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Mediating Effect of Individuals' Self-Efficacy on the Relationship between Digital Capability and Concern of Online Credential Adoption in Kuwait University

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ABSTRACT

This study investigates the mediating effect of self-efficacy on the relationship between digital capability and concerns toward online credential adoption among faculty members at Kuwait University. As higher education increasingly transitions toward digital credentialing systems, understanding how faculty members' perceive these technologies has become essential for successful implementation. Using quantitative design, data collected from faculty member at Kuwait Universityand analyzed through partial least squares structural equation modeling. The findings show that digital capability is a multidimensional construct encompassing ICT proficiency, information literacy, communication and collaboration skills, digital identity awareness, digital learning development, and creative problem-solving abilities. These capabilities influence faculty members' concerns in distinct ways: identity-, literacy-, and ICT-related skills were associated with higher concerns, reflecting heightened awareness of privacy, security, and data protection risks, while creative and problem-solving skills reduced concerns by enhancing faculty members' confidence in navigating digital platforms. Self-efficacy demonstrated a selective mediating role, significantly mediating some digital capability dimensions but not others, suggesting that confidence interacts differently with different types of digital skills. Overall, the model explained a substantial proportion of variance in concerns, underscoring the importance of digital capability and self-efficacy in shaping faculty members' readiness to adopt online credentials. The study provides valuable insights for higher education institutions seeking to enhance digital preparedness, reduce adoption barriers, and build trust in emerging credentialing technologies.

Keywords: Digital capability, Self-efficacy, Online Credential Adoption, Kuwait University.

INTRODUCTION

The rapid digitalization of higher education has accelerated demands for advanced digital capabilities among students, faculty members, and administrative staff. Universities increasingly rely on digital platforms to manage learning, assessment, credentialing, and faculty members support services, positioning digital capability as a core determinant of institutional

effectiveness [1, 2]. In this evolving environment, higher education institutions must ensure that individuals possess competencies across multiple domains, including ICT proficiency, information and media literacies, digital communication, digital content creation, and digital well-being [3, 4]. Strong digital capability supports more effective participation in online learning environments, improves productivity, and enhances the adoption of emerging educational technologies [5, 6]. As digital ecosystems expand, one area of increasing importance is the adoption of online credentials digital or micro-credential formats used to verify competencies, learning achievements, and professional skills [7, 8]. Online credentials have emerged as a transformative mechanism for recognizing learning in flexible, stackable, and verifiable ways. Their growth is driven by the need for faster skills recognition, employer demand for verified competencies, and the shift toward lifelong learning models [9, 10]. Blockchain-enabled credentials further enhance trust by offering secure, tamper-resistant validation processes, which support credibility for global learners and employers [11, 12]. Despite these opportunities, many individuals remain hesitant to adopt online credentials due to concerns related to privacy, trust, system complexity, and uncertainty about institutional readiness [13, 14]. Understanding the determinants of these concerns is essential for enhancing credential adoption in higher education.

Self-efficacy, the belief in one's ability to use digital tools effectively has been repeatedly identified as a crucial psychological factor shaping individuals' engagement with educational technologies. High levels of digital self-efficacy promote greater confidence in navigating online systems, reduce anxiety, and facilitate the adoption of innovative technologies such as learning analytics, micro-credentials, and blockchain-based credentialing systems [15-17]. Conversely, low self-efficacy increases perceived difficulty and risk, reinforcing resistance toward digital credential systems [18, 19]. Studies across various educational contexts show that self-efficacy mediates the impact of digital capability on behavioral outcomes, including technology adoption, online learning success, and academic performance [20, 21]. This suggests that individuals with strong digital capabilities may still experience concerns about online credentials if their self-efficacy is weak. In Kuwait University, digital transformation initiatives are expanding rapidly, yet the adoption of online credential systems remains uneven. This highlights the need to analyze how digital capability shapes individuals' concerns toward online credential adoption and whether self-efficacy plays a mediating role in this relationship. Understanding these dynamics is essential for designing effective policies, improving digital preparedness, and fostering engagement with emerging credentialing technologies. Grounded in current digital competency frameworks and technology adoption literature, this study investigates the mediating effect of self-efficacy in the link between digital capability and concerns toward online credential adoption, offering evidence-based insights to support Kuwait University's digital transformation agenda.

LITERATURE REVIEW

Theoretical Discussion

The growing digitalization of higher education has driven scholars to revisit theoretical foundations explaining how individuals develop digital capabilities, adopt emerging technologies, and respond to new credentialing practices. Central to this discourse is the concept of **digital capability**, a multidimensional construct covering ICT proficiency, information and media literacy, digital communication, content creation, innovation, and digital well-being [1, 3]. These domains mirror the broader digital competence frameworks proposed

in recent literature, which view digital capability as an integrated system of skills enabling individuals to effectively engage with digital learning environments [4, 22-24].

Digital capability is not merely technical competence; it reflects the ability to interpret information, collaborate in digital spaces, solve problems using digital tools, and manage one's online identity and well-being [6, 25]. The maturation of digital capability in higher education aligns with theoretical models of digital transformation, which emphasize organizational readiness, digital literacy development, and user confidence as determinants of successful technology adoption. A second theoretical pillar relevant to this study is the growing body of work on **online credentialing systems**, including micro-credentials, digital badges, and blockchain-based academic records. These credentials represent a shift toward flexible, modular, and verifiable learning recognition systems that support global mobility and lifelong learning [7, 8].

The theoretical rationale for micro-credentials draws from human capital theory and competency-based education, asserting that learners benefit from transparent, skills-based recognition and employers gain more precise indicators of competencies [9, 10]. Block chain-enabled credentials introduce an added theoretical dimension related to trust, decentralization, and information security, reinforcing the legitimacy and portability of academic achievements [11, 12]. However, the literature also identifies psychological and behavioral concerns such as perceived risk, privacy, system complexity, and lack of institutional clarity that may hinder adoption [13, 14]. Understanding these concerns is essential to evaluating how individuals respond to technological innovation in credentialing.

