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The Mediating Role of Digital Literacy in the link between English Language Proficiency and Digital Leadership Competencies

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ABSTRACT

This study aims to examine the mediating role of Digital Literacy in the relationship between English Language Proficiency and Digital Leadership Competencies in higher education sector. The study adopted a quantitative approach, and used a self-administered cross-sectional survey to collect the data from 254 faculty members in higher educational institutions in Palestine. Employing the Structural Equation Model Partial Least Square (SEM-PLS) technique, using SMART PLS 4 software, validity, reliability, and hypothesis testing were done. The results showed significant positive associations between ELP and DL, and DL and DLC. The analysis indicates a significant positive indirect effect of ELP on DLC through DL, supporting the mediation hypothesis. This suggests that while ELP has no direct value, the impact of ELP on DLC is channeled through the development of DL. Implications, limitations, future research were discussed.

INTRODUCTION

In the last decades the world have witnessed a shift in globalization and digitalization which has raised the level of competition among higher education institutions (Sart *et al.*, 2022). During Covid-19 pandemic, most of the universities around the world have shifted to distance learning or blended learning (Aristovnik *et al.*, 2020; Gillis & Krull, 2020). In recent years, the artificial intelligence tools have rapidly increased their presence worldwide, and have affected the education, assessment, and university administration (Trevisan *et al.*, 2023). Given this context, the nature of work, the demands, and the required resources to meet the job were potentially reshaped and altered through digitalization (Larjovuori *et al.*, 2018).

Current technological advancement has played a vital role in the perception of digital transformation as a trending theme (Matzler *et al.*, 2018). (Vial, 2019) asserts that digital transformation is achieved through processes that improve an organization by encouraging vital changes and ensuring the integration of communication, information, computing, and connectivity technologies. While the availability of such technologies has an essential role in facilitating digital transformation, it is not the only factor influencing such transformations. According to Zhong *et al.* (2017), the fourth industrial revolution has reshaped global perceptions of organizations and changed how they operate, as the standards, process, and professional relations have become more reliant on advanced and novel technology. Traditional jobs have become more exposed to computerization, which sheds light on the importance of continuous learning and the ability to adapt; therefore, Kohnová *et al.* (2019) recommend that the contemporary workforce demands serious changes in learning, training, and skills development.

Many studies published during and after the pandemic have highlighted the impact of COVID-19 on the higher education industry, focusing on the dramatic shifts in educational practices caused by the digital transformation (Scholkmann, 2023; Scholkmann *et al.*, 2024). This technological disruption has impacted both how work is performed and how leadership is practiced across organizations (Schwarz Müller *et al.*, 2018). The dramatic change in technology has emphasized the need for understanding the phenomena of leadership, making it necessary to include technology into leadership studies, (Inel, 2019). With the growing rate of implementation of technology transformation in every aspect of life, most of the organizations have strived to adapt to these changes. This transformation in technology highlights the importance of digital leadership and its effect on the way contemporary organizations operate. Thus, investing in the development of leadership competences is regarded as an essential condition for driving and enhancing this transition (Horlacher & Hess, 2016).

The tendency for many organizations to adopt modern leadership approaches, such as digital leadership, remains unclear in leadership literature (Eberl & Drews, 2021). More thorough research in digital leadership is still in need (Dinh *et al.*, 2014), including how they differ from and are similar to other leadership styles, such as transactional, transformational, and servant leadership styles (Eryeşil, 2021). Even with the significant effects of digital leadership on organizational outcomes, such as performance, innovation and agility (Valentine & Stewart, 2015; Weill, 2017), much remains to be understood about the particular factors that lead to these results.

In regions with limited access to authentic materials and resources, increasing adoption of digital technology has

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made it necessary to support foreign language instruction and learning (Choi, 2021). Technological advancements, such as software applications, blockchain, the Internet of Things, virtual reality, augmented reality and artificial intelligence have enhanced the educational outcomes through offering innovative means for refining teaching and learning methods and integrating modern solutions into the educational process (Gaol & Prasolova-Førland, 2021).

In the fields of business, commerce, science, and academia, English is currently the most widely used language for communication among people with different first languages (Choi, 2021; Tomec & Gričar, 2024). Consequently, the employment and education sectors are increasingly recognizing the importance of English, especially in the context of English as a Foreign Language (EFL) (Motamedi *et al.*, 2024). Research indicates that digital technologies can positively influence English language learning by reducing learning time, supporting personalized instruction, and enhancing learner motivation (Al-khresheh, 2024). Accordingly, Desta *et al.* (argue that integrating digital technologies into the educational process can significantly improve learners' English language proficiency. This is further supported by a systematic review by (Asare *et al.*, 2023), which highlights that the integration of information technology into English language instruction significantly enhances student engagement and language acquisition outcomes. Their findings emphasize that while digital tools provide immersive and personalized learning experiences, successful implementation requires addressing technical barriers and providing continuous professional development for educators.

In the Palestinian educational sector, challenges related to its special political circumstances have continued to dictate the need for digital transformation, much like during the COVID-19 pandemic. These challenges include the frequent closure of university campuses in the West Bank due to Israeli raids and the widespread checkpoints that severely limit the movement of students and faculty to and from their schools and universities (Scott *et al.*, 2025)). This necessity has prompted educators to develop digital competence, engage in continuous professional learning, and strengthen their problem-solving capacities in order to adapt to disruptions and sustain academic activities despite ongoing instability (Scott *et al.*, 2024).

