

E- LEARNING IN PALESTINIAN UNIVERSITIES: COMPETENCIES AND DIFFICULTIES

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Abstract:

Background: Palestinian universities operate within a complex context of political instability and infrastructural constraints, making e-learning implementation particularly challenging. While previous research has documented general barriers, few studies have examined how institutional and demographic factors influence faculty experiences with digital education. This study addresses this gap by investigating the interplay between organizational contexts and individual characteristics in shaping e-learning adoption.

Methods: A cross-sectional study was conducted during the 2023-2024 academic year with 64 faculty members from three Palestinian universities selected through stratified random sampling. The study utilized validated self-administered questionnaires measuring e-learning competencies (18 items) and difficulties (37 items) on 5-point Likert scales. Statistical analyses included descriptive statistics, independent samples t-tests, one-way ANOVA, and post-hoc LSD tests using SPSS.

Results: The analysis revealed no significant differences in e-learning competencies or difficulties based on gender, teaching experience, academic discipline, or teaching location. However, significant inter-institutional differences emerged in perceived competencies, with faculty at Hebron and Arab American universities reporting higher competency levels than those at Al-Istiqlal University. Counterintuitively, academics residing in refugee camps reported significantly fewer difficulties than their counterparts in cities and villages, suggesting unexpected adaptive resilience in more challenging environments.

Conclusion: This study demonstrates that institutional factors, rather than individual demographic characteristics, predominantly shape e-learning experiences in Palestine's resource-constrained environment. The adaptability observed in refugee camps reflects a resilience-based approach driven by strong community interaction and cohesion. The study recommends that Palestinian universities focus on strengthening institutional capacity rather than designing interventions based on individual traits. Future research should adopt longitudinal or qualitative designs to further investigate the mechanisms of adaptive resilience in conflict-affected educational environments.

Keywords: E-learning, Palestinian universities, competencies, E- Learning difficulties

INTRODUCTION:

The global higher education has undergone a profound transformation, accelerated by the COVID-19 pandemic which necessitated an abrupt shift from traditional pedagogy to emergency remote teaching (Iter et al., 2023). While this transition presented universal challenges, its impact was profoundly magnified in contexts of pre-existing adversity. Palestine represents a critical case study, where the universal pressures of digital transition intersect with a unique constellation of structural constraints, including political instability, military occupation, recurrent conflicts, and chronic infrastructural fragility (Bashitalshaaer et al., 2021). For Palestinian universities, e-learning evolved beyond a mere pedagogical alternative into a vital mechanism for academic survival and continuity (Al-Heeh et al., 2023).

This complex reality demands a nuanced investigation that moves beyond cataloging challenges to understanding the human and institutional capabilities that mediate them. The effectiveness of e-learning is fundamentally contingent upon two interdependent pillars: the digital competencies of academic staff and their capacity to navigate a landscape of multifaceted difficulties (Ahmad, 2023; Albrahim, 2020). While the international literature outlines a broad framework of required skills and common barriers, the specific manifestation and interaction of these factors within the pressurized, resource-constrained environment of Palestinian higher education remain inadequately explored. This study seeks to fill this gap by providing a rigorous empirical analysis of the competencies and difficulties faced by academics in Palestinian universities, offering insights that contribute to both local policy development and the broader theoretical understanding of e-learning in conflict-affected environments.

THEORETICAL FRAMEWORK

E-learning encompasses several distinct modalities, each with unique characteristics and applications. Synchronous online learning occurs in real-time through videoconferencing technology, facilitating immediate interaction (Van Wart, 2022). In contrast, asynchronous learning is self-paced, utilizing pre-recorded materials and discussion forums, which offers flexibility but requires high self-discipline (Ahmad, 2023). Blended learning hybridizes face-to-face instruction with online components, aiming to leverage the benefits of both environments (Farrah et al., 2025). A distinct form that emerged from crises is emergency remote teaching, a temporary shift to online delivery due to emergencies, which differs from carefully planned online education (Iter et al., 2023). The implementation and effectiveness of these modalities are profoundly influenced by contextual challenges, such as those documented in the Palestinian higher education sector, including infrastructure limitations and varying digital competencies among educators and students (Al-Heeh et al., 2023; Iter et al., 2023).

