Commentary on COVID-19 and African Americans
The numbers are just a tip of a bigger iceberg

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ABSTRACT. Higher education institutions (HEIs) create, disseminate, and share knowledge through relationships involving people, processes, and technologies. Tacit knowledge is difficult to formalize and depends on social context. Its sharing is influenced by individual, organizational, and structural factors, and the knowledge management strategy. The literature suggests that this topic is quite relevant and that there is an evident lack of empirical studies investigating the tacit knowledge sharing in higher education institutions (HEIs). In this context, the main objective of this article is to identify the factors that influence the sharing of tacit knowledge in research groups in higher education institutions (HEIs). Data were collected at a Brazilian public higher education institution with a questionnaire applied to research faculty members. The sample was composed of 255 respondents. The data collected enabled the analysis of a structural equation model. The results reveal that individual, organizational structure, and knowledge management strategy factors are determinants for sharing tacit knowledge in the institution's research groups.

INTRODUCTION

As economies have become more knowledge-intensive, it has become evident to most organizations that knowledge is a valuable resource (Asrar-ul-Haq and

Anwar 2016; Thomas and Gupta 2022). Thus, it has been recognized as a vital and crucial element in today's dynamic and competitive era (Anwar 2017). Moreover, it is fundamental to organizations' sustainability and the long-term success of higher education (Cormican et al. 2021; Mahamed Ismail et al. 2015; Bejinaru et al. 2018).

Knowledge plays a consolidated role in higher education (Al-Kurdi et al. 2018; Ghab- ban et al. 2018). This is particularly true as academic organizations promote knowledge generation and dissemination as their primary mission (Howell and Annansingh 2013). Moreover, since knowledge is an input and an output of higher education institutions (HEIs), they have maintained a unique and distinctive environment of tacit knowledge in the research and innovation environment (Mitchell et al. 2021). In addition, these institu- tions have supported social and cultural ventures and learning through their teaching and research programs, working with businesses and other organizations to foster innovation (Fullwood et al. 2013).

A primary knowledge management (KM) process that impacts the success of KM programs is knowledge sharing (Gupta and Thomas 2019; Fullwood and Rowley 2017; Al-Kurdi et al. 2018). Furthermore, knowledge sharing is the most important knowledge management process that HEIs should seek to develop (Tan 2016). In this regard, sharing tacit knowledge is an effective and efficient strategy for knowledge gain (NooriSepehr and Keikavoosi-Arani 2019).

Consequently, it is rational to expect universities to take a proactive approach, aiming to develop knowledge management strategies and deeply understand how to manage and optimize the value of their knowledge assets (Fullwood et al. 2018). Despite this, there is limited research on tacit knowledge sharing in the context of knowledge-intensive organi- zations such as HEIs, especially considering research groups. In a dynamic information context, research groups are essential for individual and organizational development and learning in academic institutions. Research groups can be identified as those composed of individuals whose profession deals with scientific and technological research (Coadic 2004).

Therefore, this research aims to answer the following question: What factors influence the tacit knowledge sharing of professors and researchers in research groups in higher education institutions?

LITERATURE REVIEW

According to Ipe (2003), knowledge sharing is a condition for knowledge creation and dissemination at different levels of the organization. Fullwood and Rowley (2017) suggest that knowledge sharing in higher education can initiate enhanced decision-making processes, accelerating development and research. According to Yi (2009), it provides value-added benefits to the organization and contributes to the ultimate effectiveness of its processes. Therefore, it can

ultimately increase productivity, improve the work process, create business opportunities, and help the organization to achieve its performance objectives through learning. Knowledge sharing in the context of work is described as the exchange or dissemination of explicit or tacit data, ideas, experiences, or technology between individuals or groups of employees (Cabrera and Cabrera 2002).

Knowledge sharing is the process where individuals mutually exchange their knowl- edge and jointly create new knowledge. This process is essential in translating individual knowledge to organizational knowledge and can be expected to be influenced by different factors (van den Hooff and de Ridde 2004).

