

Mapping Information Technology and Personal Factors on Faculty Members' Knowledge Sharing at Higher Education Institutions of Pakistan

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ABSTRACT

This study aims to investigate the interaction between information technology and personal characteristics in promoting knowledge sharing among teachers. Promoting knowledge sharing is an ongoing focus in the education sector of Sindh. In this context, this study examines the impact of technological infrastructure and social media as various aspects of information technology and the impact of personal characteristics such as trust, self-efficacy and personality traits. This study adopted a quantitative method of convenience sampling. Data were collected electronically through social media platforms using a structured questionnaire survey of 335 participants. The proposed model was empirically tested with Structural Equation Modeling (SEM). This study emphasizes the importance of technology in knowledge sharing, highlighting the role of collaborative platforms like virtual learning environments and knowledge management systems in facilitating accessibility and collaboration among faculty members. Leadership support and organizational incentives are keys in encouraging and rewarding knowledge sharing behaviors. Targeted training programs and incentives can empower faculty members to actively engage in sharing knowledge, enhancing the institution's intellectual capital.



Introduction

The increased demand for high-quality educational services is causing rapid transformations in the global higher education sector (Mathew, 2010). External pressures are compelling the industry to enhance its efficiency, effectiveness, and innovation (Herbst and Conradie, 2011). Knowledge and its sharing are crucial resources and opportunities driving these changes, serving as the foundation for competitive advantage and fostering innovation (Von Krogh, Nonaka, & Rechsteiner, 2012). Knowledge can augment the value of information or possess inherent value, enabling informed

decision-making and action (Sabherwal, 2010). Given its significance, effective management of knowledge is essential to generate value, necessitating the adoption of knowledge management practices, which significantly influence organizational success (Zheng, 2017). Knowledge management encompasses various activities, including the discovery, capture, sharing, and application of knowledge across all organizational processes (Mahendrawathi, 2015).

However, knowledge sharing poses challenges due to various barriers that hinder individuals from sharing knowledge with others. These barriers include the perception that knowledge equates to power, leading individuals to withhold information, as well as occupational factors that limit individuals' time for knowledge-sharing activities (Chikoore, 2013). In knowledge-based institutions like universities and colleges, effective knowledge sharing is particularly crucial, as it permeates nearly all core activities within these organizations.

Despite its importance, the application of knowledge management strategies in universities and colleges is not automatic, as highlighted by the findings of previous studies (Sarja, 2014; Prabowo, 2010). Consequently, knowledge sharing, as a vital component of knowledge management, may not be optimally implemented in educational institutions.

The purpose of this study is to determine whether there is a structural relationship between the information technology and individual factors to the role of knowledge sharing in higher education institutions of Sindh province.

To achieve this goal, this article is structured as follows: In the next part the theoretical foundations of the organization are presented Knowledge sharing and, individual factors and their connections to information technology. The article presents previous research on the relationships between these factors. This is respected through an overview of the structural equation modeling method used for the analysis hypotheses.

Theoretical Background and Hypotheses Development

The theoretical framework is established by integrating research models developed by prior researchers and incorporating theories from textbooks to reinforce researchers' understanding of the factors influencing knowledge-sharing activities. The Theory of Planned Behavior (TPB) explains how individual behavior is driven by behavioral intentions, which in turn are influenced by attitudes, subjective norms, and perceived behavioral control. The theory can be applied to explain teachers' knowledge sharing behavior in the context of personal factors, such as attitudes toward knowledge sharing, norms within academic departments, and teachers' perceived extent to which knowledge sharing is shared.

Social exchange theory (SET) posits that knowledge sharing is based on the idea of reciprocal exchange, where individuals share knowledge with the expectation of receiving something in return (such as recognition, trust, or future help). In higher education institutions, faculty are more likely to share knowledge if they believe they will benefit from the exchange—whether through collaborative research, enhanced reputation, or support for scholarly activities.