A third theoretical foundation underpinning this research is **self-efficacy theory**, originally conceptualized by Bandura but extensively expanded within digital learning contexts. Self-efficacy refers to individuals' belief in their ability to perform tasks successfully, influencing effort, persistence, and willingness to engage with technological systems [15, 18]. Within higher education, digital and technological self-efficacy have been shown to shape online learning outcomes, technology integration behaviors, and willingness to adopt new educational tools [16, 17]. High self-efficacy reduces anxiety, enhances confidence in digital environments, and strengthens individuals perceived control over complex technologies such as micro-credential platforms and blockchain-based systems [19, 26]. Conversely, low self-efficacy increases perceived barriers, amplifies concerns, and may inhibit engagement with digital credentials even when digital capabilities are present [20, 27]. The intersection of these theoretical domains establishes the foundation for the current study. Digital capability provides the technical and cognitive skills necessary for interacting with online credential systems, while self-efficacy represents the psychological mechanism influencing individuals' confidence in using these technologies. Concerns toward online credential adoption emerge as behavioral responses shaped by both digital readiness and perceived self-competence. Prior research suggests that self-efficacy may mediate the relationship between digital capability and behavioral outcomes related to technology adoption [21, 28].

Therefore, integrating digital capability frameworks, online credentialing theories, and self-efficacy theory offers a comprehensive lens to examine how individuals at Kuwait University navigate emerging digital credential ecosystems.

Hypotheses Development

The rapid expansion of digital transformation in higher education has intensified scholarly interest in understanding how faculty members develop readiness for emerging digital systems, including online credentials, micro-credentials, and blockchain-verified academic records. Digital capability, self-efficacy, and technology-related concerns have become central constructs in examining individual adoption behavior, as these factors jointly influence perceptions of system usefulness, trust, and credibility [1, 7]. Faculty members in digitally evolving institutions increasingly encounter certification platforms, digital badges, and online verification systems that require not only technical skills but also psychological confidence to adopt. Consequently, theoretical perspectives on digital capability and self-efficacy provide a basis for explaining how individuals interpret and respond to online credential systems. This section outlines the hypotheses for the study by synthesizing evidence from digital capability frameworks, online credentialing literature, and self-efficacy theory.

Digital capability has been widely identified as a foundational determinant of how individuals evaluate and engage with digital environments. It comprises ICT proficiency, information and media literacy, digital learning ability, digital communication, creative problem-solving, and digital well-being all of which equip individuals with the skills needed to navigate digital platforms [3, 4, 25]. Scholars argue that individuals with stronger digital capability are more adept at understanding system functions, recognizing data validation mechanisms, and assessing privacy protections embedded in online credentials [6, 10]. This reduces uncertainty and minimizes perceived risks, one of the primary barriers to the adoption of digital certifications [14]. Conversely, individuals with limited digital capability often struggle to interpret system features, leading to heightened concerns regarding data misuse, technological complexity, and the credibility of digital records [13, 29]. Therefore, digital capability is expected to significantly shape individuals' concerns toward adopting online credentialing systems by influencing how they evaluate system security, functionality, and trustworthiness.

- H1: digital capability has a significant effect on concerns toward online credential adoption.

Beyond its direct influence on concerns, digital capability is also theorized to enhance individuals' digital self-efficacy. Bandura's self-efficacy theory posits that mastery experiences are the strongest contributors to confidence in performing tasks, and this principle is widely supported in digital learning research [15]. Individuals who possess strong ICT skills, information literacy, and digital problem-solving competencies tend to feel more capable and independent in technology-rich environments [18]. Recent empirical findings confirm that digital capability directly predicts academic and technological self-efficacy in higher education, supporting the argument that skill development strengthens personal beliefs in one's ability to use digital tools effectively [20, 30]. This relationship has also been documented in online learning contexts where competence in digital systems leads to greater confidence in managing digital tasks, navigating platforms, and resolving technical challenges [16, 17, 31, 32]. Therefore, digital capability serves as the cognitive and experiential basis from which digital self-efficacy emerges.

- H2: digital capability has a significant effect on self-efficacy.

Self-efficacy itself is a central predictor of technology adoption and has been widely used to explain behavioral outcomes related to digital learning, online instruction, and ICT integration.

Individuals with high digital self-efficacy are more motivated, persistent, and resilient when engaging with new technologies and tend to perceive fewer risks or obstacles [19, 26, 33]. This psychological readiness reduces anxiety and enables individuals to approach online credential platforms with trust and openness, influencing how credible, secure, and beneficial they perceive such systems to be [28, 34]. Research shows that self-efficacy influences perceptions of data security, system complexity, and overall acceptance of digitally mediated certifications, suggesting that users with greater self-efficacy exhibit lower levels of concern toward online credential adoption [27, 35]. Consequently, self-efficacy is expected to function as a significant determinant of individuals' concerns toward using online credential systems at Kuwait University.

- H3: self-efficacy has a significant effect on concerns toward online credential adoption.

In addition to its direct effect, self-efficacy is widely regarded as a mediating mechanism that connects skill development with actual technology-related perceptions and behaviors. Several studies in digital learning, AI integration, and online instructional design confirm that self-efficacy mediates the relationship between competence and behavioral outcomes such as adoption intention, perceived usefulness, and risk perception [15, 36-38]. This suggests that digital capability alone does not guarantee confidence or positive perceptions; rather, individuals must believe in their ability to apply these skills in authentic digital environments. Mediation findings further indicate that when individuals possess high digital capability but low self-efficacy, concerns regarding privacy, accuracy, and reliability of digital records may persist [21, 28]. On the other hand, individuals with both strong capability and strong self-efficacy tend to demonstrate lower levels of concern and higher acceptance of innovations such as micro-credentials, blockchain-verified certificates, and automated verification systems. Therefore, self-efficacy is expected to play a central mediating role by translating digital capability into reduced concerns toward online credential adoption.

