006) revealed that "...employees who were engaged in making decisions related to the technology changes reacted more positively to the changes than individuals with lower levels of involvement. Mainly, the second hypothesis has been formulated based on the following statement made by Van Der Schaft et al. (2024): "Whereas management might see digital transformation as an inevitable and logical form of change for their organization, employees' buy-in cannot be taken for granted as their perceptions and interpretations vary and may differ from management's claims."

To test the difference in perceptions of institutional barriers and personal barriers to digital transformation by different age groups, as well as by administrative and teaching staff, Mann-Whitney U test was performed. The selection of the non-parametric technique has been substantiated by the results of the Shapiro-Wilk test. In all cases, $p < 0.05$ indicated that data did not follow a normal distribution.

3. Results

Table 3 summarizes the results of the frequency analysis, taking into accounts only respondents who were "agree" or "completely agree" with the B and C scale statements.

Table 3. Results of frequency analysis.

Institutional barriers	% of respondents who agreed with the statement	Personal barriers	% of respondents who agreed with the statement
IT knowledge	30%	Cybersecurity	32%
Information	25%	External control	27%
Understanding DT processes	20%	Job loss	17%
Infrastructure	42%	Income reduction	20%

Data security	32%	IT skills	37%
Traditions	15%	Learning-teaching activities	29%
Vision	39%	Management support	42%
Digital culture	22%	Family support	20%
Financial risk	32%	Self-efficacy	22%
Risk of failure	20%	Openness to change	17%
Fear	10%	Time	63%
Understanding about DT potential	22%	Anxiety	20%
Financial resources	54%	Motivation	29%
Time	68%	Willingness	20%
Management engagement	24%	Limitations	17%
Training programs	39%	Financial barriers	32%
Motivation	51%	Technical support	32%
Communication	32%	Traditions	12%
Coordination	42%		
Understanding of purpose	49%		
Staff resistance	42%		
DT standards	42%		

Source: Compiled by the authors.

Based on respondents' answers, both institutional and personal barriers can be categorized according to the frequency of responses, which indicate the perceived importance or strength of barriers. The first three categories can be identified within the top 50% of the most frequently mentioned responses. For institutional barriers, where the highest frequency was 68%, the top 50% ranged from 34% to 68%. For personal barriers, where the highest frequency was 63%, the top 50% ranged from 31.5% to 63%. Within these ranges, categories were divided into three equal parts based on frequency.

The most frequently cited barrier, appearing in over 60% of responses for both institutional and personal categories, was time (68% and 63%, respectively).

For institutional barriers, the next most common factors included financial resources, motivation, and understanding of the purpose. The issue of insufficient funding to support digital transformation was highlighted also in the study of Gkrimpizi & Peristeras (2022). Regarding the motivation (IB – 51%), these results are aligned with studies performed by Deloitte (Hagel, 2019) and Robertsone & Lapina (2022).

In the third frequency category, respondents identified factors such as staff resistance, digital transformation (DT) standards, coordination, infrastructure, vision, and training programs. Regarding personal barriers, after time, the second category included management support, while the third category incorporated IT skills, cybersecurity, financial barriers, and technical support. Overall, the key barrier across both categories was time. Other common factors identified in the second and third categories included financial constraints and technical infrastructure and support. Unlike personal barriers, institutional barriers also highlighted factors related to staff characteristics.

The lower level of 50% of the responses ranged between 10% and 32% for institutional barriers, and 12% and 29% for personal barriers. Considering the raw percentage value, these barriers can be viewed as low priority, which is why even though they can be categorized by frequency, it might be

also reasonable to group them by content. Under such categorization, the barriers could be grouped into organizational, competence, psychological, social, and economic factors.

Organizational factors encompass the barriers of data security, financial risk, communication, management engagement, digital culture, understanding the potential and processes of digital transformation (DT), risk of failure, traditions, technical support, external control, and limitations.

Competence factors include IT knowledge, information, learning-teaching activities, and self-efficacy, which are essential for equipping individuals with the necessary expertise and confidence to engage effectively in digital transformation processes.

