

-RESEARCH ARTICLE-

THE EFFECT OF DIGITAL CITIZENSHIP ON KNOWLEDGE SHARING BEHAVIOUR: A FIELD STUDY OF ACADEMIC DEPARTMENTS HEADS

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—Abstract—

Digital citizenship has become a practical requirement of academic leadership, yet its behavioural consequences inside universities remain weakly evidenced. This study examines whether digital citizenship, operationalised as digital literacy, digital security, and digital health and well-being, promotes knowledge sharing behaviour across individual, organisational, and technological dimensions. A descriptive-analytical design was applied to heads of academic departments at Al-Mustansiriya University, a population occupying the hinge between the academic and administrative functions of the institution. Purposive sampling yielded 78 valid responses from 83 distributed questionnaires, a 94.0% response rate, measured through a 30-item five-point Likert instrument and analysed in SPSS 26. The instrument showed acceptable internal consistency ($\alpha = .890$) and satisfied normality assumptions. Descriptive results

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indicate uniformly high practice levels, with digital literacy strongest ($M = 4.059$) and organisational support for knowledge sharing weakest ($M = 3.708$). Digital citizenship correlated positively with knowledge sharing ($r = .615$, $p < .001$) and explained 37.8% of its variance. Entered simultaneously, the three dimensions explained 38.2% of variance; a relative-weight decomposition attributed 41.9% of that explained variance to digital health and well-being, 34.7% to digital security, and 23.4% to digital literacy. Safety and sustainability of digital practice, rather than technical competence alone, appear to drive academic knowledge exchange.

Keywords: Digital Citizenship; Knowledge Sharing Behaviour; Digital Security; Digital well-being; Higher Education; Academic Leadership.

INTRODUCTION

Universities are knowledge-intensive organisations whose principal output, the creation and circulation of understanding, depends less on physical assets than on whether the people inside them are willing to make what they know available to others. That willingness has always been contingent, but it is now mediated almost entirely by digital infrastructure. Curricula are designed in shared repositories, committee work is conducted asynchronously, examination records move through institutional platforms, and the informal exchanges that once happened in corridors increasingly happen in messaging applications. The consequence is that the competence, confidence, and sustainability with which academic staff inhabit digital environments have become preconditions for the organisational behaviour that universities most need.

Digital citizenship is the construct that has emerged to capture this bundle of preconditions. It describes the knowledge, competencies, and behavioural norms that allow individuals to participate in digital environments appropriately, safely, and productively, and it extends well beyond operational facility with devices to encompass ethical conduct, the protection of rights, and meaningful participation. [Hawamdeh et al. \(2022\)](#) demonstrated that awareness of digital citizenship practices differs systematically between students and faculty within the same distance-learning institution, indicating that the construct is not evenly distributed even among highly educated populations. [Alenezi and Alfaleh \(2024\)](#) further showed that institutional integration of digital citizenship frequently lags behind international standards, with practitioners identifying pedagogical and infrastructural obstacles rather than conceptual disagreement as the binding constraint. Where universities have examined staff-side digital capability directly, the picture is similar: [Moreira-Choez et al. \(2024\)](#) found substantial variation in faculty digital competencies across technological literacy, information use, communication, digital citizenship, and innovation, suggesting that institutional digital maturity conceals considerable internal dispersion.

The Iraqi higher education sector supplies a particularly instructive setting for

examining these questions. Public universities in Iraq have undergone rapid and largely unplanned digitalisation over the past decade, absorbing learning management systems, electronic student records, and institutional communication platforms within compressed timeframes and under persistent resource constraints. Adoption has therefore outpaced the development of the governance, training, and workload arrangements that ordinarily accompany such transitions in better-resourced systems. Academic staff in this environment have acquired digital practice largely through necessity rather than through structured preparation, which means that the components of digital citizenship are likely to be unevenly developed within the same individual. A department head may be technically adept while remaining insecure in judgement or unsustainable in working pattern. This unevenness, which more mature systems tend to smooth out, makes the Iraqi context analytically useful: it permits the components of digital citizenship to be observed as separable attributes rather than as facets of a uniformly developed capability.

Running alongside this literature is a mature body of work on knowledge sharing in higher education. [Fan and Beh \(2024\)](#), synthesising fifty empirical studies, organised the antecedents of academic knowledge sharing into three groups, namely individual, organisational, and technological factors, and observed that technological factors remain markedly understudied relative to the other two. That imbalance matters here, because digital citizenship is precisely the construct that sits at the junction of the individual and the technological. It is an attribute of persons, not of infrastructure, yet it determines how infrastructure is used. If the technological antecedents of knowledge sharing are underexamined, the person-level capabilities that activate them are more underexamined still.

Research Problem

The research problem arises from a specific gap rather than from a general call for more study. Three observations define it.

First, the two literatures have developed in parallel with little contact. Digital citizenship research has concentrated on school pupils, pre-service teachers, and undergraduates, populations selected because they are being educated into digital norms. Knowledge sharing research in higher education has concentrated on academics as knowledge producers, typically modelling trust, climate, incentives, and perceived cost. The intermediate population, namely academic staff who hold administrative authority and are simultaneously subject to digital policy and responsible for enacting it, has received little attention in either stream.

Second, where digital capability has been linked to work behaviour, the linkage is usually assumed to run through competence. The implicit model is that more skilled users make fuller use of platforms and therefore exchange more knowledge. Recent

evidence complicates this. Koch and Fehlmann (2025) report that digital literacy among university staff is necessary but not sufficient for digital performance, which also depends on organisational conditions, service provision, and dispositional factors. Caroline et al. (2025) similarly observe that no generic measure of digital literacy reliably links the construct to innovative work behaviour in organisational settings. If competence alone does not explain performance, the protective and regulatory components of digital citizenship, namely security practice and well-being management, may carry explanatory weight that existing models do not allocate to them.

Third, the practical question facing university management is one of allocation. Digital transformation budgets are finite and must be divided between skills training, security governance, and workload or well-being policy. Without evidence on the relative contribution of these components to the behaviour the institution wants, allocation defaults to whichever component is most visible, which is usually skills training. The present study is designed to supply that evidence.

Accordingly, the study addresses four questions. First, what level of digital citizenship and knowledge sharing behaviour is present among heads of academic departments at Al-Mustansiriya University? Second, is there a statistically significant association between the components of digital citizenship and the dimensions of knowledge sharing? Third, does digital citizenship exert a statistically significant effect on knowledge sharing behaviour, and what proportion of variance does it explain? Fourth, when the components are considered simultaneously, which exerts the greatest influence, and how is the explained variance distributed among them?

Significance of the Study

The significance of the study rests on four grounds.

The choice of respondents is consequential rather than convenient. Heads of academic departments occupy a structural position that no other group in a university occupies. They are practising academics, and therefore participants in the knowledge exchange being studied, but they also hold delegated administrative authority over the systems through which that exchange is organised. Their digital practice is thus both a personal attribute and an institutional signal: the security habits of a department head propagate downward through the unit, as do the norms of availability and response time. Sampling this group means observing digital citizenship at the point where individual behaviour becomes organisational policy.

The setting addresses a documented geographical imbalance. Fan and Beh (2024) note that empirical work on academic knowledge sharing has been conducted predominantly in Asian contexts, with Middle Eastern public universities thinly represented. Al-

Mustansiriya University, as a large, long-established Iraqi public institution operating under resource constraints and rapid digital expansion, represents conditions under which the relationship between digital citizenship and knowledge sharing may behave differently from those documented in better-resourced systems.

Methodologically, the study decomposes rather than aggregates. Much of the existing work treats digital citizenship as a single scale score, which obscures whether its components operate through a common mechanism. By entering the three components simultaneously and partitioning the explained variance among them, the analysis produces an ordering that has direct operational meaning for institutions choosing where to intervene.

Finally, the study has practical value for institutional governance. If the components of digital citizenship contribute unequally to knowledge sharing, then digital transformation programmes that concentrate resources on skills acquisition while treating security and well-being as compliance matters are misallocating effort relative to the behavioural outcome they claim to pursue.

Research Objectives

The study consists of the following objectives

- To determine the prevailing level of digital citizenship and knowledge sharing behaviour among heads of academic departments, and to establish whether these levels differ significantly from the neutral point of the measurement scale.
- To establish the direction and strength of association between each component of digital citizenship and each dimension of knowledge sharing.
- To determine whether digital citizenship and each of its components exert a statistically significant effect on knowledge sharing behaviour, and to quantify the magnitude of those effects.
- To identify which component of digital citizenship contributes most to knowledge sharing when all three are considered simultaneously, and to partition the explained variance among them.
- To derive evidence-based recommendations for the allocation of institutional effort across the components of digital citizenship.

LITERATURE REVIEW

Digital Citizenship: Concept and Scope

Digital citizenship emerged as an analytical category in the late twentieth and early twenty-first centuries, as digital technologies became embedded in social and economic activity and created a corresponding need to specify what appropriate and safe

engagement with them entails. No single definition has achieved universal acceptance, and the construct has been elaborated differently across educational, civic, and organisational traditions. What the traditions share is the position that digital citizenship cannot be reduced either to online presence or to technical facility with devices. It concerns instead how people conduct themselves in environments where a substantial part of their professional and civic life now takes place.