Few studies have examined e-readiness and digital leadership skills in the context of Palestinian higher education institutions, despite their increasing significance in higher education, especially in light of the digital transformation. Studies on e-readiness and digital leadership have been conducted worldwide, but they often overlook the specific challenges faced by organisations in developing nations such as Palestine, where sociopolitical and economic factors can significantly affect digital adoption and leadership practices. Furthermore, despite the fact that learning English as a second language is acknowledged as a crucial ability for global leadership

and academia, little is known about how it influences the development of digital leadership competences and preparedness. The gap is especially noticeable in Palestine, where leaders must negotiate English-dominated academic and digital contexts while working in multilingual settings.

LITERATURE REVIEW

Digital Leadership competencies

Literature on leadership has clarified the differences between e-leadership and digital leadership. (Eberl & Drews, 2021) argued against using these terms as synonyms. While e-leadership uses technology to support current operations, digital leadership is a broader concept aimed at achieving digitally enabled business models (Oberer & Alptekin, 2018; Petry, 2018), including aspects such as employee management (Eggers & Hollmann, 2018) and digital organization (Collin, 2015). (Larjovuori, 2016) defined digital leadership as “the leaders’ ability to create a clear and meaningful vision for the digitalization process and the capability to execute strategies to actualize it” (Larjovuori *et al.*, 2018). Digital leadership in organizations aims to achieve a customer-centered, digitally enabled, and innovative business model through adjusting various determinants (Eberl & Drews, 2021). Within this context, there is an emphasis on the need for the digital leader’s role, skills, and leadership style, as well as adjustments to organizational structures and people management.

As with, the dramatic advancement in technology, digital leadership has become key element for organizational success and ability to adapt to the digitalization (Paulienu, 2017). : This transformation necessitates the development of leadership competence for all the organizational levels to ensure organizational resilience and readiness to cope with the complexities. This is supported by the concept of complex leadership role which involves enhancing creativity, learning, and adaptability to create dynamic environment that fosters innovation, creativity and the ability to response to change (Uhl-Bien *et al.*, 2007).

According to (Kreutzer *et al.*, 2017), digitalization needs effective leadership at all organizational level. Additionally, Bennis (2007) highlighted that this can be reached through leaders who build strong and cooperative relations with their employees rather than hierarchical relationships. (Berghaus, 2018) and (Savić, 2019) also noted that digitalization needs flexible organizational culture that allows for learning lessons from failed stores, while (Mikulić & Stefanic, 2018) noted that change resistance occurs when people feel afraid of dealing with new technologies . Thus (Hill *et al.*, 2012) recommend that communication should be enhanced between all managerial levels to ensure collective commitment to the change vision.

In their study (Lau & Subedi, 2019) focus on the importance of diversity and integration in digital work to enhance innovation and productivity. (Kazim, 2019) noted that building a culture of continuous learning is essential

for an organization to be acquainted with digitalization. With regards to digital skills, (Zirpoli & Cabigiosu, 2018) explains that the success of an organization depends on leaders and employees with high digital skills and who are capable of using it effectively. (April, 2019) confirm that emotional intelligence is a key element for empowering leaders to manage change and cope effectively with unstable environments. (Reis *et al.*, 2018) concluded that the success of digitalization is associated with the ability of leaders to integrate technology with organizational culture, encourage innovation, and create environment

of continuous learning that support cooperation and resilience.

Recently, (Munsamy, 2022) has proposed a comprehensive framework for digital leadership implementing six key competencies which includes: embracing digital, facilitating digital drive, digital adaptiveness and resilience, cultivating digital culture, digital skills, and digital competitive intelligence. Each of these competences addresses essential element of digital management and organizational adaptability. Table 1 shows six competences of this style.

Table 1: Core Competencies of Digital Leadership

	Competencies	Explanation
I.	embracing digital transformation	Focusing on the importance of skills development and continuous learning among individuals and teams to enhance the readiness to switch to digital environment.
II.	facilitating digital drive	Improving organizational readiness through assessing the organizational processes and operations and then creating dynamic digital culture that fosters digital initiatives.
III.	digital adaptiveness and resilience	Focusing on the importance of the organizational adaptability and ability to build resilience in complex environments to be able to effectively and rapidly response to changes in technologies.
IV.	cultivating digital culture	Focusing on digital leaders who can encourage collaboration among team members to ensure unity, enhance innovation, and value diversity and teamwork.
V.	digital skills	Maintaining and enhancing the organization's competitive and to stay aware of the trends and risks within the digital setting.
VI.	digital competitive intelligence	Focusing on using effective digital tools, enhancing the technical skills, considering the significance of big data, improving listening abilities and encouraging curiosity for digital know-how.

English as a foreign Language (EFL)

Various factors play a significant role in the leadership environment in Palestinian higher education institutions, particularly English as a foreign language (Bakar *et al.*, 2025). English, as the international language of academia and global communication, enables leaders to access worldwide networks, participate in international research, and implement cutting-edge practices that are essential for institutional growth (Song & Sahid, 2025). Nonetheless, varying levels of English proficiency among leaders may influence their ability to effectively apply digital leadership competencies and e-readiness initiatives (Elmatsani *et al.*, 2024). Strong English skills enhance a leader's capacity to collaborate with global stakeholders, navigate complex digital platforms, and interpret emerging global trends. Conversely, limited proficiency may hinder access to vital resources, training opportunities, and international collaboration. English, as the lingua franca of research and education in the Palestinian HEIs, plays a critical role in positioning Palestinian HEIs within the global academic discourse (Qaddumi *et al.*, 2021). This correlation intensifies the need for targeted language development initiatives to ensure that leaders in Palestinian HEIs can

fully realize the transformative potential of digital and global integration (Rafiquddin *et al.*, 2024).

