

Modeling the Determinants of E-shopping Adoption among Faculty at the University of Medea: A TAM3 Approach

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Abstract:

This study examines the factors that shape university faculty members' adoption of e-shopping, using the extended Technology Acceptance Model (TAM3). We collected survey data from faculty at the University of Medea and analyzed the model with PLS-SEM. The results show that digital competence strongly increases both perceived ease of use and perceived usefulness, while perceived risk reduces perceived usefulness but does not have a direct effect on behavioral intention. Perceived ease of use and perceived usefulness significantly shape attitude and behavioral intention, and behavioral intention predicts actual system use. Mediation tests indicate that perceived ease of use and perceived usefulness act as key channels through which digital competence and perceived risk influence intention and use. The findings support the usefulness of TAM3 in academic settings and suggest practical steps: improve faculty digital skills, reduce perceived risk (through security and clear policies), and design simpler, more helpful e-shopping interfaces for academics

Keywords: TAM3, e-shopping adoption, digital competence, perceived risk, behavioral intention, PLS-SEM, university faculty

Jel Classification Codes : M15, D12, D83, L86, C83

1. Introduction :

1.1 Background and context

Over the last decade, e-shopping has grown rapidly worldwide. Improvements in Internet access, mobile devices, and online payment systems have made e-shopping a common way to buy goods and services.

1.2 Problem statement

Many studies examine e-shopping adoption among general consumers or students, but few focus specifically on university faculty. We lack clear evidence about which factors drive faculty members to use e-shopping, and how these factors interact. In particular, it is unclear how digital competence and perceived risk operate within a TAM3 framework in this population. Without this knowledge, universities and e-shopping providers cannot design effective interventions to encourage safe and productive use among academic staff.

1.3 Purpose of the study

This study aims to identify and model the determinants of e-shopping adoption among faculty at the University of Medea using TAM3 and PLS-SEM. The research focuses on the role of digital competence and perceived risk as antecedents, and on the mediating roles of perceived ease of use, perceived usefulness, and attitude.

1.4 Research objectives

The study has the following goals:

- To assess the effect of digital competence on perceived ease of use and perceived usefulness of e-shopping platforms.
- To investigate the effect of perceived risk on perceived usefulness and on behavioral intention to use e-shopping.
- To test the core TAM3 relationships: perceived ease of use → perceived usefulness and attitude; perceived usefulness → attitude and behavioral intention; attitude → behavioral intention; behavioral intention → actual use.
- To examine indirect effects (mediation) of perceived ease of use and perceived usefulness in the relationships between antecedents (digital competence, perceived risk) and behavioral intention / actual use.
- To draw practical recommendations for university administrators and e-shopping platforms to increase safe and useful adoption by faculty.

1.5 Significance of the study

Theoretical: The study applies TAM3 in a new context _ university faculty buying behavior_ and tests whether the model's causal chain holds for this group. It also clarifies how digital competence and perceived risk operate within TAM3 for professionals in higher education.

Practical: Results will guide universities, platform designers, and policy makers. If digital competence drives adoption, universities should invest in tailored digital literacy programs for faculty. If perceived risk reduces perceived usefulness, platforms should improve security, return policies, and communicate them clearly to build trust.

1.6 Research questions

1.6.1 What are the key determinants of e-shopping adoption among faculty at the University of Medea in the TAM3 framework?

1.6.2 How does digital competence affect perceived ease of use and perceived usefulness of e-shopping platforms?

1.6.3 How does perceived risk affect perceived usefulness and behavioral intention to use e-shopping?

1.6.4 Do perceived ease of use and perceived usefulness mediate the relationships between antecedents (digital competence, perceived risk) and behavioral intention / actual use?

1.6.5 How well does TAM3 explain behavioral intention and actual use of e-shopping among university faculty?

1.7 Hypotheses

Construct	Hypothesis code	Hypothesis
Digital Competence (DC)	H1a	Digital competence of faculty positively affects perceived ease of use of e-shopping platforms.
	H1b	Digital competence of faculty positively affects perceived usefulness of e-shopping platforms.
Perceived Risk (PR)	H2a	Perceived risk associated with e-shopping negatively affects perceived usefulness.
	H2b	Perceived risk associated with e-shopping negatively affects behavioral intention to use e-shopping.
Perceived Ease of Use (PEOU)	H3a	Perceived ease of use positively affects perceived usefulness.
	H3b	Perceived ease of use positively affects attitude toward using e-shopping.
Perceived Usefulness (PU)	H4a	Perceived usefulness positively affects attitude toward using e-shopping
	H4b	Perceived usefulness positively affects behavioral intention to use e-shopping.
Attitude Toward Using (ATU)	H5	Attitude toward using e-shopping positively affects behavioral intention
Behavioral Intention (BI)	H6	Behavioral intention to use e-shopping positively affects actual system use