- H4: self-efficacy significantly mediates the relationship between digital capability and concerns toward online credential adoption.

METHODOLOGY

This study employed a quantitative research design to examine the relationships among digital capability, self-efficacy, and concerns toward online credential adoption among faculty members at Kuwait University. Quantitative methods are widely used in higher education technology research because they enable statistical testing of theoretical relationships and provide objective evidence for understanding adoption behaviors [16, 30]. Consistent with studies investigating digital transformation, micro-credential adoption, and self-efficacy in academic contexts, this approach allows for the systematic measurement of latent constructs and the development of a predictive structural model [7, 28]. A structured survey instrument was used to gather data from participants, as surveys are effective for capturing perceptions, competences, and technology-related attitudes across large faculty members populations in higher education [1, 39]. The survey included validated measurement scales reflecting three key constructs: digital capability, self-efficacy, and concerns toward online credential adoption. Items for digital capability were adapted from contemporary digital competency frameworks emphasizing ICT proficiency, information and media literacies, digital learning and communication skills, and digital well-being [3, 4, 6].

Self-efficacy items were drawn from established technology self-efficacy measures frequently used in digital learning and online teaching research [15, 17, 18]. Measures for concerns toward online credentials were informed by recent literature on micro-credentials, blockchain credentialing systems, and digital badge adoption, focusing on perceptions of privacy, security risks, system complexity, and institutional trust [10, 13, 14]. All items were assessed using a five-point Likert scale to capture variations in respondents' attitudes and perceptions. A non-probability convenience sampling approach was utilized to recruit participants from various colleges within Kuwait University. This sampling strategy is appropriate in digital education research where access to large and diverse faculty members groups is necessary, and it aligns with sampling practices used in micro-credential, online learning, and digital capability studies across global higher education institutions [5, 6]. Data collection was conducted electronically through an online survey platform to ensure accessibility and efficiency, reflecting current methodological practices in research related to digital innovation, micro-learning, and digital transformation in universities [8, 40].

After data collection, responses were screened for completeness, outliers, and missing values, following standard data preparation procedures used in quantitative educational research [41-44]. Structural equation modeling (SEM) using partial least squares (PLS-SEM) was adopted to analyze the data. PLS-SEM is particularly suitable for studies that include mediation, latent constructs, and predictive modeling, and it has been widely applied in research on self-efficacy, digital competence, AI adoption, and technology-mediated learning environments [16, 21, 36]. The analysis involved assessing the measurement model for reliability and validity, followed by testing the structural model to examine the direct and mediating effects proposed in the hypotheses. Ethical considerations were addressed by ensuring voluntary participation, anonymity, and confidentiality throughout the study. Participants were informed of the study's objectives and their right to withdraw at any time. This approach is consistent with ethical standards in contemporary higher education research involving digital behavior, online credentialing, and technology adoption [45, 46].

FINDINGS

The findings of this study are presented in line with the structural equation modeling (SEM–PLS) procedures, including assessment of data normality, descriptive statistics, measurement model evaluation, discriminant validity, structural model testing, coefficient of determination, effect sizes, and mediation analysis. Each table is described and interpreted to highlight the meaning and significance of the results within the context of digital capability, self-efficacy, and concerns toward online credential adoption among faculty members at Kuwait University.

The normality of the dataset was assessed using skewness and kurtosis values for all constructs, including ICT proficiency and productivity, information and media literacies, digital learning and development, digital communication and collaboration, digital creation and problem-solving, digital identity and well-being, concerns toward online credential adoption, and self-efficacy. As shown in Table 1, all skewness values fall within the acceptable range of ±1, indicating that the distributions do not exhibit problematic asymmetry. Likewise, the kurtosis values ranged between −1.625 and −0.447, which is well within the commonly accepted thresholds of ±2, demonstrating that none of the constructs display severe peakedness or flatness. These results confirm that the dataset does not deviate significantly

from normal distribution assumptions, suggesting that the data are suitable for further analysis using structural equation modeling techniques.

Table 1: Normality Test

Construct	N	Skewness	Kurtosis
ICT	255	0.212	-1.610
ILC	255	-0.259	-1.117
DLD	255	0.146	-1.451
DCP	255	-0.512	-0.604
DCI	255	0.166	-1.216
DIW	255	0.386	-1.625
COC	255	0.346	-0.447
SE	255	-0.325	-1.146

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

As presents in Table 2 the descriptive statistics for the main constructs of the study, including ICT proficiency (ICT), information and media literacies (ILC), digital learning and development (DLD), digital communication and collaboration (DCP), digital creation and innovation (DCI), digital identity and well-being (DIW), concerns toward online credential adoption (COC), and self-efficacy (SE). The results show that all constructs have mean scores ranging between **3.07 and 3.61**, indicating moderate to moderately high levels across respondents. Among the digital capability components, **digital communication, collaboration, and participation (DCP)** recorded the highest mean (M = 3.612), suggesting that faculty members feel most confident engaging and interacting within digital environments. This is followed by **digital learning and development (DLD)** (M = 3.538) and **digital creation and innovation (DCI)** (M = 3.514), reflecting relatively strong competencies in managing digital learning tasks and producing digital outputs. Information and media literacies (ILC) also showed a moderately high mean (M = 3.351), indicating that respondents generally possess adequate skills in evaluating, interpreting, and processing digital information.

