

Predictors of tacit knowledge retention and sharing in Uganda's public universities



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Background: Tacit knowledge, which university lecturers draw on while teaching, is important to retain though, difficult to express in words. Factors that predict the retention and sharing of this knowledge had hitherto not been investigated in relation to Uganda's public university's unique setting.

Objectives: This study examined the extent to which 10 factors could be used as valid predictors of tacit knowledge retention and sharing (TKRS) within Uganda's public universities.

Method: A quantitative survey was applied, and data were collected from 349 academics chosen using stratified random sampling. Data analysis was done using descriptive and complex factorial analysis with tools including STATA software Version 15 and SmartPLS software Version 4.1.0.9.

Results: A baseline theoretical factor model was developed and serves as a guide to support a TKRS information system. Four direct predictors and one indirect predictor with several mediator factors were confirmed. The most important direct predictor was the collaborative tacit knowledge management factor ($\beta = 0.472, p = 0.000$), followed by the individual personal disposition factor ($\beta = 0.241, p = 0.000$).

Conclusion: Collaborative tacit knowledge management is the most important factor in predicting the retention and sharing of tacit knowledge in public universities in the country.

Contribution: The study contributes to understanding the importance of each one of the predictor factors explored and their ideal logical combination in managing tacit knowledge in public universities in Uganda.

Keywords: higher education institutions; public universities; structural equation modelling; tacit knowledge management information system; tacit knowledge retention; tacit knowledge-sharing.

Introduction

This study contributes to the tacit dimension of knowledge management systems (KMS) in higher education institutions (HEIs). Al-Hawamdeh (2002) points out that much of the focus in information management is mostly on managing explicit knowledge. There is less emphasis on managing tacit knowledge. Dei and Van der Walt (2020) indicate that universities use knowledge to gain and sustain competitive advantages.

Although tacit knowledge is what we draw on while teaching (Polanyi 1966) and is important to manage (Abelein & Paech 2016), this knowledge is difficult to express in language. It is however important to retain it in HEIs, which equates to maintaining competitive advantage (El-Farr & Hosseingholizadeh 2019; Ngulube 2019).

Empirical knowledge of the various factors that predict tacit knowledge retention and sharing (TKRS) within the knowledge management information system (KMIS) of an academic institution is important.

Changes emanating from globalisation would demand universities to re-strategise in how they operate, so as to remain relevant in the 21st century. The main problem universities face is aligning their operations to be in tandem with global trends of developed countries. This calls for the need for HEIs to innovate in order to improve their way of working to make it relevant to the dynamic environment of the 21st century (Paudel 2022; Squicciarini & Loikkanen 2008).

Note: Additional supporting information may be found in the online version of this article as Online Appendix 1.

In Uganda's case, rethinking how best public universities in the country ought to operate in supporting a TKRS information system, would require a theoretical model relating to factors that need to be considered in re-engineering the institutions' business processes.

Based on this background, this study proposed a theoretical factor model universities could use as a guide to support the tacit knowledge management information system (TKMIS) that could best harness TKRS within a public university in the Ugandan context.

Research philosophy and theory

The study largely applied the positivism philosophy in relation to data management. The theoretical grounding of the study was the knowledge-based theory (KBT) of the firm or knowledge-based view (KBV) of the firm. The KBT theory adopts the objectivist perspective on knowledge which according to Hislop, Bosua and Helms (2018), is aligned with the positivism philosophical perspective.

The objectivist perspective on knowledge explains tacit knowledge as a commodity and as an asset. The first tenet of the objectivist perspective explains knowledge as a commodity. The second tenet relates to the organisation or institution possessing knowledge as a resource that is significant in relation to maintaining the competitive advantage of that institution. This theory was considered the most appropriate for this study since it specifically points out 'knowledge' as the primary resource to support a firm's competitive advantage and considers it the most strategically significant resource by placing knowledge at the centre of the firm's purpose and operations.

Other theories like the resource-based view (RBV) of the firm take a generic view of all valuable resources responsible for competitive advantage (Barney, Ketchen & Wright 2021; Mailani et al. 2024). The KBT theory on its part specifically argues that knowledge-based resources, for instance human resources, do provide a more sustainable advantage since they are difficult to copy.

The KBT theory also recognises the distinction between tacit and explicit knowledge, unlike other conventional theories. The theory supports the argument that managing tacit knowledge is crucial for innovation and problem solving.

Structure of the article

The article is structured as follows: The 'Introduction' presents the introduction and background. Section 'Literature review and hypotheses' reviews relevant literature together with hypotheses development. Section 'Research methods and design' discusses the methodology. Section 'Results' presents the research findings. Section 'Discussion' presents the discussion of the research findings. Section 'Conclusion' presents the conclusion. The 'Acknowledgements' section also presents the competing

interests, authors' contributions, funding information, data availability and disclaimer.

Literature review and hypotheses

Tacit knowledge retention and sharing

According to Hassan (2021), HEIs rely heavily on tacit knowledge-sharing (TKS). Kucharska and Erickson (2023) point out that for knowledge to have any impact or meaning in an organisation, it has to be shared. According to Amundsen, Ballam and Cosgriff (2019), tacit knowledge is known to be a competitive asset within the HEIs. The argument is that tacit knowledge held by individuals and by communities of practice in a university should be harnessed. Mentoring is one way to share tacit knowledge from senior subject specialists to their juniors. Johnson and Griffin (2024) argue that mentoring in an HEI should be intentional and deliberate. Coaching and good succession planning is one way of mentoring; and it supports the organisation in enhancing creativity and collaboration (Rothwell 2023). According to Chesbrough (2019), organisations should however, desist from the logic of closed innovation since it is no longer sustainable.

It is, therefore, better to use both internal and external ideas and allow knowledge to flow inbound (bringing in ideas from outside) and outbound (by securing knowledge transfer partnerships with entities outside your organisation).

Factors influencing tacit knowledge management in higher education institutions

Godfrey and Ejiri (2022) point out several factors which influence tacit knowledge management. Organisational culture and organisational structure are some of the factors. In addition, Alves and Pinheiro (2022) highlight, among other factors, the knowledge management strategy factor (KMSF).