LITERATURE REVIEW:

The Palestinian Context:

Palestinian e-learning research reveals challenges and competencies intertwined with specific sociopolitical and infrastructural conditions. Digital competencies among faculty remain at medium levels, with particular needs in advanced skills like creating interactive digital content and managing virtual classrooms (Aqil, 2023). This competency gap predates recent crises, indicating systemic rather than emergent challenges (Shraim & Khlaif, 2010).

Research consistently identifies multifaceted obstacles including pedagogical, technical, and ethical challenges (Al-Heeh et al., 2023), with particular infrastructural difficulties in Gaza universities featuring frequent power outages and unreliable internet connectivity (Bashithalshaaer et al., 2021). These findings are corroborated from teacher perspectives, identifying poor technical infrastructure, lacking technical support, and limited digital competencies as primary obstacles (Subaih et al., 2021).

Student perspectives reveal preference for face-to-face instruction due to weak internet, poor interaction, and low motivation (Zboun & Farrah, 2021), while institutional research notes absent comprehensive e-learning policies hampering smooth transition during pandemic (Iter et al., 2023). The post-2023 context has intensified these challenges, with unprecedented crisis severely disrupting education through infrastructure damage, loss of life, and psychological trauma (*Annual Operational Report 2024 | UNRWA*, n.d.).

Specialized fields face particular challenges, with medical education documenting lack of practical clinical training and unreliable internet access (Ismail et al., 2023), while digital platforms raise ethical concerns regarding surveillance and privacy (Hamamra et al., 2022). Despite these challenges, resilient models emerge, such as proactive e-learning approaches at An-Najah National University (Affounh & Raba, 2017).

Global Context

Globally, e-learning acceptance challenges involve complex multifaceted barriers including lacking technical support, institutional unpreparedness, and insufficient faculty digital skills (Ahmad, 2023). Kenyan research echoes Palestinian experiences, identifying insufficient national policies, inadequate ICT infrastructure, and lacking pedagogical training as systemic obstacles (Kibuku et al., 2020).

International scholarship provides valuable frameworks for understanding required competencies, systematically categorizing essential skills into pedagogical, content, design, technological, management, and social-communication domains (Albrahim, 2020). Research on award-winning faculty practices distills effective approaches into key roles including facilitator, course designer, subject matter expert, and mentor (Martin et al., 2019), while crisis contexts highlight the importance of addressing displacement and psychological distress (Barham, 2023).

The Research Gap

While significant research has addressed Palestinian e-learning challenges, most studies remain descriptive. A clear research gap exists in understanding how demographic factors—including university affiliation, gender, years of

experience, and place of residence—affect academics' perceptions of challenges and competencies. This study bridges this gap through detailed analysis of perspective differences among academic groups, providing evidence-based foundation for context-responsive training programs and contributing to quality and equity improvement in digital higher education.

The study addresses the main research question: What challenges do academics in Palestinian universities face in their e-learning experience, and how do these challenges and their perceived competencies differ according to their demographic characteristics?

population, Sampling, and Data Collection Procedure

Data collection was conducted during the 2023-2024 academic year following ethical approval from the participating universities' institutional review boards. A multi-stage sampling strategy was employed to ensure representativeness and minimize selection bias. First, three universities (Al-Istiqlal University, Hebron University, and Arab American University) were purposively selected to represent diverse institutional contexts across different geographical regions and institutional types in Palestine.

The sampling frame was established through collaboration with human resources departments, which provided complete lists of all eligible faculty members holding Master's or PhD degrees (N=400). To ensure randomization and eliminate selection bias, a computer-generated random number sequence was applied to select a proportional random sample of exactly 20% (n=80) from each university's list independently, maintaining proportional representation across institutions.

Researchers implemented several measures to ensure data integrity and minimize bias during collection. All potential participants were approached using a standardized protocol based on their randomized selection order rather than availability. The study's purpose, voluntary nature, and confidentiality safeguards were explicitly explained using a prepared script to ensure consistent information delivery across all participants.