The literature on knowledge sharing has identified a wide range of factors that may affect the success or failure of initiatives for sharing knowledge. These factors are individ- ual factors, the organizational structure, the organizational culture, and the knowledge management strategy. These factors are per several studies on tacit knowledge sharing (Ardichvili et al. 2003; Cabrera et al. 2006; Joia 2007; Mcdermott and O'Dell 2001; Oliveira and Pinheiro 2020).

According to Szulanski (1996), Davenport and Prusak (1998), Riege (2005), and Sun and Scott (2003), several impediments inhibit knowledge sharing in organizations. Furthermore, as per Riege (2005, 2007), the barriers to knowledge sharing are essential for the success or failure of a knowledge management strategy. Therefore, sharing knowledge is challenging due to the unstructured nature of tacit knowledge and the many barriers that impede the successful flow of knowledge. Thus, we present the barriers and enablers identified in the analysis of the factors.

Factors Influencing Tacit Knowledge Sharing

Individual Factor

Davenport and Prusak (1998) mention that, in an organizational context, time is a scarce resource and should increasingly be spent on tasks that bring added value to the organization. Therefore, time constraints also affect the knowledge management process (Miller 2019). Individual time management becomes essential for sharing tacit knowledge, mainly because this type of knowledge results from experiences, reflections, and dialogue— three activities that require time to make personal relationships happen (Joia and Lemos 2010; Lee and Jung 2017).

There is the assumption of a common language in tacit knowledge sharing. This points out the necessity for both individuals to know the terminology and jargon used in communication (Davenport and Prusak 1998). This is relevant because these terminologies and expressions assume specific connotations depending on the organizational context in which they are used (Haldin-Herrgard 2000; Joia and Lemos 2010; Disterer 2003).

Trust is central to knowledge sharing (Asrar-ul-Haq and Anwar 2016; Davenport and Prusak 1998; Fullwood et al. 2018). It is understood as the willingness of an individual to engage in a strong relationship with a colleague. It is considered the first step toward effective knowledge sharing (Yusof et al. 2012), mainly when it aims at creating and sustaining knowledge sharing (Tan 2016).

The barriers originating from individual behavior or the perceptions and actions of people may relate to individuals or groups. Regarding the factors associated with the individual, some of the barriers identified are a general lack of time to share knowledge, apprehension regarding job security, the dominance of sharing explicit knowledge over tacit knowledge, differences in experience levels, lack of time for contact and interaction, poor verbal and interpersonal skills, age and gender differences, lack of social network, differences in education levels, fear of not receiving recognition, and cultural differences (Riege 2005). Lack of trust is a fundamental obstacle to knowledge sharing (Cabrera et al. 2006; Wang and Noe 2010; Mura et al. 2021).

Assuming that the individual factor influences the sharing of tacit knowledge in research groups, the following hypothesis is proposed:

Hypothesis 1 (H1). The individual factor positively affects tacit knowledge sharing among aca- demics in research groups.

Organizational Structure Factor

The growing importance that has been given to knowledge sharing is due to the difficulty that organizations have in knowing where the knowledge that they need is so that they can use it (Davenport and Prusak 1998). One of the difficulties in sharing tacit knowledge stems from a poor diagnosis of the need for tacit knowledge that each element of the organization must have and the amount and quality of the knowledge that must be acquired to meet this need (Szulanski 1996).

According to Joia (2007), some aspects of organizational bureaucracies can hinder the knowledge transfer process, such as a hierarchical chain of command, specialization of positions, and standardized procedures for each function, in addition to a non-flexible organizational structure. The hierarchical organizational structure may create difficulties for knowledge sharing through geographic distribution or competition among units (Riege 2005; Lee et al. 2016). According to Lee et al. (2016) and NooriSepehr and Keikavoosi- Arani (2019), a bureaucratic, hierarchical, or inflexible organization makes tacit knowledge sharing even more difficult.