Two features of the construct recur across the literature. The first is its normative content: digital citizenship specifies standards of conduct relating to safety, ethics, legality, and self-protection, rather than describing capability alone. The second is its participatory content: it concerns the capacity to use digital technologies for interaction, access to information, expression of opinion, and contribution to a community. [Iskandar et al. \(2025\)](#), testing a structural model among 250 respondents, found that digital citizenship education and technological literacy both operate on digital citizenship literacy, but that the effect is transmitted principally through privacy awareness rather than through participation in digital campaigns, which did not function as a mediator. That finding is instructive because it separates the two features empirically: the protective component carried the mechanism, while the participatory component did not.

Operationalisations vary in breadth. Comprehensive frameworks enumerate as many as nine elements, spanning access, commerce, communication, literacy, etiquette, law, rights and responsibilities, health and wellness, and security. [Al-Otaibi \(2025\)](#) applied a full multi-element digital citizenship scale alongside a cultural intelligence measure among 220 Saudi university students and reported systematic associations between the two constructs, supporting the view that digital citizenship is embedded in broader dispositional and cultural capabilities rather than standing apart from them. [Almethen and Alomair \(2024\)](#), surveying 300 elementary teachers, found that the inclusion of digital citizenship elements varied significantly by teacher age, grade level taught, and subject area, which indicates that the construct is enacted unevenly even within a single professional population working under a common curriculum. [Popa and Assante \(2024\)](#), modelling data from 501 students across Romanian and Italian universities, found digital citizenship to be explained jointly by personal values, civic attitudes, and accumulated digital experience, which confirms that the construct is dispositional as well as technical and therefore varies between individuals with comparable access to technology.

The present study adopts a deliberately narrowed operationalisation comprising three components: digital literacy, digital security, and digital health and well-being. The narrowing is justified on two grounds. First, these three components are the ones over which a department head exercises direct personal and unit-level discretion; elements such as digital commerce or digital law are governed at national or institutional level

and are not behaviourally available to the respondent. Second, the three map onto a coherent conceptual sequence, namely capability, protection, and sustainability, which permits the components to be compared rather than merely summed. This tripartite structure corresponds to the protective and educative groupings used in the broader digital citizenship literature.

Digital Literacy

Digital literacy refers to the capacity to locate, evaluate, use, and produce information through digital technologies, and to adapt that capacity as technologies change. It is the component of digital citizenship most frequently measured and most frequently assumed to be the operative one. [Khan et al. \(2022\)](#), examining the drivers of digital literacy in higher education, found that critical skills, operational skills, and collaborative learning orientation jointly enhance digital literacy, and that digital literacy in turn improves both academic performance and employability. [Salju et al. \(2023\)](#), surveying 596 employees of Indonesian universities, reported that information technology training, digital infrastructure, and work-family conflict all significantly affect employees' digital literacy, and that digital literacy functions as a strong mediator between organisational and individual factors and employee performance, while direct management support played a comparatively minor role.

The assumption that literacy is the operative component has nonetheless been challenged from within the literature on university staff. [Koch and Fehlmann \(2025\)](#) argue explicitly that digital literacy is essential but does not guarantee digital performance, and propose a model in which literacy sits alongside openness to digital developments, digital culture, primary conditions, institutional service provision, and mindfulness. [Caroline et al. \(2025\)](#), reviewing the intersection of digital literacy, employability, and innovative work behaviour, reach a compatible conclusion, reporting that no generic measure of digital literacy exists that reliably links the construct to innovative behaviour in business contexts, and that contextual factors mediate the relationship. Taken together, these findings warrant treating digital literacy as a necessary enabling condition rather than as the principal driver of downstream work behaviour, and they generate a testable expectation: that literacy will correlate positively with knowledge sharing but will not dominate it once other components are controlled.

Digital Security

Digital security concerns the preventive practices through which individuals protect information, devices, and identity in networked environments. In organisational settings it encompasses the maintenance of protective software, the management of credentials, the careful handling of personal and institutional data, the recognition of fraud and intrusion attempts, and discretion in what is disclosed and to whom.

Its relevance to knowledge sharing is not obvious at first inspection, and the mechanism deserves statement. Knowledge sharing requires the transfer of material from one party to another, frequently across unit boundaries and frequently in forms that are institutionally sensitive: examination material, student records, unpublished research, committee deliberations. A person who cannot reliably judge whether a transfer is safe has two options: transfer indiscriminately, which is institutionally hazardous, or withhold, which suppresses sharing. Security competence removes this dilemma by allowing the individual to distinguish safe from unsafe transfers, and therefore to share confidently within the safe set. On this reasoning, security does not compete with sharing but underwrites it.

The empirical evidence is consistent with this mechanism. [Iskandar et al. \(2025\)](#) found that digital privacy awareness directly improved digital citizenship literacy and mediated the effects of both digital citizenship education and technological literacy upon it, making privacy awareness the operative channel in their model. [Al-Otaibi \(2025\)](#) likewise treats digital security as a constitutive dimension of the digital citizenship construct rather than as an external constraint on it. The counterfactual case is equally informative. [Xu et al. \(2024\)](#), studying public sector universities, document knowledge hiding as an active behaviour with identifiable antecedents and measurable consequences for job performance, confirming that withholding is a real behavioural option in academic settings rather than a residual category. Measurement work supports treating security as a multidimensional behavioural construct rather than a single awareness score: [Bognár and Bottyán \(2024\)](#), developing and validating a personal cybersecurity awareness scale in a university population, identified five distinct behavioural dimensions and reported systematic variation across gender, age, discipline, and cultural background.

Digital Health and Well-being

Digital health and well-being concerns the capacity to maintain a balanced and sustainable relationship with technology, protecting physical and psychological health while limiting the adverse consequences of excessive or poorly regulated engagement. It includes ergonomic practice, the regulation of exposure, the allocation of rest, awareness of dependency, and the management of exposure to hostile or inappropriate content.

[Laffier et al. \(2025\)](#) develop a conceptual framework in which digital wellness skills, including emotional intelligence, mindfulness, mental health literacy, and critical thinking, moderate healthy engagement with technology by reducing risk and increasing benefit, and argue that these skills should be cultivated in workplaces as well as schools. [Neagu and Vieriu \(2025\)](#), studying university students, report that digital well-being is determined not by volume of screen exposure but by the quality, purpose, and context of digital engagement. [Wang et al. \(2023\)](#) demonstrate that cyber wellness literacy,

understood as the capacity to avoid internet dependency and maintain a healthy digital life, can be deliberately developed through structured intervention, with accompanying gains in motivation and emotional engagement.

The most directly relevant evidence concerns academics themselves. [Wang and Yao \(2025\)](#), surveying 251 academics across Chinese higher education institutions, decomposed technostress into five stressors and found that only techno-invasion, the penetration of work technology into personal time and space, significantly reduced psychological well-being; they also found that information and communication technology self-efficacy was negatively associated with techno-complexity and techno-insecurity. Two implications follow for the present study. The first is that the harm which digital work inflicts on academics is specifically a boundary harm rather than a volume or complexity harm. The second is that literacy and well-being are empirically linked, since self-efficacy attenuated two of the five stressors. A person who has established sustainable boundaries around digital work retains the discretionary capacity that knowledge sharing requires, because sharing is a voluntary behaviour that draws on reserves rather than on obligation. A person operating in a state of techno-invasion has no such reserves, whatever their skill level.

Knowledge Sharing Behaviour

Knowledge sharing denotes the reciprocal exchange of knowledge, experience, and skill among individuals and units, encompassing both explicit knowledge, which can be codified and documented, and tacit knowledge, which is acquired experientially and resists formalisation. It is properly understood as a continuing social process rather than a discrete transmission event, and it is voluntary in a way that most organisational behaviours are not: institutions can require attendance and compliance, but they cannot require the transfer of tacit understanding.

[Hosen et al. \(2023\)](#), examining knowledge sharing behaviour among academics through the theory of planned behaviour, perceived trust, and organisational climate, note that academics continue to hoard knowledge even when incentives to share are provided, which indicates that the behaviour is not principally a response to reward structures. [Ahmad et al. \(2023\)](#), studying academicians across Indian higher education institutions, likewise locate the determinants of sharing in attitudinal and relational factors rather than in institutional provision alone. [Fadilla et al. \(2024\)](#), applying an integrated model combining the theory of planned behaviour, social capital theory, and perceived cost to 239 academics, found social networks, trust, self-efficacy, management support, and social media use to be significant determinants, while commitment, extrinsic reward, and facilitating conditions were not.

The evidence on rewards specifically is instructive because it is counter-intuitive. [Nguyen Kim and Nguyen Thi Hang \(2024\)](#) found that rewards affected only explicit

knowledge sharing, leaving tacit sharing untouched, although both forms contributed positively to individual work performance. [Nguyen and Prentice \(2022\)](#), testing a reverse specification, found job performance to be significantly related to knowledge donating and collecting, and identified intrinsic rather than extrinsic rewards as the operative mechanism, with top management support moderating the relationship. The convergent conclusion is that the tacit component of knowledge sharing, which is the component universities most need, is not purchasable. It depends on conditions that make discretionary contribution feasible and safe, which returns the analysis to the individual-level capabilities that digital citizenship describes.