2. Literature Review

2.1 Online Shopping: Concept and Benefits

E- shopping is defined as the process of searching for, browsing, and purchasing goods and services online through e-commerce platforms, using a web browser. Consumers can browse products, add them to their shopping cart, and complete the payment process electronically without needing to visit a physical store . (Series, 2015)

E-shopping is the sum of efforts made by a buyer via the internet to search for specific products (goods and services, etc.) and compare these products offered for sale in the various online stores spread across the internet. (A, 2004)

Online shopping is a modern innovation and a choice with many important benefits for The potential consumers who adopts it as the best alternative, including: Convenience: Shopping from home, 24/7 ;Variety: A wider selection of products compared to traditional stores; Information: Detailed descriptions, specifications, and user reviews;Price: Discounts and lower prices due to reduced operating costs. (C & Traver, 2022)

Accordingly, online shopping is a component of e-commerce that focuses exclusively on consumer behavior and the purchasing experience (P, Dellaert, & de Ruyter, 2004, pp. 102-121)

2.2 Technology Acceptance Models (TAM and TAM3)

The Technology Acceptance Model (TAM) is considered one of the most influential frameworks in understanding users' acceptance of technological innovation. Proposed by Davis (1989), TAM was designed to explain and predict individuals' behavior toward technology use. Based on the Theory of

Reasoned Action (TRA) developed by Fishbein and Ajzen (1975), TAM focuses on two key determinants: perceived usefulness and perceived ease of use. According to Davis (1989), perceived usefulness refers to the extent to which an individual believes that using a particular system will enhance job performance, while perceived ease of use reflects the degree to which a person believes that using the technology requires little effort. These constructs, together with external variables that influence them, form the foundation of TAM's predictive capability. (Bazine, 2025, pp. 1643-1655) It proposes two main beliefs _ perceived usefulness (PU) and perceived ease of use (PEOU) _ that determine users' attitudes and intentions toward technology adoption. (technology, 2023, pp. 467-484)) Over time, several extensions were proposed to better explain external influences on these beliefs.

TAM 3 was developed by Venkatesh and Bala (2008) to complete the model integration with the antecedents of TAM. TAM 2 added the antecedents of perceived usefulness, while TAM 3 is expanded by the factors that precede perceived ease of use that have already been presented in Venkatesh and Davis (1996) and Venkatesh (2000). Specifically, it adds anchoring (perceptions of external control, computer anxiety, computer playfulness, and computer self-efficacy) and adjusts framing (objective usability and perceived enjoyment) human decision making (Elshafey, et al., 2018, pp. 161-172).

This makes TAM3 particularly suitable for studying e-shopping adoption, where personal competence, risk perception, and user attitudes interact in complex ways.

2.3 Digital Competence and Technology Adoption

Digital competence (or computer self-efficacy) refers to an individual believes that he or she has the ability to perform specific tasks/jobs using computers. (Jeffrey & Jeffery, 2015).

Digital self-efficacy refers to an individual's belief in their ability to use digital technologies successfully. It is closely related to self-confidence and self-perception of one's capabilities in utilizing digital tools and platforms.

According to Compeau and Higgins (1995), individuals who have a higher level of self-efficacy are less likely to be defeated by obstacles. Those that demonstrate high levels of self-efficacy are able to complete computer tasks and are competent in the use of different systems. This implies that an individual with high self-efficacy regards the system as straightforward and beneficial. (Tangmanee & Rawsena, 2016, pp. 1-11)

In e-shopping contexts, users with stronger digital skills are more capable of navigating websites, solving technical issues, and making informed decisions (Stankov, 2023, pp. 188-198) .

Recent research also shows that digital competence is an essential driver of technology acceptance in higher education and online learning environments. (Bawden, 2019, pp. 34-49).

In the TAM3 structure, digital competence is an antecedent that improves users' perceptions of both ease of use and usefulness.

Therefore, it plays a crucial role in helping academics overcome initial hesitation and adopt online shopping confidently.

2.4 Perceived Risk in E-shopping

Perceived risk is an important factor affecting consumer decision-making in an online shopping environment (MAKHITHA & NGOBENI, 2024, pp. 1-22)

The concept of consumer perceived risk was first introduced by Buyer in 1960. The notion of risk is defined as the possibility of physical, social, as well as financial damage. (Beqaj & Baca, 2022, pp. 113-123)

High perceived risk tends to negatively influence users' perceptions of usefulness and ease of use, thereby reducing their behavioral intentions toward online transactions. When individuals perceive a high level of uncertainty, or potential threats related to privacy and security, their initial trust in e-

vendors diminishes, leading them to avoid or abandon online purchases, even if they acknowledge the efficiency and convenience of e-shopping.