For Roberts (2000) and van den Hooff and de Ridde (2004), the use of valuable forms of communication is relevant in sharing tacit knowledge. Personal conversations are evaluated as the most valuable ones, as they promote mutual and immediate feedback, using multiple forms of communication, such as the demonstration of personal skills and even the use of body language (Haldin-

Herrgard 2000; Leonard and Sensiper 1998). In addition, knowledge sharing can occur through interactive communications via a network with other members and organizations to seize knowledge from others (Cummings 2004; Kim et al. 2015; Panahi et al. 2016).

The literature has emphasized the importance of interactive knowledge manage- ment technologies in bringing the human side into the knowledge management equation (Ardichvili et al. 2003; Brouwer and Jansen 2019; Jiang and Xu 2020).

On the other hand, sharing tacit knowledge often requires proximity between the transmitter and the receiver. Thus, videoconferencing and organizational media platforms can assist in sharing tacit knowledge (Razmerita et al. 2016; Paroutis and Saleh 2009; Pour and Taheri 2019). The perception that technologies can hinder the status quo acts as an inhibiting factor. Past strategies and knowledge management approaches also play a negative role, as well as the absence of incentives for the most sceptic to use the tools made available in the organization (Paroutis and Saleh 2009). However, if there is some degree of trust when opportunities for face-to-face social interaction are limited, and individuals are willing to share knowledge through these tools, the degree of explicitness increases, providing opportunities for sharing tacit knowledge (Hislop 2002).

Assuming that the factor of the organizational structure influences the sharing of tacit knowledge in research groups, the following hypothesis is proposed:

Hypothesis 2 (H2). The organizational structure factor positively affects tacit knowledge sharing among academics in research groups.

Organizational Culture Factor

The organizational culture factor is the most significant regarding knowledge sharing (Fullwood et al. 2018). De De Long and Fahey (2000) indicate that a collaborative and open culture positively affects knowledge sharing.

An engaging organizational environment is supported by a sense of collegiality and a social climate dominated by openness in communication and trust (Nakano et al. 2013). The organizational climate guides members' behavior by indicating the appropriate and desirable behavior (Chennamaneni et al. 2012). However, the absence of a safe environ- ment to express and experience different opinions and ideas hampers the sharing of tacit knowledge in an organization (Sun and Scott 2005).

Tacit knowledge in organizations influences their sharing culture (O'Dell and Grayson 1998). An organizational culture that values tacit knowledge uses several forms of it, such as intuition, experience, and personal skills, as they are considered valuable by organizations and their employees (Haldin-Herrgard 2000; Leonard and Sensiper 1998; Joia and Lemos 2010).

Recognizing knowledge as a power source is another poorly explored aspect. Knowledge- intensive organizations know that knowledge is an asset in the labor market and often leads to situations in which people who possess rare or relevant

knowledge enjoy a privileged reputation among their colleagues (Davenport and Prusak 1998; Haldin-Herrgard 2000). Therefore, if individuals perceive that power comes from their knowledge, this may lead to knowledge accumulation rather than knowledge sharing (Gupta and Govindarajan 2000).

The main reason, however, that most companies do not achieve their knowledge sharing objectives seems to be the lack of clarity between the knowledge management strategy and the company objectives, possibly because knowledge sharing is perceived as a particular activity (Riege 2005). For Mcdermott and O'Dell (2001), companies that successfully implement knowledge management do not try to change their culture to fit their knowledge management approach.

Assuming that the organizational culture factor influences the sharing of tacit knowl- edge in research groups, the following hypothesis is proposed:

Hypothesis 3 (H3). The organizational culture factor positively affects tacit knowledge sharing among academics in research groups.