Information Technology

Information Technology is an essential consideration for organizations aiming to harness the benefits of knowledge-sharing initiatives (Raharso et al., 2014). As data volumes surge and data requirements become more intricate, the manual handling of knowledge within organizations becomes almost untenable. Information technology plays an increasingly important role in critical

processes such as data collection and processing, knowledge sharing, and the assessment, creation, and improvement of knowledge (Asgari et al., 2012).

Technology Infrastructure

Technology infrastructure, often denoted as IT (Information Technology) infrastructure, stands as a pivotal component within contemporary organizations and society at large. It encompasses hardware, software, networks, data centers, and other essential elements vital for facilitating the flow of information, data, and services. Knowledge management technology, such as video conferencing, electronic discussion groups, and platforms for sharing best practices and lessons learned, plays a significant role in this infrastructure. Certain knowledge management scholars contend that the effectiveness of knowledge management is dependent on the existing technical framework. Such hardware and software-enabled computing devices can significantly support knowledge-sharing initiatives (Indrajit et al., 2017). Without a comprehensive company-wide IT infrastructure, an organization cannot fully enable its employees to exchange information. However, the common pitfall that many companies encounter is not a dearth of IT infrastructure but an excessive fixation on it. It's important to recognize that while IT is a crucial component of knowledge management initiatives, it's just one facet; providing a platform for communication and information sharing is only part of the equation (Ismail, 2010).

Social Media

Social media is increasingly recognized as a crucial technology for disaster relief efforts. Social media platforms facilitate the open exchange of information online through conversations and interactions (Anayo, 2013). The advent of online social media has significantly influenced the knowledge sharing landscape, serving as a platform that enables users to engage in knowledge sharing activities. Online social media platforms not only foster interaction and engagement but also serve as a motivating factor for individuals to share their knowledge (Gaál et al., 2015).

Individual Factors

"Individual factors" encompasses a wide array of personal attributes, characteristics, and traits that impact an individual's conduct, choices, and engagements. These factors exert a substantial influence on individuals' perceptions of the environment and their responses to different circumstances. Derived from internal considerations, individual factors stem from one's internal disposition. Personal factors encompass a variety of personal attributes, characteristics, and traits that influence an individual's behavior, decisions, and interactions. These factors play an important role in shaping how people perceive the world and how they respond to various situations (McCrae & Costa, 1999).

Trust

People tend to trust others when they can predict their behavior. This principle is closely related to consistency and reliability, which have a significant impact on interpersonal trust (Deutsch, 1960). Factors such as having shared values and adhering to ethical standards help build trust. Specifically, ethical leadership is closely related to fostering trust in organizational settings (Brown & Treviño, 2006). Demonstrating proficiency and expertise in a specific domain or task can also enhance trust (McKnight, Choudhury & Kacmar, 2002). Trust is widely considered to be positively correlated with knowledge sharing and is a cornerstone of effective communication and organizational vitality (Saide et al., 2016). Trust can be understood as an expression of confidence between parties involved in an exchange, indicating that the parties have mutually assured that

negative outcomes will not occur or be exploited (Szulanski, 2002). In addition, research has shown that relationships characterized by compassion, mutual trust, empathetic participation, collaborative assistance, non-judgmental attitudes, and courage are important factors in promoting knowledge sharing (Din et al., 2012).

Self-efficacy

Self-efficacy is a psychological concept first coined by the famous psychologist Albert Bandura, which refers to an individual's confidence in his or her ability to effectively perform specific tasks or achieve specific goals. Essentially, it reflects one's belief in their ability to accomplish something. Here are some essential aspects regarding self-efficacy (Triana, 2014). Individuals with higher levels of self-efficacy typically demonstrate greater willingness to share their knowledge compared to those with lower self-efficacy levels (Bulan, 2012).

Self-efficacy is the conviction that one can carry out particular actions or reach specified objectives on one's own (Bandura, 1977). According to Bandura (1997), it is a fundamental idea in social cognitive theory and affects behaviour motivation, effort level, and perseverance in the face of difficulties. Because self-efficacy beliefs are domain-specific, they might change depending on the task or circumstance. While people with low self-efficacy may shy away from obstacles or give up easily, those with high self-efficacy are more likely to face challenging activities with confidence, persistence, and resilience (Bandura, 1986).