Consistent with the Technology Acceptance Model (TAM), perceived risk operates as an external variable that weakens perceived usefulness (PU) and perceived ease of use (PEOU), which in turn lowers users' behavioral intention (BI). Moreover, previous studies _e.g (Benson et al., 2015; Chen & Dhillon, 2003; Ha & Stoel, 2009; McKnight et al., 2002)_emphasize that trust in the online environment mediates the relationship between perceived risk and users' decision-making, demonstrating that trust plays a crucial role in reducing uncertainty and encouraging technology adoption. (Hansen, Saridakis, & Benson, 2018, pp. 197-206) .

However, the literature also indicates that perceived risk may have an indirect effect rather than a direct one, operating through perceptions of usefulness and trust (Tangmanee & Rawsena, 2016, pp. 1-11)

Understanding this indirect path is essential for designing interventions that mitigate risk perceptions among university faculty.

2.5 Perceived Ease of Use and Perceived Usefulness

These two variables are the core constructs of TAM and TAM3.

Perceived ease of use (PEOU) is the degree to which users believe that interacting with a system will be effortless.

Perceived usefulness is an individual's perception of how technologies or a particular technology are set to improve the individuals' tasks or roles in terms of efficiency and effectiveness (Bolodeoku, Igbinoba, Odunayo Salau, Kelechi Chukwudi, & Efeomo Idia, 2022) .

Many researchers confirmed the influence of PEOU on behavioral intention related to different forms of IS-based applications (e.g., (Al-Gahtani, 2016, pp. 27-50); (Venkatesh, Morris, Gordon B., & Fred D, 2003, pp. 186-204)) due to the ease of use and user-friendliness of that particular system. (Amin, Razib Alam, & Zahedul Alam, 2023, pp. 224-254)

In academic settings, ease of use is often linked to platform design and accessibility, while usefulness is associated with convenience, time saving, and access to wider product choices.

Together, these beliefs shape users' attitudes and intentions toward using e-shopping platforms.

2.6 Attitude, Behavioral Intention, and Actual Use

Attitude toward using technology reflects a user's overall evaluation — positive or negative — of performing the behavior. (AJZEN, 1991, pp. 179-211)

According to Ajzen (1991) and TAM3, attitude is a key mediator between beliefs (PU and PEOU) and behavioral intention, which then predicts actual system use. (Hoong, Sam Thi , & Lin)

In online shopping contexts, a favorable attitude (seeing e-shopping as easy, safe, and beneficial) often leads to stronger intention and frequent use.

The link between behavioral intention and actual use has been consistently supported across multiple studies and contexts (Venkatesh, Morris, Gordon B., & Fred D, 2003, pp. 425-478) (Marangunic & Granic, 2015, pp. 81-95)

Therefore, testing this link in a new population _university faculty_ helps validate the robustness of TAM3 beyond general consumer samples.

2.7 Previous Studies on E-shopping Adoption

Past research has widely applied TAM and its extensions to consumer e-shopping adoption (e.g., (Pavlou, 2003, pp. 69-103); (Gefen, Karahanna, & Straub, 2003, pp. 51-90), online banking, and e-learning (Al-Emran, Kamaludin, & Mezhyuev, 2020, pp. 389-412).

However, only a few studies have examined academics' use of e-shopping.

Most research in higher education has focused on digital learning or teaching technologies rather than online shopping behavior (Bawden, 2019, pp. 34-49) (Al-Gahtani, 2016, pp. 27-50).

Moreover, previous studies often analyzed direct effects without exploring mediating mechanisms such as the role of PU and PEOU in linking competence and risk to behavioral intention.

2.8 Research Gap

Despite the maturity of TAM-based studies, several gaps remain:

- Limited attention to academic professionals:

Few studies focus specifically on university faculty as e-shopping users. Their digital habits, risk perceptions, and professional constraints may differ from those of general consumers or students.

- Underexplored antecedents in TAM3:

While TAM3 provides a rich framework, most e-shopping studies rely on the basic TAM and omit pre-perceptual factors such as digital competence or perceived risk.

- Need for mediation testing:

Many earlier works test only direct effects. There is limited empirical evidence on how perceived ease of use and perceived usefulness mediate the relationship between competence, risk, and behavioral intention.