The Higher Education context in Palestine

Palestine's higher education sector plays a vital role in shaping the nation's social and economic development amidst a complex political ground Isaac *et al.* (2019). Palestinian higher education institutions (HEIs, including public, private, and community colleges and universities, strive to provide quality education despite ongoing challenges such as political instability, limited mobility, and scarce resources (Jebril, 2025). Also, administrators and faculty members often face additional barriers related to language, culture, and technology. Despite these challenges, Palestinian HEIs are exerting their leadership abilities to bridge gaps in e-readiness and global competitiveness by increasingly adopting digital transformation initiatives to enhance their leadership, research, and teaching capabilities (Bakar *et al.*, 2025).

The relationship between ELP and DLC through Digital Literacy

The transformation to digital leadership, such as internet,

emails and virtual meetings which required effective digital communication, has started with the spread of information technology in the late 1990s. This has led to the development of e-leadership concept (Avolio *et al.*, 2000). Several studies have asserted that technology did not only change the tools used by leadership, but also leadership competence concept in which leaders must have clear digital vision to effectively lead capable teams and rapidly adapt to innovations. (Cortellazzo *et al.*, 2019) assert that digitalization has changed the nature of leaders from being reliant on hierarchal authority model to a new model that relies on digital communication and digital organizational culture. In the era of digitalization and rapid change, digital leadership has become an essential factor for organizational sustainability and ability to compete.

Initially, in terms of the link between ELP and DL, recent studies have found that ELP contributes to the development of digital skills through facilitating accessibility to technical and educational resources available in the English language. (Bui, 2022; Şentürk & Mirici, 2019) declared that ELP can boost academic performance; improve the ability of faculty members to use educational technology; and enhance their skills in research and digital data analysis. (Hauge *et al.*, 2024) added that, those who are with high levels of ELP would be more successful in developing digital skills due to their ability to interact with different digital learning environments. In a similar vein, (Burgos & Anthony, 2024) explored the intersection of digital literacy and English proficiency, finding that high levels of digital competence enable students to effectively utilize multimedia platforms and language learning applications to improve their fluency. The study underscores how digital literacy fosters learner autonomy and provides access to diverse resources, suggesting that educational institutions should prioritize training programs that enhance students' digital capabilities to support academic achievement.

Building on the social learning theory of (Bandura, 1986), this relation can be explained since language is considered as a knowledge tool that facilitates self-learning and social interaction in digital environment. Accordingly, this suggests that faculty members with functional proficiency in English language are more likely to access available digital learning sources. This linguistic competence may also increase their trust in using technology, which in turn enhances digital self-efficacy which is a key element of digital literacy. In their studies (Feng & Sumettikoon, 2024; Zhang, 2023) have asserted that positive perception towards technology may enhance digital skills among English teachers, enabling them to effectively use educational technology tools to build stronger and clearer collaboration in the social contexts of education. Thus we propose the following hypothesis:

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leaders from being reliant on hierarchal authority model to a new model that relies on digital communication and digital organizational culture. The transformation to digital leadership has started with the spread of information technology in the latest ninetens, such as internet, emails and virtual meetings which required effective digital communication, lead to the development of e-leadership concept (Avolio *et al.*, 2000). Later, several studies have described that technology did not only change the tools used by leadership but also the leadership competences, and leaders should have clear digital vision and lead capable teams can effectively and rapidly adapt to the innovation.

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Building on the social learning theory of (Bandura, 1986), this relation can be explained since language is considered as knowledge tool that facilitate self-learning and social interaction in digital environment, accordingly, This suggests that faculty members with functional proficiency in English language are more likely to access the available digital learning sources. This linguistic competence may also increase their trust in using technology, which in turn enhance the digital self-efficacy which is a key element of digital literacy. In their studies (Feng & Sumettikoon, 2024; Zhang, 2023) have asserted that positive perception towards technology may enhance the digital skills among English teachers, enabling them to effectively use the educational technology tools to build stronger collaboration, and clearer interaction in the social contexts of education. Thus we propose the following hypothesis: Ha1: ELP significantly affects DLC.

Ha2: ELP significantly affects DL.

The literature highlights DL as an essential component that gives leaders strong competencies to deal with digitalization. (Munsamy *et al.*, 2023) propose that leaders with high level of digital skills are more likely to adopt digitalization and lead their teams through virtual platforms. (Hamzah *et al.*, 2025) suggested that basic digital skills include strategic thinking, digital tools usage for cooperation, and decisions making based on data analysis. Theoretically, this relation can be explained by employing human capital theory, as capital theory since digital skills can be considered as a form of knowledge capital that may enable leaders to use technology to attain the organizational goals (Nadezhina & Avduevskaia, 2021; Zervas & Stiakakis, 2024). Additionally, transformational leadership support this link. (Bass & Riggio, 2006)

suggested that leaders in the era of digitalization need to effectively communicate with and motivate their followers in order to enhance their ability to use and deal with different digital tool.

