

Assessment of Construction Practitioners' Knowledge Sharing Attitude in Construction Projects in Nigeria

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Abstract

Individuals such as Construction Practitioners (CPs) are the focal point of Knowledge Sharing (KS). KS plays a cardinal role in knowledge management (KM). Literature has shown that KS success is largely driven by individual level variables such as attitude. Studies on KS largely neglect the individual level variables e.g., perception, motivation and attitude. Hence, there is a lack of knowledge on the influence of the determinants of attitude on Construction Practitioners' (CPs') KS attitude. This indicates lack of understanding about the knowledge sharing attitudes of CPs and the factors that influence their willingness to share knowledge. This knowledge gap hinders the development of effective strategies and interventions to enhance knowledge sharing practices and ultimately improve project outcomes in the Nigerian construction industry. Therefore, this study aimed at assessing the influence of the determinants of attitude on CPs KS Attitude in construction projects with a view to improving knowledge sharing among CPs. The determinants of KS Attitude and their components were identified from literature and were used to conduct a survey to assess the CPs KS Attitude. Quantitative method was adopted for this research and the data was collected using structured questionnaires administered to 174 Construction practitioners using Stratified Random Sampling. Data was analysed using Structural Equation Modelling. The study identified six determinants of KS attitude with four independent (perceiver, target, intensity and persistence) and two dependents (cognitive and affective). It was found out that the CPs perceiver, target, intensity and persistence as determinants of KS has influence on KS attitude. The findings proved a high significant influence between measures of CPs' motivation (intensity and persistence) KS attitude compared to measures of their perception (perceiver and target) and the strongest influence is between CPs intensity and their cognitive. The study concludes that CPs as the perceivers and KS as what is been perceived (target) do not affect CPs Knowledge Sharing Attitude, instead intensity and persistence (motivation) does. The study provides empirical insights into knowledge-sharing attitudes among construction practitioners in Nigeria which enriches the academic literature and advanced theoretical understanding of collaboration in construction projects. The findings also provide valuable insights for construction practitioners, project managers and policy makers in Nigeria by highlighting the current attitudes towards knowledge sharing within the industry.

Keywords: Construction practitioners, Knowledge sharing attitude, PLS-SEM, Nigeria

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1.0 INTRODUCTION

Knowledge Sharing (KS) plays a cardinal role in knowledge management (KM). It is recognised as one of the most crucial aspects of knowledge management (Chandran and Alammari, 2021; Issa and Haddad, 2008). The sharing of knowledge leads to better performance of organisations. Tserng and Lin (2004) identified that Knowledge sharing helps construction organisations to promote innovation, facilitate experience reuse, enhance the effectiveness of training, improve the effectiveness of job, increase intelligent assets, and decrease repetitive problems. Organisations that practice knowledge sharing have successful knowledge management initiatives (Seokyon, 2022; Wang and Noe 2010). Managers in organisations also improve organisational performance by enhancing knowledge sharing among members (Seokyon, 2022; Wang et al., 2014). Love, Huang, Edwards and Irani (2005) agreed that KS leads to better performance of construction projects. Organisations in the construction sector can also enhance their decision- making process (DPM) by practicing knowledge management activities such as knowledge sharing (Abuezhayeh, Ruddock and Shehabat, 2022).

There are several issues surrounding KS and quite a number of these issues revolve around five aspects, namely: concept, enablers, implementation, practice and processes (Chedid, Alvelos and Teixeira, 2022; Frost, 2014; Wang, and Meng, 2018; Aiken, 2016 and Appiah, 2014). Past research has worked on the implementation aspect of KS and channeled the effort on barriers and facilitators to successful KS implementation (Chedid, Alvelos and Teixeira, 2022; Frost, 2014 and Wang, and Meng, 2018), models for the implementation of KS (Ahmad,2010), Leadership and Motivation (Chedid, et al., 2022; Chi, Lan, and Dorjgotov (2012). Whilst some research focused on best practices, KS and firm performance (Aiken, 2016 and Appiah, 2014). Others examine KS capabilities and KS practices in different part of the world, e.g. China and Ghana.