Written informed consent was obtained using university-approved forms before questionnaire distribution. To reduce social desirability bias, questionnaires were administered anonymously in controlled settings with guaranteed confidentiality. Participants completed self-administered

See table 1.

Table 1. *Sociodemographic and Professional Characteristics of the Study Participants (N = 64)*

Variable	n	%	Variable	n	%
Gender			Course Type Taught		
Male	39	60.9	Scientific	24	37.5
Female	25	39.1	Humanities/Literature	33	51.6
			Laboratory	7	10.9
University Affiliation			Place of Residence		
Al-Istiqlal University	27	42.2	City	36	56.3
Hebron University	25	39.1	Village	24	37.5
Arab American University	12	18.8	Refugee Camp	4	6.3
Teaching Experience (years)			Primary E-Teaching Location		
< 5	15	23.4	University Campus	13	20.3
5–10	21	32.8	Home	48	75.0
> 10	28	43.8	Anywhere	3	4.7

Note. The total sample size was N=64. Percentages are calculated based on the total number of respondents for each variable.

Instrument Development and Validation:

The data collection instrument was a structured questionnaire developed by the research team. The questionnaire comprised three main sections:

1. Sociodemographic Data: This section collected information on gender, university affiliation, years of teaching experience, type of courses taught (scientific, literary, labs), place of residence (city, village, refugee camp), and the primary location from which they conducted e-learning sessions (university, home, or both).

2. E-Learning Competency Scale: This scale consisted of 18 items measuring participants' self-perceived proficiency in various e-learning skills (e.g., "I am proficient in using the software specified by my university to deliver e-lectures," "I can convert course content into electronic material"). Responses were recorded on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree).

3. E-Learning Difficulties Scale: This scale contained 37 items assessing the challenges encountered by academics (e.g., "Unreliable internet connectivity hinders my teaching," "E-learning has fostered a culture of cheating among students in exams"). It utilized the same 5-point Likert scale.

To ensure validity, the initial draft of the questionnaire was reviewed by a panel of six experts in the fields of educational technology, curriculum design, and research methodology. They evaluated the instrument for clarity, relevance, comprehensiveness, and appropriateness for the Palestinian context. Their feedback was incorporated to refine the wording and structure of the items. Furthermore, the instrument was piloted with a small group of academics (n=10) not included in the main study to check for ambiguity and estimate the time required for completion.

To ensure reliability, the internal consistency of the scales was measured using Cronbach's alpha after data collection. The results indicated excellent reliability, with a coefficient of .922 for the Competency scale and .929 for the Difficulties scale.

Data Analysis:

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 21. Descriptive statistics (frequencies, percentages, means, and standard deviations) were computed to summarize the demographic characteristics of the sample and the responses to the scales. Inferential statistics, including independent samples t-tests and one-way Analysis of Variance (ANOVA), were employed to examine statistically significant differences in perceptions of competencies and difficulties based on demographic variables. A significance level of ($\alpha \leq 0.05$) was used for all tests. For ANOVA results that were significant, post-hoc comparisons were conducted using the Least Significant Difference (LSD) test to identify the specific groups between which the differences occurred.

Ethical approval for this study was granted by the Research Ethics Committee at Al-Istiqlal University. Participant consent was obtained implicitly via a detailed introductory statement in the questionnaire, ensuring voluntary participation and the right to withdraw. Data were collected and analyzed anonymously to guarantee confidentiality. Study findings will be shared with the relevant university units and disseminated to participants through appropriate academic and public channels.

RESULTS:

- The results of the "one-way Anova" analysis to examine the significance of the differences according to the university variable:

Table 2. One-way ANOVA Results for Competency and Difficulty Scales by Accommodation Type.

Domain	Source of Variation	Sum of Squares	df	Mean Square	F	p
Competency Scale	Between Groups	2.283	2	1.142	3.678	*0.031
	Within Groups	18.932	61	0.310		
	Total	21.215				
Difficulty Scale	Between Groups	0.418	2	0.209	0.538	0.586
	Within Groups	23.272	60	0.388		
	Total	23.689				

* $p < .05$ indicates statistically significant differences between groups.