Factors that were considered in this study are as follows: (1) The collaborative tacit knowledge management factor (CTKMF), (2) The leadership practice factor (LPF), (3) The organisational culture factor (OCF), (4) The individual personal disposition factor (IPDF), (5) The knowledge management strategy factor (KMSF), (6) The organisational environment factor (OEF), (7) The tacit knowledge management institutionalisation factor (TKMIF), (8) The human resource management practice factor (HRMPF), (9) The job design factor (JDF) and (10) The staff motivation factor (SMF).

Collaborative tacit knowledge management factor

The collaborative aspect of tacit knowledge management is supported by research from Kucharska and Erickson (2023); Sharma and Dey (2018) and by Mezghani, Exposito and Drira (2016).

In addition, Amundsen et al. (2019) also note that academic work often presumes collaboration among interdependent individuals. However, current tacit knowledge management

models in HEIs hardly address the collaborative aspect. Based on these arguments, the study hypothesised as follows: Hypothesis 1 (H1). *The CTKMF positively affects TKRS among academic staff in public universities in Uganda.*

The leadership practice factor

Novitasari et al. (2021) point to a link between leadership practice and TKS in relation to charismatic leadership. However, extant tacit knowledge management models in HEIs hardly address the LPF. Other scholars have explored leadership styles, innovative work behaviour, organisational culture and organisational citizenship as influencing each other (Khan et al. 2020). Based on these arguments, the study hypothesised as follows: Hypothesis 2 (H2). *The LPF positively affects TKRS among academic staff in public universities in Uganda.*

The organisational culture factor

Several studies note a significant influence organisational culture has on TKS and in influencing employee attitudes towards knowledge behaviour, which stimulates scientific research (Horban et al. 2021; Ibrahim & Ali 2021).

Salta et al. (2022) suggest a communities of practice framework in HEIs to help promote TKS between learners and facilitators. These arguments led to the following hypothesis: Hypothesis 3 (H3). *The OCF positively affects TKRS among academic staff in public universities in Uganda.*

The individual personal disposition factor

Scholars like McClelland (1961), Shihabeldeen, Babiker and Ahmed (2020), Munns (2021), Chandra and Alammari (2021), Nicholls et al. (2022) as well as Enakrire and Smuts (2024) have investigated several aspects of the IPDF. This factor embodies personal needs such as desire for power, achievement and affiliation, as well as one's attitude towards knowledge-sharing.

This factor, therefore, embodies individual personal traits and attitudes; as well as motivational and behavioural issues. With reference to these observations, the study hypothesised as follows: Hypothesis 4 (H4). *The IPDF positively affects TKRS among academic staff in public universities in Uganda.*

The knowledge management strategy factor

Alves and Pinheiro (2022) carried out a study in Brazilian universities and found that the knowledge management strategy strongly influenced TKS. Based on this argument, this study hypothesised that: Hypothesis 5 (H5). *The KMSF positively affects TKRS among academic staff in public universities in Uganda.*

The organisational environment factor

The organisational environment is a broad concept that can encompass internal and external factors (Akpviroro & Owotutu 2018). Tanatova, Yudina and Korolev (2023), in their study, address the complex social environment in a university as part of the organisational environment. They highlight the importance of institutionalising tacit

knowledge management. Bui and Tran (2023) also explain that the knowledge created by employees within an organisation is an internal environmental complexity factor, whereas information processing and digital transformation are considered as external environmental complexity factors.

In our study, the organisational environment was conceptualised to constitute the administrative structure, the operational structure and the social environment within the institution. This study, therefore, hypothesised that: Hypothesis 6 (H). *The OEF positively affects tacit knowledge management institutionalisation in public universities in Uganda.*

The tacit knowledge management institutionalisation factor

Nonaka and Takeuchi (1995), supporting institutionalising tacit knowledge management within the organisation or institution, developed the Socialisation, Externalisation, Combination, Internalisation (SECI) model for informal knowledge processes. The model suggests a four-step process through which tacit knowledge could be created and shared.

You (2017) also supports the institutionalisation of informal learning arguing that 'social interaction provides useful explanations for tacit knowledge-sharing and creation'. Based on these observations, this study hypothesised that: Hypothesis 7 (H). *The TKMIF positively affects the human resource management practice in public universities in Uganda.*

The human resource management practice factor

Seeletse and Thabane (2016) as well as Hislop et al. (2018) endeavour to explain the influence human resource management has on staff retention and job design. Accordingly, job design can enhance employee satisfaction and motivation. In addition, effective human resource management practices create intrinsically interesting and challenging jobs that would encourage knowledge-sharing and utilisation.

Extant tacit knowledge management models in HEIs, however, hardly address the HRMPF. In light of these arguments, this study hypothesised that: Hypothesis 8 (H). *The HRMPF positively affects job design in public universities in Uganda.*

The job design factor

For job design, Hislop et al. (2018) explain that job design can support organisational knowledge management activities.

Liu et al. (2022) also note that there is a relationship between job characteristics and controlled motivation as well as autonomous motivation. However, existing tacit knowledge management models in HEIs, hardly address the JDF. The study, therefore, hypothesised that: Hypothesis 9 (H). *The JDF positively affects staff motivation in public universities in Uganda.*

Staff motivation factor

Borrowing Vroom's valence expectancy theory, the argument is that people may want different things from an organisation, such as a steady salary, job security, advancement and challenging work (Vroom 1964).

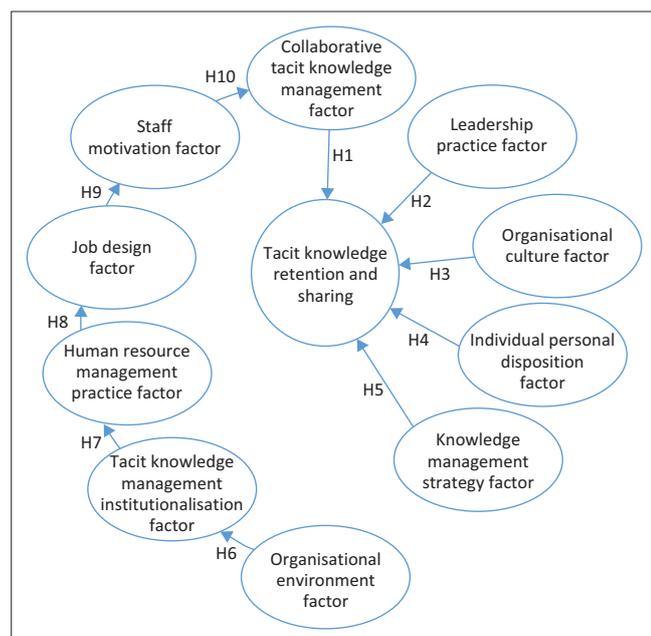
Drawing ideas from Vroom's theory, in relation to tacit knowledge management in public universities, Akosile and Olatokun (2020) as well as Hislop et al. (2018), argue that academic staff must be motivated to participate in tacit knowledge management activities within universities.