Another area that Researchers have worked on is KS Enablers and they worked on KS capabilities including KS capabilities and Firm's performance, KS and knowledge effectiveness, KS capabilities and adoption of KS concepts, enablers for KS such organisational culture (Javaid, Soroya and Mahmood, 2020; Chandran and Alammari, 2021). Research about KS processes and determinants have discussed the antecedents of KS (Nazeem and Mukherjee, 2016). Amongst studies that looked at knowledge creation is (Hao and Xianhai, 2018), knowledge sharing (Issa and Haddad, 2008; Cummings, 2004; Wang and Noe, 2010 and Wang et al., 2014).

Several problems were addressed by researchers such as enabling factors for successful knowledge sharing and influence of factors on knowledge sharing. The studies that have been carried out on knowledge sharing enablers focuses on culture, management support, etc. (Javaid, et al., 2020; Chandran and Alammari, 2021; Alavi et al., 2005, Chakravorti, 2011; Rai, 2011 and Saifi, 2015), without much focus on people. I.e. studies on KS largely neglects the individual level variables such as perception, motivation and attitude.

However, generic literature has shown that KS success is largely driven by individual level variables e.g. attitude (Chedid et al., 2022; Javaid et al., 2020; Sanboskani, Kiomjian and Srour, 2020; Zabidin, Belayutham, and Che Ibrahim, 2023; Rowley and Fullwood, 2017). Behaviours exhibited by individuals such as motivation, perception and Attitude are known to affect task performance (Robbins and Judge, 2017), in this case, knowledge sharing, and attitude is dependent on process at the individual level of analysis.

Despite what researchers are doing on knowledge sharing, little or no improvement was reported on people aspect of knowledge sharing. People (construction practitioners included) are the focal point of knowledge sharing, yet little is known about these individuals and that needs to be researched on. Hence, there is a lack of knowledge on Construction Practitioner's (CPs) KS attitude, it's determinants and the interactions between them. By that it shows lack of understanding about the knowledge sharing attitudes of construction practitioners and the factors that influence their willingness to share knowledge. i.e., we do not know how those things affect knowledge sharing. This knowledge gap hinders the development of effective strategies and interventions to enhance knowledge sharing practices and ultimately improve project outcomes in the Nigerian construction industry. Assessing the Construction Practitioners' Knowledge Sharing Attitude in Construction Projects will reveal results that would inform organisations about the perception and motivation level as well as the attitude of construction practitioners toward sharing of knowledge and the results will yield benefits which include that: Members of the project organisation would have a better understanding of their attitude to KS and the projects Organisations would have a better knowledge as to where to improve in order to enhance the KS attitude of the team members in the organisation. The next section of this paper is the literature review, followed by the research methodology which outline how the study was conducted. After the methodology is the result section, which was succeeded by the conclusion and recommendation parts, after which an acknowledgement was given and finally the reference section.

■2.0 LITERATURE REVIEW

2.1 Knowledge sharing in construction

In the construction sector, most knowledge is implicit rather than explicit, and sharing this knowledge is essential to improving project performance. A wide range of human characteristics, including behavior, attitude, skills, experience, interpersonal contact, and interaction, have a significant impact on implicit knowledge sharing (Tahir et al., 2021). A study by Shi, et al (2022) examine the role of knowledge sharing among member enterprises between collaborative innovation activities and innovation performance and between building information modelling (BIM) application and innovation performance in the construction supply chain found that explicit and tacit knowledge sharing as well as innovation performance were positively impacted by collaborative innovation activities in the building supply chain. The adoption of BIM improved innovation performance and explicit knowledge sharing, but it had no appreciable effect on implicit knowledge sharing. While tacit information sharing improved organizational performance, explicit knowledge sharing had no beneficial influence on innovation performance. A study by (Senaratne, et al., 2023) identified knowledge sharing processes within social networks in construction organisation using social network analysis (SNA) and found that networks portraying relational social capital dimension are the strongest ties