Digital identity and well-being (DIW) recorded a slightly lower mean (M = 3.271), suggesting that some faculty members may still face challenges related to managing online presence, privacy, or digital well-being. The overall concern toward online credential adoption (COC) yielded a moderate mean score (M = 3.129), implying that while concerns exist, they are not excessively high among respondents. Self-efficacy (SE) demonstrated a moderate level (M = 3.260), indicating that respondents possess a fair degree of confidence in their ability to engage with digital systems. Standard deviations across constructs ranged from **0.549 to 0.949**, reflecting acceptable variability within the dataset.

ICT proficiency and productivity (ICT) exhibited the highest variability (SD = 0.949), suggesting that faculty members differ substantially in their basic digital capabilities. In contrast, DLD displayed the lowest variability (SD = 0.549), indicating more consistent skill levels in managing digital learning tasks among participants. Overall, descriptive analysis shows that

respondents possess moderately strong digital capabilities while maintaining moderate levels of self-efficacy and concerns related to online credential adoption.

Table 2: Descriptive Analysis

Construct	N	Mean	Std. Deviation
ICT	255	3.071	0.949
ILC	255	3.351	0.859
DLD	255	3.538	0.549
DCP	255	3.612	0.612
DCI	255	3.514	0.744
DIW	255	3.271	0.900
COC	255	3.129	0.706
SE	255	3.260	0.726

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

As shown in Table 3 the final measurement model results assessing item loadings, internal consistency reliability, and convergent validity for all study constructs, including concerns toward online credential adoption (COC), digital creation/innovation (DCI), digital communication and participation (DCP), digital identity and well-being (DIW), digital learning and development (DLD), ICT proficiency (ICT), information and media literacies (ILC), and self-efficacy (SE). Overall, the results demonstrate that the measurement model meets the recommended psychometric criteria for PLS-SEM analysis. Item loadings across constructs range from acceptable to excellent.

Most items loading at **0.70 or higher** reflect strong indicator reliability, particularly for DCI, DLD, DIW, ICT, and ILC, which show consistently high loadings (e.g., DCI4 = 0.941; DIW4 = 0.937; ICT3 = 0.937; ILC5 = 0.913). Although some COC items exhibit lower loadings (e.g., COC31 = 0.530; COC19 = 0.529), the retention of several lower-loading items is expected in multidimensional constructs measuring perceptions and concerns, which often require broader coverage of behavioral and affective indicators. Internal consistency reliability is supported by **Cronbach's alpha** and **Composite Reliability (CR)** values. All constructs exceed the recommended minimum of **0.70**, confirming high internal reliability [47-50]. COC demonstrates exceptionally strong reliability (Cronbach's $\alpha = 0.960$; CR = 0.964), indicating stable measurement despite its larger item set. Similarly, DCI, DIW, ILC, and DLD show robust reliability (CR values ranging from 0.902 to 0.928), while ICT and SE also meet acceptable reliability thresholds (CR = 0.887 and 0.842, respectively).

Convergent validity is affirmed through the **Average Variance Extracted (AVE)** values. AVE measures how much variance in the construct is explained by its indicators. Most constructs exceed the **0.50 threshold**, including DCI (0.767), DIW (0.687), DLD (0.648), ICT (0.727), and ILC (0.634), demonstrating strong convergent validity. Although SE shows a relatively lower AVE (0.473), it remains close to the acceptable threshold, and values slightly below 0.50 may still be considered permissible when composite reliability exceeds 0.60, as recommended in PLS-SEM literature [37, 47, 51]. COC shows an AVE of 0.502, meeting the minimum level of

convergent validity for multidimensional constructs. Overall, the measurement model demonstrates acceptable reliability and validity across all constructs, confirming that the indicators appropriately measure their respective latent variables. These results allow progression to the structural model assessment, where the hypotheses regarding digital capability, self-efficacy, and concerns toward online credential adoption can be tested.

Table 3: Final Model Measurements

Items	Loading	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
COC10	0.866	0.960	0.964	0.502
COC11	0.739			
COC12	0.625			
COC14	0.537			
COC15	0.802			
COC16	0.594			
COC17	0.694			
COC18	0.889			
COC19	0.529			
COC21	0.630			
COC22	0.739			
COC23	0.835			
COC24	0.801			
COC25	0.868			
COC26	0.727			
COC27	0.649			
COC28	0.660			
COC29	0.727			
COC31	0.530			
COC32	0.506			
COC33	0.564			
COC34	0.763			
COC5	0.816			
COC6	0.523			
COC7	0.576			
COC8	0.868			
COC9	0.793			
DCI3	0.687	0.894	0.928	0.767
DCI4	0.941			
DCI5	0.930			
DCI6	0.919			
DCP3	0.548	0.695	0.805	0.513
DCP4	0.811			
DCP5	0.775			
DCP6	0.703			
DIW1	0.848	0.887	0.915	0.687
DIW2	0.919			
DIW3	0.640			
DIW4	0.937			

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DIW5	0.764			
DLD1	0.752	0.875	0.902	0.648
DLD2	0.880			
DLD3	0.789			
DLD4	0.765			
DLD5	0.831			
ICT3	0.937	0.821	0.887	0.727
ICT4	0.899			
ICT5	0.703			
ILC3	0.680	0.898	0.922	0.634
ILC4	0.765			
ILC5	0.913			
ILC6	0.863			
ILC7	0.853			
ILC8	0.530			
ILC9	0.896			
SE1	0.650	0.777	0.842	0.473
SE2	0.811			
SE3	0.739			
SE4	0.699			
SE5	0.666			
SE6	0.530			

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

Table 4 presents the Heterotrait–Monotrait Ratio of Correlations (HTMT), which is recognized as one of the most robust criteria for establishing discriminant validity in PLS-SEM. According to methodological guidelines, HTMT values should ideally be below 0.85, while values up to 0.90 are acceptable for conceptually related constructs. Values approaching or exceeding 0.95 indicate poor discriminant validity and conceptual overlap [38, 52-54].