Ha3: DL significantly affects DLC.

It is clear from the discussion above that high ELP alone may not guarantee effective digital leadership without a corresponding level of Digital Literacy (DL). Hence, the relationship between ELP and DLC is not entirely direct, but it might pass through DL as a mediator. Individuals with a high level of ELP can access international digital learning resources and participate in digital leadership communities, and employ data analysis tools in English language (Bickel *et al.*, 2013; Kim *et al.*, 2025). These abilities evolve later into vital and tangible DLC, such as encouraging innovation, sitting digital strategies and managing virtual teams. This argument is supported by (Shin *et al.*, 2023) who stated that digital leadership positively affect the organizational performance through building strong digital culture and high level of

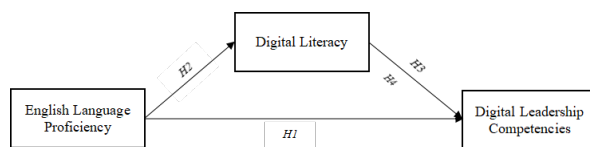


Figure 1: Conceptual Framework

organizational commitment. (Rüth & Netzer, 2020) also asserted that digital leaders who have deep understanding of technology will show higher level in organizational resilience and innovation. Therefore, it can be concluded that digital literacy acts as a developmental mechanism that translates ELP into DLC. Thus, examining this model is important to understand how to shape digital leadership competences in the context of accelerated digitalization.

Ha4: ELP significantly affects DLC through DL.

Conceptual Framework

The research framework suggests that while ELP may directly contribute to developing or enhancing certain aspects of DLC, it can also be seen as a developmental process that explains the causal relationship. DL, in turn, serves as a mediator which effective the link between ELP and DLC.

Fig. 1 shows the study conceptual framework, which is derived from the aforementioned theoretical foundation.

MATERIALS AND METHODS:

Research Design

This study employed a cross-sectional survey design to enable the researchers to collect quantitative data to describe existing relationships without manipulation (Creswell, 2009). This design was adopted to examine the direct and indirect links between ELP, DL and DLC.

Population and Sampling

The population for this study was full-time faculty members working in 11 higher education institutions in Palestine. The survey for this study was designed to study their perspectives on their participation in decision-making processes, and strategies to cope with the challenges facing their universities. A purposive sample from the participants was formed to include faculty members who previously held or currently hold mid-to-senior administrative positions within Palestinian universities. These participants were selected in order to obtain in-depth insights from those who have detailed information about the structure, challenges, and practices of academic administration, which might help in understanding the dynamics of leadership at different levels within the higher education sector.

A total of 254 responses were obtained. This number was considered sufficient based on established statistical guidelines. According to the “10-times rule” in Partial Least Squares Structural Equation Modeling (PLS-SEM), the minimum sample size should be at least ten times the maximum number of structural paths directed at any construct (Hair Jr *et al.*, 2021). Utilizing the PLS-SEM for mediated model is sufficient to produce reliable and valid results with medium sample sizes between 150 and 300 (Kock & Hadaya, 2016).

Instruments

The study used a structured questionnaire consisting of four sections. The first section consisted of questions on participants’ demographic information. The second section included questions on the participants’ ELP in the areas of reading, writing, speaking and listening language skills. Third section was related to DL and last section was for DLC.

Data Collection Procedure

The distribution of the survey was carried out among faculty members working in the higher education institutions in Palestine using Google Form. A total of 400 questionnaires were electronically disseminated to a list of faculty members who met the predefined criteria for supervisory or managerial roles in the academia field. Participants were asked to voluntarily engage in the survey, after providing their informed consent to ensure the participant autonomy while maintaining ethical standards of voluntary participation. Data was collected between March and April of 2025. Out of the 400 distributed questionnaires, 254 were returned, representing a 75% response rate.

Data analysis and results

The data analysis procedure was implemented in two structured stages. In the first stage, after ensuring that the minimum sample size required for statistical analysis had been collected, the authors employed SPSS (version 28) for data cleaning and preparation. Then

they performed descriptive statistics to outline the demographic characteristics of the respondents. In the second stage, they focused on evaluating the structural model and hypotheses employing the partial least squares structural equation modeling (PLS-SEM) through Smart PLS 4. This analytical approach was selected for its strength in understanding the causal relationship among latent variables and for providing a better assessment of the structural model and verify the hypotheses.

Preliminary Data Analysis

After entering all the responses into SPSS, data screening for outliers has been carried out to ensure the data accuracy. The normality of the distribution was conformed without the need for any data transformation. Likewise, with regards to linearity, the examination of the dataset and the scatterplots confirmed the absence of nonlinearity issues. The data preparation and screening ensured the reliability of subsequent statistical analyses in the second stage.

