

Digital Pedagogy in Higher Education: Students' Perceptions and Practices

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Abstract

The accelerated transformations driven by digitalization have significantly impacted the educational process, leading to the emergence and consolidation of the concept of digital pedagogy. The present study aims to investigate students' perceptions and practices regarding the use of digital tools in higher education. The research is based on an online questionnaire administered to a sample of students from various study programs, through which digitally assisted learning experiences, the frequency of technology use, perceived benefits, and encountered challenges were analyzed. The study employed a quantitative research design using a structured questionnaire with 24 items, covering three dimensions: the use of technology in learning, digital skills, and students' attitudes towards digital pedagogy. Responses were rated on a five-point Likert scale, and the instrument demonstrated good internal consistency (Cronbach's $\alpha = 0.85$). Data were collected electronically from a sample of 116 female students enrolled in pedagogy programs at the Faculty of Orthodox Theology and Educational Sciences. Descriptive statistics and non-parametric tests (Kruskal-Wallis) were performed using SPSS V22. The results indicate that students reported frequent use of technology in learning, high levels of digital skills, and predominantly positive attitudes towards digital pedagogy. A strong positive correlation was identified between digital skills and attitudes ($r = 0.68$, $p < 0.01$), confirming that students with higher digital competences show more favorable perceptions of digital pedagogy. Furthermore, significant differences emerged

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according to the year of study: third-year students achieved the highest scores across all dimensions, suggesting greater exposure to digital tools, while first-year students, despite lower digital competences, reported higher technology use than second-year peers. These findings support the hypotheses and highlight the role of higher education in fostering digital competences and constructive engagement with digital pedagogy.

Keywords: *digital pedagogy, digital competences, educational practices, higher education, students' perceptions.*

Introduction

The transformations brought about by digitalization have generated major changes in higher education, where the integration of information and communication technologies is no longer merely an option but an essential condition for the modernization of the educational process. The concept of digital pedagogy extends beyond the simple use of digital tools, encompassing a reflective and critical approach to how technology supports learning, teaching, and assessment. In the specialized literature, digital pedagogy is defined as a combination of technological resource utilization and the development of innovative teaching practices aimed at fostering students' autonomy, creativity, and active engagement in the educational process.

Over the past two decades, numerous studies have highlighted that the digitalization of higher education brings significant benefits, such as greater flexibility in accessing educational resources, the diversification of teaching and learning methods, and the facilitation of communication between teachers and students. At the same time, the implementation of e-learning platforms, interactive applications, and online collaborative tools has contributed to the creation of more dynamic and personalized learning environments. Research conducted in the post-COVID-19 period has further emphasized the critical role of digital pedagogy in ensuring the continuity of university education and in developing the digital competences of all actors involved

(Bozkurt & Sharma, 2020; Hodges et al., 2020; Bond et al., 2021; Rapanta et al., 2020; Miulescu & Matei, 2021).

Conversely, the literature identifies several challenges related to the use of educational technologies, including technical difficulties, uneven digital competencies, potential declines in students' intrinsic motivation, and reduced face-to-face interaction, which can impact the socio-emotional aspects of learning (Clark & Mayer, 2011; Dhawan, 2020; Aristovnik et al., 2020). Students' perceptions and attitudes toward these technologies are influenced by prior experiences, individual learning styles, and the quality of pedagogical design provided by instructors. Accordingly, classical pedagogical taxonomies are increasingly being complemented by frameworks that emphasize digital competencies and the adaptation of teaching strategies to the needs of contemporary student cohorts.

Analyzing students' perceptions and attitudes toward digital pedagogy is particularly important, as it provides valuable insights for designing more effective educational practices that address their actual needs. Positive attitudes can enhance motivation and active engagement, whereas negative perceptions may indicate barriers related to infrastructure, resources, or instructional methods. For this reason, research on digital pedagogy is not limited to technological aspects but primarily focuses on the pedagogical dimension and students' learning experiences.

The concept of digital pedagogy has emerged in response to the profound transformations brought about by the digitalization of contemporary society and the integration of information and communication technologies into the educational process. In its current understanding, digital pedagogy goes beyond the mere use of technological tools in teaching and learning activities, representing a reflective, critical, and innovative pedagogical approach to how technology can support skill development, critical thinking, and learner autonomy. This paradigm entails a reconfiguration of the teacher's role, positioning them as a facilitator of learning and a

designer of digitally assisted educational experiences. Students, in turn, are regarded as active participants, engaged in constructing their own knowledge through exploration, collaboration, and reflection. From this perspective, digital pedagogy aligns with constructivist and connectivist models, in which technology serves as an environment for connection and meaning-making.