Staff members will collaborate in knowledge-sharing activities if they expect that the effort they expend on these tasks would lead to acceptable performance (expectancy). They must also believe that this effort will be handsomely, fairly and justly rewarded (instrumentality), and that the rewards themselves will be valuable (valence).

Akosile and Olatokun (2020) continue to argue that academic staff who are the source of much of the knowledge in HEIs need to be motivated in some way in order to share their knowledge. However, existing tacit knowledge management models in HEIs hardly address the SMF. The study, therefore, hypothesised: Hypothesis 10 (H10). *The SMF positively affects collaborative tacit knowledge management in public universities in Uganda.*

Proposed research model

The foregoing hypotheses are illustrated in the conceptual framework or research model presented in Figure 1, which has been adapted from Alves and Pinheiro (2022).



Source: Adapted from Alves, R.B.C. & Pinheiro, P., 2022, 'Factors influencing tacit knowledge sharing in research groups in higher education institutions', *Administrative Sciences* 12(3), 89. <https://doi.org/10.3390/admsci12030089>

FIGURE 1: The Proposed Research Model for Factors Predicting Tacit Knowledge Retention and Sharing within the Tacit Knowledge Management Information System in Uganda's Public Universities.

Explanation of the proposed research model

Figure 1 represents the proposed research model and the hypothesised relationships between the factors. Five factors were hypothesised to have a direct and positive influence on TKRS in public universities. One factor, the OEF, was hypothesised to be mediated by a string of other factors in influencing TKRS.

Tacit knowledge-sharing in universities

Tacit knowledge-sharing in universities has been explored by a number of scholars like Fayda-Kinik (2022), who note a correlation between TKS and organisational commitment.

Hassan (2021) indicated that one of the mediators between organisational factors and TKS among academic staff in HEIs is the quality of the KMS.

Mazorodze and Mkhize (2022) explained that rewards, recognition, promotion and bonuses were significant motivators that promote TKS in universities. Yu and Zhou (2015) identified four types of TKS processes in education: peer review, learning communities, thumb-a-lift and academic conferences.

Conclusion and gap analysis

Literature indicates the value and importance of a TKMIS in HEIs and the factors that influence TKRS. We posit that it is prudent for public universities in Uganda to support a TKMIS by taking into consideration key factors that predict TKRS.

This study fills the gap where there was no theoretical factor model to guide public universities in Uganda to support the retention and sharing of tacit knowledge in these institutions by providing a theoretical factor model to serve as a guide.

Research methods and design

The data collection instrument was organised into a dozen sections (see Online Appendix 1). Initially, a consent statement and an introductory note explained the objective of the study. Questions in Section One related to the demographic characteristics of the respondents. The rest of the sections handled questions relating to the various factors that this study considered.

Research procedure

The procedure followed involved problem identification and definition. This was followed by formulating the research objectives and hypotheses. The main data collection instrument was designed, ethical approval was secured, data were collected and results were analysed. The process was finalised with model development, discussion, conclusion and results dissemination.

Research design

A quantitative survey and complex factorial analysis were used to understand the relationships between factors considered valid predictors of TKRS in Uganda's public universities.

Data were collected from 349 academic staff in four public universities from November 2023 to February 2024 mainly using the Google Forms survey platform.

The study sampling strategy

Stratified random sampling was used to select respondents composed of academics at various levels in the four public universities selected. They were categorised into top-notch academics, middle-level academics and lower-level academic staff.

Administering the survey

Extant databases on targeted academic staff respondents in the four universities were applied to get email contacts of university academic staff. According to Tessler et al. (2019), survey research allows investigators to explore a large population and focus on relevant data.

Data collection

The main tool was pre-tested in the four universities and revised based on reviewers' suggestions.

The final version was sent to 400 academic staff members primarily via email and to a lesser extent directly administered in print. The results were based on 349 well-completed responses.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Research and Ethics Committee of the Uganda Christian University (No. UCUREC-2023-523) and the Uganda National Council of Science and Technology (UNCST) (No. SIR255ES).

Results

Demographic findings are presented in Table 1.

Demographic distribution of respondents

In terms of sex, male respondents (67%) dominated the female respondents (33%). These demographics demonstrate the predominance of male academic staff among the public universities explored, implying a gender imbalance in academia. This imbalance would translate into the fact that results generated were more representative of the male perspective in relation to TKRS in the university.

In terms of the age bracket, those below 30 years of age comprised a mere 2% of the sample, while the '31–40' year's

TABLE 1: Demographic profile characteristics of respondents.

Item	Frequency	%
Sex		
Male	234	67.0
Female	115	33.0
Total	349	100.0
Age (years)		
< 30	08	2.0
31–40	101	29.0
41–50	148	42.0
51–60	85	24.0
61–70	07	2.0
> 70	0	0.0
Total	349	100.0
Education level		
Post Doctorate	23	7.0
PhD	155	44.0
Masters	143	41.0
Bachelors	28	8.0
Total	349	100.0
Academic rank		
Professor	12	3.0
Associate Professor	15	4.0
Senior Lecturer	54	16.0
Lecturer	97	28.0
Assistant Lecturer	143	41.0
Teaching Assistant	28	8.0
Total	349	100.0
Teaching experience (years)		
1–5	43	12.0
6–10	58	17.0
11–15	81	23.0
16–20	87	25.0
> 20	80	23.0
Total	349	100.0

PhD, Doctor of Philosophy.

age bracket formed 29% of the sample. The '41–50' year's age bracket was the modal category contributing 42%. This was followed by the '51–60' year's age bracket, which comprised 24% of the sample, while those with '61–70' years of age constituted 2% of the sample. None of the respondents were in the 'Above 70' age bracket.