As shown in Table 4 most HTMT values fall below or near the acceptable threshold, supporting adequate discriminant validity among the constructs. The relationships between COC and other constructs including DCI (0.508), DCP (0.553), DLD (0.424), and ICT (0.353) all fall comfortably below 0.85, indicating that concerns toward online credential adoption are empirically distinct from the digital capability dimensions measured in this study. Similarly, DCP demonstrates moderate HTMT associations with DCI (0.635), DIW (0.594), and ILC (0.603), all well within acceptable limits for discriminant validity. Some constructs show higher HTMT values, particularly DIW–DCI (0.894), DLD–DCI (0.886), ILC–DCI (0.816), and SE–DCI (0.892). Although these values are high, they remain under the upper boundary of 0.90, which is permissible when constructs are theoretically related [55-58], as is the case with digital capability dimensions and self-efficacy.

Similarly, the HTMT values between SE–ILC (0.842), SE–DIW (0.818), and SE–DCP (0.702) fall within acceptable ranges and do not indicate problematic overlap. The highest HTMT value, SE–ICT (0.726), is still safely below the 0.85 threshold. Taken together, the HTMT results indicate

that discriminant validity is generally satisfied for the measurement model. Although some digital capability components show strong conceptual associations as expected in an integrated capability framework, their HTMT scores remain within acceptable parameters, confirming that each construct captures a distinct aspect of the broader model. These findings support the adequacy of the measurement model and justify progressing to the structural model assessment.

Table 4: The Heterotrait-Monotrait Ratio of Correlations (HTMT)

	COC	DCI	DCP	DIW	DLD	ICT	ILC	SE
COC								
DCI	0.508							
DCP	0.553	0.635						
DIW	0.801	0.894	0.594					
DLD	0.424	0.886	0.725	0.589				
ICT	0.353	0.640	0.607	0.518	0.800			
ILC	0.658	0.816	0.603	0.792	0.735	0.474		
SE	0.723	0.892	0.702	0.818	0.685	0.726	0.842	

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

Table 5 presents the Fornell–Larcker criterion results, which provide an additional evaluation of discriminant validity by comparing the square root of each construct's AVE with its correlations with other constructs. According to the criterion, discriminant validity is established when the square root of the AVE for each construct is greater than its inter-construct correlations. As shown in Table 5, the diagonal values (in bold) represent the square roots of AVE, and all exceed their corresponding correlations across the rows and columns, indicating that the constructs are sufficiently distinct from one another.

For concerns toward online credential adoption (COC), the square root of AVE (0.709) is greater than its correlations with other constructs, confirming COC's distinctiveness. Digital creation, problem solving, and innovation (DCI) also meets the criterion, with a square root of AVE of 0.876 exceeding all inter-construct correlations, including its highest correlations with ILC (0.803) and DLD (0.782).

Similarly, digital communication, collaboration, and participation (DCP) demonstrates strong discriminant validity, as indicated by the square root of its AVE (0.716) being higher than its correlations with all other variables. Digital identity and wellbeing (DIW), with a square root of AVE of 0.829, remains distinct from other constructs despite moderately high correlations with COC (0.791) and ILC (0.755). Digital learning and development (DLD), digital proficiency (ICT), and information and media literacies (ILC) also satisfy the Fornell–Larcker criterion, with square roots of AVE values of 0.805, 0.853, and 0.796 respectively, each exceeding their highest correlations.

While some correlations are strong for example, between DCI–ILC (0.803), DIW–COC (0.791), and SE–ILC (0.760) the square roots of AVE remain higher, indicating acceptable discriminant

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validity among these theoretically related constructs. Finally, self-efficacy (SE) records a square root of AVE of 0.688, which is higher than all of its correlations with other variables, including DCI (0.730) and DIW (0.715). Although SE shows moderate to strong associations with multiple digital capability dimensions, these relationships reflect the theoretical expectation that self-efficacy is closely aligned with digital competence. Importantly, none of these associations exceed the diagonal values, confirming that discriminant validity is preserved. Overall, the Fornell–Larcker results support the conclusion that all constructs in the measurement model are statistically distinct, further validating the adequacy of the instrument and reinforcing the findings from the HTMT analysis.

Table 5: Discriminant Validity Fornell-Larcker Criterion

	COC	DCI	DCP	DIW	DLD	ICT	ILC	SE
COC	0.709							
DCI	0.450	0.876						
DCP	0.267	-0.335	0.716					
DIW	0.791	0.776	0.101	0.829				
DLD	0.012	0.782	-0.410	0.504	0.805			
ICT	0.082	0.544	-0.242	0.432	0.762	0.853		
ILC	0.596	0.803	-0.385	0.755	0.554	0.419	0.796	
SE	0.583	0.730	-0.329	0.715	0.494	0.511	0.760	0.688

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

Table 6 presents the direct structural relationships between the digital capability dimensions, self-efficacy, and concerns toward online credential adoption (COC). The results provide insight into the predictive power of each construct and indicate which components significantly influence individuals' concerns about adopting online credentials. Statistical significance was evaluated using t-statistics and p-values, with $p < 0.05$ treated as the threshold for significance. As shown in Table 6 several digital capability dimensions exhibit significant direct effects on concerns toward online credential adoption. Digital creation, problem solving, and innovation (DCI) demonstrates a significant negative effect on COC ($\beta = -0.604$, $p = 0.043$), suggesting that individuals with stronger creative and problem-solving digital skills tend to report fewer concerns regarding online credentials.