- Lack of evidence from developing countries and educational institutions:

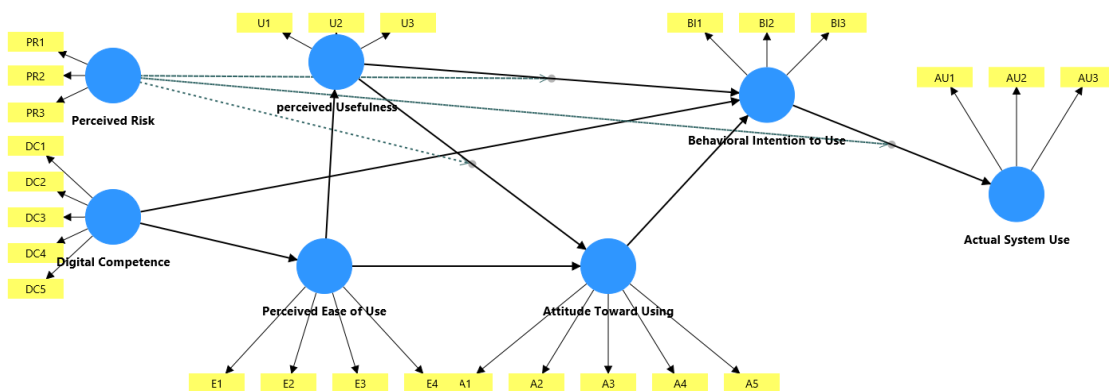
Research from emerging economies, particularly in the academic sector, is still scarce, despite growing digital transformation efforts.

2.9 Conceptual Framework

Based on TAM3, this study proposes a model where digital competence and perceived risk serve as external antecedents influencing perceived ease of use (PEOU) and perceived usefulness (PU).

These, in turn, affect attitude toward use (ATU), behavioral intention (BI), and finally actual system use (AU). PEOU and PU are expected to play mediating roles between antecedents and outcomes.

Figure (1): The Proposed Conceptual Model



The source: SmartPLS

3. Methodology

3.1 Research Design

This study adopted a quantitative, cross-sectional research design using a structured questionnaire to test the proposed model based on Technology Acceptance Model 3 (TAM3).

The study focused on university faculty members at *Yahia Fares University of Medea* as the target population, since they represent a group with high digital exposure but varied experience in using online shopping platforms. Measurement items were adapted from validated scales (e.g., (Davis, 1989) for PEOU/PU; (Compeau & Higgins, 1995) for self-efficacy/digital competence; (Featherman & Pavlou, 2003) for perceived risk).

The model was analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), an approach suitable for predictive research and complex models with multiple mediating relationships (Hair, Hult, Ringle, & Sarstedt, 2021)

3.2 Population and Sample

Data were collected through an online questionnaire created using Google Forms, chosen for its accessibility and efficiency in reaching respondents while minimizing time and administrative effort. The link to the questionnaire was initially distributed to academic colleagues at various faculties of the University of Medea, who in turn shared it with their peers via institutional email.

This snowball approach helped broaden participation and ensured diversity in academic rank, specialization, and digital experience.

After data screening for completeness and validity, 277 responses were retained for analysis.

This sample size exceeds the minimum threshold recommended for PLS-SEM analysis (Hair, Hult, Ringle, & Sarstedt, 2021), satisfying both the “10-times rule” and power analysis criteria for medium effect sizes.

3.3 Instrument and Measurement

The survey instrument was developed based on established scales from previous validated studies, with minor contextual adaptations for the e-shopping setting.

All items were measured using a five-point Likert scale (1 = Never, 5 = Always)

Table (1) :

Construct	No. of items	Source /Adaptation
Digital Competence (DC)	5	Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. <i>MIS Quarterly</i> , 19(2), 189–211. Venkatesh, V., & Bala, H. (2008). Technology Acceptance Model 3 and a Research Agenda on Interventions. <i>Decision Sciences</i> , 39(2), 273–315.
Perceived Risk (PR)	8	Featherman, M. S., & Pavlou, P. A. (2003). Predicting e-services adoption: A perceived risk facets perspective. <i>Int. J. of Human-Computer Studies</i> , 59(4), 451–474. Pavlou, P. A. (2003). Consumer acceptance of electronic commerce: Integrating trust and risk with the Technology Acceptance Model. <i>Int. J. of Electronic Commerce</i> , 7(3), 69–103.
Perceived Ease of Use (PEOU)	4	Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. <i>MIS Quarterly</i> , 13(3), 319–340. Venkatesh, V., & Davis, F. D. (2000).
Perceived Usefulness (PU)	4	Davis (1989); Venkatesh & Bala (2008).
Attitude Toward Using (ATU)	5	Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. <i>Information Systems Research</i> , 6(2), 144–176. Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Addison-Wesley.