In relation to the level of education attained, almost an equal number of respondents had qualifications of a master's degree (41%) and PhD (44%), while those with only a bachelor's degree (Teaching Assistants/Graduate Trainees) were 8%.

For academic rank, while assistant lecturer (41%) contributed the biggest percentage, lecturer (28%) contributed the second biggest percentage of the respondents. Senior lecturer constituted 16%, while teaching assistant was 8%. The lowest percentages included Associate Professor (4%) followed by Professor (3%). The finding indicates that academics from the rank of associate professor are the minority and should be specially motivated and encouraged to share and transfer their expertise to their juniors to support continuity in institutional knowledge and expertise in case the seniors departed.

In relation to years of teaching experience, this study observed that 12% of the respondents had taught at university level for up to 5 years, 17% had taught at the university for between 6 and 10 years, 23% had served between 11 and 15 years, 25% had served between 16 and 20 years and 23% above 20 years.

The implication is that a wider margin of staff possessed experiential knowledge accumulated over the years they taught at university. This suggests a tendency for staff to stay for decades in university employment. The modal age bracket of 41–50 years constitutes 42% with the 51–60 years bracket only 24% and the 61–70 year bracket taking only 2%. This points to the need to prioritise TKS by those more experienced and about to retire from academia so that their rich knowledge is tapped before they get separated from the institution.

Findings relating to suitability of data collected for factor analysis

The study assessed the final data collected to affirm their suitability for factor analysis. Data were first transformed. The Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy were done as a preliminary check to ensure that the data collected were suitable for factor analysis. According to Bartlett (1951), a significant result ($p < 0.05$) of the test would indicate that the factors would be sufficiently correlated and thus suitable for factor analysis. The findings are presented in Figure 2.

The results presented in Figure 2 indicate a $p = 0.000$ of the Bartlett's test. This implies that the variables were sufficiently inter-correlated and were, therefore, fit for factor analysis. In addition, the KMO test for sampling adequacy had a KMO value = 0.896, which is a value close to 1, indicating that the results were excellent for factor analysis.

Findings relating to normality of data collected

The study assessed whether data collected for each factor were normally distributed. The Shapiro-Wilk W test for

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. factortest TKRS CTRMF SMF JDF HRMPF TKMIF OEF KMSF IPDF OCF LPF
Determinant of the correlation matrix
Det = 0.002

Bartlett test of sphericity
Chi-square = 2077.595
Degrees of freedom = 55
p-value = 0.000
H0: variables are not intercorrelated

Kaiser-Meyer-Olkin Measure of Sampling Adequacy
KMO = 0.896

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CTKMF, Collaborative Tacit Knowledge Management Factor; HRMPF, Human Resource Management Practice Factor; IPDF, Individual Personal Disposition Factor; JDF, Job Design Factor; KMSF, Knowledge Management Strategy Factor; LPF, Leadership Practice Factor; OCF, Organisational Culture Factor; OEF, Organisational Environment Factor; SMF, Staff Motivation Factor; TKMIF, Tacit Knowledge Management Institutionalisation Factor; TKRS, Tacit Knowledge Retention and Sharing.

FIGURE 2: Test results for suitability of data collected for factor analysis.

normal data indicated p -values below 0.05 for data collected on all variables. This implied a non-normal distribution. This finding served as justification for applying *SmartPLS* software known to adequately handle non-normal distributions.

Findings relating to model assessment

To assess the measurement model and the structural model, the study applied exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The primary goal of both the analyses was to affirm whether a combination of the 10 factors hypothesised would be valid predictors of TKRS in public universities in Uganda. The study was more interested in the predictive ability of the intended model.

The study used the R -squared metrics and p -values to draw a conclusion. Findings indicate that all the hypothesised relationships were valid predictors of TKRS in Uganda's public universities, except the KMSF.

Collinearity analysis for factor data collected

Variance inflation factor (VIF) values (typically above 5) would indicate multicollinearity (Hair, Ringle & Sarstedt 2019). The highest VIF value obtained in this study was 4.000, indicating the absence of multicollinearity among the predictor variables (see Table 2).

Assessing the measurement model for construct reliability and validity

Confirmatory factor analysis in partial least squares structural equation modelling (PLS-SEM) is a statistical technique used to assess measurement models (Hair et al. 2019).

TABLE 2: Variance inflation factor.

Indicator	VIF	Indicator	VIF
CTKMF1	2.037	OCF1	1.292
CTKMF2	2.975	OCF2	1.334
CTKMF3	2.509	OCF3	1.167
CTKMF4	1.456	OEF1	3.746
CTKMF5	2.116	OEF2	3.673
CTKMF6	1.382	OEF3	1.545
HRMPF1	1.841	SMF1	2.01
HRMPF2	1.499	SMF2	2.814
HRMPF3	1.376	SMF3	2.682
IPDF1	1.897	SMF4	1.947
IPDF2	1.897	SMF5	1.794
JDF1	2.135	SMF6	1.858
JDF2	2.185	TKMIF1	2.919
JDF3	1.466	TKMIF2	3.511
JDF4	1.678	TKMIF3	3.489
KMSF1	4.000	TKMIF4	2.145
KMSF2	4.000	TKRS1	1.296
LPF1	1.504	TKRS2	1.111
LPF2	1.809	TKRS3	2.299
LPF3	2.249	TKRS4	2.128
LPF4	1.415	-	-
LPF5	1.751	-	-

VIF, variance inflation factor; CTKMF, collaborative tacit knowledge management factor; HRMPF, human resource management practice factor; IPDF, individual personal disposition factor; JDF, job design factor; KMSF, knowledge management strategy factor; LPF, leadership practice factor; OCF, organisational culture factor; OEF, organisational environment factor; SMF, staff motivation factor; TKMIF, tacit knowledge management institutionalisation factor; TKRS, tacit knowledge retention and sharing.

Table 3 indicates internal consistency in terms of Cronbach’s alpha and composite reliability (CR) measures as well as results for convergent validity in terms of average variance extracted (AVE).