Psychological factors involve fear, anxiety, motivation, willingness, and openness to change, highlighting the personal and emotional responses of individuals towards digital transformation, which can significantly influence their engagement and acceptance of new technologies. Social factors include family support, indicating the role of personal relationships and social backing in an individual's ability to cope with and embrace digital transformation.

Economic factors address concerns about income reduction and job loss, focusing on the financial implications and job security issues that may arise as a result of digital transformation initiatives. This comprehensive categorization helps in understanding the multi-faceted nature of digital transformation and the various dimensions that need to be considered for its successful implementation.

For testing of the hypotheses, a non-parametric Kruskal-Wallis Test was applied. The difference in perception of barriers towards digital transformation within different age groups was discovered only in case of the barrier "IT skills". The evaluation of this barrier by representatives of the age group "42 to 58 years old" was statistically higher than evaluation by other age groups (Table 4). So, the conclusion is that the first hypothesis (H1: There is a difference in perception of digital transformation barriers by staff members representing different age groups) is rejected.

Table 4. Kruskal-Wallis H test results: grouping variable – age.

Institutional barriers			Personal barriers		
	Kruskal-Wallis H	Asymp. Sig.		Kruskal-Wallis H	Asymp. Sig.
IT knowledge	1.659	0.436	Cybersecurity	1.962	0.375
Information	3.133	0.209	External control	0.334	0.846
Understanding DT processes	2.594	0.273	Job loss	0.130	0.937
Infrastructure	0.051	0.975	Income reduction	1.208	0.547
Data security	0.654	0.721	IT skills	6.410	0.041
Traditions	0.441	0.802	Learning-teaching activities	3.217	0.200
Vision	1.768	0.413	Management support	3.077	0.215
Digital culture	3.200	0.202	Family support	4.824	0.090
Financial risk	1.966	0.374	Self-efficacy	0.501	0.779
Risk of failure	1.918	0.383	Openness to change	0.030	0.985
Fear	0.280	0.869	Time	0.635	0.728
Understanding about DT potential	1.923	0.382	Anxiety	1.121	0.571
Financial resources	2.432	0.296	Motivation	0.516	0.773
Time	0.074	0.964	Willingness	0.082	0.960
Management engagement	2.074	0.355	Limitations	0.559	0.756
Training programs	3.855	0.146	Financial barriers	1.144	0.564
Motivation	4.910	0.086	Technical support	4.085	0.130
Communication	0.832	0.660	Traditions	1.691	0.429
Coordination	0.157	0.924			
Understanding of purpose	0.273	0.872			
Staff resistance	0.411	0.814			
DT standards	0.860	0.650			

Source: Compiled by the authors.

With the lower confidence, the difference was revealed in case of the institutional barrier “Lack of an appropriate motivation system to stimulate employees to engage in DT processes” (Motivation) and personal barrier “Lack of family support (family members against the teacher spending his home time on IT skills training)” (Family support).

The difference in perception by academic and administrative staff was revealed in case of only two statements (Table 5). The second hypothesis (H2: There is a difference in perception of digital transformation barriers by administrative and academic staff members) is also rejected.

Table 5. Kruskal-Wallis H test results: grouping variable – position.

Institutional barriers			Personal barriers		
	Mann-Whitney U	Asymp. Sig. (2-tailed)		Mann-Whitney U	Asymp. Sig. (2-tailed)
IT knowledge	186.500	0.541	Cybersecurity	169.000	0.279
Information	198.000	0.766	External control	207.500	0.968
Understanding DT processes	148.000	0.100	Job loss	192.000	0.641
Infrastructure	173.000	0.329	Income reduction	207.500	0.967
Data security	181.000	0.438	IT skills	172.000	0.322
Traditions	127.000	0.021	Learning-teaching activities	180.000	0.432
Vision	170.500	0.303	Management support	172.000	0.320
Digital culture	185.000	0.509	Family support	180.500	0.436
Financial risk	169.500	0.287	Self-efficacy	164.500	0.228
Risk of failure	187.000	0.553	Openness to change	206.000	0.935
Fear	188.000	0.566	Time	196.500	0.735
Understanding about DT potential	140.000	0.062	Anxiety	157.500	0.163
Financial resources	194.000	0.686	Motivation	190.500	0.620
Time	204.500	0.902	Willingness	137.000	0.050
Management engagement	209.000	1.000	Limitations	191.500	0.634
Training programs	183.000	0.487	Financial barriers	166.500	0.251
Motivation	172.000	0.314	Technical support	203.500	0.883
Communication	176.000	0.376	Traditions	170.000	0.281
Coordination	186.500	0.548			
Understanding of purpose	192.500	0.659			
Staff resistance	192.000	0.649			
DT standards	204.500	0.903			

Source: Compiled by the authors.