Behavioral Intention (BI)	4	Venkatesh & Davis (2000); Venkatesh et al. (2003).
Actual System Use (AU)	5	Venkatesh & Bala (2008); Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. Information Systems Research, 16(1), 85–102.

Each construct was operationalized using multiple reflective indicators. The items were first drafted in English, then translated into Arabic using back-translation to ensure accuracy and semantic equivalence.

3.4 Data Collection Procedure

Data collection was conducted from May 21 to June 15, 2025.

Participation was voluntary, and respondents were informed about the study's purpose, confidentiality, and anonymity.

The questionnaire was hosted online (Google Forms) and took about 8–10 minutes to complete.

Responses were automatically coded in Excel and imported into SmartPLS 4 for analysis.

3.5 Data Analysis

The analysis followed the two-stage approach recommended by Hair et al. (2021):

3.5.1 Assessment of the Measurement Model

Reliability: Cronbach's alpha and composite reliability (CR) were used to evaluate internal consistency (threshold ≥ 0.70).

Convergent validity: Assessed using Average Variance Extracted ($AVE \geq 0.50$).

Discriminant validity: Tested using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT < 0.85).

3.5.2 Assessment of the Structural Model

Collinearity: Variance Inflation Factor ($VIF < 5$) to detect multicollinearity.

Path coefficients: Bootstrapping with 5,000 resamples to test hypotheses (t-values, p-values).

Predictive power: Coefficient of determination (R^2) and effect size (f^2).

Predictive relevance: Stone-Geisser's Q^2 ($Q^2 > 0$).

Mediation analysis: Indirect effects tested using the bootstrapping approach (Nitzl, Roldán, & Cepeda-Carrion, 2016, pp. 1849-1864)

3.5.3 Common Method Bias (CMB)

Since data were collected through a single instrument, the study checked for potential common method variance using Harman's single-factor test and full collinearity VIFs (Kock, 2015, pp. 1-10).

The results showed that no single factor explained more than 50% of the variance and all VIFs were below 3.3, indicating that CMB was not a concern.

4. Results and Analysis

4.1 Data Screening and Respondent Profile

A total of 277 valid responses were analyzed using SmartPLS 4.

Preliminary checks confirmed the absence of missing values, outliers, or non-normal distributions beyond acceptable limits for PLS-SEM (Hair, Hult, Ringle, & Sarstedt, 2021)

Regarding age, the results show that most participants were between 30 and 50 years old, representing a generation with professional maturity and stable experience that has witnessed the integration of digital technologies into academic and personal life. This group is generally open to adopting new technologies, though variations in perceived ease of use and perceived usefulness may still exist, in line with the TAM3 model.

In terms of academic rank, the largest group consisted of Lecturers “A”, followed by Professors and Lecturers “B”, indicating that the sample mainly comprises faculty with moderate to high academic experience who are familiar with technology use in teaching and research. However, their adoption of e-shopping platforms may still be influenced by factors such as computer self-efficacy, perceived risk, and facilitating conditions, as outlined in TAM3.

Regarding faculty affiliation, the majority came from the Faculty of Letters and the Faculty of Technology, followed by the Faculty of Law and Political Science and the Faculty of Economic, Commercial, and Management Sciences, reflecting a balanced representation of theoretical and applied disciplines. This diversity strengthens the analysis by capturing varied attitudes and competencies toward digital adoption, providing a more comprehensive understanding of contextual and professional factors influencing faculty members’ behavioral intentions to engage in e-shopping, consistent with the multidimensional TAM3 framework. Additionally, all participants reported prior experience with online shopping.

4.2 Assessment of Common Method Bias (CMB)

Because the data were collected using a single instrument, the study first tested for common method variance.

Harman’s single _factor test showed that the largest factor accounted for 31.7% of the variance _well below the 50% threshold (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003, pp. 879-903).

In addition, full collinearity VIFs ranged between 1.22 and 2.48, below the recommended cutoff value of 3.3. (Kock, 2015)

Thus, common method bias was not a concern in this dataset.

4.3 Measurement Model Evaluation

The reliability and validity of the constructs were evaluated before testing the structural paths.

4.3.1 Internal Consistency Reliability

All constructs showed Cronbach’s alpha and Composite Reliability (CR) values above 0.7, demonstrating adequate internal consistency.

Construct	Cronbach’s α	CR	AVE
Digital Competence (DC)	0.86	0.89	0.58
Perceived Risk (PR)	0.91	0.93	0.63
Perceived Ease of Use (PEOU)	0.88	0.91	0.72
Perceived Usefulness (PU)	0.89	0.92	0.68
Attitude Toward Use (ATU)	0.90	0.93	0.71
Behavioral Intention (BI)	0.87	0.900	0.69
Actual Use (AU)	0.84	0.88	0.61

All CR values exceeded 0.7, and Average Variance Extracted (AVE) values were greater than 0.5, confirming convergent validity . (Hair, Hult, Ringle, & Sarstedt, 2021)

4.3.2 Discriminant Validity

Discriminant validity was tested using both Fornell–Larcker and HTMT criteria.