Dimensions of Knowledge Sharing

Following [Fan and Beh \(2024\)](#), knowledge sharing is treated here as operating through three interdependent dimensions: individual, organisational, and technological.

The individual dimension locates the person at the centre of exchange, encompassing expertise, communication capability, personal disposition, and motivation, together with the relational conditions of trust and belonging that make contribution feasible. [Peng \(2024\)](#), analysing social capital in the workplace, found that both relational and structural forms of social capital positively influence knowledge management processes and thereby enhance employees' knowledge sharing and transfer behaviours. [Hu and Noor \(2024\)](#), in a systematic review of knowledge sharing intentions, identified forty-seven determinants clustered into psychological, technological, environmental, and social themes, with trust and attitude occupying the central position.

The organisational dimension concerns the structures, regulations, climate, and incentive arrangements through which an institution either enables or obstructs exchange. Organisational structure establishes formal authority and patterns of communication between units, while organisational climate describes the experienced conditions under which individuals decide whether contribution is worthwhile. [Suliati et al. \(2025\)](#), surveying 377 employees, demonstrated that transformational leadership operates on innovative work behaviour through a sequential path running first through knowledge sharing and then through creative self-efficacy, with a significant indirect effect, which positions knowledge sharing as a mechanism through which leadership produces organisational outcomes rather than as an outcome in its own right. Within higher education specifically, [Chen et al. \(2024\)](#), surveying 570 university teachers across six institutions, found that transformational leadership raised knowledge sharing behaviour and that perceived organisational support mediated the relationship, indicating that the organisational dimension operates through what staff perceive the institution to provide rather than through formal provision alone.

The technological dimension concerns the institution's capacity to provide and use systems that facilitate exchange, including repositories, communication platforms, and

collaborative tools. Kucharska and Erickson (2023), analysing 2,168 cases across two countries and three industries, found that information technology competency dimensions support formal and informal knowledge sharing differently depending on national and industry context; in some settings all competency dimensions supported explicit sharing while only specific dimensions supported tacit sharing. Zhang and Jahng (2024), modelling use intentions on knowledge sharing platforms among 511 users, found that perceived enjoyment and community influence strengthened use intentions, whereas perceived knowledge value and platform design did not, indicating that the social properties of a platform outweigh its technical specification. Kumar et al. (2024), reviewing eighteen empirical studies on the influence of information and communication technologies upon knowledge sharing in higher education, found that such technologies shape sharing across teaching, governance, and research functions, while identifying digital literacy and connectivity as recurrent barriers to their effective use. This is a significant qualification: technological provision is a necessary condition but an inert one, activated only by the dispositions of those who use it.

Hypothesis Development

The reviewed evidence supports a model in which the three components of digital citizenship operate on knowledge sharing through distinct but convergent mechanisms. Digital literacy provides the operational capability to participate in digitally mediated exchange. Digital security provides the confidence to transfer material without institutional hazard. Digital health and well-being provides the discretionary capacity that voluntary contribution requires. Because all three components are behaviourally available to the respondent and all three plausibly condition exchange, positive associations are expected throughout, while the relative magnitudes remain an empirical question. Two principal hypotheses and their sub-hypotheses are accordingly proposed.

H1: *A statistically significant positive correlation exists between digital citizenship and knowledge sharing behaviour.*

H1a: *Digital literacy is significantly correlated with the dimensions of knowledge sharing.*

H1b: *Digital security is significantly correlated with the dimensions of knowledge sharing.*

H1c: *Digital health and well-being is significantly correlated with the dimensions of knowledge sharing.*

H2: *Digital citizenship has a statistically significant positive effect on knowledge sharing behaviour.*

H2a: *Digital literacy has a significant effect on knowledge sharing.*

H2b: *Digital security has a significant effect on knowledge sharing.*

H2c: *Digital health and well-being has a significant effect on knowledge sharing.*

H2d: *The three components jointly explain a significant proportion of variance in knowledge sharing, and their relative contributions differ.*

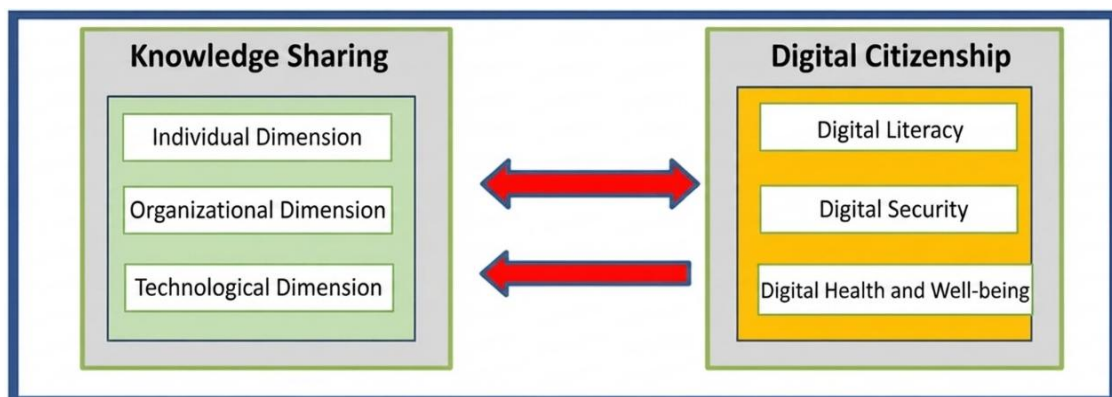


Figure 1: Hypothesised Research Model

Note: Solid arrows denote hypothesised effects (H2 and sub-hypotheses); the association between the composite constructs is tested as H1. The dimension labelled digital culture in the original model is designated digital literacy throughout this paper, as explained in Section 3.4.

METHODOLOGY

Research Design

The study employs a descriptive-analytical design combining documentary review of the relevant literature with the collection of primary quantitative data through a structured questionnaire. The design is appropriate because the research questions concern the prevailing level of two constructs within a defined population and the magnitude of association between them, neither of which requires manipulation. The study is cross-sectional, and the causal language used in the hypotheses should be read as denoting directional association within a theoretically specified model rather than as establishing temporal precedence.

Population and Sampling

The field of research comprised the faculties of Al-Mustansiriya University. Purposive sampling was applied, targeting heads of academic departments on the grounds set out in Section 1.2. The total population of department heads was 85, of whom 83 were reachable and received questionnaires. Seventy-eight instruments were returned complete and usable, and five were excluded as incomplete, yielding an effective response rate of 94.0% against distribution and 91.8% against the full population. The near-census character of the sample is methodologically consequential: because the realised sample covers 91.8% of the target population, sampling error is minimal and the findings can be read as descriptive of the population rather than as inferences from a sample to it. The distribution of questionnaires is summarised in [Table 1](#).

Table 1: Distribution and Return of Research Questionnaires

Total department heads	Questionnaires distributed	Returned and valid	Excluded as incomplete	Response rate (%)
85	83	78	5	94.0

Note: Response rate is calculated against questionnaires distributed. The valid sample represents 91.8% of the total population of department heads.

A sample of 78 provides adequate power for the analyses conducted. For a two-tailed correlation test at $\alpha = .05$ with power of .80, the minimum detectable effect is approximately $r = .31$; all correlations of theoretical interest in this study exceed that threshold. For multiple regression with three predictors under the same conditions, the design is powered to detect effect sizes of $f\text{-squared} = .14$ and above, and the observed model effect substantially exceeds this.

Demographic Profile

Demographic characteristics are reported in [Table 2](#). They are presented not as background but because they bear on the interpretation of the substantive findings.

Table 2: Demographic Characteristics of the Research Sample (N = 78)

Variable	Category	f	%
Gender	Male	58	74.4
	Female	20	25.6
Academic qualification	Master	5	6.4
	PhD	73	93.6
Academic title	Assistant Professor	35	44.9
	Professor	43	55.1
Age (years)	30 to less than 40	0	0.0
	40 to less than 50	51	65.4
	50 to less than 60	27	34.6
	60 and above	0	0.0
Years of service	5 to less than 10	0	0.0
	10 to less than 15	27	34.6
	15 to less than 20	51	65.4
	20 and above	0	0.0

Note: f = frequency. Percentages are calculated on the valid sample of 78 respondents and may not sum to 100.0 owing to rounding.

The sample is homogeneous in ways that matter. Every respondent holds a senior academic title, 93.6% hold a doctorate, and all fall within a twenty-year age band between 40 and 60 years. Years of service cluster entirely within the 10 to 20 year range, with 65.4% in the 15 to under 20 year category and 34.6% in the 10 to under 15 year category; no respondent reported fewer than 10 or more than 20 years of service. This homogeneity has a methodological consequence worth stating explicitly. Because the

sample contains no early-career and no late-career academics, the between-person variation observed in the substantive variables cannot be attributed to generational differences in technology exposure. Variation in digital citizenship within this sample reflects differences in practice among broadly comparable individuals, which strengthens the interpretation of the correlational findings. The corresponding limitation is that the findings cannot speak to how the relationship behaves among academics at the extremes of the career distribution.