In relation to Cronbach’s alpha and CR, values ranging between 0.40 and 0.708 may be removed only if removing indicators with such values would lead to an increase in the internal consistency reliability or convergent validity; otherwise, the indicator may remain. Since the majority of values in Table 3 for Cronbach’s alpha and CR were above 0.708, CR was confirmed.

According to Hair et al. (2021), AVE for constructs should be larger than 0.5. All the values for AVE in Table 3 were larger than 0.5; thus, AVE was satisfactory. Therefore, convergent validity was confirmed.

Assessing the measurement model for discriminant validity

Discriminant validity applied the heterotrait-monotrait (HTMT) test. Findings are presented in Table 4. According to Henseler, Ringle and Sarstedt (2015), HTMT values should at most be below 0.90. In our case, at least all the values in Table 4 were below 0.90; thus, discriminant validity was confirmed.

TABLE 3: Construct reliability and convergent validity.

Variable	Cronbach’s alpha	CR (rho_a)	CR (rho_c)	AVE
CTKMF	0.847	0.883	0.887	0.573
HRMPF	0.731	0.748	0.848	0.652
IPDF	0.815	0.860	0.914	0.841
JDF	0.788	0.832	0.860	0.609
KMSF	0.928	0.945	0.965	0.933
LPF	0.823	0.851	0.873	0.581
OCF	0.632	0.693	0.789	0.558
OEF	0.855	0.866	0.913	0.778
SMF	0.868	0.882	0.900	0.602
TKMIF	0.901	0.909	0.931	0.772
TKRS	0.722	0.768	0.829	0.558

AVE, average variance extracted; CR, composite reliability; CTKMF, collaborative tacit knowledge management factor; HRMPF, human resource management practice factor; IPDF, individual personal disposition factor; JDF, job design factor; KMSF, knowledge management strategy factor; LPF, leadership practice factor; OCF, organisational culture factor; OEF, organisational environment factor; SMF, staff motivation factor; TKMIF, tacit knowledge management institutionalisation factor; TKRS, tacit knowledge retention and sharing.

TABLE 4: Discriminant validity – heterotrait-monotrait.

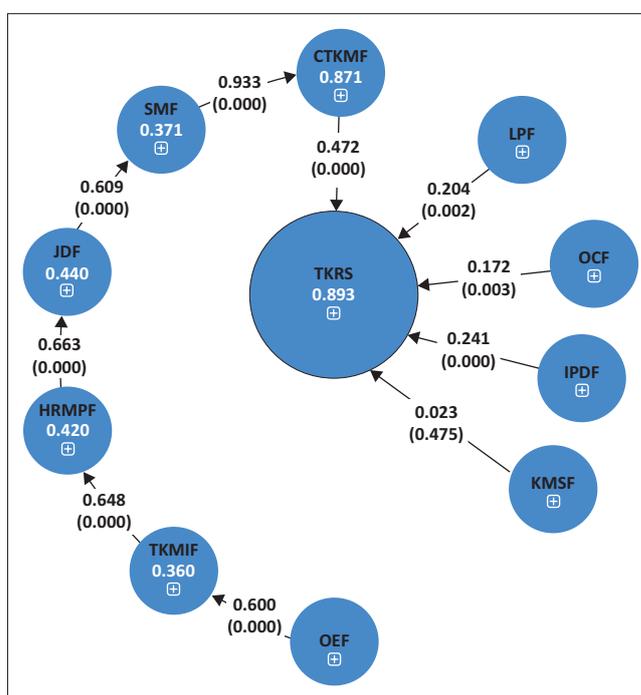
Variable	CTKMF	HRMPF	IPDF	JDF	KMSF	LPF	OCF	OEF	SMF	TKMIF	TKRS
CTKMF	-	-	-	-	-	-	-	-	-	-	-
HRMPF	0.320	-	-	-	-	-	-	-	-	-	-
IPDF	0.388	0.548	-	-	-	-	-	-	-	-	-
JDF	0.508	0.472	0.513	-	-	-	-	-	-	-	-
KMSF	0.114	0.174	0.240	0.200	-	-	-	-	-	-	-
LPF	0.468	0.303	0.465	0.575	0.237	-	-	-	-	-	-
OCF	0.507	0.569	0.617	0.767	0.198	0.734	-	-	-	-	-
OEF	0.505	0.395	0.495	0.744	0.084	0.515	0.724	-	-	-	-
SMF	0.514	0.770	0.873	0.759	0.210	0.535	0.775	0.622	-	-	-
TKMIF	0.395	0.405	0.487	0.705	0.072	0.552	0.632	0.676	0.619	-	-
TKRS	0.322	0.229	0.286	0.559	0.248	0.469	0.464	0.512	0.388	0.594	-

CTKMF, collaborative tacit knowledge management factor; HRMPF, human resource management practice factor; IPDF, individual personal disposition factor; JDF, job design factor; KMSF, knowledge management strategy factor; LPF, leadership practice factor; OCF, organisational culture factor; OEF, organisational environment factor; SMF, staff motivation factor; TKMIF, tacit knowledge management institutionalisation factor; TKRS, tacit knowledge retention and sharing.

Structural model assessment

For structural model assessment, R-squared values, path coefficients and p-values were used to evaluate the model. According to Hair et al. (2021), R-squared values are used to understand the variation of each independent variable (IV) with its dependent variable (DV). R-squared values, path coefficients and p-values are indicated in Figure 3.

R-squared values in Figure 3 indicate that 89.3% of the variation in the dependent variable TKRS was explained by all the IVs combined, implying a high proportion of the variation in the DV being explained by the model. In our study, all hypotheses were proven true except one: there was no significant relationship between the KMSF and TKRS.



CTKMF, Collaborative Tacit Knowledge Management Factor; HRMPF, Human Resource Management Practice Factor; IPDF, Individual Personal Disposition Factor; JDF, Job Design Factor; KMSF, Knowledge Management Strategy Factor; LPF, Leadership Practice Factor; OCF, Organisational Culture Factor; OEF, Organisational Environment Factor; SMF, Staff Motivation Factor; TKMIF, Tacit Knowledge Management Institutionalisation Factor; TKRS, Tacit Knowledge Retention and Sharing; LPF, leadership practice factor.