Information and media literacies (ILC) show a significant positive effect ($\beta = 0.257$, $p = 0.004$), indicating that faculty members with stronger information-processing abilities may be more aware of potential risks and therefore express slightly higher concerns. Digital learning and development (DLD) also shows a significant positive effect ($\beta = 0.597$, $p = 0.002$), suggesting that as individuals become more proficient in managing digital learning tasks, they may simultaneously become more conscious of issues related to credential security and system reliability. Digital identity and well-being (DIW) emerges as one of the strongest predictors ($\beta = 0.781$, $p = 0.002$), implying that individuals who are more attuned to issues of digital identity, privacy, and safe online behavior tend to have elevated concerns about adopting online credential systems.

ICT proficiency (ICT) likewise demonstrates a significant positive effect on concerns (β = 0.388, p = 0.003), reflecting that individuals with higher technical awareness may also be more sensitive to system vulnerabilities or data management issues. By contrast, digital communication, collaboration, and participation (DCP) shows no significant effect on concerns toward online credentials (β = –0.026, p = 0.848). This indicates that communication-related digital skills do not meaningfully influence perceptions of risk or hesitation toward online credential adoption. Finally, self-efficacy (SE) has a positive but statistically non-significant effect on COC (β = 0.304, p = 0.058). Although the relationship approaches significance, it does not meet the p < 0.05 threshold [33, 42, 59, 60]. This suggests that confidence in one's ability to use digital tools does not independently predict concerns about online credentials in the presence of other digital capability factors. Overall, the direct path analysis reveals that digital capability dimensions influence concerns toward online credential adoption in different ways some reducing concerns (DCI) and others heightening them (DIW, ICT, ILC, DLD). These findings highlight the complexity of faculty members' perceptions and the multifaceted nature of digital readiness in the context of online credential adoption.

Table 6: Direct Model Path Analysis

Direct Path	Beta	SD	T statistics	P values
DCI -> COC	-0.604	0.299	2.023	0.043
DCP -> COC	-0.026	0.136	0.191	0.848
DIW -> COC	0.781	0.252	3.101	0.002
DLD -> COC	0.597	0.273	2.188	0.002
ICT -> COC	0.388	0.193	2.01	0.003
ILC -> COC	0.257	0.125	2.051	0.004
SE -> COC	0.304	0.161	1.893	0.058

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

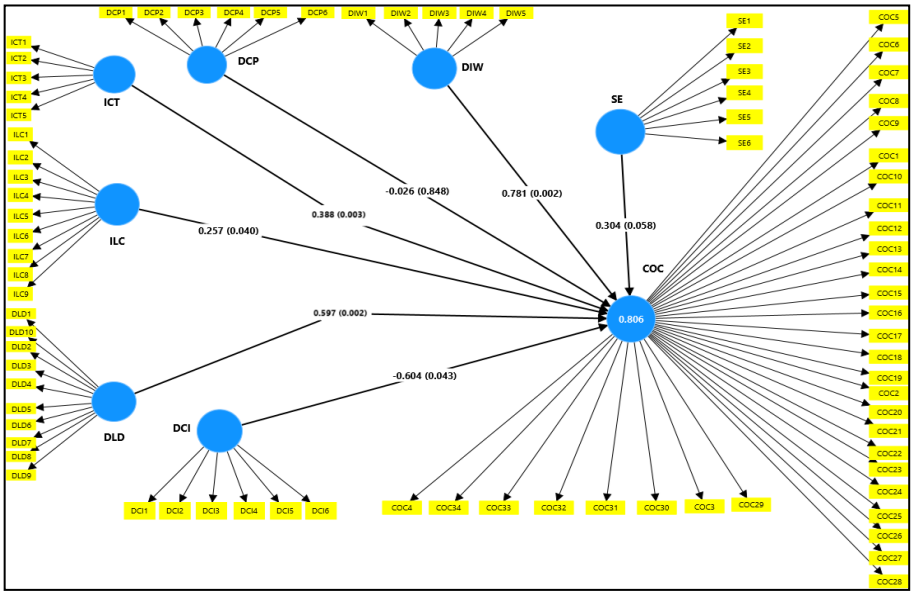

Figure 1: Reflective Structural (Inner) Model without Mediation PLS-SEM

Table 7 reports the coefficient of determination (R^2) for the study's main endogenous construct, concerns toward online credential adoption (COC). R^2 represents the proportion of variance explained by the independent variables in the structural model and is considered a key indicator of the model's predictive accuracy in PLS-SEM. As shown in Table 7 the R^2 value for COC is 0.811, with an adjusted R^2 of 0.806. According to established benchmarks, R^2 values of 0.67, 0.33, and 0.19 represent substantial, moderate, and weak explanatory power, respectively. Therefore, an R^2 of 0.811 indicates substantial explanatory power, meaning that approximately 81% of the variance in concerns toward online credential adoption is explained by the combined effects of digital capability dimensions (DCI, DCP, DIW, DLD, ICT, ILC) and self-efficacy (SE). This high level of explanatory power demonstrates that the model is statistically robust and that the selected predictors collectively offer strong insights into faculty members' concerns about online credential adoption. Given the complexity of psychological and behavioral responses to emerging digital credentialing systems, an R^2 value above 0.80 is considered exceptionally strong, reflecting the effectiveness of the theoretical framework employed in this study. The strong R^2 also indicates that digital capability and self-efficacy are critical components influencing perceptions of online credential systems in the context of Kuwait University.

Table 7: R Square (R^2) Results

	R-square	R-square adjusted
COC	0.811	0.806

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

Table 8 presents the effect size (f^2) of each predictor on concerns toward online credential adoption (COC). While the R^2 value indicates the overall explanatory power of the model, f^2 provides insight into the individual contribution of each exogenous variable. According to established benchmarks, f^2 values of 0.02, 0.15, and 0.35 represent small, medium, and large effects, respectively. As shown in Table 8, several digital capability dimensions demonstrate meaningful effects on COC. Digital creation, problem solving, and innovation (DCI) exhibits a medium-to-large effect (f^2 = 0.323), indicating that faculty members' ability to create digital content and solve digital problems substantially reduces or shapes their concerns toward adopting online credentials. Digital learning and development (DLD) also show a medium-to-large effect (f^2 = 0.309), highlighting the importance of faculty members' digital learning readiness and familiarity with online learning processes when forming perceptions about online credential systems.