Male respondents constituted 74.4% of the sample and female respondents 25.6%. This distribution reflects the composition of departmental leadership at the institution rather than a sampling decision, since the study approached the entire population of department heads.

Instrument

Data were collected through a structured questionnaire of 30 items measured on a five-point Likert scale anchored at strongly agree (5), agree (4), somewhat agree (3), disagree (2), and strongly disagree (1). The instrument comprised six subscales of five items each. Digital citizenship was measured through digital literacy (items 1 to 5), digital security (items 6 to 10), and digital health and well-being (items 11 to 15). Knowledge sharing was measured through the individual dimension (items 16 to 20), the organisational dimension (items 21 to 25), and the technological dimension (items 26 to 30). Items were developed from the constructs identified in Section 2 and adapted to the university context, with digital citizenship items phrased at the level of personal practice and knowledge sharing items phrased at the level of institutional provision, consistent with the theoretical position that sharing behaviour is individually enacted but organisationally conditioned.

Terminological note. The dimension labelled digital literacy in this paper corresponds to what parts of the digital citizenship literature term digital culture. The label digital literacy is adopted here because the constituent items measure capability in keeping pace with technological change, evaluating information sources, using communication platforms, and deploying technology for instructional purposes, all of which fall within standard definitions of literacy rather than of culture. The label is applied consistently throughout.

Validity and Reliability

Internal consistency at item level was examined using corrected item-total correlations, with a retention threshold of .30. All 30 items met the criterion, with coefficients ranging from .339 to .543, and all were statistically significant. No item was sufficiently weakly associated with its subscale to warrant removal. Item-level results are reported in [Table 3](#).

Table 3: Corrected Item-Total Correlations for the Research Instrument

Item	r(it)	p	Item	r(it)	p	Item	r(it)	p
1	.526	<.001	11	.525	<.001	21	.388	<.001
2	.458	<.001	12	.487	<.001	22	.462	<.001
3	.451	<.001	13	.339	.002	23	.406	<.001
4	.423	<.001	14	.467	<.001	24	.456	<.001
5	.506	<.001	15	.539	<.001	25	.346	.002
6	.390	<.001	16	.379	<.001	26	.435	<.001
7	.473	<.001	17	.439	<.001	27	.375	<.001
8	.466	<.001	18	.461	<.001	28	.400	<.001
9	.415	<.001	19	.413	<.001	29	.537	<.001
10	.543	<.001	20	.496	<.001	30	.475	<.001

Note: r(it) = corrected item-total correlation. All coefficients exceed the retention threshold of .30; no item was removed. Analysis conducted in SPSS 26.

Scale reliability was assessed using Cronbach's alpha, adopting the conventional threshold of .70 for behavioural research. Subscale coefficients ranged from .796 to .845, the two composite scales returned .841 and .818, and the full instrument returned .890. Table 4 reports the standard error of measurement for each subscale, computed as the product of the subscale standard deviation and the square root of one minus alpha. These values, ranging from .229 to .271 scale points, quantify the precision of individual scores and indicate that the observed differences between subscale means reported in Section 4 exceed the measurement error of the instrument.

Table 4: Reliability Coefficients and Standard Error of Measurement for Research Variables and Dimensions

Variable / dimension	k	alpha	SEm	Level
Digital literacy	5	.845	.229	Good
Digital security	5	.823	.256	Good
Digital health and well-being	5	.820	.250	Good
Individual dimension	5	.809	.262	Good
Organisational dimension	5	.796	.271	Acceptable
Technological dimension	5	.826	.254	Good
Digital citizenship (composite)	15	.841	—	Good
Knowledge sharing (composite)	15	.818	—	Good
Total instrument	30	.890	—	High

Analytical Procedure

Analysis proceeded in five stages using SPSS 26. Distributional assumptions were examined first through skewness and kurtosis coefficients, with values within plus or minus one treated as acceptable for parametric analysis. Descriptive statistics were then computed for each item and subscale, comprising the arithmetic mean, standard deviation, relative importance expressed as the mean as a percentage of the scale maximum, and the

coefficient of variation. Third, each subscale mean was tested against the scale midpoint of 3.00 using a one-sample t-test, with Cohen's d reported as the standardised effect size and 95% confidence intervals computed around each mean. Fourth, Pearson correlation coefficients were computed between all components of digital citizenship and all dimensions of knowledge sharing. Fifth, simple and multiple linear regression models were estimated, with Cohen's f-squared reported for each model, variance inflation factors and tolerance values examined for collinearity, the Durbin-Watson statistic examined for residual independence, and the explained variance of the multiple model decomposed into the relative contribution of each predictor using the product of each standardised coefficient and its zero-order correlation with the criterion.

Ethical procedures followed institutional requirements. Participation was voluntary, the purpose of the study was disclosed to respondents in advance, no personally identifying information was recorded on the instrument, and responses were analysed only in aggregate.

RESULTS

Distributional Assumptions

Skewness and kurtosis coefficients for all variables and dimensions are reported in [Table 5](#). All values fall within plus or minus one, indicating no substantial departure from normality and supporting the use of Pearson correlation and linear regression. The absence of ceiling effects, notwithstanding uniformly high means, is confirmed by the moderate negative skew values, which range from -.360 to .266 and indicate dispersed rather than clustered responses.

Table 5: Normality of Distribution for Research Variables and Dimensions

Variable / dimension	Skewness	Kurtosis	Judgement
Digital literacy	-0.258	-0.546	Acceptable
Digital security	-0.186	-0.460	Acceptable
Digital health and well-being	-0.125	-0.189	Acceptable
Individual dimension	-0.315	-0.604	Acceptable
Organisational dimension	-0.141	-0.760	Acceptable
Technological dimension	-0.181	-0.537	Acceptable
Digital citizenship	0.266	-0.128	Acceptable
Knowledge sharing	-0.360	0.094	Acceptable

Note: Values within ± 1.00 were treated as indicating no substantial departure from normality for parametric analysis.

Descriptive Results: Components of Digital Citizenship

Item-level descriptive statistics for the three components of digital citizenship are reported in [Table 6](#), [7](#), and [8](#).

Digital literacy recorded the highest subscale mean at 4.059, with a standard deviation of .582, relative importance of 81.2%, and a coefficient of variation of 14.3%. As shown in Table 6, the strongest item was the first, concerning department heads' engagement with technological progress in ways that permit mastery of it ($M = 4.180$, $SD = .550$), while the weakest was item 4, concerning the development of distance learning methods through e-learning programmes ($M = 3.940$, $SD = .640$). The 0.240 gap between these items is notable in kind rather than only in magnitude: the strongest item measures personal disposition toward technological change, whereas the weakest measures a specific applied deliverable. The pattern suggests that general digital orientation among department heads outpaces the implementation of particular instructional technologies, which may reflect differences in the suitability of e-learning across academic specialisations.

Table 6: Descriptive Statistics for Digital Literacy Items

No.	Heads of departments are concerned with	M	SD	RI (%)	CV (%)	Level
1	Keeping pace with technological progress in a way that helps them master it	4.180	0.550	83.6	13.2	High
2	Verifying information and evaluating its sources before use	4.100	0.570	82.0	13.9	High
3	Sharing knowledge through various social media platforms	4.020	0.610	80.4	15.2	High
4	Developing various methods of distance learning through e-learning programmes	3.940	0.640	78.8	16.2	High
5	Employing technology in innovative ways suited to the requirements of e-learning	4.055	0.540	81.1	13.3	High
—	Total digital literacy	4.059	0.582	81.2	14.3	High

Note: M = mean; SD = standard deviation; RI = relative importance, expressed as the mean as a percentage of the scale maximum; CV = coefficient of variation. N = 78. Analysis conducted in SPSS 26.

Digital security recorded a subscale mean of 3.882, with a standard deviation of .608, relative importance of 77.6%, and a coefficient of variation of 15.7%. Table 7 shows that the strongest item was item 8, concerning the maintenance of information privacy and the withholding of information absent formal approval ($M = 4.020$, $SD = .550$), while the weakest was item 9, concerning verification before transmitting personal information to an entity or individual through a website ($M = 3.780$, $SD = .660$). The contrast is diagnostic. The strongest item describes a rule-governed institutional behaviour, whereas the weakest describes an independent judgement exercised in an unstructured situation. Department heads are therefore stronger at following established confidentiality protocols than at evaluating novel requests on their merits, which locates the security vulnerability precisely at the point where protocol does not reach. Item 9 also returned the highest coefficient of variation in this subscale at 17.5%, confirming that verification practice is the least consistent behaviour within it.

Table 7: Descriptive Statistics for Digital Security Items

No.	Heads of departments are concerned with	M	SD	RI (%)	CV (%)	Level
6	Knowledge and awareness of how to deal with hacking and electronic fraud	3.910	0.600	78.2	15.3	High
7	Regularly updating operating systems and protecting personal computers	3.840	0.630	76.8	16.4	High
8	Maintaining information privacy and withholding it absent formal approval	4.020	0.550	80.4	13.7	High
9	Verifying an entity or website before sending personal information to it	3.780	0.660	75.6	17.5	High
10	Using the facility for blocking spam messages received	3.860	0.600	77.2	15.5	High
—	Total digital security	3.882	0.608	77.6	15.7	High

Note: M = mean; SD = standard deviation; RI = relative importance, expressed as the mean as a percentage of the scale maximum; CV = coefficient of variation. N = 78. Analysis conducted in SPSS 26.