Knowledge Management Strategy Factor

The types of training used by the organization characterize its strategies to share new and existing knowledge. Joia and Lemos (2010) highlight the importance of training based on mentoring and the sharing of knowledge through personal contact. This type of training is related to hiring new employees, transferring employees between different areas of the organization, or promoting staff to other positions. More personalized strategies based on personal contact that demand more time, such as coaching and mentoring, are more appropriate for transmitting tacit knowledge (Gangeswari et al. 2016; Joia and Lemos 2010; Disterer 2003). From this perspective, Hansen et al. (1999) argue that personalization strategies can transfer organizational knowledge. In the personalization strategy, the focus is on people, emphasizing dialogue and relationships. Since knowledge is shared by personal contact, the organization should prioritize people contact (Joia 2007; Hansen et al. 1999; Leonard and Sensiper 1998; Nonaka and Takeuchi 1995).

Assuming that the factor of the knowledge management strategy influences the shar- ing of tacit knowledge in research groups, the following hypothesis is proposed:

Hypothesis 4 (H4). The knowledge management strategy factor positively affects tacit knowledge sharing among academics in research groups.

Figure 1 represents the research model and the relationships between the variables: individual factor, organizational culture factor, structure organizational factor, knowledge management strategy factor, and tacit knowledge sharing.

Figure 1. Research model.

METHODOLOGY

This study has employed a quantitative research approach. Quantitative data are analyzed using partial least squares structural equation modeling (PLS-SEM). According to Hair et al. (2017), structural equations modeling (SEM) is a continuation of some multivariate analysis techniques, mainly multiple regression and factor analysis. However, it differs from the other multivariate techniques because SEM allows the examination of several dependency relationships simultaneously. In contrast, the other techniques can simultaneously verify and examine a single relationship between variables.

For data collection, we contacted the organization's communication sector to request the dissemination of the online research questionnaire through institutional e-mails. Data were collected using an online self-administered questionnaire available from December 2021 to January 2022 on the Google Forms survey platform. Participation in the survey was voluntary, and the questionnaires were administered anonymously to ensure the confidentiality of the respondents.

The questionnaire was organized into two parts (see Appendix A). Initially, an intro- duction explained the study's objective. Then, the first section covered a set of questions eliciting the demographic characteristics of the respondents (see Table 1). The second section presented a set of questions with items adapted from previous studies in the context of tacit knowledge sharing (see Appendix A). This set of questions had the objective to measure, through the opinion of each respondent, the following variables: individual fac- tor, organizational culture factor, structure organizational factor, knowledge management strategy factor, and tacit knowledge sharing.

Table 1. Demographic profile characteristics.

	Category	Frequency	%
Function	Researcher	156	61.18
	Leader	99	38.82
Formation	Master	28	10.98
	PhD	225	88.24
	Specialist	02	0.78
Time of experience	Less than 05 years	56	21.96
	From five to 10 years	94	36.86
	More than 10 years	105	41.18
Gender	Male	126	49.41
	Female	129	50.59
Knowledge area	Social Sciences	72	28.24
	Human Sciences	59	23.14
	Health Sciences	39	15.29
	Linguistics, Literature and Arts	23	9.02
	Engineering	19	7.45
	Exact and Earth Sciences	18	7.06
	Biological Sciences	15	5.88
	Agricultural Sciences	10	3.92
Total		255	

The study variables were measured on a five-point Likert scale with five response categories ranging from “strongly disagree” to “strongly agree”. The Appendix shows the construct, items, and source.

A panel of three academic researchers conducted the pre-test on a small scale, in which they also evaluated some questionnaire issues. They did not report any significant problems that would require a major revision of the questionnaire. Their comments focused on the necessity of rewriting some questions to clarify them. Subsequently, alterations were made following their suggestions, thus improving the questionnaire’s understanding.

This study used Smart PLS 3.3 software (Ringle et al. 2015) for model evaluation. The PLS-SEM data analysis tool efficiently controls the sample size and non-normal data in complex models (Hair et al. 2017).

Finally, the survey obtained two hundred fifty-five (255) valid answers to the question- naire. Of these, 88.24% of the respondents were PhDs, 10.98% Masters, and 0.78% Specialists.