The implementation of Knowledge Sharing (KS) has been the focus of research and various aspects such as models for KS implementation has been developed, leadership and motivation for successful implementation (Chedid, et al., 2022; Chi, Lan and Dorjgotov, 2012, and Ahmad, 2010) and barriers and facilitators to successful KS implementation (Chedid, Alvelos and Teixeira, 2022; Frost, 2014 and Wang, and Meng, 2018). While some studies that examined practices concentrated on firm performance, KS, and best practices (Aiken, 2016 and Appiah, 2014). Others look at KS practices and skills in other parts of the world, such as Ghana and China. Researchers have also focused on KS enablers, KS capabilities, organization culture, KS and knowledge effectiveness, KS capabilities and adoption of KS concepts, and KS capabilities and firm performance (Javaid, Soroya and Mahmood, 2020; Chandran and Alammari, 2021). Haider, Zubair, Tehseen, Iqbal, and Sohail (2023). Lastly, research about KS processes and determinants have discussed the antecedents of KS (Nazeem and Mukherjee, 2016). Amongst studies that looked at knowledge creation is (Hao and Xianhai, 2018), knowledge sharing (Tahir et al., 2021; Shi et al., 2022 and Senaratne, et al., 2023)

2.2 Antecedents of Knowledge Sharing

A review of the literature shows that studies on KS focused on KS at (1) individual level (Chedid et al., 2022; Javaid et al., 2020; Rowley and Fullwood, 2017), (2) group, team or unit level (Imam and Zaheer, 2021; Kmiecik, 2021; Tiwari, 2022), and (3) organisational level (Javaid et al., 2020; Nguyen, 2021; Anand et al., 2021; Garcia et al., 2022). These studies come from a variety of disciplines such as information systems, organisation theory, sociology, psychology and social psychology. However, as a starting point for exploring KS in an organisation, this research focuses more on factors related to individual level, as mentioned earlier that KS originates from individual organisational member. Drawing on the summary of literature, four major factors at individual level are identified as important to KS in

organisations, namely self-efficacy, organisation commitment, interpersonal trust and attitude (Yang and Xu, 2021; Samboskani and Srour, 202; Fauzi et al., 2023).

2.3 Attitude

Individual members in organisations are different and have different value systems. Such a value system can provide insights into one's attitude. According to Schermerhorn (2008, p. 379), an attitude is "a predisposition to act in a certain way toward people and things in one's environment". A similar definition can be found from Robbins and Judge (2017) that attitudes are evaluative statements either favourable or unfavourable concerning objects, people, or events. They reflect how one feels about something. There are three components in understanding attitude, namely, cognitive, affective or emotional and behavioural (Robbins and Judge, 2017; Schermerhorn, 2008). From an organisational behaviour perspective, attitude influence people's behaviour and influence how they interact with other organisational members.

Research by Lavanya (2012) posited attitude as one of the individual determinants in the study on antecedents of KS. Support is also gained from other literature such as Zhang and Ng's (2012); Chedid et al., (2022); Javaid et al., (2020) and Sanboskani et al., (2020). Study on KS in construction teams and Thanos et al.'s (2013) study on KS in employee weblogs. Both studies reveal that attitude towards KS significantly determined the intention to share knowledge, which then determines KS behaviour. Therefore, it is expected that the higher the level of favourable attitude towards KS, the higher the level of interpersonal KS in organisations. Hence, the Robins and Judge (2013) model of organisational behaviour has a little difference from the normal theories/ models that exists such as the Theory of Planned Behaviour (TPB) and the Theory of Reasoned Action (TRA). The model forms the basis of this research work.