Demographic Information

Table 2 presents the respondents’ demographic profile of 254 faculty members demonstrates the diversity, experience, and representativeness of the participants across supervisory and managerial positions. Among the respondents, 81.5% were male, reflecting the gender composition of higher-level positions in the higher education sector. Age distribution shows a mature workforce, with 42.5% aged above 50, 37.0% aged 40 to 50, 15.4% aged 30 to 40 and only 5.1% less than 30, indicating that younger faculty members constitute a smaller proportion of supervisory and managerial roles. Notably, 45.3% of the faculty members were assistant professor, 30.7% were associate and full professors,

Table 2: Demographic information

		Frequency	Percent
Gender	Female	47	18.5
	Male	207	81.5
Age	<30	13	5.1
	>30-40	39	15.4
	>40-50	94	37.0
	>50	108	42.5
University affiliations	A l - A q s a University	11	4.3
	A L - A z h a r University - Gaza	6	2.4
	A l - I s t i q l a l University	55	21.7
	A l - Q u d s O p e n University	54	21.3
	A l - Q u d s University	22	8.7

	A l n a j a h University	30	11.8
	A r a b American University	12	4.7
	B e r z i t University	13	5.1
	H e b r o n University	25	9.8
	I s l a m i c University of Gaza	5	2.0
	P a l e s t i n e Technical University	21	8.3
Academic Rank	Professor	25	9.8
	A s s o c i a t e Professor	53	20.9
	A s s i s t a n t Professor	115	45.3
	Lecturer	45	17.7
Years of Experience	Teacher	16	6.3
	<5 years	7	2.8
	5 <10 years	38	15.0
	10- <15	58	22.8
	>15 years	151	59.4
	Total	254	100

highlighting the association between the academic rank and the supervisory role in the higher education sector. Professional tenure was also considerable, with 58.4% of the respondents having over 15 years of experience in the academia field, which may affect decision-making and managerial performance.

Regarding organizational affiliation, the study respondents were drawn from 11 universities in Palestine, representing a diverse range of institutions in the higher education sector. The distribution of respondents across the universities was as follows: Al-Istiqlal University (21.7%), Al-Quds Open University (21.3%), Alnajah University (11.8%), Hebron University (9.8%), Al-Quds University (8.7%), Palestine Technical University (8.3%), Berzhit University (5.1%), Arab American University (4.7%), Al-Aqsa University (4.3%), AL-Azhar University (2.4%), and Islamic University of Gaza (2.0%). This distribution provides a comprehensive overview of employees across multiple organizational contexts, capturing a broad spectrum of the banking workforce.

Assessment of the measurement model

In the first stage, the examination of the measurement model has been implemented to evaluate the constructs’ quality through assessing the factor loading to ensure the constructs’ reliability and validity. Fig. 2 displays the inner

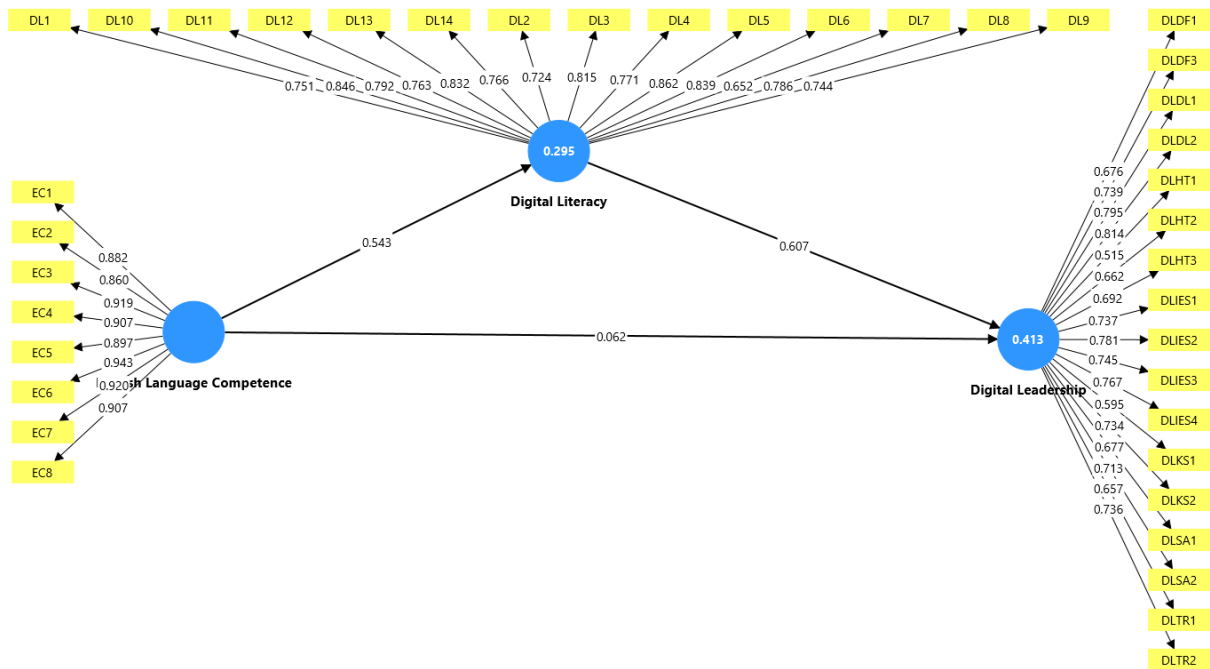


Figure 2: The inner model for the first-order construct.

model for the first-order constructs.

Factor loading

The factor loading was assessed following the recommendations of Hair, Sarstedt [73]. According to these recommendations, factor loadings of the items were required to achieve a validity score equal to or greater than 70%. Items with factor loading below 50% should be removed, except in cases where the values of

internal consistency reliability, AVE, and HTMT were obtained. Therefore, 2 items related to digital leadership were removed from the model.