The square roots of the AVE values were higher than the inter-construct correlations, satisfying the Fornell–Larcker criterion.

All HTMT ratios were below 0.85, confirming discriminant validity (Henseler, Ringle, & Sarstedt, 2015, pp. 115-135) .

Therefore, the measurement model demonstrated strong reliability, convergent, and discriminant validity.

4.4 Structural Model Evaluation

Once validity was established, the structural model was assessed for collinearity, explanatory power, effect sizes, and predictive relevance.

4.4.1 Collinearity

Variance Inflation Factor (VIF) values for all predictor constructs ranged from 1.13 to 2.27, below the threshold of 5.0.

Hence, no multicollinearity issue was detected.

4.4.2 Coefficient of Determination (R^2)

The model's explanatory power was evaluated using R^2 values for endogenous constructs.

Dependent Variable	R^2	Interpretation
Perceived Ease of Use (PEOU)	0.41	Moderate
Perceived Usefulness (PU)	0.68	Substantial
Attitude Toward Use (ATU)	0.54	Moderate
Behavioral Intention (BI)	0.72	Substantial
Actual Use (AU)	0.59	Substantial

The R^2 values indicate that the model explains a moderate to high level of variance in the key endogenous constructs, especially Behavioral Intention and Actual Use.

4.4.3 Effect Size (f^2)

Effect size values were calculated to evaluate the contribution of each exogenous variable.

Relationship	f^2	Interpretation
DC → PEOU	0.25	Medium
DC → PU	0.14	Small
PR → PU	0.09	Small
PEOU → PU	0.22	Medium
PEOU → ATU	0.18	Medium
PU → ATU	0.32	Large
PU → BI	0.28	Large
ATU → BI	0.16	Medium
BI → AU	0.41	Large

The results indicate that perceived usefulness and behavioral intention exert the strongest effects within the model.

4.4.4 Predictive Relevance (Q^2)

Using the blindfolding procedure, all endogenous constructs had positive Q^2 values ranging between 0.27 and 0.45, confirming adequate predictive relevance of the model. (Hair, Hult, Ringle, & Sarstedt, 2021)

4.4.5 Hypothesis Testing

Bootstrapping (5,000 subsamples) was conducted to test the significance of path coefficients.

Path	β	t-value	p-value	Decision
H1a: DC → PEOU	0.42	8.17	<0.001	Supported
H1b: DC → PU	0.31	5.24	<0.001	Supported
H2a: PR → PU	-0.18	3.71	0.002	Supported
H2b: PR → BI	-0.07	1.45	0.147	Not supported
H3a: PEOU → PU	0.36	6.22	<0.001	Supported
H3b: PEOU → ATU	0.28	4.85	<0.001	Supported

H4a: PU → ATU	0.47	9.12	<0.001	Supported
H4b: PU → BI	0.39	7.86	<0.001	Supported
H5: ATU → BI	0.24	4.13	<0.001	Supported
H6: BI → AU	0.52	10.02	<0.001	Supported

Nine out of ten hypotheses were supported, confirming the robustness of the TAM3 framework in explaining e-shopping adoption among faculty members.

4.4.6 Mediation Analysis

Mediation effects were examined using bootstrapping to estimate indirect effects.

Indirect Path	Mediator(s)	β	t-value	p-value	Type
DC → BI	PEOU → PU	0.152	5.27	<0.001	Partial
DC → AU	PU → BI	0.141	4.92	<0.001	Partial
PR → BI	PU	-0.069	2.44	0.015	Partial
PEOU → BI	ATU	0.112	3.86	<0.001	Partial

The results confirm that perceived ease of use and perceived usefulness play crucial mediating roles between digital competence, perceived risk, and behavioral outcomes.

4.5 Summary of Main Findings

- Digital competence significantly enhances both ease of use and usefulness perceptions.
- Perceived risk reduces perceived usefulness but does not directly affect behavioral intention.
- Ease of use improves both usefulness and attitude, reinforcing the core TAM3 relationships.
- Usefulness and attitude are strong predictors of behavioral intention, which in turn drives actual use.
- Mediation analysis confirms that cognitive beliefs (PEOU, PU) transmit the effects of competence and risk toward behavioral outcomes.

Overall, the model shows high explanatory and predictive power, confirming the validity of TAM3 for analyzing e-shopping adoption among university faculty.