2.4 Organisational Behaviour Model

Several models have been used to study Knowledge Sharing Behaviours. Some of the models are Theory of Planned Behaviour (TPB) by (Ajzen, 1991) and Theory of Reasoned Action (TRA) by (Ajzen and Fishbein, 1980), and Organisational Behaviour Model (OB Model) by Robbins and Coulter (2013) Organizational behaviour is an applied behavioural science built on contributions from a number of behavioural disciplines, mainly psychology and social psychology, sociology, and anthropology. Psychology's contributions have been mainly at the individual or micro level of analysis, while the other disciplines have contributed to our understanding of macro concepts such as group processes and organization.

Using the Organisational behaviour model in Robbins and Judge (2013), attributes exhibited by individuals affects their task performance, in this case knowledge sharing. There are Three proposed variables in OB model (Input, Processes and outcomes) at Three levels of analysis (Individual, Group and Organisational). The model proceeds from left to right, with inputs by the left leading to processes at the middle and processes leading to outcomes. Notice that the model also shows that outcomes can influence inputs in the future. From the model, it could be seen that attitude is influenced by four processes, namely: perceptions, motivation, moods and emotions. This work considered only two attributes in the process's variable of the organisational behavior model (i.e Perception and Motivation) for time restriction and also due to the fact that perceptions are meant to be affected by individuals' mood, in order word., a person's mood makes up the perceiver which is part of makes up perception, so when we study perception, it is as though moods have been taken care of. However, individuals' perception and level of motivation is meant to affect their decision making (Robbins and Judge, 2017). Therefore, for the purpose of this study, the antecedents of decision making becomes more relevant to study rather than decision making itself.

2.4.1 Perception

Schacter, Gilbert, and Wenger, (2009) defined Perception as the organisation, identification, and interpretation of a sensation in order to form a mental representation (emphasis in original).

Perception is a process by which individuals organise and interpret their sensory impressions in order to give meaning to their environment (Robbins and Judge 2013). Robbins and Judge, (2013) also argued that what is been perceived can be substantially different from objective reality. Perception is important in studying behaviour (KS) because people's behavior is based on their perception of what reality is, not on reality itself. In this sense, perception has three components which are Perceiver, Situation and Target and are referred to as factors that influences perception (Robbins and Judge, 2013). Factors by the perceiver and Target are what is been considered in this research. Such items like Knowledge self –efficacy, perceived enjoyment in helping others, etc.

- i. H1: Perceiver's perception has a significant influence on cognitive component of attitude.
- ii. H2: Perceiver's perception has a significant influence on affective component of attitude.
- iii. H3: Target's part of perception has a significant influence on cognitive component of attitude.
- iv. H4: Target's part of perception has a significant influence on affective component of attitude.

2.4.2 Motivation

Luthan (1998) defines motivation as, a way that begins with a physiological deficiency or need which leads to a given behaviour or action to satisfy a goal. Motivation is also defined as the processes that account for an individual's intensity, direction, and persistence of effort toward attaining a goal (Robbins and Judge, 2013). In their definition, there are three key elements that makes up motivation. They are intensity, direction and persistence. Intensity describes how hard a person tries and it is the element most of us focus on when we talk

about motivation. However, it is unlikely that intensity alone will lead to favourable job performance outcomes unless the effort is channelled in a direction that benefits the organisation.

Therefore, both quality of the effort as well as its intensity is considered. For motivation to be high, Effort directed toward, and consistent with, the organisation's goals are the kind of effort that should be sought. Moreover, motivation has a persistence dimension which measures how long a person can maintain effort. Motivated individuals stay with a task long enough to achieve their goal. Chedid et al. (2022) identified motivation to positively affect knowledge sharing attitude. Chennamaneni et al. (2012) found that individuals contribute to their knowledge because they feel good about helping others and feel that knowledge sharing is important and won't take anything away of them (Samboskani, et al., 2020). Expected contribution and intrinsic reward were also found affect knowledge sharing attitude (Alice et al., 2022). Thus: -