Digital identity and wellbeing (DIW) contribute a medium effect (f^2 = 0.279), suggesting that issues related to privacy, digital identity protection, and safe online behavior significantly influence faculty members' concerns. Information, data, and media literacies (ILC) demonstrates a small-to-medium effect (f^2 = 0.084), indicating that faculty members' awareness of information processing and media risks moderately shapes their perceptions of online credential adoption. Self-efficacy (SE) shows a small effect (f^2 = 0.101), meaning that confidence in one's own digital abilities contributes modestly to the level of concern, though it remains an important psychological factor in the overall model. In contrast, ICT proficiency

(ICT) has only a very small effect (f^2 = 0.013), and digital communication, collaboration, and participation (DCP) shows no meaningful effect (f^2 = 0.001).

These findings suggest that while basic technical skills and communication-related digital competencies are valuable, they do not play a significant role in predicting concerns toward online credential adoption. Collectively, the effect size results indicate that the constructs most closely tied to higher-order digital capability, problem-solving, identity protection, and digital learning behavior exert the strongest influence on faculty members' concerns. Meanwhile, communication-oriented competencies and general ICT proficiency contribute minimally. This emphasizes that faculty members' deeper cognitive and identity-related digital capabilities rather than surface-level skills are the primary drivers of how they perceive the risks and challenges of adopting online credential systems.

Table 8: Effect Size (F^2)

Path	f-square
DCI -> COC	0.323
DCP -> COC	0.001
DIW -> COC	0.279
DLD -> COC	0.309
ICT -> COC	0.013
ILC -> COC	0.084
SE -> COC	0.101

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy.

The mediation analysis examined whether self-efficacy serves as an indirect mechanism linking each dimension of digital capability to concerns toward online credential adoption. As shown in Table 9, the results reveal a selective pattern of mediation effects, where some indirect paths are significant while others are not. Significant mediation was observed for DCP, DIW, ICT, and ILC, indicating that these digital capabilities influence concerns partially through self-efficacy. For example, the indirect effect for DCP is negative (β = –0.117, p = 0.018), suggesting that faculty members with stronger communication and collaboration skills tend to have higher self-efficacy, which in turn reduces their concerns about using online credential systems. In contrast, DIW (β = 0.196, p = 0.001), ICT (β = 0.135, p = 0.002), and ILC (β = 0.141, p < 0.001) show positive indirect effects, meaning that faculty members who possess strong awareness of digital identity risks, higher ICT proficiency, and stronger information literacy tend to have higher self-efficacy, yet this confidence increases their concerns. This pattern may reflect the possibility that more digitally knowledgeable faculty members are also more aware of system vulnerabilities, privacy risks, and data security issues, which heightens concern even when confidence is high. The mediation paths for DCI (β = 0.082, p = 0.271) and DLD (β = –0.110, p = 0.115) were not significant, implying that creative problem-solving skills and digital learning development influence concerns directly rather than through self-efficacy. Overall, the results indicate that self-efficacy acts as a **partial and selective mediator**, reinforcing the idea that different digital skills shape concerns in distinct ways, and that confidence interacts with specific capabilities rather than functioning as a universal mediator across all dimensions.

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Table 9: Mediation Analysis

Direct Path	Beta	SD	T statistics	P values
DCI -> SE -> COC	0.082	0.074	1.102	0.271
DCP -> SE -> COC	-0.117	0.049	2.361	0.018
DIW -> SE -> COC	0.196	0.076	2.578	0.001
DLD -> SE -> COC	-0.110	0.070	1.577	0.115
ICT -> SE -> COC	0.135	0.044	3.057	0.002
ILC -> SE -> COC	0.141	0.044	3.205	0.000

ICT: ICT proficiency and productivity; ILC: information, data, and media literacies; DLD: digital learning and development; DCP: digital communication, collaboration, and participation; DCI: digital creation, problem-solving, innovation; DIW: digital identity and wellbeing; COC: concerns toward online credential adoption; SE: Self-efficacy