Personality

According to McCrae and Costa (1999), personality is the particular combination of persistent traits, characteristics, and behaviour that characterize a person's distinctive ways of feeling, thinking, and acting. These traits influence how people perceive and engage with their environment, which in turn affects how they respond to different situations and events (Cervone & Pervin, 2019). Personality is generally considered to be relatively stable over time, although it may also develop and change throughout the lifespan (Roberts et al., 2008). Personality psychology seeks to explore the underlying factors and dynamics that contribute to the formation, expression, and development of personality (Funder, 2001). Jung believed that the existence of various personality types is shaped by two basic attitudes: introversion and extroversion. Extroverts direct their mental energy outward, focusing on external things rather than subjective experiences. In contrast, introverts tend to immerse themselves in their inner world, which is characterized by personal prejudices, fantasies, dreams, and perceptions. Although they are able to perceive and participate in the external world, their interactions are often filtered by their subjective perspective (Hvidsten et al., 2016).

Knowledge Sharing

The act of exchanging information, insights, expertise, and experience among individuals or groups within an organization or community is called knowledge sharing. It involves sharing important information to support decision-making, learning, and problem solving (Al-Husseini et al., 2021). Knowledge sharing is the process of exchanging information, ideas, expertise, or experience with others. It is a fundamental aspect of human communication and collaboration, and it can take place in various forms and scenarios. Knowledge sharing has been identified as the key to successful knowledge management. The sharing of employee experience, capabilities, and information is known as knowledge sharing. Its benefits include maintaining intellectual property and increasing productivity. It ensures that employees have ready access to knowledge within the organization when they need it. According to early research, information technology (IT),

employee motivation, and a culture that encourages knowledge sharing are the three most important factors that influence knowledge sharing (Jones et al., 2006).

Research Framework

A research framework, also known as a theoretical framework or conceptual framework, provides a structure and foundation for conducting research by guiding the formulation of research questions, hypotheses, and the interpretation of results. It is usually composed of concepts, theories, and models that help researchers understand the phenomenon being studied and establish relationships between variables (Creswell, J. W. (2014)). According to Sekaran and Bougie (2003), the theoretical framework is the foundation of all research models. Based on the theoretical framework, hypotheses can be proposed and tested to determine whether the constructed theory is valid. Then, appropriate statistical analysis can be used to measure its effectiveness. To this end, the author constructed a research model as shown in Figure 1 below:

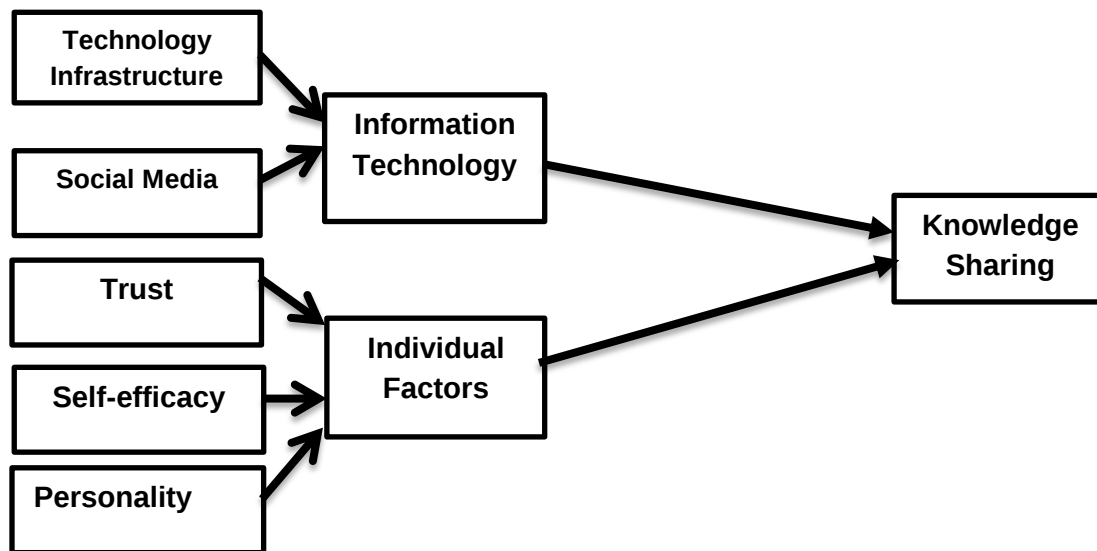


Figure 1: Research Framework

Hypothesis Development

- H1: Information technology factors have positive impact on knowledge sharing among the faculty members of HEIs.
- H2: Individual factors have positive impact on knowledge sharing among the faculty members of HEIs.

Research Methodology

The methodology employed in this research adopts a quantitative approach, which involves analyzing a specific population or sample by utilizing research instruments tailored to the variables under investigation, with the objective of testing predetermined hypotheses. Data collection was conducted through convenience sampling, targeting respondents willing to participate in the study. The study population consisted of 6500 individuals from 24 public higher education institutions in the Sindh province of Pakistan. To achieve a desired precision level of 7% and a 95% confidence level, a minimum sample size of 200 faculty members was determined based on the guidelines of Glenn (2003). Hair, Black, Babin, and Anderson (2010) suggest that, in Structural Equation Modeling (SEM), a sample size exceeding 100 is necessary to ensure adequate statistical power.

Therefore, the sample size obtained in this study was deemed sufficient. Questionnaires were distributed using a delivery and collection method, with a total of 550 questionnaires administered and 378 (63%) returned. Among the returned questionnaires, 335 were considered usable, resulting in a usable response rate of 42%. The demographic characteristics of the respondents are outlined in Table 1. Females accounted for 54.4% of the respondents, while males represented 45.6%. With regard to age profile, tenure, and academic position, respondents were distributed unevenly across various categories

Findings and Discussion

Structural equation modeling (SEM) was chosen as an appropriate method to estimate these composite cause-result relationships through analysis of the questionnaire response, as this investigation aimed to look at the effect of information technology and individual factors on knowledge sharing with mediating role of organizational factors.

Measurement Model

The links between the latent construct and its observable indicators are specified by the measurement model. It outlines the relationships between the observed and latent variables. For confirmatory factor analysis (CFA) and structural equation modeling (SEM), which are common statistical techniques for measurement modeling, measurement models are often represented using path diagrams and equations. The measurement model describes how the observed variables "load" onto the latent construct.

Convergent Validity

In research and psychometrics, convergent validity is a term used to describe the closeness or correlation of data from multiple measures or methods that are believed to be related to the same construct. It is an important construct validity that indicates how well the measurement method captures the target construct. To achieve convergent validity, Chin (2010) and Hair et al. (2014) stated that the minimum loading, composite reliability (CR), and average variance extracted (AVE) should all be greater than 0.70. The loading of all bars in this survey was higher than the necessary 0.70. After the CR internal consistency test and Cronbach's α coefficient test, the reliability of all items exceeded 0.70. The validity and reliability results were good, as shown in Table 1.

Table 1: Overloading, CR AVE

Variable	Items	Loading	CR	AVE	Cronbach's Alpha
Technology Infrastructure	TI1	0.792	0.934	0.881	0.962
	TI2	0.771			
	TI3	0.779			
	TI4	0.793			
	TI5	0.822			
Social Media	SM1	0.819	0.948	0.779	0.925
	SM2	0.868			
	SM3	0.817			
	SM4	0.849			
	SM5	0.804			

Trust	TR1	0.819	0.921	0.687	0.881
	TR2	0.819			
	TR3	0.819			
	TR4	0.799			
	TR5	0.832			
Self-efficacy	SE1	0.737	0.918	0.678	0.883
	SE2	0.791			
	SE3	0.819			
	SE4	0.849			
	SE5	0.799			
Personality	PR1	0.712	9.62	0.845	0.935
	PR2	0.717			
	PR3	0.770			
	PR4	0.804			
	PR5	0.810			
Knowledge Sharing	KS1	0.712	9.42	0.885	0.945
	KS2	0.717			
	KS3	0.770			
	KS4	0.804			
	KS5	0.810			