The most frequent function in the research group, amounting to 61.18%, was that of the researcher, followed by 38.82% of leaders. The experience in research activities showed that 41.18% had “more than 10 years”; 36.86% “between 5 and 10 years”; and 21.96%, “less than 5 years”. Regarding gender, 49.41% were male, and 50.59% were female. Table 1 presents the demographic profile characteristics of the respondents.

As for the research areas of the participants, 28.24% were from Social Sciences; 23.14% from Human Sciences; 15.29% from Health Sciences; 9.02% from Linguistics, Literature and Arts; 7.45% from Engineering; 7.06% from Exact and Earth Sciences; 5.88% from Bio-logical Sciences; and 3.92% from Agricultural Sciences.

RESULTS

Measurement Model

The measurement model evaluation aims to confirm the reliability and validity of the constructs and their dimensions. Firstly, the values of internal consistency (Cronbach's alpha) and composite reliability (CR) were calculated. The CR is more suitable for PLS because it prioritizes the variables according to their reliability. At the same time, the CA is more sensitive to the number of variables in each construct. In both cases, CA and CR are used to assess whether the sample is free of bias and whether the responses are reliable (Ringle et al. 2014). According to Hair et al. (2017), CA values above 0.60 and 0.70 are considered adequate in exploratory research, and values of 0.70 and 0.90 for the CR are considered satisfactory.

Indicators with factor loadings above 0.60 are considered adequate (Chin et al. 1997). The average variance extracted (AVE) for constructs is larger than 0.5, indicating good convergent validity.

Table 2. Construct validity.

	Factorial Loadings	Composite Reliability (CR)	Cronbach's Alpha (CA)	Average Extracted Variance (AVE)
Individual Factor				
IF1	0.711	0.847	0.734	0.649
IF2	0.840			
IF3	0.858			
Organizational Culture Factor		0.886	0.843	0.611
OCF1	0.783			
OCF2	0.837			
OCF3	0.855			
OCF4	0.683			
OCF5	0.738			
Organizational Structural Factor		0.789	0.606	0.558
OSF1	0.625			
OSF2	0.799			
OSF3	0.802			
Knowledge Management Strategy Factor		0.889	0.751	0.800
KMSF1	0.908			
KMSF2	0.881			
Tacit Knowledge Sharing		0.891	0.817	0.733
TKS1	0.849			
TKS2	0.903			
TKS3	0.814			

Source: Survey data, 2022.

The instrument was assessed for construct validity and internal consistency. Internal consistency describes how closely the items in a survey measure the same construct. The correlations between several items on the same test are used to ascertain whether different items claiming to measure the same basic construct give similar results. The individual factor scale consisted of three items (α = 0.734), the organizational culture factor scale consisted of five items (α = 0.843), the organizational structure factor scale consisted of three items (α = 0.606), the

knowledge management strategy factor scale consisted of two items (α = 0.751), and the tacit knowledge sharing scale consisted of three items (α = 0.817), thus demonstrating internal consistency. Table 2 shows the factorial loadings, alpha coefficient, composite reliability (CR), and average variance extracted (AVE).

All constructs' average variance extracted (AVE) and composite reliability (CR) are higher than the suggested values of 0.50 and 0.70, respectively. Convergent validity and reliability, therefore, are confirmed. Similarly, discriminant validity was also calculated (Table 3) according to the criterion of Fornell and Larcker (1981).

Table 3. Discriminant validity.

	OSF	IF	OCF	KMSF	TKS
OSF	**0.747**				
IF	0.393	**0.806**			
OCF	−0.287	−0.133	**0.782**		
KMSF	0.489	0.232	−0.261	**0.895**	
TKS	0.408	0.436	−0.137	0.323	**0.856**

Note: The data on the diagonal (in bold) are the square root of the construct's AVE, while the other values are the correlations with other constructs. Organizational Structural Factor (OSF); Individual Factor (IF); Organizational Culture Factor (OCF); Knowledge Management Strategy Factor (KMSF); tacit knowledge sharing (TKS).

