

Adoption of Microsoft Teams platform by Romanian university students

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ABSTRACT

The pandemic challenged universities to move to distance education. The educational platform became the main working space and reshaped the teaching and learning tasks. After two years, university life came back to normal in Romanian universities. The objective of this paper is to explore the behavioral intention to use Microsoft Teams platform after the pandemic. A technology acceptance model that is featuring two external variables has been tested on a sample of Romanian students (N181) from a civil engineering university. The results show that students are willing to continue using this platform after the pandemic.

Keywords

Online learning, Microsoft Teams, pandemic, perceived ease of use, perceived usefulness, continuance intention.

ACM Classification

D.2.2: Design tools and techniques. H5.2 User interfaces.

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INTRODUCTION

The pandemic generated by the coronavirus COVID19 challenged Romanian universities to move to distance education. The educational platform became the main working space and reshaped the teaching and learning tasks. The effort to adapt to a new lifestyle created negative perceptions of online learning that have been identified in terms of lack of attention, lack of motivation, stress, boredom, and fatigue [1, 4, 7, 10, 20]

During the pandemic, students succeeded to adapt to online learning and found it beneficial in many respects, such as the comfort of learning from home, easy and fast access to lectures and educational resources, time, and money-saving [14, 17]. After two years, university life in Romania came back to normal and students had to re-adapt to the traditional education system.

The investment in an educational platform is important and created a potential for future use. Students and teachers got new abilities and developed self-efficacy in using the platform. Some universities did not use an LMS (learning management system) before the restrictions. The question is to what extent a new platform that has been used for two years under lockdown is accepted by university students.

The objective of this paper is to explore the behavioral intention of university students to use the Microsoft Teams platform after the pandemic. A technology acceptance model that is featuring two external variables has been tested on a sample of Romanian students (N181) from a civil engineering university.

The next section presents the theoretical background and conceptualization. Then the model testing results are presented and discussed.

BACKGROUND AND CONCEPTUALIZATION

Related work

The technology acceptance model (TAM) has been widely tested on various systems and technologies in education [11]. Technology acceptance is driven by several factors, among which the main drivers are the perceived ease of use and the user's motivation [8]. Apart from these main drivers, TAM may include external variables, as antecedents of the perceived ease of use and motivation.

Almaiah et al. [2] analyzed the challenges and factors influencing the adoption and usage of e-learning systems during the pandemic. The main challenges found by them are infrastructure, technical issues, course design issues, change management issues, and computer self-efficacy. As regards the main factors, they mentioned technology, e-learning system quality, and cultural and trust aspects.

The study of Pal & Vanijja [16] tested the likelihood to recommend the Microsoft Teams platform during the pandemic in India and found that the perceived ease of use and perceived usefulness are significant predictors that together explain 66.7% variance.

Camilleri & Camilleri [5] adapted TAM to analyze the acceptance of learning management systems and video conferencing technologies during the pandemic. Their model includes facilitating conditions and perceived interactivity as antecedents of perceived usefulness. The model has been tested on a sample of 501 students and the results show that perceived usefulness is a strong predictor of the intention to use.

Mailiziar et al. [13] tested a technology acceptance model having two external variables: system quality and e-learning experience. They found that while the former had a significant influence on the perceived usefulness, the latter did not significantly influence the perceived ease of use and perceived usefulness.

The study of Aguilera-Hermida et al. [1] analyzed the acceptance of online learning during the pandemic in four countries. Their model featured cognitive engagement having as antecedents the attitude toward online learning, self-efficacy, motivation and affect. They found several differences between countries as regards the number of predictors and concluded that is not possible to take a single approach in all cases of exclusive online learning.

Research model and measures

In this study, we propose a TAM model that includes two antecedents of perceived ease of use (PEU) and perceived usefulness (PU): platform quality (PQ) and information quality (IQ). The research model is presented in Figure 1.

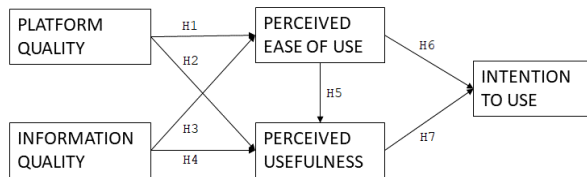


Figure 1. The research model

Platform quality refers to the ubiquitous access and efficiency of using the Microsoft Teams platform. It is expected that the quality of the platform has a positive influence on the perceived ease of use and perceived usefulness. [1, 2, 13].

[H1] Platform quality has a positive influence on the perceived ease of use (PQ → PEU).