1. Scale B “Keeping traditional principles (management believes that digital transformation is not necessary)”. Academic staff members evaluated this barrier higher. This means that more academic staff agree with this statement compared to administrative staff.

2. Scale C “Lack of willingness”. Results show that administrative staff evaluated willingness for digital transformation statistically higher than academic staff. This barrier seems more significant for administration.

Conclusions

Digital transformation has been underway; however, its progress varies due to numerous impeding factors. Earlier, Uzule and Verina (2023) distinguished digital transformation barriers into institutional and personal categories. This research continued that study, aiming to evaluate these barriers as perceived by different staff groups in Latvian higher educational institutions (HEIs).

The survey results identified the ranking of barriers based on response frequency. The primary barrier for both institutional and personal categories was time. Financial barriers and technical infrastructure & support factors were significant for both institutional and personal barriers, forming a second tier when combined due to the minimal difference. However, institutional barriers also included issues related to personal and professional traits of staff members. Barriers with a frequency below 30% were grouped into organizational, competence, psychological, social, and economic factors. Organizational barriers included data security, financial risk, communication, management engagement, digital culture, and risk of failure. Competence barriers involved IT knowledge, information, learning-teaching activities, and self-efficacy. Psychological barriers encompassed fear, anxiety, motivation, willingness, and openness to change, while social barriers included family support. Economic factors addressed concerns about income reduction and job loss. This comprehensive categorization provides a deeper understanding of the multifaceted nature of digital transformation and highlights the various dimensions that need to be considered for its successful implementation.

The research also tested two hypotheses and found differences in the perception of barriers between academic and administrative staff. Academic staff perceived adherence to traditional principles as a more significant barrier, while administrative staff viewed the lack of willingness for DT more critically. Age-related differences were notable only in the evaluation of IT skills, particularly among the 42 to 58 age group. Considering that the differences were revealed regarding the small number of statements, the research hypotheses have been treated as rejected.

Although the small sample size limits the generalizability of these findings, the results underscore the complexity of digital transformation and the importance of addressing both institutional and personal barriers.

This research offers several important implications and benefits for higher education institutions aiming to navigate the complexities of digital transformation. First, by identifying time constraints as the most significant barrier, institutions can prioritize time management strategies and streamline processes to facilitate smoother digital transitions. Recognizing the importance of financial resources, motivation, and understanding the purpose highlights the need for strategic investment and clear communication of digital transformation goals to all stakeholders. The categorization of barriers into organizational, competence, psychological, social, and economic factors provide a holistic framework for HEIs to develop targeted interventions. For instance, enhancing IT knowledge and self-efficacy through comprehensive training programs can address competence-related barriers, while fostering a supportive digital culture can mitigate psychological resistance. Addressing economic concerns such as job security can help alleviate financial anxiety among staff, promoting a more accepting attitude towards digital changes.

Finally, the research underscores the necessity of differentiated strategies for academic and administrative staff, as well as for various age groups. Tailoring approaches to the specific needs and perceptions of these groups can enhance the effectiveness of digital transformation initiatives. Overall, this study is a platform for further investigation. The next steps for this research include: 1) enlarging the sample size and testing hypotheses about differences in the evaluation of barriers towards digital transformation based on all profile characteristics (age, gender, education level, position, work experience); and 2) conducting a cross-country study to compare results between countries. Currently, the authors have agreements with the European Digital Learning Association, Trakia University – Stara Zagora (Bulgaria), Ilia State University (Georgia), National University "Yuri Kondratyuk Poltava Polytechnic" (Ukraine), Universidad Católica de Valencia (Spain), University of Galati (Romania), Hadassah Academic College (Israel), and Università di Urbino Carlo Bo (Italy).

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