Another extended discriminant analysis adopted a new criterion for assessing the discriminant factors using the heterotrait–monotrait (HTMT) ratio of correlation. Hetrotrait and monotrait ratios are shown in Table 4. As Hair et al. (2019) suggest, it shows that all the HTMT values are less than 0.90.

Table 4. Discriminant validity (HTMT).

	OSF	IF	OCF	KMSF	TKS
Organizational Structure Factor					
Individual Factor	0.594				
Organizational Culture Factor	0.415	0.172			
Knowledge Management Strategy Factor	0.729	0.324	0.323		
Tacit Knowledge Sharing	0.567	0.547	0.154	0.412	

Source: Survey data, 2022.

Structural Model

We followed the recommendations given by Hair et al. (2019) to evaluate the structural model. First, we assessed potential collinearity. The only way to assess collinearity issues is using the variance inflation factor (VIF). Therefore, the variance inflation factor (VIF) was used to measure collinearity problems. The scores of the predictor constructs fit the VIF criteria below 3 (Hair et al. 2019), which can be observed in Table 5.

Table 5. Verification of hypotheses.

	Hypotheses	β	Error Standard	t-Value	*p*-Value	VIF	f^2	R^2
Individual Factor → TKS	H1	0.320	0.062	5.200	0.000	1.186	0.119	
Organizational Structural Factor → TKS	H2	0.211	0.073	2.893	0.004	1.521	0.04	0.273
Organizational Factor → TKS	H3	0.004	0.044	0.089	0.929	1.113	0	
Knowledge Management Strategy Factors → TKS	H4	0.147	0.058	2.543	0.011	1.346	0.022	

Source: Survey data, 2022.

Second, we computed the predictive power of the structural model in terms of the variance explained (R2), as shown in Table 5. R2 values and path coefficients indicate how well the data support the hypothesized model (Chin 1998).

Third, we examined the size and significance of the path coefficients representing the research hypotheses. Following Hair et al. (2019), the significance levels of the path coefficients were obtained using the bootstrapping procedure (with 5000 bootstrap samples). Table 4 provides the path coefficients, t-statistics, significance levels, and p-values. Analysis of the path coefficients and levels of significance shows that the hypotheses are supported, except for H1, H2, and H4.

Finally, we also calculated the overall model fit using the standardized root mean square residual (SRMR) to capture the root mean square discrepancy between the observed correlation and the model implied correlations. Values below 0.08 are considered suitable(Hu and Bentler 1999). The model estimation with PLS-SEM in this study reveals an SRMR value of 0.07, which confirms the overall fit of the PLS-SEM path model (Hair et al. 2019).

We observed that, considering the f2 and the p-values and t-values, the relationship for the individual factor is more substantial and significant (t-value = 5.200 and p-value = 0.000) and relevant (f2 = 0.119). It was the most important for tacit knowledge sharing. Results showed that only H1 ($\beta = 0.320$, $p < 0.05$), H2 ($\beta = 0.211$, $p < 0.05$), and H4 ($\beta = 0.147$, $p < 0.05$) had a significant and positive influence on tacit knowledge sharing, while hypothesis H3 ($\beta = 0.004$, $p > 0.05$) was not supported.

R2 evaluates the portion of the variance of the endogenous variables that the structural model explains. The findings shown in Figure 2 reveal that the exogenous variables explain 27.3% of the endogenous variables.

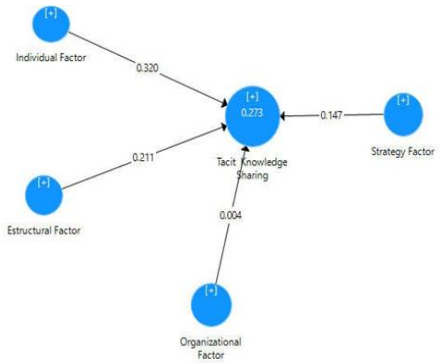

Figure 2. Path coefficient values. Source: SmartPLS.