Fig. 2 and Table 3 show the factor loadings for the remaining factors which indicates that most of the factor loadings of the items met the required threshold of .70.

Multicollinearity test

Table 3: Factor loading and multicollinearity statistics (VIF) for indicators

	Digital Leadership	Digital Literacy	English Competence	VIF
DL1		0.751		2.17
DL10		0.846		3.595
DL11		0.792		2.539
DL12		0.763		2.371
DL13		0.832		3.245
DL14		0.766		2.306
DL2		0.724		2.575
DL3		0.815		3.149
DL4		0.771		3.293
DL5		0.862		3.636
DL6		0.839		3.271
DL7		0.652		2.052
DL8		0.786		2.431
DL9		0.744		2.368
DLC-DF1	0.676			2.002
DLC-DF3	0.739			2.46
DLC-DL1	0.795			3.242

DLC-DL2	0.814			3.353
DLC-HT1	0.515			1.604
DLC-HT2	0.662			2.16
DLC-HT3	0.692			2.239
DLC-IES1	0.737			2.518
DLC-IES2	0.781			2.774
DLC-IES3	0.745			2.16
DLC-IES4	0.767			2.572
DLC-KS1	0.595			2.03
DLC-KS2	0.734			2.486
DLC-SA1	0.677			2.843
DLC-SA2	0.713			2.938
DLC-TR1	0.657			2.185
DLC-TR2	0.736			2.508
EC1			0.882	4.409
EC2			0.860	4.154
EC3			0.919	5.711
EC4			0.907	5.152
EC5			0.897	4.925
EC6			0.943	8.893
EC7			0.920	5.556
EC8			0.907	5.868

Table 2 displays the values of factor loading for each item of the three main constructs. The results show that all of the values ranging from 0.65 to 0.90, which means that most of the items are highly correlated with their parent constructs. This reflects the quality and reliability of the used measurements (Hair Jr *et al.*, 2021). While the value of Variance Inflation Factor (VIF) falls within 3.6 -1.6 for most of the items of DLC and DL, these values show

there is no serious problems in inflation. The items of ELP, VIF appear with greater values fall within 4.1-8.8. However, these values remain in the acceptable range. According to (Hayo *et al.*, 2020), VIF values between 5 and 10 may show similarities between the items of the construct, but do not affect the assessment of the measurement model as long as it has a clear theoretical building. In our case, the high value in similarities among

Table 4: Cronbach's alpha, composite reliability statistics, and average variance extracted (AVE)

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
DLC	0.938	0.945	0.945	0.506
DL	0.951	0.955	0.957	0.614
ELP	0.968	0.973	0.973	0.818

the items might show an overlap because they measure one core language skill. Thus, most of the items in our study remain in the acceptable level which indicates the overall quality of the measurement model.

Reliability and convergent validity measures.

The results in table 3. present the values of both the Cronbach's alpha and composite reliability (CR) for the study constructs. For ELP, DL, and DLC the Cronbach's alpha values (0.938, 0.951 and 0.968) respectively, while the composite reliability values were (0.945, 0.957, and 0.973), respectively. These results indicate that most constructs have values above the minimum recommended threshold of 0.70 (Hair Jr *et al.*, 2017). Hence, the reliability has

been established.

The results also indicate that the convergent validity,

Table 5: Discriminant validity - Fornell and Larker criterion

	DLC	DL	ELP
DLC	0.712		
DL	0.640	0.784	
ELP	0.392	0.543	0.905

where the AVE statistics show that all the constructs have an AVE value that exceed the recommended threshold of 0.50. This shows that the items are suitable for measuring

the main study constructs. Thus, the convergent validity of the model was confirmed.

Discriminant validity

To examine the discriminant validity, the criterion developed by Furnell and (Fornell & Larker, 1981) was used. Discriminant validity is established when the square of the AVE for a construct is greater than the value of

Table 6: Discriminant validity - Cross loading

	DLC	DL	ELP
DL1	0.597	0.751	0.540
DL10	0.482	0.846	0.400
DL11	0.500	0.792	0.361
DL12	0.472	0.763	0.308
DL13	0.550	0.832	0.409
DL14	0.414	0.766	0.323
DL2	0.517	0.724	0.340
DL3	0.541	0.815	0.470
DL4	0.466	0.771	0.463
DL5	0.534	0.862	0.469
DL6	0.488	0.839	0.535
DL7	0.361	0.652	0.355
DL8	0.522	0.786	0.487
DL9	0.510	0.744	0.394
DLC-DF1	0.676	0.415	0.253
DLC-DF3	0.739	0.511	0.260
DLC-DL1	0.795	0.526	0.373
DLC-DL2	0.814	0.494	0.294
DLC-HT1	0.515	0.337	0.190
DLC-HT2	0.662	0.352	0.255
DLC-HT3	0.692	0.414	0.260
DLC-IES1	0.737	0.494	0.344
DLC-IES2	0.781	0.602	0.350
DLC-IES3	0.745	0.508	0.263
DLC-IES4	0.767	0.550	0.293
DLC-KS1	0.595	0.354	0.286
DLC-KS2	0.734	0.400	0.255
DLC-SA1	0.677	0.339	0.209
DLC-SA2	0.713	0.368	0.244