Digital health and well-being recorded the lowest subscale mean among the digital citizenship components at 3.823, with a standard deviation of .589, relative importance of 76.5%, and a coefficient of variation of 15.4%. As [Table 8](#) shows, the strongest item was item 11, concerning awareness of electronic dependency and methods of mitigating it (M = 3.880, SD = .580), while the weakest was item 14, concerning the allocation of rest periods and physical activity during computer work (M = 3.740, SD = .640). The two items stand in an informative relation: the former measures awareness and the latter measures enactment of that same awareness. The gap between them indicates that department heads understand the requirements of digital health more completely than their working conditions permit them to practise it, a gap attributable to administrative and academic workload rather than to deficient knowledge.

Table 8: Descriptive Statistics for Digital Health and Well-being Items

No.	Heads of departments are concerned with	M	SD	RI (%)	CV (%)	Level
11	Awareness of electronic dependency and ways of mitigating it	3.880	0.580	77.6	14.9	High
12	Maintaining healthy posture while using the computer	3.840	0.610	76.8	15.9	High
13	Using technology moderately and providing adequate lighting to reduce eye strain	3.790	0.600	75.8	15.8	High
14	Allocating rest periods and undertaking physical exercise during computer work	3.740	0.640	74.8	17.1	High
15	Developing methods for analysing and dealing with offensive digital content	3.865	0.560	77.3	14.5	High
—	Total digital health and well-being	3.823	0.589	76.5	15.4	High

Note: M = mean; SD = standard deviation; RI = relative importance, expressed as the mean as a percentage of the scale maximum; CV = coefficient of variation. N = 78. Analysis conducted in SPSS 26.

Descriptive Results: Dimensions of Knowledge Sharing

The individual dimension recorded the highest mean among the knowledge sharing dimensions at 3.982, with a standard deviation of .600, relative importance of 79.6%, and a coefficient of variation of 15.1%.

Table 9 shows the strongest item to be item 16, concerning encouragement of department heads to discuss work procedures and instructions ($M = 4.080$, $SD = .560$), and the weakest to be item 19, concerning motivation to generate knowledge from internal and external sources ($M = 3.890$, $SD = .650$).

Table 9: Descriptive Statistics for the Individual Dimension of Knowledge Sharing

No.	The university is concerned with	M	SD	RI (%)	CV (%)	Level
16	Encouraging department heads to discuss work procedures and instructions	4.080	0.560	81.6	13.7	High
17	Department heads sharing knowledge and information with one another	4.040	0.580	80.8	14.4	High
18	Providing an atmosphere of safety and trust for acquiring new knowledge	3.960	0.620	79.2	15.7	High
19	Motivating department heads to generate knowledge from internal and external sources	3.890	0.650	77.8	16.7	High
20	Enhancing the efficiency of department heads through knowledge sharing	3.940	0.590	78.8	15.0	High
—	Total individual dimension	3.982	0.600	79.6	15.1	High

Note: M = mean; SD = standard deviation; RI = relative importance, expressed as the mean as a percentage of the scale maximum; CV = coefficient of variation. N = 78. Analysis conducted in SPSS 26.

The organisational dimension recorded the lowest mean of any dimension in the study at 3.708, with a standard deviation of .600, relative importance of 74.2%, and a coefficient of variation of 16.2%. Table 10 shows the strongest item to be item 21, concerning reliance on laws, regulations, and instructions for knowledge sharing ($M = 3.780$, $SD = .580$), and the weakest to be item 23, concerning reliance on a reward system supporting the knowledge sharing process ($M = 3.550$, $SD = .690$).

Item 23 is the weakest item in the entire instrument and also returned the highest coefficient of variation of any item at 19.4%, indicating both the lowest level and the least agreement among respondents. The combination of a low mean with high dispersion suggests not a uniformly absent reward system but an unevenly experienced one.

Table 10: Descriptive Statistics for the Organisational Dimension of Knowledge Sharing

No.	The university relies on	M	SD	RI (%)	CV (%)	Level
21	Laws, regulations, and instructions governing knowledge sharing	3.780	0.580	75.6	15.3	High
22	Creativity in solving problems encountered during work	3.740	0.610	74.8	16.3	High
23	A reward system that supports the knowledge sharing process	3.550	0.690	71.0	19.4	Moderate
24	Participation of department heads in developing solutions to work problems	3.760	0.590	75.2	15.7	High
25	Focused promotion of knowledge sharing behaviours	3.710	0.620	74.2	16.7	High
—	Total organisational dimension	3.708	0.600	74.2	16.2	High

Note: M = mean; SD = standard deviation; RI = relative importance, expressed as the mean as a percentage of the scale maximum; CV = coefficient of variation. N = 78. Analysis conducted in SPSS 26.

The technological dimension recorded a mean of 3.813, with a standard deviation of .610, relative importance of 76.3%, and a coefficient of variation of 16.0%. As shown in Table 11, the strongest item was item 26, concerning provision of human resources experienced in modern technological systems (M = 3.860, SD = .590), and the weakest was item 28, concerning attention to department heads' desire to participate in specialised software courses and workshops (M = 3.760, SD = .650). The technological dimension is internally the most compressed in the study, with only .100 separating its strongest and weakest items, indicating that respondents perceive technological provision as uniform across its aspects rather than strong in some and deficient in others.

Table 11: Descriptive Statistics for the Technological Dimension of Knowledge Sharing

No.	The university is concerned with	M	SD	RI (%)	CV (%)	Level
26	Providing human resources experienced in modern technological systems	3.860	0.590	77.2	15.3	High
27	Providing modern technology that contributes to knowledge sharing	3.840	0.600	76.8	15.6	High
28	Department heads' desire to join specialised software courses and workshops	3.760	0.650	75.2	17.3	High
29	Providing multiple electronic channels for reviewing submitted suggestions	3.790	0.620	75.8	16.4	High
30	Adopting modern communication methods permitting knowledge exchange	3.815	0.590	76.3	15.5	High
—	Total technological dimension	3.813	0.610	76.3	16.0	High

Note: M = mean; SD = standard deviation; RI = relative importance, expressed as the mean as a percentage of the scale maximum; CV = coefficient of variation. N = 78. Analysis conducted in SPSS 26.

Comparison Against the Scale Midpoint

To establish whether the observed levels differ significantly from neutrality rather than merely appearing high, each subscale mean was tested against the scale midpoint of 3.00 using a one-sample t-test. Results, together with Cohen's d and 95% confidence intervals, are reported in [Table 12](#).

Table 12: One-Sample t-Tests of Subscale Means Against the Scale Midpoint (N = 78)

Variable / dimension	M	SD	t(77)	p	d	95% CI
Digital literacy	4.059	0.582	16.07	<.001	1.82	[3.928, 4.190]
Digital security	3.882	0.608	12.81	<.001	1.45	[3.745, 4.019]
Digital health and well-being	3.823	0.589	12.34	<.001	1.40	[3.690, 3.956]
Individual dimension	3.982	0.600	14.45	<.001	1.64	[3.847, 4.117]
Organisational dimension	3.708	0.600	10.42	<.001	1.18	[3.573, 3.843]
Technological dimension	3.813	0.610	11.77	<.001	1.33	[3.675, 3.951]

Note: Test value = 3.00 (scale midpoint). d = Cohen's d. CI = confidence interval for the mean. All tests are two-tailed.

All six subscales exceeded the midpoint at $p < .001$, with t-values ranging from 10.42 to 16.07 and effect sizes from $d = 1.18$ to $d = 1.82$, all of which are large by conventional standards. The confidence intervals are informative about the ordering of the dimensions. The interval for digital literacy, [3.928, 4.190], does not overlap with that for the organisational dimension, [3.573, 3.843], establishing that the difference between the strongest and weakest constructs is statistically reliable and not an artefact of measurement imprecision. The intervals for digital security, digital health and well-being, and the technological dimension overlap substantially, indicating that these three should be read as occupying a common intermediate band rather than as ordered among themselves.

Correlation Analysis

Pearson correlation coefficients between the components of digital citizenship and the dimensions of knowledge sharing are reported in [Table 13](#). Shared variance is reported alongside each coefficient to express the strength of association in interpretable terms.

Digital citizenship correlated with knowledge sharing at $r = .615$ ($p < .001$), a moderate to strong positive association accounting for 37.8% of shared variance, which supports H1. All fifteen sub-relationships were positive and statistically significant, supporting H1a, H1b, and H1c. The strongest sub-relationship was between digital health and well-being and the individual dimension ($r = .394$), and the weakest was between digital literacy and the technological dimension ($r = .189$).