In the context of contemporary education, the integration of digital technologies necessitates a rethinking of traditional teaching and learning paradigms, materializing in an approach often referred to as digital pedagogy. A study conducted at universities found that, in the transition to e-learning, technology should be viewed not as a replacement for the teacher but as a tool to enhance learning, and teaching–learning styles must be adapted accordingly (Sain, Baskara, Vorfi Lama, 2024).

According to a definition proposed in the Romanian literature, “digital pedagogy is the branch of pedagogy that studies the design, implementation, and evaluation of educational situations with a significant digital technology component, as well as the conditions necessary for their conduct” (Istrate, Velea & Ceobanu, 2025). This definition emphasizes three dimensions: the integration of technology into the teaching process, the development of digital competencies among educational actors, and the adoption of positive attitudes toward digitally assisted learning.

The international literature also emphasizes that the digital transformation of higher education involves four interconnected domains—educational, personal, socio-cultural, and institutional—which influence the successful implementation of digital learning (Bitar & Davidovich, 2024). Thus, the success of digital pedagogy depends not only on technological availability but also on how instructors and students adopt new roles: the teacher as a designer of learning experiences and the student as an active agent in the learning process. Another important aspect concerns students’ motivation, autonomy, and perceptions in online learning environments. A study

conducted in Spain indicates that learning autonomy, intrinsic motivation, and the quality of digital pedagogy are key factors influencing students' positive perceptions of online learning (Díaz-Noguer, Hervás-Gómez, De la Calle-Cabrera, & López-Meneses, 2022). This highlights the link between digital competencies, appropriate pedagogical strategies, and the success of digitally assisted learning.

From a theoretical perspective, digital pedagogy can be viewed as a framework akin to active and connectivist pedagogies: learning occurs through exploration, collaboration, and reflection, while technology serves as an environment for connection and meaning-making (Istrate et al., 2025). Within this context, the present study aims to explore how university students perceive and evaluate the integration of digital pedagogy in teaching and learning activities, with a focus on their attitudes, expectations, and encountered challenges, in order to inform potential improvements in higher education practices.

Research methodology

Materials and methods

To carry out this study, we developed a questionnaire based on the literature on students' attitudes towards digital pedagogy (Cohen et al., 2022; Haleem et al., 2022; Wang et al., 2023). Thus, the questionnaire had 3 dimensions (use of technology in the learning process, digital skills and students' attitude towards digital pedagogy) with 24 items in total. The answers are predefined on a Likert scale from 1 = total disagreement to 5 - total agreement. Scores can range between 24 and 120, where high scores illustrate digital competences and the integration of technology into the learning process.

Questionnaire Dimensions Component:

1. Dimension Use of Technology in the Learning Process: items 1-6;
2. Dimension Digital Skills: items 7 – 11;

3. Dimension Students' Attitude towards Digital Pedagogy: items 12-24.

For our sample, the Cronbach's a internal consistency index was 0.85, which illustrates that this questionnaire measures what it purports to measure. The Cronbach's a index was 0.79 for the dimension of technology use in learning, 9.89 for the dimension of digital skills, and 0.83 for the dimension of students' attitudes towards digital pedagogy.

Data collection procedure

Participants were selected from among the students of the Faculty of Orthodox Theology and Educational Sciences, Pedagogy specialization. The participants' agreement was obtained in writing by completing the informed consent. Participation was voluntary, and participants could withdraw at any time. No personal information such as address, email, CNP, etc. was taken. The questionnaires were completed electronically via the Google Forms platform. The data were collected in an encrypted Excel document to which only the researchers had access. Statistical analysis of the data was performed using SPSS V22 by applying descriptive statistics (mean, standard deviation, frequencies, percentages) and the Kruskal Wallis Test for differences between groups.

Sample

The study involved 116 female students from the Faculty of Orthodox Theology and Educational Sciences, majoring in pedagogy. 93 are pursuing a bachelor's degree program and 23 are pursuing a master's degree program. 26 of the participants are in their first year of study, 33 are in their second year of study, 34 are in their third year of study, and 23 are in their second year of master's degree. 92 of the students are between 18 and 25 years old and 24 are between 26 and 45 years old (Tables 1-3).