DISCUSSION

The results demonstrate the importance of the individual factor for faculty members' tacit knowledge sharing in research groups ($\beta = 0.320$, $p < 0.05$). This finding corroborates previous studies, such as those of Joia and Lemos (2010), Obrenovic et al. (2020), Oliveira and Pinheiro (2020), and Abbasi et al. (2021), in identifying the individual factor as fundamental to the sharing of tacit knowledge. Fauzi et al. (2019) obtained similar results, showing that trust increases the relationships between academics. Roberts (2000) mentions that tacit learning is, in the learning processes, embedded in individuals' experiences. Their predisposition for sharing tacit knowledge increases, placing more trust in relationships and showing greater interest in developing a shared language with other professionals. The shared language in the form of shared intellect is essential in group activities (Bou- Llusar and Segarra-Ciprés 2006; Nonaka and Krogh 2009). García-Sánchez et al. (2019) evidence that, in research groups, the intensity and frequency of interactions are essential to strengthen relationships and create bonds of trust. Blanco-Valbuena and Pineda (2019) corroborate this. These authors identified that the availability of time is indeed one of the fundamental characteristics of sharing tacit knowledge.

The results show that the organizational structure factor supports sharing tacit knowl- edge ($\beta = 0.211$, $p < 0.05$). The organizational structure aims to support and integrate the institution's communication flow and coordinate activities and responsibilities. It is a deter- minant of knowledge sharing processes as it depends on organizations' size, formalization, centralization, and integration. In line with the results of Bibi and Ali (2017), an organiza- tional structure is a determinant of knowledge sharing processes as they depend on the organization's size, formalization, centralization, and integration. This corroborates the assertion of AlShamsi and Ajmal (2018), who state that the organizational structure defines the flow of information and knowledge within the organization. In turn, Krishnaveni and Sujatha (2012) reinforce that relational networks also boost knowledge in the organization when the relationships between the sources and the recipients of knowledge are cohesive (strong ties) and already exist in the face of a hierarchical organizational structure. In a strong network, people interact and share their experiences, abilities, and knowledge formally and informally (Razzaque 2020; Zhang et al. 2021). Social group interaction con- tributes to knowledge sharing in HEIs (Ma and Chan 2014; Kang and Kim 2017). These results are confirmed in the communities of practice, where participants seek professional improvement, reciprocity in contributions, and advancement in their communities (Wasko and Faraj 2000; Moghavvemi et al. 2017).

Based on the research results, the knowledge management strategy factor positively influences the sharing of tacit knowledge ($\beta = 0.147$, $p < 0.05$). The nature of tacit knowledge requires strategies that prioritize contact between individuals, enabling interactions and contacts in search of solutions, and learning

from more experienced employees. This finding confirmed that the most used strategies and tools prioritize personal contacts in formal or informal mechanisms (Holste and Fields 2010; Joia and Lemos 2010). This finding is consistent with the emphasis on knowledge transmission among academics in their practice. Academics' previous work experiences are central to the processes of knowledge sharing and are also associated with job mobility (Lee and Jung 2017). Therefore, we conclude that the knowledge management strategy through the transmission of knowledge and training is effectively supported in the activities of research groups. Thus, the more tacit knowledge is for developing activities in research groups, the more interactions for transmitting this knowledge among the participants happen. Furthermore, the knowledge management strategy emphasizes developing and promoting organizational vision in support of tacit knowledge (AlShamsi and Ajmal 2018; Bedford and Harrison 2015). Fauzi et al. (2019) state that faculty members share tacit knowledge in training events, organization conferences, informal social networks, and peer-to-peer communication in universities. However, we did not investigate the frequency of interactions for transmission and training in groups. We, therefore, encourage future studies to explore this topic.

CONCLUSIONS

The environment of higher education institutions is highly dynamic and dependent on their intellectual capital. Therefore, it is imperative to encourage public higher education institutions to develop strategies appropriate to the tacit knowledge sharing factors. Research groups are fundamental in sharing knowledge in higher education institu- tions, as they are responsible for developing disciplines and the institution. Consequently, they promote learning for individuals, groups, and organizations. Furthermore, consid- ering that internal and external agents are constantly impacting teaching and research institutions, the constant motivation of individuals involved in research activities, both in- trinsically and extrinsically, is essential since the skills and experience acquired in research come from teaching practice in research groups.