DLC-TR1	0.657	0.419	0.234
DLC-TR2	0.736	0.493	0.305
ELP1	0.362	0.482	0.882
ELP2	0.348	0.456	0.860
ELP3	0.296	0.430	0.919
ELP4	0.398	0.535	0.907
ELP5	0.446	0.574	0.897
ELP6	0.316	0.495	0.943
ELP7	0.322	0.443	0.920
ELP8	0.305	0.473	0.907

Heterotrait–Monotrait Ratio (HTMT)

its correlation with all other constructs. The bolded and italicized square root of the AVE shown in Table 4, indicate that the AVE for each construct is greater than its correlation with any other construct in the model. For example, the results show that the square of the AVE for DLC (0.712) is greater than its correlations with DL (0.640) and ELP (0.392). This indicates that the shared

Table 7: Heterotrait–Monotrait Ratio (HTMT) of the first-order construct

	DLC	DL	ELP
DLC			
DL	0.660		
ELP	0.401	0.552	

variance among the indicators of the DLC is greater than its shared variance with other constructs (Hair Jr *et al.*, 2021). Thus, the discriminant validity is confirmed.

Cross Loadings

Cross loading method tests whether an item has a higher correlation with the construct it belongs to than with the other constructs. Table 5 shows that the factor loadings results confirm that each item fits best within its own construct, as they have greater correlation with their parent construct than when they are correlated with any of the other constructs in the model. Hence, by evaluating the cross-loadings, we may determine that the constructs of our model are distinct.

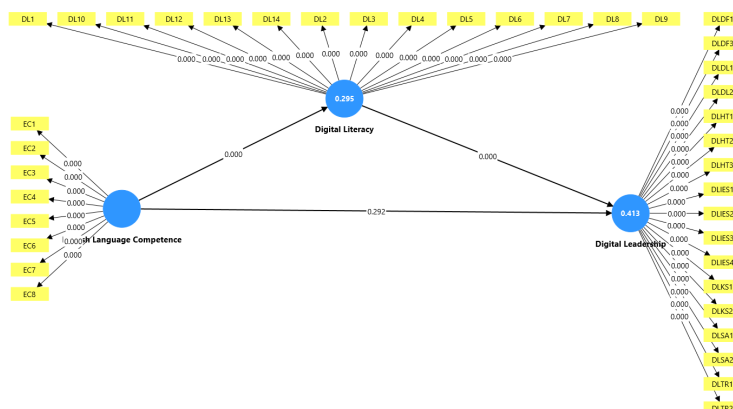


Figure 2: Structural model of the first-order construct

Additionally, to confirm the discriminant validity, the HTMT ratio was evaluated based on the recommendation of (Teo *et al.*, 2008), which consider 0.90 or lower as the accepted level of threshold for HTMT. Thus, the result of HTMT analysis shown in table 6 reveals that the HTMT ratios among all constructs were all below the recommended threshold of 0.90.

Structural model evaluation

The Structural model was evaluated using the bootstrapping technique, implemented through SmartPLS 4.0. It was used to evaluate the inner model's validity and structure, and to test the study hypothesis. Thus, the structural model analysis as shown in Fig. 2, table 7 and Table 8, indicate that two direct links were statistically significant at the 0.001 level. Precisely, the paths between ELP and DLC, and DL and DLC were

Table 8: Direct Relationship Results

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
DL -> DLC	0.607	0.612	0.056	10.894	0.000
ELP -> DLC	0.062	0.059	0.059	1.054	0.292
ELP -> DL	0.543	0.545	0.045	12.010	0.000

supported, while the direct path between ELP and DLC was not supported. This result suggests the possibility of an indirect link between ELP and DLC. Details are discussed in the following sections.

Testing the direct paths

Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the direct links among the latent constructs ELP, DL, and DLC. Smart PLS results presented in Table 7 show that the direct path from DL

to DLC was a statistically significant and positive effect ($\beta = 0.607$, $T = 10.894$, $p < 0.001$). The strong statistical significance suggests that DL is a significant predictor of DLC, showing high T-value and low p-value, which confirms the strength of this correlation. Also the results found that ELP significantly related to DL. This link was moderately strong ($\beta = 0.543$, $T = 12.010$, $p < 0.001$). However, the direct link between ELP and DLC

Table 9: Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
ELP -> DL -> DLC	0.329	0.334	0.044	7.514	0.000

Table 10: Total effect

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
DL -> DLC	0.607	0.612	0.056	10.894	0.000
ELP -> DLC	0.392	0.393	0.058	6.807	0.000
ELP -> DL	0.543	0.545	0.045	12.010	0.000

was statistically unsupported ($\beta = 0.062$, $T = 1.054$, $p = 0.292$). This result may indicate that the impact of ELP on DLC may occur indirectly through DL.

Testing the mediating effect of DL

The mediation analysis was implemented using smart PLS to test the mediation role of DL in the link between ELP and DLC. The results shown in Table 8 statically confirmed the specific indirect effect ($O = 0.329$, $STDEV = 0.044$, $T = 7.514$, $p < 0.001$), suggesting that the link between ELP and DLC is partially mediated by DL. Furthermore, the test of total effect presented in Table 9, indicate that ELP significantly and directly related to DLC ($O = 0.392$, $T = 6.807$, $p < 0.001$), while DL also significantly affected DLC ($O = 0.607$, $T = 10.894$, $p < 0.001$). ELP significantly influenced DL ($O = 0.543$, $T = 12.010$, $p < 0.001$), confirming the first path of the mediation. Generally, the results suggest partial mediation:

ELP effects DLC only indirectly through DL. The high T-values and low p-values support the robustness of these effects.