The results of the one-way ANOVA, as presented in Table [2], indicate a mixed outcome regarding the effect of university. For the Difficulty scale, the analysis yielded a non-significant ($p = .586$). Therefore, we retain the null hypothesis, indicating no statistically significant differences in perceived difficulties based on university affiliation. Conversely, for the Competency scale, the analysis revealed a statistically significant difference ($p = .031$). Consequently, we reject the null hypothesis, suggesting that university affiliation is significantly associated with self-perceived e-learning competencies.

To identify the source of this significance, a post-hoc Least Significant Difference (LSD) test was conducted.

table 3

University	Mean	Comparison	F	p
Al-Istiqlal University	3.83	Hebron: *353, Arabic American: *431	4.891	0.012*
Hebron University	4.19	—		
Arabic American University	4.26	—		

*Values marked with * indicate statistically significant differences between universities at $p < .05$. Comparison column shows results of post hoc tests (mean differences).*

The analysis revealed that faculty members at Al-Istiqlal University ($M = 3.83$) reported significantly lower competency levels compared to their counterparts at both Hebron University ($M = 4.19$, $p = .015$) and Arab American University ($M = 4.26$, $p = .005$). However, no statistically significant difference was found between Hebron University and Arab American University ($p = .562$). These results indicate that the significant overall effect is driven by the lower perceived competencies among academics at Al-Istiqlal University."

- The results of the "one-way Anova" analysis, to examine the significance of the differences according to accommodation variable.

Insert table 4

Domain	Source of Variation	Sum of Squares	df	Mean Square	F	p
Competency Scale	Between Groups	0.054	2	0.027	0.077	0.926
	Within Groups	21.162	61	0.347		
	Total	21.215				
Difficulty Scale	Between Groups	2.446	2	1.223	3.454	*0.038
	Within Groups	21.243	60	0.354		
	Total	23.689				

** $p < .05$ indicates statistically significant differences between groups.*

The previous table indicates the acceptance of the hypothesis that says, "There are no statistically significant differences at the significance level ($\alpha \leq 0.05$) in the difficulties of applying e-learning in Palestinian universities from the academics' point of view themselves, due to the place of residence". In the scale of competencies and its rejection in the scale of difficulties, the level of significance was as follows:

1. Scale of competencies: the significance level reached (0.926), which is higher than ($\alpha \leq 0.05$), which means that the hypothesis is accepted.

2. Difficulty Scale: The significance level is (0.038), which is less than ($\alpha \leq 0.05$), which means that the hypothesis is rejected.

Post-hoc comparisons using the LSD test were conducted to elucidate the significant main effect of accommodation on perceived difficulties. The results of these comparisons are presented in Table 5

Accommodation	Mean	Comparison	F	p
City	3.37	—	3.454	0.038*
Village	3.49	—		
Refugee Camp	2.64	City: *845, Village: *728		

*Values marked with * indicate statistically significant differences between groups at $p < .05$. F and p values are from one-way ANOVA for Difficulty Scale by accommodation type.*

The analysis revealed a surprising pattern: academics residing in refugee camps reported encountering significantly fewer difficulties ($M = 2.64$) compared to those living in cities ($M = 3.37$, $p < .05$) and villages ($M = 3.49$, $p < .05$). No statistically significant difference was observed between the responses of participants living in cities and those in villages ($p > .05$). This indicates that the overall significant effect is attributable to the notably lower perceived difficulties among refugee camp residents

- The location from which academics conducted their e-learning sessions (university, home, or anywhere) was also examined as a potential factor. A one-way ANOVA confirmed that the teaching location had no statistically significant impact on the participants' self-reported competencies ($F = 0.240$, $p = .788$) or their perceived difficulties ($F = 0.558$, $p = .576$).
- 2. Difficulty Scale: The significance level reached (0.576), which is higher than ($\alpha \leq 0.05$), which means that the hypothesis is accepted.
- A one-way analysis of variance (ANOVA) was performed to assess the impact of teaching experience (categorized into three groups: less than 5 years, 5-10 years, and more than 10 years) on the study's main variables. The analysis indicated no statistically significant effect of teaching experience on either perceived e-learning competency ($F = 0.124$, $p = .884$) or perceived difficulties ($F = 1.062$, $p = .352$).
- To determine if the type of course taught (scientific, literary, or lab-based) influenced the outcomes, a one-way ANOVA was conducted. The results showed no statistically significant differences in perceived competencies ($F = 0.805$, $p = .452$) or difficulties ($F = 0.494$, $p = .613$) across the different course types.
- Independent samples t-tests were conducted to examine differences in perceived competencies and difficulties based on gender. The results revealed no statistically significant differences between male and female academics in their self-reported e-learning competencies ($t = 1.042$, $p = .302$) or in the difficulties they encountered ($t = -0.908$, $p = .296$).