[H2] Platform quality has a positive influence on the perceived usefulness (PQ → PU).

Information quality refers to the quality of information needed to perform a task. It is expected that clear, reliable, and complete information will be useful for students and will make the learning tasks easier to accomplish [1, 2, 3].

[H3] Information quality has a positive influence on perceived ease of use (IQ → PEU).

[H4] Information quality has a positive influence on perceived usefulness (IQ → PU).

Perceived ease of use has been defined as a belief that using a given technology will be free of effort [8]. Perceived usefulness has been defined as a belief that using a given technology will improve job performance [8]. TAM posits that the perceived ease of use has a positive influence on the perceived usefulness and both core beliefs have a positive influence on the behavioral intention to use the technology [5, 8, 13, 16]:

[H5] Perceived ease of use has a positive influence on perceived usefulness (PEU → PU).

[H5] Perceived ease of use has a positive influence on the behavioral intention to use (PEU → BI).

[H7] Perceived usefulness has a positive influence on the behavioral intention to use (PU → BI).

The constructs have been operationalized by adapting existing scales in the literature [8]. Before testing the model, an exploratory factor analysis (EFA) with a maximum likelihood estimation method and varimax rotation has been carried on. The analysis revealed several

cross-loadings so four items have been eliminated. The variables used in this study are presented in Table 1.

Table 1. Variables (N=181)

Item	Statement
PQ1	Microsoft Teams is available and accessible permanently
PQ2	Microsoft Teams operates in a time-saving manner
PQ3	I can access Microsoft Teams anytime from anywhere
IQ1	The information needed to perform a task is clear
IQ2	The information needed to perform a task is reliable
IQ3	The information needed to perform a task is complete
PEU1	Using the online learning platform is simple
PEU2	My interaction with the online platform is clear and understandable
PU1	Using Microsoft Teams will improve my learning achievements
PU2	Using Microsoft Teams makes it easier for me to study
PU3	Using Microsoft Teams makes learning more productive
BI1	I intend to use Microsoft Teams in the future
BI2	I would use Microsoft Teams if it is available after the pandemic

Method and sample

The model was analyzed with Lisrel 9.3 for Windows [15], using the maximum likelihood estimation method. The analysis has been done in a two-step approach: testing the measurement model (relationships between construct and indicators) for construct validity and then the structural model (relationships between constructs) for model fit and hypotheses checking.

The following criteria have been used to assess the validity of the measurement model: scale reliability by examining the convergent validity through the composite reliability (CR) and average variance extracted (AVE), discriminant validity by comparing the square root of AVE with the correlations between constructs [9], and fit of the model with the data.

Based on the recommendations from the literature [12], the following goodness-of-fit indices were used to assess the model fit: chi-square (χ^2), normed chi-square (χ^2/df), comparative fit index (CFI), goodness-of-fit index (GFI), standardized root mean square residual (SRMR), and root mean square error of approximation (RMSEA).

A questionnaire has been administrated in 2022 to students from the Technical University of Civil Engineering of Bucharest. Students answered some general questions related to demographics (age, gender) and enrollment (university, faculty, year of study), then evaluated the items on a 5-points Likert scale.

A total of 216 questionnaires have been received out of which 35 have been eliminated for incomplete data. The resulting working sample has 181 observations (119 male students and 62 female students). Most students are undergraduates (91%). Students are enrolled in civil engineering (111), engineering and management (29), project management (15), railways and bridges (12), and other study programs (14).

As regards the infrastructure, the university purchased a Microsoft Teams platform. There was no LMS available in the university before the pandemic.

EMPIRICAL STUDY

Measurement model

The descriptive statistics, composite reliability (CR), average variance extracted (AVE), and factor loadings are presented in Table 2.

Table 2. Descriptives, convergent validity, and factor loadings(N=181)

Factor	CR	AVE	Item	M	SD	Loadings
PQ	.757	.510	PQ1	4.73	0.66	0.75
			PQ2	4.55	0.81	0.75
			PQ3	4.69	0.77	0.65
IQ	.848	.651	IQ1	4.44	0.86	0.79
			IQ2	4.64	0.74	0.78
			IQ3	4.39	0.93	0.85
PEU	.852	.743	PEU1	4.77	0.59	0.92
			PEU2	4.78	0.61	0.79
PU	.938	.835	PU1	4.27	1.02	0.87
			PU2	4.22	1.07	0.95
			PU3	3.98	1.13	0.92
BI	.811	.683	BI1	3.52	1.17	0.87
			BI2	3.85	1.06	0.78

All observed scores are over the neutral value of 3.00, which shows a positive perception of using Microsoft Teams. Ease of use was the highest-rated construct with a mean of 4.38, then the facilitating conditions (4.37), and perceived ease of use (4.16).