This study aimed to identify what factors influence the tacit knowledge sharing of teachers and researchers in research groups in higher education institutions. Based on structural equation modeling, the empirical study identified that the individual factor, organizational structure factor, and knowledge management strategy factor positively affect tacit knowledge sharing. However, the organizational culture factor did not significantly affect tacit knowledge sharing.

We should also note in this regard that the organizational culture factor can be in- fluenced both by the organizational culture and departmental culture in the case of HEIs. Thus, it is suggested that managers should give more relevance to the actions of research groups to promote the sharing of tacit knowledge as an institutional strategy. Our article contributes to the literature on knowledge

management and tacit knowl- edge sharing in Brazilian higher education institutions, as studies in these institutions are scarce. It also reveals that the individual factor is the main enabler of tacit knowledge sharing in research groups in Brazilian HEIs. This finding implies that investing in human resources is fundamental for the development of academic researchers, groups, and institutions, as research groups' activities are motivated by individual interests. Thus, promoting interaction between academics and groups is essential since it encourages organizational benefits and strengthens the knowledge sharing culture in the institution.

This work also contributes by studying the knowledge management strategy factor in HEIs. It notes that the strategies used to share tacit knowledge benefit the institution as personal knowledge is transferred to the institution's groups and society through their results. In practice, this work can help the institution to define strategies and develop future actions to promote a knowledge sharing culture supported by an empirical study.

This research has some limitations. For example, we collected data from academic researchers in a higher education institution. These institutions have specific academic specificities related to their management, reflecting the need for unique processes, policies, and structures. Thus, these results should not be generalized.

Sharing tacit knowledge is a promising field of interest. In this way, other studies can observe tacit knowledge sharing and the evaluation measures of HEIs in different aspects, such as growth, innovation, research results, internationalization through the indicators studied, and the frequencies of interactions between individuals, institutions, and nations. In addition, other studies can analyze the leader's influence on the sharing of tacit knowledge in different disciplines. Finally, gender studies must be developed in a tacit knowledge sharing context.

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Appendix A.

Constructs and Items

Construct	Indicators	Item	Source
Individual Factor	Individual Management of Time	1. I have the time and opportunity to share with and receive know-how from others.	(Joia and Lemos 2010)
	Language	2. The used common language and jargon are known by everyone.	
	Trust	3. I feel safe sharing information and know-how with my colleagues.	
Organizational Structure Factor	Relationship Network	1. I know exactly who at the university has the specific know-how that can help me in the research group.	Adapted (Joia and Lemos 2010)
	Hierarchy	2. I have access to people who with the know-how I need, regardless of their hierarchical level.	
	Media	3. The organization provides a communication system that allows researchers in my course/group to share knowledge.	
Organizational Culture Factor	Communicational	1. Communication in the organization is insufficient to promote knowledge sharing. 2. The hierarchical structure of the organization inhibits knowledge sharing. 3. There is a lack of communication about the benefits of sharing knowledge. 4. There is little time available to develop internal and external relationships with other sources of knowledge. 5. It is necessary to change the organization's culture to increase knowledge sharing.	Adapted (Joia and Lemos 2010) and (Riege 2005)
Knowledge Management Strategy Factor	Knowledge transference	1. When I need some know-how, I am encouraged to try to get it from other colleagues.	(Joia and Lemos 2010)
	Training	2. When I need specific know-how, I find a training specialist in the organization.	
Tacit Knowledge Sharing		1. I am often willing to share knowledge from my experience with other members of research groups and more often 2. I offer my tacit knowledge when requested by other members of the organisation. 3. I am willing to receive knowledge based on the experience of other members of the organisation.	Adapted (van den Hooff and de Ridde 2004)

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