Discriminant validity

To determine whether multiple constructs or variables in a study are different from each other, researchers apply the concept of discriminant validity. It assesses whether the measurement accurately captures a specific construct or constructs and does not overlap with other measurements in the same research project. To determine whether a construct successfully distinguishes itself from other constructs in the same model, discriminant validity must be ensured. Applying the Fornell-Larcker criterion is one way to assess discriminant validity, which requires finding a latent variable that has a higher correlation with its indicator than other latent variables (Fornell and Larcker, 1981).

Table 2: Fornell–Larcker criterion discriminant validity

Variables	Trust	Self-Efficacy	Personality	Social Media	Technology Infrastructure	Knowledge Sharing
Trust	0.87					
Self-Efficacy	0.29	0.94				
Personality	0.41	0.42	0.86			
Social Media	0.34	0.38	0.51	0.91		
Technology Infrastructure	0.48	0.45	0.67	0.42	0.86	
Knowledge Sharing	0.27	0.34	0.51	0.35	0.64	0.89

Structural model

Structural modeling is an interdisciplinary concept used to describe and understand the connections and interactions between components or elements within a system. The term is applied to a variety of fields such as physics, engineering, economics, and social sciences. Goodness-of-fit indices indicate an acceptable degree of adequacy of the model, as described above. The results of the structural equation model (SEM) analysis of direct effects are robust and statistically significant.

R-Squire

Table 3: R Square Value

Variable	R Squire	R Squire Adjusted
KS	0.938	0.940

Hypothesis Testing

The associations between the variables (see Table 3) were tested to determine the relationship between the parameters and knowledge sharing activities. The data found that both individual variables and technology had a positive impact on knowledge sharing behavior. Information technology ($c=0.33$, $p<0.05$) and individual factors ($c=0.14$, $p<0.05$) were related to knowledge sharing. Therefore, this study verified both hypotheses.

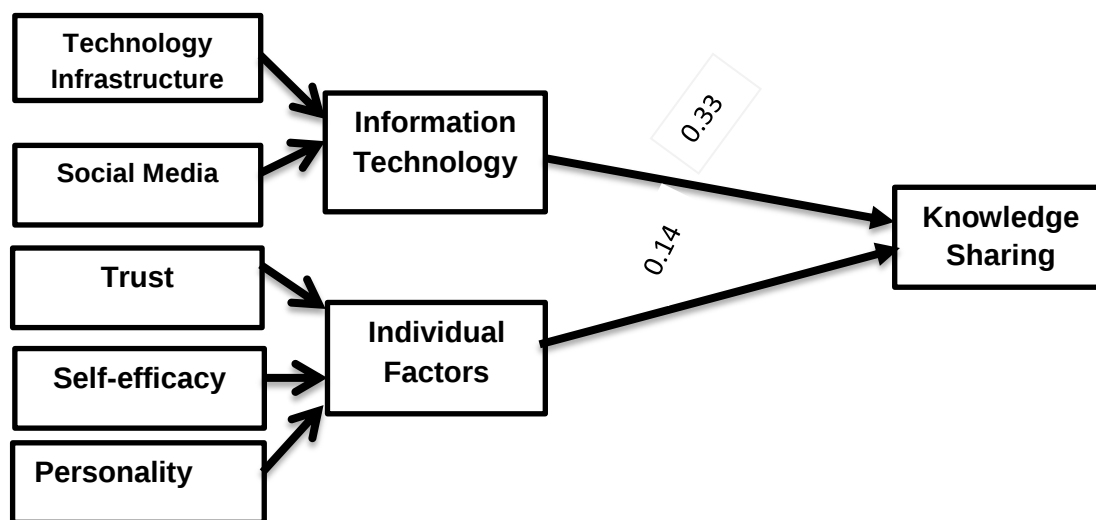


Figure 1: Relationship Model

Table 4: Result of hypotheses

Hypotheses	Coefficients	T-Values	P- Values	Results
H1 Information Technology Factors → Knowledge Sharing	0.33	5.71	0.00	Accepted
H2 Individual Factors → Knowledge Sharing	0.14	2.72	0.01	Accepted