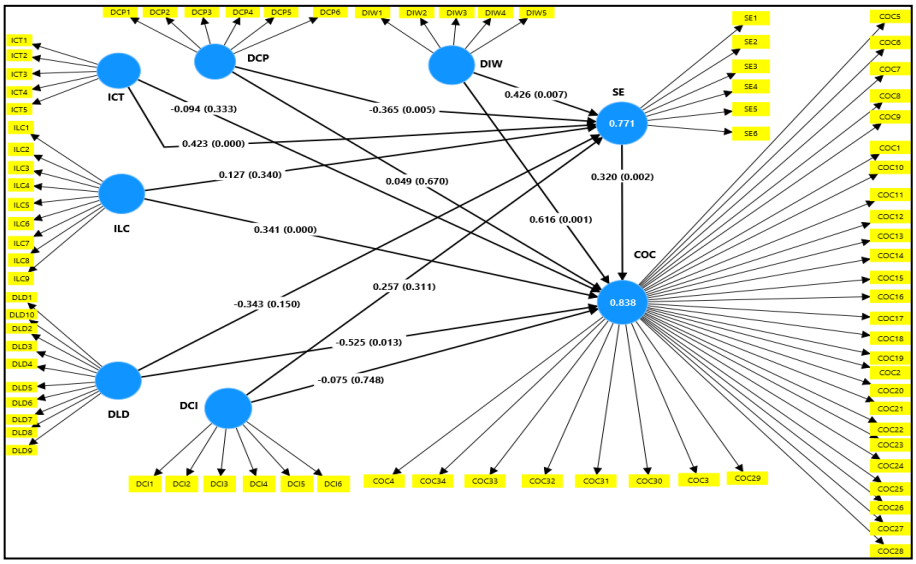

Figure 2: Structural Model with Mediation PLS-SEM

DISCUSSION

The purpose of this study was to examine how different dimensions of digital capability influence faculty members' concerns toward online credential adoption at Kuwait University, and to assess whether self-efficacy mediates these relationships. The findings reveal a nuanced and multidimensional pattern that aligns with contemporary discussions in digital transformation, digital literacy, and credentialing research. Overall, the model demonstrates strong explanatory power, confirming that digital capability understood as a composite of technical, cognitive, communicative, and identity-related competencies plays a central role in shaping perceptions of digital credential systems. This supports emerging work highlighting that the digital readiness of learners is a significant determinant of how they evaluate new educational technologies in higher education environments [1, 2, 6]. One of the most noteworthy findings is that certain digital capability dimensions specifically digital identity and wellbeing (DIW), ICT proficiency (ICT), information and media literacies (ILC), and digital learning development (DLD) were positively associated with concerns toward online credential adoption. This pattern indicates that more digitally knowledgeable faculty members tend to express **greater caution**, not less. Prior research supports this counterintuitive trend: individuals with higher awareness of digital identity, data protection, and online risk are more sensitive to potential vulnerabilities in digital systems, including credential verification, data

privacy, and long-term recognition of digital credentials [3, 13, 41]. For these learners, improved digital understanding does not automatically yield trust; rather, their awareness exposes them to the complexities and risks of digital infrastructures. This aligns with credentialing literature highlighting that adoption barriers often arise from perceived threats related to legitimacy, privacy, and data misuse, even among digitally skilled populations [8, 9].

In contrast, digital creation, problem-solving, and innovation skills (DCI) demonstrated a negative effect on concerns, suggesting that faculty members with advanced creative and analytical digital capabilities tend to be more open to adopting online credentials. These individuals often approach digital systems with adaptability and confidence, viewing new platforms as opportunities rather than threats [22, 30]. Their ability to troubleshoot, produce content, and navigate digital platforms appears to reduce perceived complexity, thereby reinforcing a more positive stance toward credentialing technologies. This supports prior studies indicating that innovative digital competency enhances acceptance of disruptive educational technologies and supports greater technological resilience [16]. The mediation analysis offers additional clarity by showing that self-efficacy plays a **partial and selective** mediating role. Self-efficacy mediated the relationships for DCP, DIW, ICT, and ILC, indicating that psychological confidence interacts differently with various digital skills. For DCP, the mediation effect was negative, suggesting that faculty members who collaborate and communicate digitally often feel more efficacious, which reduces their concerns about online credentials. This aligns with research demonstrating that active participation in digital environments fosters confidence and reduces technology-related apprehension [15, 16]. Conversely, the positive mediation effects for DIW, ICT, and ILC highlight that faculty members with high digital awareness and technical proficiency may simultaneously feel confident yet critical their understanding of risks may outweigh their confidence in overcoming them. Similar patterns have been observed in literature exploring digital identity management and ICT-related risk perception, where more informed users often express heightened caution due to increased exposure to digital vulnerabilities [35, 61].

The non-significant mediation for DCI and DLD further suggests that some digital competencies exert their influence directly rather than through psychological mechanisms. Creative digital skills and learning development readiness may shape concerns more through cognitive mastery and functional independence than through self-belief alone. This reflects broader findings in digital competence research indicating that higher-order digital skills often reduce uncertainty and increase digital adaptability irrespective of self-efficacy levels [19, 30]. Overall, the findings contribute to the growing literature on digital transformation and micro-credentialing in higher education. As institutions shift toward digital credentials, understanding user perceptions is essential for ensuring smooth adoption. This study indicates that digital capability is not uniformly protective or risk-enhancing; instead, each dimension carries its own psychological and cognitive implications. Universities therefore need to focus not only on building digital skills, but also on addressing sources of concern, such as privacy, data security, identity management, and system transparency. This is consistent with calls for more structured approaches to credential design, verification mechanisms, and learner empowerment in digitally evolving academic ecosystems [7, 14, 62]. Strengthening faculty member trust alongside capability development may be crucial for advancing digital credential adoption in higher education, particularly within GCC contexts embracing rapid digital innovation.

CONCLUSION

This study explored how different dimensions of digital capability influence faculty members' concerns toward online credential adoption in the context of Kuwait University, while also examining the selective mediating role of self-efficacy. The findings demonstrate that digital capability is a multidimensional construct that shapes perceptions in complex ways rather than acting as a uniform predictor. Skills related to digital identity, ICT proficiency, information literacy, and digital learning development tended to heighten concerns, reflecting faculty members' increased awareness of privacy, security, and data management risks. In contrast, creative digital skills and problem-solving abilities reduced concerns, suggesting that faculty members who feel more capable navigating digital environments approach online credentialing technologies with greater openness and confidence. Self-efficacy emerged as a partial and selective mediator, influencing some digital capability pathways but not others. This highlights that confidence alone does not determine faculty members' comfort with digital credentials; instead, confidence interacts differently depending on the type of digital skill. The overall model demonstrated strong explanatory power, indicating that digital capability and self-efficacy together play a substantial role in shaping faculty member readiness for online credential systems. These findings underscore the importance of addressing both capability development and system-related concerns as universities transition toward digital credentialing. Enhancing digital skills must be accompanied by transparent communication, user-centered design, and strong assurances regarding privacy and data protection. By understanding how faculty members interpret risks and benefits based on their digital experiences, institutions can better support the effective and confident adoption of online credentials in higher education.

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