Discussion

The results of this study provide empirical support for the proposed conceptual model we previously developed, explaining the associations among ELP, DL, and DLC. The confirmation of the direct link between ELP and DL indicates that ELP acts as an enabler for acquiring digital skills. Since most contemporary software, programs, local and international online collaborative platforms are in English, the results of this study indicate that faculty members who are proficient in English show higher capability in handling tools, thus improving their digital competences. The study findings show that English language is not only a mean for communication, but an essential tool to access digital contents. This is aligned

with findings of previous research. In their study of Indonesian university students, (Isnaniah & Ningsih, 2022) found a significant relationship between digital competences and ELP. In another study on blended learning in higher education (Wahyuddin *et al.*, 2024), found that merging digital competences with the English language module would result in mutual improvement in both level of English skills and digital skills. Meanwhile, the results also indicate potential challenges faced by faculty members with lower level of ELP when dealing with digital tools which might negatively reflect on the performance of both individuals and institutions.

The absence of the direct link between ELP and DLC seems to be logical from both theoretical and practical perspective, as the English language would provide to individuals the ability to access the resource and practical perspective. English language would provide individuals with the ability to access resources and deal with technology, nonetheless, this alone does not ensure digital leadership competences, especially in higher education context where faculty members have the same nationality and speak the same language without the need to use English for daily interaction, which might explain the absence of clear direct link between ELP and DLC. In this context, ELP might not be a condition for leadership development, but it remains a vital predictor for digital literacy

Although the results of this study found insignificant direct relationship between ELP and DLC, the results confirm the indirect link between ELP and DLC through DL. The supported indirect link reveals a significant portion of ELP's positive effect on DLC is directed through the development of DL. Therefore, ELP acts as an important predictor helps to gain another critical component which is DL. In turn, DL is then transformed to build a higher-order component which is DLC. This argument is aligned with theoretical perspectives like the Resource-Based View (Barney & Arian, 2005). Previous studies on digital literacy also confirm that using digital tools effectively would not only be achieved through the existence of ELP, but it also requires practices and training. In this context, (Anwar, 2025) found that digital competences play a meditative role in linking transformational leadership and performance improvement. In a recent study by (Supriadi, 2025) found that digital competences play a mediative role in the relationship between digital leadership and teacher performance, which supports the idea that improving digital competences would empower the effectiveness of DL.

The results of this study suggest that ELP serves as the fundamental base, facilitating the development of DL, which in turn becomes a more direct and powerful enabler of DLC. This underscores the inadequacy of viewing these constructs as independent when considering leadership development in the digital age. Both ELP and DL dependently and synergistically contribute to DL.

Implications and Recommendations

The study has both theoretical and practical implications. Theoretically, the study provides support for integrating concepts from three major fields: languages, technology, and leadership theory, providing in-depth understanding of the way individuals need to improve their digital leaders' competences. Practically, this study has several essential implications, primarily emphasizing DL as a key element in developing leadership capabilities... Therefore, it is highly recommended to incorporate digital modules in leadership training programs. Additionally, providing training programs for enhancing English communication skills would contribute in enhancing the digital literacy and in turn the DLC. Higher education institutions' administrations also need to recognize ELD and DL when recruiting and selecting their faculty members to ensure hiring potential leaders with strong leadership abilities who can cope with current and future challenges.. Faculty members seeking leadership roles in their universities should pay more attention to the importance of developing both their ELP and their DL. They should invest their time and efforts in enhancing these factors to develop their DLC, which will help them and their universities to enhance their readiness for the era of digitalization.

CONCLUSION

Future research

This study examined the mediating role of Digital Literacy (DL) in the relationship between English Language Proficiency (ELP) and Digital Leadership Competencies (DLC) among 254 faculty members in Palestinian higher education institutions. Using a quantitative approach with Structural Equation Modeling-Partial Least Squares (SEM-PLS), the analysis confirmed significant positive associations between ELP and DL, and between DL and DLC. The results also showed a significant indirect effect of ELP on DLC through DL, indicating full mediation. Key metrics included an R^2 of 0.62 for DLC and standardized path coefficients above 0.30 for the main relationships, demonstrating the model's explanatory power in this context.

The findings contribute to understanding how ELP supports DLC via DL in non-native English settings, with implications for training programs in higher education. By highlighting DL as a key mechanism, this research provides insights into enhancing digital transformation in educational environments, particularly in regions facing globalization and technological shifts.

Regardless of the potential significance of the study's findings, there are a number of limitations. First, employing only a cross-sectional survey design did not allow us to draw in-depth explanation of the phenomenon. Whereas the mediation analysis explained the mechanism on how ELP affect DLC, longitudinal research is needed to confirm these results. Second, regardless of the efforts made in validating the scales, employing self-report measures for the study constructs might yield biases, the use of other tools such as interviews might help in

neutrality.

Following with the study limitations, some future researches are suggested. First, longitudinal studies might be needed to track to track faculty members over time to better understand the causal relationships among ELP, DL, and DLC. Second, conducting interviews or incorporating multi-source data, such as objective ELP test scores would help in mitigating common method bias and enhance construct validity. Finally, conducting this model in higher education sector with different cultural backgrounds might help in generalizing the findings of this study.

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