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Table 1. Level of study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	licence	93	80,2	80,2	80,2
	master	23	19,8	19,8	100,0
	Total	116	100,0	100,0	

Table 2. Year of study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	26	22,4	22,4	22,4
	2	33	28,4	28,4	50,9
	3	34	29,3	29,3	80,2
	4	23	19,8	19,8	100,0
	Total	116	100,0	100,0	

Table 3. Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18-25 years	92	79,3	79,3	79,3
	26-35 years	13	11,2	11,2	90,5
	36-45 years	11	9,5	9,5	100,0
	Total	116	100,0	100,0	

The aim of study

The aim of the present research is to analyze university students' perceptions and attitudes towards the use of digital pedagogy in higher education, with a particular focus on identifying its perceived advantages, challenges, and expectations. The study aims to provide a foundation for developing educational strategies that are better aligned with students' real learning and training needs.

Objectives

To achieve this goal, we formulated the following objectives:

O1. Identify a possible relationship between the level of students' digital skills and students' attitudes towards the use of technology in higher education.

O2. Identify differences between students' level of study and the degree of use of technology in the learning process, their level of digital skills and their attitude towards digital pedagogy.

The hypotheses of this study are:

I1. It is assumed that there is a relationship between students' level of digital skills and students' attitudes towards the use of technology in higher education.

I2. It is assumed that there are statistically significant differences between students depending on their year of study in terms of the degree of use of technology in the learning process, their level of digital skills and their attitude towards digital pedagogy.

Results

In the table below we can see that the students in our sample use technology in the learning process, have high digital skills and have a positive attitude towards digital pedagogy, as evidenced by the high averages for all these aspects (24.22, 19.33 and 50.17, respectively).

Table 4. *Descriptive statistics of research variables*

	N	Mean	Std. Deviation	Minimum	Maximum
the.use.of.technology.in.learning	116	24,22	5,043	12	30
digital.skills	116	19,33	5,011	8	25
attitude.towards.digital.pedagogy	116	50,17	10,596	23	65

There is a relationship between students' level of digital skills and students' attitudes towards the use of technology in higher education, $r=0.68$, $p<0.01$. This fact illustrates that the higher the students' digital skills, the more positive their attitude towards digital pedagogy (Table 5).

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Table 5. Correlations

			digital.skills	attitude.towards.digital.pedagogy
Spearman's rho	digital.skills	Correlation Coefficient	1,000	,684**
		Sig. (2-tailed)	.	,000
		N	116	116
	attitude.towards.digital.pedagogy	Correlation Coefficient	,684**	1,000
		Sig. (2-tailed)	,000	.
		N	116	116

** . Correlation is significant at the 0.01 level (2-tailed).

In the study, we also tested hypothesis I2 according to which there are significant differences between students depending on the year of study in terms of the use of technology in learning, digital skills and their attitude towards digital pedagogy. According to tables 6 and 7, this hypothesis is supported by the collected data:

- $Z_{\text{The use of technology in learning}}(3)=17.10$, $M1 = 51,79$, $M2 = 43,50$, $M3 = 75,71$, $M4 = 62,17$, $p < 0.01$
- $Z_{\text{Digital skills}}(3)=21.26$, $M1 = 44,35$, $M2 = 44,58$, $M3 = 74,21$, $M4 = 71,26$, $p < 0.01$
- $Z_{\text{Attitude towards digital pedagogy}}(3)=19.72$, $M1 = 39,98$, $M2 = 55,09$, $M3 = 77,78$, $M4 = 55,83$, $p < 0.01$

We can also observe that the highest average ranks were obtained by the third year students. A possible explanation for this result would be that these students have come into contact with more ways of using technology in learning than their other colleagues. Although the first year students have poor digital skills, they manage to use technology to a greater extent than the second year students.

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Table 6. Ranks			
	year.of.study	N	Mean Rank
the.use.of.technology.in.learning	1	26	51,79
	2	33	43,50
	3	34	75,71
	4	23	62,17
	Total	116	
digital.skilles	1	26	44,35
	2	33	44,58
	3	34	74,21
	4	23	71,26
	Total	116	
attitude.towards.digital.pedagogy	1	26	39,98
	2	33	55,09
	3	34	77,78
	4	23	55,83
	Total	116	

Table 7. Kruskal Wallis Test^{a,b}			
	The use of technology in Digital learning	Attitude towards digital	pedagogy
Chi-Square	17,107	21,267	19,727
df	3	3	3
Asymp. Sig.	,001	,000	,000

a. Kruskal Wallis Test

b. Grouping Variable: year.of.study

Conclusions

In conclusion, there is a close relationship between the level of development of students' digital skills and the positive attitude towards digital pedagogy and, secondly, the higher the level of education of students, the more they use technology in learning, have a positive attitude towards digital pedagogy and their digital skills are much more developed. Higher education, therefore, encourages the development of digital skills and their use in a constructive and

efficient way for the development of other skills in the instructional-educational process.

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