FIGURE 3: Theoretical Model for Factors Predicting Tacit Knowledge Retention and Sharing within the Tacit Knowledge Management Information System in Uganda’s Public Universities.

Discussion

The study revealed four main factors chiefly responsible for directly and significantly predicting TKRS within the TKRS information system in the context of Uganda's public universities. These factors are: CTKMF: (β 0.472, p 0.000); IPDF: (β 0.241, p 0.000); LPF: (β 0.204, p 0.002) and OCF: (β 0.172, p 0.003).

The OEF was the fifth main factor in influencing TKRS indirectly via a number of mediator variables namely: TKMIF, HRMPF, JDF, SMF and CTKMF, as indicated in Figure 3.

The KMSF had no significant influence on TKRS: (β 0.024, p 0.467), in spite of earlier studies by scholars such as Alves and Pinheiro (2022), stating the contrary. This can be attributed to the fact that in our particular study, none of the universities explored had a well-formulated knowledge management strategy.

Discussion of results relating to each one of the factors

The findings for the CTKMF – an addition by this study to mainstream literature and notably the most important factor to predict TKRS – agree with Kucharska and Erickson (2023), Sharma and Dey (2018), Akanji et al. (2020) and Mezghani et al. (2016), who all acknowledge collaborative work as necessary in tacit knowledge management.

The findings for IPDF indicate that TKRS is directly affected by IPDF, as presented in Figure 3. This is in line with studies by Chandran and Alammari (2021) as well as Enakrire and Smuts (2024). The latter consider this factor to constitute openness in communication and interpersonal trust as significantly influencing the knowledge-sharing attitude. Our study confirms that interpersonal trust and willingness are necessary for staff to collaborate, communicate and share tacit knowledge.

Findings also agree with Munns (2021), who noted that uncertainty and mistrust – which in our study were part of IPDF – may prevail in an organisation and may cause a stumbling block in talent retention. Findings for the LPF agree with Novitasari et al. (2021), who explain that there is a direct link between leadership practice and TKS.

Findings for the OCF do agree with Ibrahim and Ali (2021), Horban et al. (2021), Chandran and Alammari (2021), Enakrire and Smuts (2024), Munns (2021) and Fullwood and Rowley (2018), who all acknowledge that the presence of a well-cultivated academic culture in HEIs facilitates easier and more effective sharing of tacit knowledge.

Our study contrasts with Fullwood and Rowley (2018) in the sense that whereas in their study organisational culture was noted to be the most important factor, in our study this factor was not found to be the most significant factor to predict TKRS.

In our case, the CTKMF stood out as the most significant. Our findings also disagree with Alves and Pinheiro (2022), who in their study noted organisational culture as the most significant factor affecting TKS. In our case, it was one of the most significant factors to affect TKRS in public universities in Uganda's context as indicated in Figure 3.

The findings for the KMSF disagree with Alves and Pinheiro (2022), whose study was set in the Brazilian context. In the Ugandan context, none of the public universities surveyed had a well-articulated knowledge management strategy to which this study attributes our contrary findings.

The findings for the OEF were in agreement with Tanatova et al. (2023), who note that the social environment – as part of the organisational environment – is an essential component of the quality of education and the quality of work of teaching staff, employees and partners of a university. Our findings in this case do agree with Alves and Pinheiro (2022), who similarly got positive results in relation to their organisational structure factor, which in our case was part of the OEF.

The TKMIF was one of the additions by our study to mainstream literature on tacit knowledge management in universities. This factor adds an indirect value to the TKRS system in public universities through mediators such as HRMPF, JDF, SMF and CTKMF, as indicated in Figure 3.

The HRMPF was another addition by our study to existing literature (see Figure 3). This factor had an indirect positive significant influence on the SMF and an indirect positive significant influence on TKRS. The SMF in turn had a direct positive significant influence on the CTKMF. This finding supports claims by Hislop et al. (2018) that human resource management practices have a key role to play in knowledge management activities.

The JDF is an addition by our study to mainstream literature. Our finding aligns with Hislop et al. (2018), who argue that designing jobs that are intrinsically interesting and challenging encourages and motivates employees to utilise and share their tacit knowledge.

Our study demonstrates a significant relationship between the SMF and the CTKMF as noted in Figure 3. This finding agrees with Akosile and Olatokun (2020) and with Hislop et al. (2018), who argue that knowledge-sharing in HEIs depends on motivating members of staff who are the knowledge sources in the institution.

Conclusion

Retention and sharing of tacit knowledge within a public university in Uganda is supported by a logical combination of several factors within the institution, most notably the CTKMF. The p -values indicate that the direct relationship between CTKMF and TKRS was strongest (β = 0.472, p = 0.000) in predicting TKRS in public universities in Uganda. The effect is compounded by the organisational environment,

the formalisation and institutionalisation of tacit knowledge management as well as the human resource management practices (like job design and staff motivation), which all support CTKMF in a public university in Uganda's context. Second was IPDF ($\beta = 0.241, p = 0.000$) followed by LPF ($\beta = 0.204, p = 0.002$) and OCF ($\beta = 0.172, p = 0.003$), in that order of importance. The OEF was key in indirectly influencing TKRS via five mediating variables as illustrated in Figure 3. Future research should explore how all these factors ought to be operationalised in the institution.

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Competing interests

The authors reported that they received funding from Government of the Republic of Uganda under the Makerere University Research and Innovation Fund (MakRIF) which may be affected by the research reported in the enclosed publication. The authors have disclosed those interests fully and have implemented an approved plan for managing any potential conflicts arising from their involvement. The terms of these funding arrangements have been reviewed and approved by the affiliated University in accordance with its policy on objectivity in research.

Authors' contributions

G.L. was responsible for conceptualisation and data management in the study, in addition to writing and editing the original draft. A.E.H. was responsible for administering and supervising the entire project, including funding acquisition as well as supervision of the editing of the original draft.

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Data availability

The data that support the findings of this study are available from the corresponding author, G.L., upon reasonable request.