Discussion

This study sheds light on the intricate dynamics of knowledge sharing among faculty members within higher educational institutions. The current research delved into the crucial interplay between technological advancements and individual behaviors, uncovering their substantial roles in fostering knowledge exchange within academic communities. It underscored the pivotal role of technology as a facilitator of knowledge sharing. Through survey responses, it is found that the integration of collaborative platforms, such as virtual learning environments and knowledge management systems, significantly enhances the accessibility and dissemination of valuable insights among faculty members. These platforms not only provide a centralized repository for information but also promote seamless communication and collaboration, transcending physical barriers and fostering a culture of knowledge sharing.

In addition to technological enablers, our study highlighted the significance of individual behaviors in driving knowledge sharing initiatives. It identified key behavioral determinants, including trust, reciprocity, and intrinsic motivation, as crucial catalysts for fostering a conducive environment for knowledge exchange. Faculty members who demonstrate a willingness to share their expertise, coupled with a sense of mutual respect and support, play a pivotal role in cultivating a culture of openness and collaboration within academic settings. Moreover, findings emphasize the importance of leadership support and organizational incentives in incentivizing and rewarding knowledge sharing behaviors, thereby nurturing a sustainable ecosystem for continuous learning and innovation.

Implications and Recommendations: The insights gleaned from our study have profound implications for stakeholders within higher educational institutions. By recognizing the symbiotic relationship between technological infrastructure and individual behaviors, institutions can strategically design interventions to promote and sustain knowledge sharing initiatives. This entails investing in robust technological platforms that facilitate seamless information exchange, while also fostering a supportive organizational culture that values and rewards collaborative endeavors. Furthermore, targeted training programs and incentives can be implemented to empower faculty members with the necessary skills and motivations to actively participate in knowledge sharing activities, thereby enriching the collective intellectual capital of the institution.

In conclusion, this study underscores the multifaceted nature of knowledge sharing within higher educational institutions, highlighting the integral roles played by both technological advancements and individual behaviors. By embracing these findings and implementing targeted interventions, stakeholders can foster a vibrant culture of knowledge sharing that not only enhances organizational performance but also fuels continuous innovation and excellence in academia.

Conclusions

The primary objective of this research was to examine how the impact of information technology and personal factor on knowledge sharing among the faculty members of higher educational institutes of Pakistan. The study findings suggest that both information technology and individual factors significantly influence knowledge-sharing practices. Technology serves as a crucial facilitator in knowledge dissemination, while personal inclinations also play a pivotal role in work engagement. The research successfully demonstrates the impact of individual traits and technological advancements on knowledge-sharing endeavors. Notably, trust, self-efficacy, and personality emerge as the primary determinants of knowledge-sharing activities among faculty

members. These insights offer valuable implications for both practitioners and scholars in subsequent endeavors.

Implications

The findings from the present research study could offer valuable insights for administrators within academic institutions (HEIs) to grasp the pivotal significance of information technology and personal factors on Knowledge sharing. Additionally, management's focal point has been to ascertain academic performance and efficacy. The study can also equip educators with guidelines on what measures are necessary to sustain heightened commitment to the university. Continuous research endeavors also offer valuable guidance to managers within both public and private sector universities by proposing specific policies aimed at fostering employee development and serving as knowledge reservoirs for organizations. Through such initiatives, universities can enhance their overall performance. They might contemplate the implementation of effective knowledge management policies and strategies while fostering a conducive learning atmosphere. Within higher education institutions, this can foster team-level learning, which contributes to individual and organizational advancement.

Limitation Suggestion for Future Work

The study primarily focused on public sector universities in the developing country of Pakistan of Sindh province. Therefore, future research endeavors could broaden their scope to encompass universities in developed countries, facilitating comparisons for more robust conclusions.

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