The pattern within the matrix rewards closer attention. Digital literacy correlates most

strongly with the organisational dimension ($r = .331$) and most weakly with the technological dimension ($r = .189$), which is the opposite of what a straightforward competence model would predict. Personally capable individuals are not those who report the strongest technological provision for knowledge sharing, confirming that individual capability and institutional technological readiness are distinct and only loosely coupled. Digital health and well-being, by contrast, correlates most strongly with the individual dimension ($r = .394$) and second most strongly with the technological dimension ($r = .372$), while returning the weakest association of the three components with the organisational dimension ($r = .257$). Its influence therefore operates through personal and technological channels rather than through formal institutional arrangements. Digital security occupies an intermediate position, with associations distributed comparatively evenly across the three dimensions, ranging from .291 to .337.

Table 13: Correlations Between Components of Digital Citizenship and Dimensions of Knowledge Sharing

Component	Individual	Organisational	Technological	Knowledge sharing (total)
Digital literacy	.323**	.331**	.189**	.399** (15.9%)
Digital security	.318**	.337**	.291**	.448** (20.1%)
Digital health and well-being	.394**	.257**	.372**	.485** (23.5%)
Digital citizenship (total)	—	—	—	.615** (37.8%)

Note: N = 78. ** $p < .01$. Values in parentheses in the final column express shared variance (r squared) as a percentage.

Simple Regression Analysis

Simple linear regression models were estimated for digital citizenship and for each of its components. Results are reported in Table 14, with adjusted R-squared and Cohen's f -squared added to the conventional output.

Table 14: Simple Linear Regression of Digital Citizenship and Its Components on Knowledge Sharing

Predictor	B	t	p	R ²	Adj. R ²	f ²	F(1, 76)	p
Digital literacy	0.291	3.791	<.001	.159	.148	.189	14.373	<.001
Digital security	0.313	4.369	<.001	.201	.190	.252	19.085	<.001
Digital health and well-being	0.350	4.833	<.001	.235	.225	.307	23.361	<.001
Digital citizenship (composite)	0.610	6.798	<.001	.378	.370	.608	46.208	<.001

Note: N = 78. B = unstandardised regression coefficient. f^2 = Cohen's effect size, computed as $R^2 / (1 - R^2)$; values of .02, .15, and .35 denote small, medium, and large effects respectively. Each predictor was entered in a separate model.

Digital citizenship exerted a positive and statistically significant effect on knowledge sharing ($B = .610$, $t = 6.798$, $p < .001$), explaining 37.8% of variance ($F = 46.208$, $p < .001$), which supports H2. The corresponding effect size of f -squared = .608 is large by conventional criteria. All three components exerted significant individual effects, supporting H2a, H2b, and H2c. Digital health and well-being accounted for the largest share of variance (R -squared = .235), followed by digital security (R -squared = .201) and digital literacy (R -squared = .159). Effect sizes for the components were f -squared = .307, .252, and .189 respectively, all in the medium to large range. Adjusted R -squared values remained close to their unadjusted counterparts, differing by no more than .011, which indicates that the models are not overfitted relative to the sample size.

Multiple Regression Analysis

The three components were entered simultaneously to assess their relative contribution while controlling for one another. Coefficients are reported in Table 15 and model summary statistics in Table 16.

Table 15: Multiple Linear Regression Coefficients for the Components of Digital Citizenship

Predictor	B	beta	t	p
Digital literacy	0.163	.224	2.297	.024
Digital security	0.207	.296	3.048	.003
Digital health and well-being	0.238	.330	3.339	.001

Note: $N = 78$. Criterion variable: knowledge sharing. B = unstandardised coefficient; β = standardised coefficient. All three predictors entered simultaneously.

Table 16: Summary of the Multiple Regression Model

R^2	Adj. R^2	f^2	$F(3, 74)$	p	Durbin-Watson
.382	.357	.618	15.234	<.001	1.807

Note: $N = 78$. f^2 computed as $R^2 / (1 - R^2)$. Durbin-Watson values between 1.5 and 2.5 indicate no material first-order autocorrelation in the residuals.

The combined model explained 38.2% of variance in knowledge sharing and was statistically significant ($F = 15.234$, $p < .001$), with an effect size of f -squared = .618. All three predictors retained significance. Digital health and well-being made the largest standardised contribution ($\beta = .330$, $p = .001$), followed by digital security ($\beta = .296$, $p = .003$) and digital literacy ($\beta = .224$, $p = .024$). The Durbin-Watson statistic of 1.807 falls within the acceptable range and indicates no material autocorrelation in the residuals. The increment in explained variance from the single-predictor digital citizenship model to the three-predictor model is only .004, which indicates that the composite scale captures nearly all of the predictive information carried by its components, while the decomposition reveals how that information is distributed among them.

Collinearity Diagnostics

Variance inflation factors and tolerance values were examined for the three predictors. Results are reported in [Table 17](#).

Table 17: Collinearity Diagnostics for the Components of Digital Citizenship

Component	Tolerance	VIF	Judgement
Digital literacy	.878	1.139	No collinearity concern
Digital security	.887	1.128	No collinearity concern
Digital health and well-being	.856	1.168	No collinearity concern

Note: VIF = variance inflation factor. Values below 5.00 and tolerance above .20 are conventionally regarded as acceptable. Dimensions of knowledge sharing were not included, as they constitute the criterion rather than predictors.

Variance inflation factors ranged from 1.128 to 1.168 and tolerance values from .856 to .887, all comfortably within acceptable limits and indicating no problematic collinearity. The practical significance of this result exceeds its technical function. Variance inflation factors this close to unity establish that digital literacy, digital security, and digital health and well-being are near-independent in this population: a department head who is technically capable is not thereby secure, and one who is secure is not thereby maintaining sustainable digital practice. The three are empirically separable competencies, which means an institution cannot develop one and expect the others to follow, and equally that each can be addressed independently through targeted intervention.

Relative Weight Analysis

Because the three predictors are near-independent, the explained variance of the multiple model can be partitioned among them by taking the product of each standardised coefficient and its zero-order correlation with the criterion. The resulting contributions sum exactly to the model R-squared of .382, confirming the internal consistency of the decomposition. Results are reported in [Table 18](#) and displayed in [Figure 2](#).

Table 18: Relative Weight Decomposition of Explained Variance in Knowledge Sharing

Component	beta	r	Relative weight	Share of R ² (%)
Digital health and well-being	.330	.485	.1600	41.9
Digital security	.296	.448	.1326	34.7
Digital literacy	.224	.399	.0894	23.4
Total	—	—	.3820	100.0

Note: Relative weight computed as the product of each standardised coefficient and its zero-order correlation with the criterion. Weights sum to the model R² of .382, confirming complete decomposition. Components are ordered by contribution.

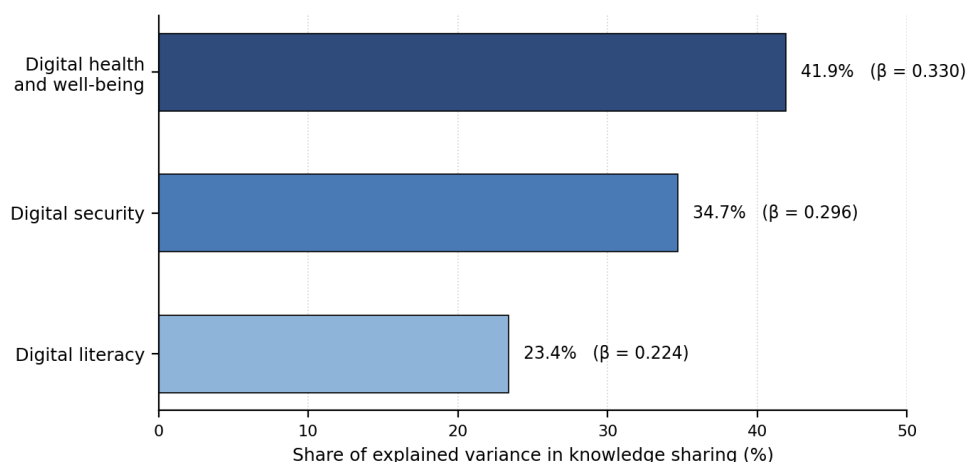


Figure 2: Relative Contribution of Digital Citizenship Components to Explained Variance in Knowledge Sharing

Note: Bars show each component's share of the 38.2% of variance in knowledge sharing explained by the three-predictor model. Relative weights are the product of each standardised coefficient and its zero-order correlation with the criterion and sum to $R^2 = .382$. $N = 78$.

The decomposition shows that digital health and well-being accounts for 41.9% of the explained variance in knowledge sharing, digital security for 34.7%, and digital literacy for 23.4%. Stated differently, the two protective and regulatory components of digital citizenship together account for 76.6% of the model's explanatory power, while the capability component accounts for less than a quarter. This ordering is the principal analytical finding of the study, and it inverts the emphasis typically placed on skills development in institutional digital transformation programmes.

Summary of Hypothesis Testing

A summary of hypothesis testing outcomes is presented in [Table 19](#).

Table 19: Summary of Hypothesis Testing Results

Hypothesis	Statistical indicator	Decision
H1: Digital citizenship is correlated with knowledge sharing	$r = .615, p < .001$	Supported
H1a: Digital literacy is correlated with knowledge sharing dimensions	$r = .189 \text{ to } .331, \text{ all } p < .01$	Supported
H1b: Digital security is correlated with knowledge sharing dimensions	$r = .291 \text{ to } .337, \text{ all } p < .01$	Supported
H1c: Digital health and well-being is correlated with knowledge sharing dimensions	$r = .257 \text{ to } .394, \text{ all } p < .01$	Supported
H2: Digital citizenship affects knowledge sharing	$R^2 = .378, F = 46.208, p < .001$	Supported

Table 19: Summary of Hypothesis Testing Results (cont...)