Discussion:

The findings of this study reveal a complex interplay between structural, social, and Palestinian contextual factors shaping e-learning experiences in higher education. While systemic challenges uniformly affect academics across demographic and professional categories, significant variations emerge across institutional and residential contexts. The significant disparity in self-perceived competencies between faculty at Al-Istiqlal University and those at Hebron and Arab American universities underscores the critical role of institutional ecosystems. This variation likely reflects differential investment in technological infrastructure, quality of professional development programs, and the implementation of coherent institutional policies—factors consistently identified as pivotal for successful e-learning integration. This finding aligns with Iter et al. (Iter et al., 2023), whose research concluded that the absence of comprehensive institutional e-learning policies was a primary barrier to digital transition in Palestinian universities. Furthermore, it supports (S. J. Affounh & Raba, 2017) emphasis on proactive institutional readiness and strategic leadership for mitigating national-level challenges in resource-constrained environments.

The counterintuitive finding that academics residing in refugee camps reported significantly fewer difficulties than those in cities and villages offers profound insight into social dynamics of technology adoption in adversity. While objective infrastructure deficits in camps are well-documented (Bashitalshaaer et al., 2021), this result suggests that

subjective experiences of difficulty are mediated by socio-adaptive mechanisms. This phenomenon of resilience in extreme adversity finds parallels in the work of (Barham, 2023), which highlighted the importance of addressing context-specific psychological distress to facilitate learning in crisis settings. Residents of camps, shaped by prolonged exposure to hardship, may develop enhanced adaptive capacities, reframing technological challenges as manageable hurdles (S. J. Affouneh & Raba, 2017; Bashitialshaaer et al., 2021). Furthermore, strong community cohesion and informal support networks likely facilitate knowledge-sharing and collective problem-solving, consistent with the community-oriented, resilient e-learning model documented by (S. J. Affouneh & Raba, 2017).

A pivotal finding is the consistent absence of significant differences in e-learning competencies and difficulties across gender, experience, discipline, or teaching location. The lack of gender-based differences aligns with global literature indicating that insufficient digital skills are a universal barrier affecting faculty regardless of gender (Ahmad, 2023). The absence of experience-based differences might reflect a balancing of competencies: younger academics' digital nativity versus older faculty's pedagogical experience (Albrahim, 2020; Shraim & Khlaif, 2010). This finding challenges a simple deficit model and is supported by (Albrahim, 2020) framework, which categorizes digital competencies as complex skills not automatically gained through traditional teaching experience. The uniformity across teaching locations can be attributed to the widespread, yet uniformly precarious, nature of internet access across all regions (Bashitialshaaer et al., 2021; Subaih et al., 2021), which minimizes location-based disparities. This reinforces existing literature identifying poor technical infrastructure as a macro-level impediment affecting all academics in Palestine (Hamamra et al., 2022; Subaih et al., 2021).

The fact that neither seniority nor discipline conferred an advantage underscores that core issues extend beyond personal upskilling. The deficit lies in the foundational ecosystem, not individual competence. Thus, interventions must be structural and institutional, targeting universal barriers rather than specific subgroups. This conclusion strongly supports recommendations for robust national and institutional policies to build a sustainable digital education ecosystem in Palestine (Al-Heeh et al., 2023; Iter et al., 2023).