5. Discussion

The aim of this study was to explore the determinants of e-shopping adoption among university faculty using the Technology Acceptance Model 3 (TAM3).

By analyzing survey data from the University of Medea with PLS-SEM, the study tested relationships among digital competence, perceived risk, perceived ease of use, perceived usefulness, attitude, behavioral intention, and actual use.

The findings support most of the proposed hypotheses and confirm the applicability of TAM3 in the academic context.

5.1 The Role of Digital Competence

The results show that digital competence has a strong positive influence on both perceived ease of use and perceived usefulness of e-shopping platforms.

This means that faculty members who feel confident in their digital skills are more likely to view online shopping as simple, useful, and efficient.

This finding aligns with Compeau and Higgins (1995) and Venkatesh and Bala (2008), who argued that computer self-efficacy enhances user perceptions and promotes technology adoption.

In the university setting, faculty members with high digital literacy can manage online systems more efficiently, quickly adapt to new digital tools, and experience fewer difficulties during online transactions.

Therefore, improving digital competence among faculty can directly strengthen their willingness to use e-shopping systems.

Interpretation: Digital competence functions as a key enabling factor, allowing faculty to convert technological familiarity into positive beliefs and actual behavioral intention.

5.2 The Impact of Perceived Risk

The analysis revealed that perceived risk negatively affects perceived usefulness but not behavioral intention directly.

This implies that although faculty members recognize potential risks related to privacy, payment, or product reliability, these concerns mainly reduce the perceived benefit of e-shopping rather than their final decision to use it.

This pattern supports Featherman and Pavlou (2003) and Pavlou (2003), who emphasized that perceived risk operates indirectly through cognitive beliefs like usefulness or trust.

However, the lack of a direct significant path from perceived risk to behavioral intention suggests that academics may be more rational and less emotionally driven than average consumers.

They may evaluate risks based on information quality and institutional credibility rather than fear-based perceptions.

Interpretation: For educated users such as university faculty, risk does not stop adoption completely, but it reduces perceived value — an indirect but meaningful barrier.

5.3 Effects of Perceived Ease of Use and Perceived Usefulness

The findings confirm the core mechanisms of TAM3:

Perceived ease of use positively influences both perceived usefulness and attitude toward use, while perceived usefulness strongly affects attitude and behavioral intention.

These results echo the work of Davis (1989), Venkatesh & Davis (2000), and Venkatesh & Bala (2008), reaffirming that ease and utility remain the main drivers of technology acceptance.

For university faculty, the perceived usefulness of e-shopping is tied to practical advantages — saving time, accessing broader product ranges, and simplifying purchasing processes.

When platforms are easy to navigate and clearly designed, users find them not only functional but also personally rewarding.

Interpretation: Ease of use builds comfort and confidence; usefulness builds motivation — together they form the cognitive foundation of e-shopping adoption.

5.4 Attitude, Intention, and Actual Use

As predicted, attitude toward use significantly affects behavioral intention, and behavioral intention has a strong impact on actual use.

This chain validates the behavioral logic proposed by the Theory of Planned Behavior (Ajzen, 1991) and supported in TAM3.

Faculty members who hold favorable attitudes toward e-shopping — seeing it as convenient and efficient — are more likely to use it regularly.

This result is consistent with previous research (Venkatesh et al., 2003; Marangunić & Granić, 2015) and demonstrates that intention remains the most reliable predictor of real digital behavior.

It also suggests that creating positive emotional and cognitive experiences with e-shopping systems is key to promoting sustained use.

Interpretation: A positive attitude transforms cognitive evaluation into behavioral commitment — turning intention into consistent action.

5.5 Mediation Effects

The mediation analysis demonstrated that perceived ease of use and perceived usefulness serve as partial mediators between antecedents (digital competence, perceived risk) and behavioral outcomes. This means these beliefs act as psychological bridges that explain how skills and concerns translate into behavior.

This finding supports the mediating role proposed by Venkatesh & Bala (2008) and confirmed by Nitzl et al. (2016) in PLS-based mediation testing.

Interpretation: Faculty members' skills and risk perceptions shape their beliefs about usefulness and ease — these beliefs, in turn, determine attitude, intention, and actual behavior.

5.6 Theoretical Implications

- Validation of TAM3 in academia: The study confirms that TAM3 effectively explains technology adoption beyond traditional consumer contexts. It adapts well to the behavioral patterns of professionals in higher education.
- Integration of digital competence and perceived risk: Incorporating these two antecedents extends TAM3's explanatory power. It clarifies how both positive (skills) and negative (risk) perceptions influence adoption decisions.
- Cognitive mediation model: The results support a cognitive mediation process where beliefs about usefulness and ease serve as the main psychological mechanisms between external and behavioral factors.
- Evidence from a developing-country context: The study contributes to global TAM literature by providing empirical evidence from Algeria — a context underrepresented in technology adoption research.