Hypothesis	Statistical indicator	Decision
H2a: Digital literacy affects knowledge sharing	B = 0.291, t = 3.791, p < .001	Supported
H2b: Digital security affects knowledge sharing	B = 0.313, t = 4.369, p < .001	Supported
H2c: Digital health and well-being affects knowledge sharing	B = 0.350, t = 4.833, p < .001	Supported
H2d: The three components jointly explain variance and differ in contribution	R ² = .382, F = 15.234, p < .001; weights 41.9 / 34.7 / 23.4%	Supported

Note: N = 78. All analyses conducted in SPSS 26.

DISCUSSION

The findings support the proposed model while reordering its internal emphasis in a way that carries direct implications for institutional practice. Three results merit particular attention.

The Primacy of Protective and Regulatory Components

The most consequential finding is that digital health and well-being and digital security jointly account for 76.6% of the variance that digital citizenship explains in knowledge sharing, while digital literacy accounts for 23.4%. This does not indicate that literacy is unimportant; its individual effect was significant and its effect size medium. It indicates that literacy functions as a necessary enabling condition that is already widely satisfied in this population, and that variation in sharing behaviour is therefore driven by the components on which respondents differ more consequentially.

The result aligns closely with the argument advanced by [Koch and Fehlmann \(2025\)](#), who contend that digital literacy among university staff is essential but insufficient for digital performance, which depends additionally on institutional conditions and dispositional factors. The present study supplies quantitative support for that position and specifies which additional factors matter most within the digital citizenship frame. It is similarly consistent with [Caroline et al. \(2025\)](#), whose review found no generic measure of digital literacy that reliably predicts innovative work behaviour, a null result that becomes intelligible if literacy operates as a threshold condition rather than as a linear driver.

The prominence of digital health and well-being connects directly to the finding of [Wang and Yao \(2025\)](#) that among five technostress dimensions only techno-invasion significantly reduced academics' psychological well-being. If the harm that digital work inflicts on academics is specifically a boundary harm, and if knowledge sharing is a voluntary behaviour requiring discretionary capacity, then a department head whose work technology has colonised personal time has no reserve from which to contribute. This interpretation is reinforced by the descriptive finding reported in Section 4.2: the

weakest item in the digital health subscale concerned the allocation of rest during computer work, while the strongest concerned awareness of dependency. Department heads know what sustainable practice requires and cannot enact it. The correlational evidence indicates that this shortfall is not merely a welfare concern but a determinant of organisational behaviour.

Security as an Enabler Rather than a Constraint

The positive and substantial contribution of digital security, at 34.7% of explained variance, contradicts an intuitive expectation that security consciousness would suppress knowledge sharing by making individuals cautious about transfer. The data show the opposite relationship, and the item-level pattern explains why. Respondents were strongest at rule-governed confidentiality behaviour and weakest at independent verification in unstructured situations. Security competence in this population therefore operates by delineating the boundary of safe transfer, within which sharing can proceed confidently. Absent that boundary, the rational response to institutionally sensitive material is to withhold it.

This reading is consistent with [Iskandar et al. \(2025\)](#), who found digital privacy awareness to be the operative mediating channel through which digital citizenship education and technological literacy influenced digital citizenship literacy, while participatory activity was not a significant mediator. It also gains support from the counterfactual evidence: [Xu et al. \(2024\)](#) document knowledge hiding as an active and consequential behaviour in public sector universities, establishing that withholding is a live behavioural alternative rather than a residual. The policy implication is that security governance and knowledge sharing policy should be designed together rather than in separate institutional silos, since the former conditions the latter.

The Organisational Deficit

The organisational dimension recorded the lowest mean of any construct in the study ($M = 3.708$), and its weakest item, concerning the reward system supporting knowledge sharing, was the weakest item in the entire instrument ($M = 3.550$) with the highest dispersion ($CV = 19.4\%$). Knowledge sharing at this institution therefore rests disproportionately on individual willingness rather than on institutional architecture.

Whether this constitutes a remediable deficiency depends on what rewards can achieve, and the evidence here counsels precision. [Nguyen Kim and Nguyen Thi Hang \(2024\)](#) found that rewards affected explicit knowledge sharing only, leaving tacit sharing unchanged. [Nguyen and Prentice \(2022\)](#) identified intrinsic rather than extrinsic rewards as the operative mechanism, with top management support acting as moderator, and [Fadilla et al. \(2024\)](#) found extrinsic reward to be non-significant among academics while trust, self-efficacy, social networks, and management support were significant.

Hosen et al. (2023) observe that academics continue to hoard knowledge despite incentives being provided. The convergent implication is that introducing a conventional extrinsic reward scheme would be unlikely to raise the tacit sharing that universities most need. The organisational deficit is better addressed through climate, trust, and structured occasions for exchange than through incentive payments.

The high dispersion on this item carries an additional diagnostic message. A uniformly low score would indicate a system that does not exist; a low score with wide dispersion indicates one that exists but is experienced inconsistently across departments. The remedy is consistency of application rather than creation of new machinery.

The Decoupling of Individual Capability from Technological Provision

The weakest association in the correlation matrix, between digital literacy and the technological dimension ($r = .189$), is theoretically informative. Individual digital capability and institutional technological readiness for knowledge sharing are only loosely coupled in this setting. The finding supports Zhang and Jahng (2024), who found that perceived enjoyment and community influence drove use intentions on knowledge sharing platforms while platform design and perceived knowledge value did not, indicating that the social properties of a technological environment outweigh its technical specification. Kucharska and Erickson (2023) likewise found that information technology competency dimensions support explicit and tacit sharing differently across national and industry contexts, rather than uniformly. For Al-Mustansiriya University the implication is that investment in platforms will not by itself convert individual capability into exchange behaviour. The technological dimension recorded the most compressed item range in the study, indicating adequate and uniform provision; the constraint therefore lies not in what is provided but in the conditions under which staff are able to use it.

Read together with the collinearity diagnostics, which established that the three components of digital citizenship are near-independent, these results describe an institution in which capability, protection, and sustainability must each be addressed on their own terms. This is a more demanding conclusion than a composite digital citizenship score would yield, but it is also a more actionable one.

CONCLUSION, RECOMMENDATIONS, AND IMPLICATIONS

Conclusion

This study examined whether digital citizenship promotes knowledge sharing behaviour among heads of academic departments at Al-Mustansiriya University, and which of its components does most of the work. Digital citizenship was positively and significantly associated with knowledge sharing ($r = .615$, $p < .001$) and explained 37.8% of its

variance, with all fifteen sub-relationships positive and significant. All hypotheses were supported. The distinctive contribution lies in the decomposition: of the 38.2% of variance explained by the three components entered simultaneously, digital health and well-being accounted for 41.9%, digital security for 34.7%, and digital literacy for 23.4%. The protective and regulatory components therefore carry more than three quarters of the explanatory weight. Collinearity diagnostics confirmed the three to be near-independent, establishing that they constitute separable competencies rather than facets of a single underlying capability. Descriptively, digital literacy was the strongest construct measured and organisational support for knowledge sharing the weakest, with the reward system the weakest single item in the instrument and the most unevenly experienced.

Recommendations

1. Reweight digital transformation investment. Because digital health and well-being and digital security jointly account for 76.6% of explained variance, institutional resources should be allocated accordingly rather than concentrated on skills training, which addresses the component contributing least at the margin in this population.
2. Introduce boundary-protective workload policy. Given the evidence that boundary intrusion rather than volume of use predicts harm, the university should establish explicit norms on out-of-hours digital contact, protected periods free of platform obligations, and workload recognition for the administrative digital burden carried by department heads.
3. Target security training at judgement rather than protocol. Respondents were strong on rule-governed confidentiality and weak on independent verification. Training should therefore use scenario-based exercises in ambiguous situations rather than restating existing protocols, which are already well observed.
4. Address the organisational deficit through climate rather than incentives. Because extrinsic rewards influence explicit but not tacit sharing, the university should invest in structured cross-departmental exchange occasions, communities of practice, and visible senior recognition of contribution, while applying existing reward provisions consistently across departments to remove the dispersion observed on this item.
5. Integrate security and knowledge sharing governance. The two should be designed jointly, with information classification schemes that state positively what may be shared and with whom, rather than as separate policy regimes that place staff in avoidable uncertainty.
6. Differentiate e-learning support by discipline. Since e-learning development was the weakest digital literacy item, support should be tailored to disciplinary requirements rather than delivered uniformly.

Theoretical and Practical Implications

Theoretically, the study contributes to the technological antecedents of academic

knowledge sharing identified as understudied by [Fan and Beh \(2024\)](#), and does so by specifying a person-level construct that activates technological provision. It also supplies quantitative evidence for the proposition that digital literacy operates as a threshold rather than a linear driver of work behaviour. Practically, the finding that the three components are near-independent means that institutions cannot treat digital citizenship as a single capability to be raised in aggregate; each component requires its own intervention logic, and the ordering established here indicates where the return is highest.