Recommendations:

Based on the study findings, the following recommendations are proposed to enhance e-learning in Palestinian universities and inform research in crisis-affected contexts:

1. **Institutional Investment in Infrastructure and Policy:** Universities and national policymakers must prioritize investments in reliable internet and digital infrastructure, identified as a universal barrier. Concurrently, clear, sustainable national and institutional e-learning policies should be developed to ensure effective governance and resource allocation.
2. **Targeted and Continuous Faculty Development:** Institutions should implement specialized, ongoing digital training programs tailored to address the specific competency gaps identified within their academic staff, moving beyond one-size-fits-all approaches.
3. **Strategic and Proactive Institutional Leadership:** University leadership should adopt a strategic, proactive role in bolstering institutional readiness for national challenges, drawing on models of effective leadership in resource-constrained environments.
4. **Harnessing Community Resilience and Fostering Collaboration:** The high adaptability demonstrated by academics in refugee camps presents a valuable model. We recommend establishing collaborative learning initiatives and knowledge-exchange platforms to leverage this community resilience and social cohesion as a resource for all academics.
5. **Shift from Individual to Systemic Reforms:** The finding that competency was unaffected by gender, experience, or discipline underscores that challenges are systemic, not individual. Reform efforts must, therefore, focus on structural and policy-level interventions rather than solely on individual skill development. Future research should analyze how institutional leadership and policy mitigate technical and social barriers to build a more resilient e-learning ecosystem.

Limitations of the Study:

despite employing a stratified random sampling strategy, the study's relatively small sample size (N=64), drawn from only three Palestinian universities, may constrain the statistical power and limit the generalizability of the results to the broader academic community in Palestine. However, it should be noted that this sample provided proportional representation from distinct institutional contexts, offering valuable preliminary insights into the phenomenon under investigation.

the analyses revealed several non-significant findings, particularly concerning differences based on gender, teaching experience, academic discipline, and teaching location. While these results were presented concisely in the Results section, the Discussion intentionally focused on the statistically significant outcomes-the inter-institutional differences and the patterns of resilience by accommodation type-as they provide the most novel and actionable insights. The

consistency of these non-significant demographic differences is itself an important finding, as it suggests that e-learning challenges in Palestine are systemic and pervasive rather than individual-specific.

The reliance on self-reported measures for assessing both competencies and difficulties introduces the potential for social desirability bias and subjective perceptions, as the study did not incorporate objective measures of e-learning proficiency. Future research would benefit from combining self-report data with objective metrics of e-learning performance and behavioral observations.

Finally, while the distinctive socio-political and infrastructural context of Palestine enhances the study's contextual relevance, it may simultaneously restrict the direct transferability of findings to other settings. These limitations collectively underscore the value of future research employing larger and more diverse samples, longitudinal designs, and mixed-methods approaches to advance a more comprehensive understanding of e-learning experiences in conflict-affected regions.

CONCLUSION

This study provides a nuanced understanding of the factors influencing e-learning implementation within the unique and constrained context of Palestinian higher education. The key finding that institutional factors, rather than individual demographics, are the primary determinants of e-learning competency underscores a critical area for intervention. The significant disparity in self-perceived competencies between faculty at different universities highlights the profound impact of institutional support, infrastructure, and policy coherence.

The counterintuitive result regarding adaptive resilience among academics in refugee camps, who reported significantly fewer difficulties, stands as a pivotal contribution of this research. It challenges deficit-based narratives and suggests that socio-adaptive mechanisms and community cohesion can effectively mitigate objective infrastructural challenges. This finding shifts the focus from merely addressing limitations to understanding and harnessing existing strengths within vulnerable communities.

Ultimately, the consistent lack of significant differences across gender, experience, discipline, and teaching location confirms that the challenges of e-learning in Palestine are not individual but pervasive and systemic. Therefore, solutions must be structural. The recommendations proposed—prioritizing institutional investment, developing context-specific training, and fostering strategic leadership—aim to build a more resilient and equitable digital education ecosystem. Future research should employ longitudinal and mixed-methods designs to further unravel the mechanisms of adaptive resilience and to evaluate the effectiveness of systemic interventions aimed at strengthening institutional capacity in conflict-affected environments.

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Ethical Approval

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Consent to participate

Informed consent was obtained from all individual participants included in the study.

Consent for publication

Consent for publication was obtained from all participants for any identifying images or data).

Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

Authors' contributions

All authors contributed to the study's conception and design and they are equally distributed.