5.7 Practical Implications

- Faculty development programs: Universities should invest in digital literacy workshops and targeted training that enhance faculty members' competence with online platforms.
- Reducing perceived risk: E-shopping platforms should emphasize data protection, transparent payment procedures, and customer support to build trust among academic users.
- Interface design and usability: Platform designers must focus on clear navigation, relevant product information, and user-friendly design to improve ease of use and perceived usefulness.
- Institutional support: Universities could establish partnerships or verified online marketplaces for staff purchases to ensure safe, convenient, and reliable online transactions.

5.8 Overall Interpretation

In summary, this study reinforces the predictive strength of TAM3 and provides evidence that university faculty's adoption of e-shopping depends primarily on their perceived usefulness and ease of use, shaped by their level of digital competence and moderated by perceived risk.

The model demonstrates strong explanatory power and offers both theoretical depth and practical direction for promoting digital adoption in higher education contexts.

6. Conclusion and Implications

6.1 Summary of Findings

This study examined the determinants of e-shopping adoption among university faculty members at the University of Medea using the Technology Acceptance Model 3 (TAM3) framework.

By applying Partial Least Squares Structural Equation Modeling (PLS-SEM), the study tested relationships among digital competence, perceived risk, perceived ease of use, perceived usefulness, attitude toward use, behavioral intention, and actual use.

The results confirm that digital competence significantly enhances both perceived ease of use and perceived usefulness, making it a crucial enabler of online shopping adoption.

Conversely, perceived risk negatively affects perceived usefulness but has no direct effect on behavioral intention, suggesting that risk shapes perceptions rather than immediate decisions.

The core TAM3 relationships were also supported: ease of use improves usefulness and attitude, and both usefulness and attitude drive behavioral intention, which in turn leads to actual use.

Mediation analysis further demonstrated that ease of use and usefulness act as psychological bridges between skills, concerns, and behavioral outcomes.

In summary, the study provides strong empirical evidence for TAM3's predictive validity in explaining e-shopping adoption among faculty members in a higher education setting.

6.2 Theoretical Implications

- Extending TAM3 to a new context: the study validates TAM3 in the underexplored context of faculty e-shopping adoption. While most prior studies applied the model to students or general consumers, this research confirms its relevance among academic professionals.
- Integration of external antecedents: Incorporating digital competence and perceived risk strengthens TAM3's explanatory power and highlights how both positive and negative antecedents influence perceived beliefs and behavioral outcomes.
- Support for mediation mechanisms: The results confirm the cognitive mediation process proposed by TAM3 — showing that the effects of competence and risk operate mainly through perceived ease of use and perceived usefulness.
- Contribution to cross-cultural evidence: This study adds empirical data from Algeria, enriching TAM research in non-Western and developing-country contexts where digital transformation in academia is still evolving.

6.3 Practical Implications

- Faculty digital training: Universities should implement continuous digital competence programs that strengthen faculty skills in using online systems, including e-shopping, digital tools, and payment security.
- Reducing perceived risk: E-shopping providers targeting academic users should improve data protection, ensure transaction transparency, and communicate return and refund policies clearly to build trust.
- Platform design and usability: Developers should focus on user-friendly interfaces, intuitive navigation, and accessible information to increase both perceived ease of use and perceived usefulness.
- Institutional partnerships: Universities could collaborate with verified e-shopping platforms to provide safe and discounted channels for faculty purchases, reinforcing trust and convenience.

Together, these measures can encourage wider and safer adoption of e-shopping among academic professionals.

6.4 Limitations and Future Research

Despite its contributions, this study has some limitations that offer opportunities for future research:

- Cross-sectional design: The study used a single time point, limiting the ability to infer causality. Future studies could use longitudinal designs to examine how faculty attitudes and behaviors evolve over time.
- Self-reported data: Since the study relied on self-administered questionnaires, responses may reflect subjective perceptions. Future research should include behavioral or transactional data to validate self-reports.
- Single institution: The sample came from one university, which may limit generalizability. Expanding to multiple universities or different regions would provide stronger external validity.
- Additional constructs: Future studies could integrate variables such as trust, perceived enjoyment, or subjective norms to capture the social and emotional dimensions of e-shopping adoption.

Comparative analysis: Cross-cultural or cross-profession studies (e.g., comparing faculty with students or administrative staff) could reveal how different occupational groups adopt e-shopping differently.

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