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References

- Abelein, U. & Paech, B., 2015, 'Understanding the influence of user participation and involvement on system success – A systematic mapping study', *Empirical Software Engineering* 20(1), 28–81. <https://doi.org/10.1007/s10664-013-9278-4>
- Akanji, B., Mordi, C., Ituma, A., Adisa, T.A. & Ajonbadi, H., 2020, 'The influence of organisational culture on leadership style in higher education institutions', *Personnel Review* 49(3), 709–732.
- Akosile, A. & Olatokun, W., 2020, 'Factors influencing knowledge sharing among academics in Bowen University, Nigeria', *Journal of Librarianship and Information Science* 52(2), 410–427. <https://doi.org/10.1177/0961000618820926>
- Akpoviro, K.S. & Owotutu, S.O., 2018, 'Impact of external business environment on organizational performance', *International Journal of Advance Research and Innovative Ideas in Education* 4(3), 498–505, viewed 22 July 2024, from <https://www.researchgate.net/profile/Mufutau-Akanmu-Popoola/publication/336320140>.
- Al-Hawamdeh, S., 2002, 'Knowledge management: Re-thinking information management and facing the challenge of managing tacit knowledge', *Information Research* 8(1), 8–1, viewed 15 April 2024, from <https://informationr.net/ir/8-1/paper143.html>.
- Alves, R.B.C. & Pinheiro, P., 2022, 'Factors influencing tacit knowledge sharing in research groups in higher education institutions', *Administrative Sciences* 12(3), 89. <https://doi.org/10.3390/admsci12030089>
- Amundsen, D., Ballam, N. & Cosgriff, M., 2019, 'The ABCs of collaboration in academia', *Waikato Journal of Education* 24(2), 39–53. <https://doi.org/10.15663/wje.v24i2.667>
- Barney, J.B., Ketchen, Jr. D.J. & Wright, M., 2021, 'Resource-based theory and the value creation framework', *Journal of Management* 47(7), 1936–1955. <https://doi.org/10.1177/01492063211021655>
- Bartlett, M.S., 1951, 'The effect of standardization on a χ^2 approximation in factor analysis', *Biometrika* 38(3/4), 337–344. <https://doi.org/10.1093/biomet/38.3-4.337>
- Bui, M.T. & Tran, T.T.H., 2024, 'The internal and external effect of environmental complexity on business responses: A PLS-SEM and artificial neural network approach', *Journal of Hospitality and Tourism Insights* 7(5), 2742–2762. <https://doi.org/10.1108/JHTI-03-2023-0147>
- Chandran, D. & Alammari, A.M., 2021, 'Influence of culture on knowledge sharing attitude among academic staff in elearning virtual communities in Saudi Arabia', *Information Systems Frontiers* 23(6), 1563–1572. <https://doi.org/10.1007/s10796-020-10048-x>
- Chesbrough, H., 2019, *Open innovation results: Going beyond the hype and getting down to business*, Oxford University Press, Oxford.
- Dei, D.G.J. & Van der Walt, T.B., 2020, 'Knowledge management practices in universities: The role of communities of practice', *Social Sciences & Humanities Open* 2(1), 100025. <https://doi.org/10.1016/j.ssaoh.2020.100025>
- El-Farr, H. & Hosseingholizadeh, R., 2019, 'Aligning human resource management with knowledge management for better organizational performance: How human resource practices support knowledge management strategies', in M. Wickham (ed.), *Current issues in knowledge management*, IntechOpen, London. <https://www.intechopen.com/chapters/67167>
- Enakrire, R.T. & Smuts, H., 2024, 'Trust as a determining factor in tacit knowledge sharing among academics in higher education institutions', in L. Uden & I.H. Ting (eds.), *Knowledge management in organisations: in Proceedings of the 18th International Conference, KMO 2024*, Kaohsiung, Taiwan, 29 July – 1 August 2024, pp. 51–60, Springer Nature, Cham.
- Farida-Kinik, F.S., 2022, 'The role of organisational commitment in knowledge sharing amongst academics: An insight into the critical perspectives for higher education', *International Journal of Educational Management* 36(2), 179–193. <https://doi.org/10.1108/IJEM-03-2021-0097>
- Fullwood, R. & Rowley, J.E., 2018, 'Knowledge management strategy in the non-profit sector: A case study at a UK heritage site', in J. Bernardino, A.C. Salgado & J. Filipe (eds.), *10th International Conference on Knowledge Management and Information Sharing 2018*, pp. 167–174.
- Godfrey, L. & Ejiri, A.H., 2022, 'Tacit knowledge management system practices in higher education institutions (HEIs) in developing economies: A systematic literature review', *London Journal of Research in Humanities and Social Science* 22(1), 47–74, viewed 15 June 2024, from https://journalspress.com/LJRHSS_Volume22/Tacit-Knowledge-Management-System-Practices-in-Higher-Education-Institutions-HEIs-in-Developing-Economies.

- Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., Danks, N.P. & Ray, S., 2021, 'An introduction to structural equation modeling', in J.F. Hair, G.T.M. Hult, C.M. Ringle, M. Sarstedt, N.P. Danks & S. Ray (eds.), *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*, pp. 1–29, Springer, Cham.
- Hassan, H., 2021, 'Impact of organisational factors on tacit knowledge sharing in HEIs: Focusing the mediating role of KM system quality', *Management Science Letters* 11, 1621–1628. <https://doi.org/10.5267/j.msl.2020.12.010>
- Henseler, J., Ringle, C.M. & Sarstedt, M., 2015, 'A new criterion for assessing discriminant validity in variance-based structural equation modeling', *Journal of the Academy of Marketing Science* 43, 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hislop, D., Bosua, R. & Helms, R., 2018, *Knowledge management in organizations: A critical introduction*, Oxford University Press, Oxford.
- Horban, O., Babenko, L., Lomachinska, I., Hura, O. & Martych, R.A., 2021, 'A knowledge management culture in the European higher education system', *Scientific Bulletin of National Mining University* 2021(3), 173–177. <https://doi.org/10.33271/nvngu/2021-3/173>
- Ibrahim, F. & Ali, D.N., 2021, 'Evaluating knowledge management practices in higher education institutions (HEIs): Towards KMPro framework guidelines', in S. Zyngier (ed.), *Enhancing academic research and higher education with knowledge management principles*, pp. 221–245, IGI Global, Hershey, PA.
- Johnson, W.B. & Griffin, K.A., 2024, *On being a mentor: A guide for higher education faculty*, Routledge, London.
- Khan, M.A., Ismail, F.B., Hussain, A. & Alghazali, B., 2020, 'The interplay of leadership styles, innovative work behavior, organizational culture, and organizational citizenship behavior', *Sage Open* 10(1), 2158244019898264. <https://doi.org/10.1177/2158244019898264>
- Kucharska, W. & Erickson, G.S., 2023, 'Tacit knowledge acquisition & sharing, and its influence on innovations: A Polish/US cross-country study', *International Journal of Information Management* 71, 102647. <https://doi.org/10.1016/j.ijinfomgt.2023.102647>
- Liu, Y., Wang, S., Zhang, J. & Li, S., 2022, 'When and how job design influences work motivation: A self-determination theory approach', *Psychological Reports* 125(3), 1573–1600. <https://doi.org/10.1177/00332941211027320>
- Mailani, D., Hulu, M.Z.T., Simamora, M.R. & Kesuma, S.A., 2024, 'Resource-based view theory to achieve a sustainable competitive advantage of the firm: Systematic literature review', *International Journal of Entrepreneurship and Sustainability Studies* 4(1), 1. <https://doi.org/10.31098/ijeass.v4i1.2002>
- Mazorodze, A.H. & Mkhize, P., 2022, 'Factors and variables to promote a knowledge-sharing culture change in higher education institutions of developing countries', *South African Journal of Information Management* 24(1), 1491. <https://doi.org/10.4102/sajim.v24i1.1491>
- McClelland, D.C., 1961, *Achieving society*, vol. 92051, Simon and Schuster, viewed 02 November 2024, from <https://www.jstor.org/stable/pdf/2504238.pdf>.
- Mezghani, E., Exposito, E. & Drira, K., 2016, 'A collaborative methodology for tacit knowledge management: Application to scientific research', *Future Generation Computer Systems* 54, 450–455, viewed 25 April 2024, from <https://hal.archives-ouvertes.fr/hal-01149983/document>.
- Munns, S., 2021, *Employee turnover rates by industry comparison*, viewed 23 September 2024, from <https://www.e-days.com/news/employee-turnover-rates-an-industry-comparison>.
- Ngulube, P., 2019, 'Mapping methodological issues in knowledge management research, 2009–2014', *International Journal of Knowledge Management (IJKM)* 15(1), 85–100. <https://doi.org/10.4018/IJKM.2019010106>
- Nicholls, H., Nicholls, M., Tekin, S., Lamb, D. & Billings, J., 2022, 'The impact of working in academia on researchers' mental health and well-being: A systematic review and qualitative meta-synthesis', *PLoS One* 17(5), e0268890. <https://doi.org/10.1371/journal.pone.0268890>
- Nonaka, I. & Takeuchi, H., 1995, *The knowledge-creating company: How Japanese companies create the dynamics of innovation*, Oxford University Press, Oxford.
- Novitasari, D., Haque, M.G., Supriatna, H., Asbari, M. & Purwanto, A., 2021, 'Understanding the links between charismatic leadership, intrinsic motivation and tacit knowledge sharing among MSME employees', *International Journal of Social and Management Studies* 2(3), 1–13, viewed 13 November 2024, from <https://ijosmas.org/index.php/ijosmas/article/view/29>.
- Paudel, J., 2022, 'Globalization and 21st century higher education: Innovation in managing global challenges', *OPIU Business Review* 1(2022), 11222, viewed 12 February 2025, from <https://jconsortium.com/index.php/opjbr/article/view/841>.
- Polanyi, M., 1966, 'The logic of tacit inference', *Philosophy* 41(155), 1–18. <https://doi.org/10.1017/S0031819100066110>
- Rothwell, W.J., 2023, 'Succession planning: The future of an organization's leadership', in B. Bakshandeh & W.J. Rothwell (eds.), *Building an organizational coaching culture*, pp. 67–80, Routledge, London.
- Salta, K., Paschalidou, K., Tsetseri, M. & Koulougliotis, D., 2022, 'Shift from a traditional to a distance learning environment during the COVID-19 pandemic: University students' engagement and interactions', *Science & Education* 31(1), 93–122. <https://doi.org/10.1007/s11191-021-00234-x>
- Sharma, R.R.K. & Dey, S., 2018, 'Managing tacit and explicit knowledge', in *International Conference on Management and Information Systems*, September 21–22, 2018, viewed 11 October 2024, from <https://www.icmis.net/icmis18/ICMIS18CD/pdf/S159-final.pdf>
- Shihabeldeen, H., Babiker, N. & Ahmed, N., 2020, 'Tacit knowledge sharing: The role of individual factors', *Management Science Letters* 10(10), 2343–2350.
- Squicciarini, M. & Loikkanen, T., 2008, *Going global: The challenges for knowledge-based economies*, viewed 15 November 2024, from https://mpra.ub.uni-muenchen.de/9663/1/MPRA_paper_9663.pdf.
- Tanatova, D. K., Yudina, T. N. & Korolev, I. V., 2023, 'Social environment of a modern university: Theory and methodology of diagnostics', in S.G. Maximova (ed.), *Complex social systems in dynamic environments: Advanced theories, innovative methods, and interdisciplinary research results*, pp. 107–116, Springer International, Cham.
- Tessler, M., Palmer, M., Farah, T.E. & Ibrahim, B., 2019, *The evaluation and application of survey research in the Arab world*, Routledge, viewed 19 October 2024, from <https://www.taylorfrancis.com/books/mono/10.4324/9780429310676/evaluation-application-survey-research-arab-world-tawfic-farah-monte-palmer-mark-tessler-barbara-ibrahim>.
- Vroom, V.H., 1964, *Work and motivation*, John Wiley & Sons, New York, NY.
- You, J., 2017, 'Institutionalization of informal learning behaviors for effective tacit knowledge management', in D. Jaziri-Bouagina & G.L. Jamil (eds.), *Handbook of research on tacit knowledge management for organizational success*, pp. 157–175, IGI Global, Hershey, PA.
- Yu, D. & Zhou, R., 2015, 'Tacit knowledge sharing modes of university teachers from the perspectives of psychological risk and value', *International Journal of Higher Education* 4(2), 214–224. <https://doi.org/10.5430/ijhe.v4n2p214>