As is shown in Table 2, all latent variables have a very good convergent validity since CR and AVE are much over the thresholds of 0.7 and 0.5 [12].

Based on the recommendations of Fornel and Larker [9], the discriminant validity has been assessed by comparing the correlations between constructs with the square root of AVE, in Table 3.

Table 3 Discriminant validity (N=181)

	PQ	IQ	PEU	PU	BI
PQ	0.714				
IQ	0.690	0.807			
PEU	0.700	0.522	0.862		
PU	0.527	0.537	0.354	0.914	
BI	0.677	0.577	0.605	0.735	0.826

Note: The bold diagonal numbers represent the square root of AVE

All constructs have good discriminant validity since the square root of AVE is greater than inter-factor correlations.

Structural model

The structural model estimation results are presented in Figure 2. The goodness of fit indices (GOF) indicate a good fit of the model with the data: $\chi^2=129.25$, $DF=57$, $p=0.000$,

$\chi^2/DF=2.267$, $CFI=0.985$, $GFI=0.911$, $SRMR= 0.0483$, $RMSEA=0.083$.

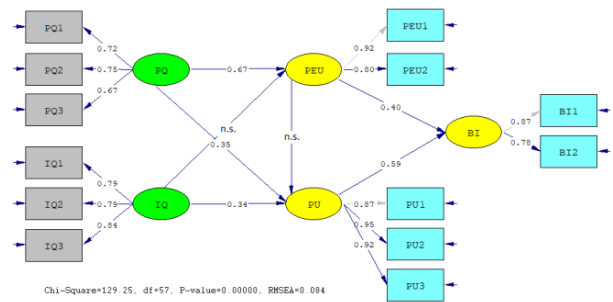


Figure 2. Model estimation results (N=181)

The hypotheses H1, H2, and H4 are supported since the paths from PQ to PEU ($\beta=0.67$, $p=0.000$), from IQ to PEU ($\beta=0.34$, $p=0.003$), and from IQ to PU ($\beta=0.35$, $p=0.028$) are significant. Hypotheses H3 and H5 are not supported. Perceived ease of use has a significant influence on the behavioral intention to use ($\beta=0.40$, $p=0.000$) thus supporting H6. Perceived usefulness has a significant positive influence on behavioral intention to use ($\beta=0.59$, $p=0.000$) so hypothesis H7 is also supported.

The model explains 51.3% variance in the perceived ease of use, 34.2% in the perceived usefulness, and 68.6% in the intention to use.

Discussion

This study contributes to an empirically validated model of Microsoft Teams acceptance by civil engineering students during the pandemic. The mean values of all variables are much over the neutral value which shows a positive perception of the ease of use and usefulness of Microsoft Teams.

The model testing results show that the perceived platform quality is a significant antecedent of the perceived ease of use and perceived usefulness. The perceived information quality is also a significant antecedent of the perceived usefulness.

The model includes only two core beliefs: the perceived ease of use and the perceived usefulness. It does not include perceived enjoyment (intrinsic motivation). Previous studies show that perceived enjoyment of using online platforms during the pandemic is pretty high and is not clear if this is due to the platform features or the personal benefits of online lectures during the pandemic [14].

University students showed a clear interest to use Microsoft Teams after the pandemic. There are several explanations for this. As shown by Cancaya & Durak [6], Microsoft Teams is convenient for universities that don't have an LMS since it provides the basic functionalities related to resource sharing, virtual classrooms and exams. Several studies reported a positive perception of Microsoft Teams amongst university students [16, 18].

In this university, Microsoft Teams fulfilled the need of having a learning management system. Last but not least, projects have an important weight in the curricula of civil engineering faculties which makes Microsoft Teams a suitable tool.

This exploratory study is not without limitations. There are inherent limitations of the cross-sectional data. The sample is relatively small and not representative at a national level since students are from only one university.

CONCLUSION AND FUTURE WORK

The rapid and unexpected changes in education during the pandemic brought in front the online teaching and learning platform as a pre-condition for continuity in education.

Understanding the factors that influence the acceptance of online platforms is a condition for a successful investment and successful usage. The results of this study show that Microsoft Teams is a suitable online platform that satisfies the specific requirements of a civil engineering university. Not only do students have a positive perception of using the platform during the pandemic but they are willing to further use it in the future.

Future research directions will include intrinsic motivation in the model and will extend the study of external variables.

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