LIMITATIONS AND FUTURE RESEARCH

Three limitations qualify these findings. The cross-sectional design permits directional association but not causal inference; longitudinal or experimental work would be required to establish temporal precedence. All measures were self-reported by a single respondent group, raising the possibility of common method variance, which future studies could address through multi-source designs incorporating peer or subordinate ratings of sharing behaviour. The sample, although a near-census of its population, is confined to one institution and to a narrow experience band of 10 to 20 years of service, so generalisation to other institutional contexts or to early and late-career academics requires caution. Future research should test the relative ordering established here in other institutional settings, examine whether it holds across disciplinary groupings, and investigate whether targeted intervention on digital well-being produces measurable change in knowledge sharing behaviour over time.

REFERENCES

- Ahmad, A., Alam, M. S., Kirmani, M. D., & Madsen, D. Ø. (2023). Why do academicians share knowledge? A study of higher education institutions in India. *Frontiers in Psychology*, 14, 1181030. <https://doi.org/10.3389/fpsyg.2023.1181030>
- Al-Otaibi, N. (2025). Cultural intelligence and its relationship to digital citizenship skills among university students. *Humanities and Social Sciences Communications*, 12(1), 1816. <https://doi.org/10.1057/s41599-025-06096-w>
- Alenezi, N., & Alfaleh, M. (2024). Enhancing digital citizenship education in Saudi Arabian elementary schools: designing effective activities for curriculum integration. *Frontiers in Education*, <https://doi.org/10.3389/feduc.2024.1494487>
- Almethen, A. A., & Alomair, M. A. (2024). The role of age, grade level, and subject area in determining the inclusion of digital citizenship elements in elementary school curricula: Perspectives of teachers in the Kingdom of Saudi Arabia. *Heliyon*, 10(14). <https://doi.org/10.1016/j.heliyon.2024.e34597>
- Bognár, L., & Bottyán, L. (2024). Evaluating online security behavior: Development and validation of a personal cybersecurity awareness scale for university students. *Education Sciences*, 14(6), 588.

<https://doi.org/10.3390/educsci14060588>

- Caroline, A., Coun, M. J., Gunawan, A., & Stoffers, J. (2025). A systematic literature review on digital literacy, employability, and innovative work behavior: emphasizing the contextual approaches in HRM research. *Frontiers in Psychology*, 15, 1448555. <https://doi.org/10.3389/fpsyg.2024.1448555>
- Chen, L., Chang, Y.-C., & Tian, Q. (2024). The mediating role of perceived organizational support in the relationship between transformational leadership and knowledge sharing behavior of university teachers in universities. *Sage Open*, 14(4), 21582440241307756. <https://doi.org/10.1177/21582440241307756>
- Fadilla, S., Nurqamarani, A. S., & Juliana, A. (2024). Decoding factors influencing knowledge sharing among Indonesian scholars. *Jurnal Manajemen*, 28(2), 410-434. <https://doi.org/10.24912/jm.v28i2.1964>
- Fan, Z., & Beh, L.-S. (2024). Knowledge sharing among academics in higher education: A systematic literature review and future agenda. *Educational Research Review*, 42, 100573. <https://doi.org/10.1016/j.edurev.2023.100573>
- Hawamdeh, M., Altınay, Z., Altınay, F., Arnavut, A., Ozansoy, K., & Adamu, I. (2022). Comparative analysis of students and faculty level of awareness and knowledge of digital citizenship practices in a distance learning environment: case study. *Education and Information Technologies*, 27(5), 6037-6068. <https://doi.org/10.1007/s10639-021-10868-7>
- Hosen, M., Ogbeibu, S., Lim, W. M., Ferraris, A., Munim, Z. H., & Chong, Y.-L. (2023). Knowledge sharing behavior among academics: Insights from theory of planned behavior, perceived trust and organizational climate. *Journal of Knowledge Management*, 27(6), 1740-1764. <https://doi.org/10.1108/JKM-02-2022-0140>
- Hu, J., & Noor, S. M. (2024). Why we share: A systematic review of knowledge-sharing intentions on social media. *Behavioral Sciences*, 14(8), 636. <https://doi.org/10.3390/bs14080636>
- Iskandar, R., Maksum, A., & Marini, A. (2025). Digital citizenship literacy in Indonesia: The role of privacy awareness and social campaigns. *Social Sciences & Humanities Open*, 12, 101697. <https://doi.org/10.1016/j.ssaho.2025.101697>
- Khan, N., Sarwar, A., Chen, T. B., & Khan, S. (2022). Connecting digital literacy in higher education to the 21st century workforce. *Knowledge Management & E-Learning*, 14(1), 46-61. <https://doi.org/10.34105/j.kmel.2022.14.004>
- Koch, C., & Fehlmann, F. (2025). Beyond digital literacy: Exploring factors affecting digital performance of university staff. *Media and Communication*, 13. <https://doi.org/10.17645/mac.8913>
- Kucharska, W., & Erickson, G. S. (2023). A multi-industry and cross-country comparison of technology contribution to formal and informal knowledge sharing processes for innovativeness. *Knowledge and Process Management*, 30(3), 300-316. <https://doi.org/10.1002/kpm.1755>

- Kumar, N., Cook, E. J., Fayda-Kinik, F. S., & Maisuradze, L. (2024). ICTs influence on knowledge sharing in higher education: A pre-AI systematic literature review. *European Journal of Education*, 59(4), e12803. <https://doi.org/10.1111/ejed.12803>
- Laffier, J., Rehman, A., & Westley, M. (2025). A conceptual framework to understand the relationships between digital wellness and artificial intelligence. *Cyberpsychology, Behavior, and Social Networking*, 28(7), 478-488. <https://doi.org/10.1089/cyber.2024.0546>
- Moreira-Choez, J. S., Gómez Barzola, K. E., Lamus de Rodríguez, T. M., Sabando-García, A. R., Cruz Mendoza, J. C., & Cedeño Barcia, L. A. (2024). Assessment of digital competencies in higher education faculty: A multimodal approach within the framework of artificial intelligence. *Frontiers in education*, <https://doi.org/10.3389/feduc.2024.1425487>
- Neagu, S. N., & Vieriu, A. M. (2025). Digital and psychological well-being among technical university students: Exploring the impact of digital engagement in higher education. *Education Sciences*, 15(9), 1192. <https://doi.org/10.3390/educsci15091192>
- Nguyen Kim, N., & Nguyen Thi Hang, N. (2024). Rewards, knowledge sharing and individual work performance: An empirical study. *Cogent Business & Management*, 11(1), 2359372. <https://doi.org/10.1080/23311975.2024.2359372>
- Nguyen, T.-M., & Prentice, C. (2022). Reverse relationship between reward, knowledge sharing and performance. *Knowledge Management Research & Practice*, 20(4), 516-527. <https://doi.org/10.1080/14778238.2020.1821588>
- Peng, M. Y.-P. (2024). Breaking down barriers: Exploring the impact of social capital on knowledge sharing and transfer in the workplace. *Humanities and Social Sciences Communications*, 11(1), 1007. <https://doi.org/10.1057/s41599-024-03384-9>
- Popa, N. L., & Assante, G. M. (2024). Explanatory factors of digital citizenship among university students. A cross-national dataset. *Data in Brief*, 57, 111011. <https://doi.org/10.1016/j.dib.2024.111011>
- Salju, S., Junaidi, J., & Goso, G. (2023). The effect of digitalization, work-family conflict, and organizational factors on employee performance during the COVID-19 pandemic. [https://doi.org/10.21511/ppm.21\(1\).2023.10](https://doi.org/10.21511/ppm.21(1).2023.10)
- Suliati, N. N., Sudiro, A., & Kurniawati, D. T. (2025). Transformational leadership and innovative work behavior: The sequential mediating role of knowledge sharing and creative self-efficacy. *Problems and Perspectives in Management*, 23(3), 358-371. [https://doi.org/10.21511/ppm.23\(3\).2025.26](https://doi.org/10.21511/ppm.23(3).2025.26)
- Wang, K., Liu, P., Zhang, J., Zhong, J., Luo, X., Huang, J., & Zheng, Y. (2023). Effects of digital game-based learning on students' cyber wellness literacy, learning motivations, and engagement. *Sustainability*, 15(7), 5716. <https://doi.org/10.3390/su15075716>
- Wang, Q., & Yao, N. (2025). Understanding the impact of technology usage at work on

- academics' psychological well-being: a perspective of technostress. *BMC psychology*, 13(1), 130. <https://doi.org/10.1186/s40359-025-02461-1>
- Xu, T., Ahmed, B., Bari, M. W., & Akmal, M. (2024). Mediating role of knowledge hiding behaviors between cronyism and job performance: an evidence from public sector universities. *Journal of the Knowledge Economy*, 15(4), 18328-18349. <https://doi.org/10.1007/s13132-024-01834-y>
- Zhang, Y., & Jahng, S. (2024). Within the ecology of communication: identifying crucial elements that drive use intentions on knowledge-sharing platforms. *Sage Open*, 14(4), 21582440241288735. <https://doi.org/10.1177/21582440241288735>