- v. H5: Intensity element of motivation has a significant influence on cognitive component of attitude.
- vi. H6: Intensity element of motivation has a significant influence on affective component of attitude.
- vii. H7: Persistence element of motivation has a significant influence on cognitive component of attitude.
- viii. H8: Persistence element of motivation has a significant influence on affective component of attitude

2.4.3 Attitude

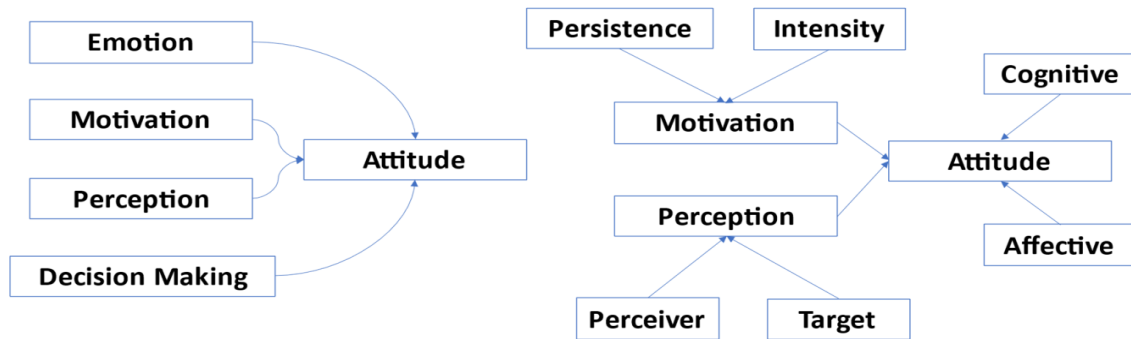
An attitude is a person's relatively enduring affective orientation for an object (Oliver, 1981). According to Ajzen and Fishbein's (1980) theory of reasoned action (TRA) a person's attitude toward a behaviour is determined by a set of salient beliefs about certain outcomes caused by the behaviours and the corresponding evaluation on the outcomes. A person's attitude towards an object or a behaviour is a function of the strength of their beliefs about the object or behaviour and the evaluative responses associated with each of those beliefs (Welschen, Tadorawa and Mills, 2012). Robbins and Judge (2013) defined attitude as evaluative statements either favourable or unfavourable concerning objects, people, or events. They reflect how one feels about something. They also outlined that there are three components in understanding attitude, namely, cognitive, affective or emotional and behavioural. From an organizational behaviour perspective, attitude influence people's behaviour and influence how they interact with other organisational members.

To explain the three components of an attitude, the cognitive component is a description of or belief in the way things are. The cognitive is the opinion or belief segment of an attitude and it sets the stage for the more critical part of an attitude, that is the affective component. Affect is the emotional or feeling segment of an attitude and is reflected in the statement. Finally, affect can lead to behavioural outcomes. The behavioural component of an attitude describes an intention to behave in a certain way toward someone or something.

2.5 Research Model

There are three proposed variables in OB model (input, processes and outcomes) at three levels of analysis (individuals, group and organisational). The model proceeds from left to right, with input by the left, leading to processes at the middle and processes leading to outcomes. The model also shows that outcomes can influence inputs in the future. From the model, it could be seen that Attitude is influenced by four processes, namely: perceptions, motivation, moods and emotions. This work considered only two attributes in the process's variable of the organisational behaviour model (i.e. Perception and Motivation). Perception and motivation have components that makes them up as well. There are three key elements that makes up motivation, they are: Intensity, direction and persistence. This study considered only two of the components (intensity and persistence). For perception, the three components are: perceiver, situation and target, and this study also considered two of the elements which include perceiver and target. Finally for attitude, the three components of understanding an attitude are cognitive, Affective or emotional and behavioural., the study also considered two components (cognitive and affective).

Since the Robbins and Judge (2013) Model of Organisational behaviour formed basis of the study, the following model was deduced.



LITERATURE REVIEW & HYPOTHESIS

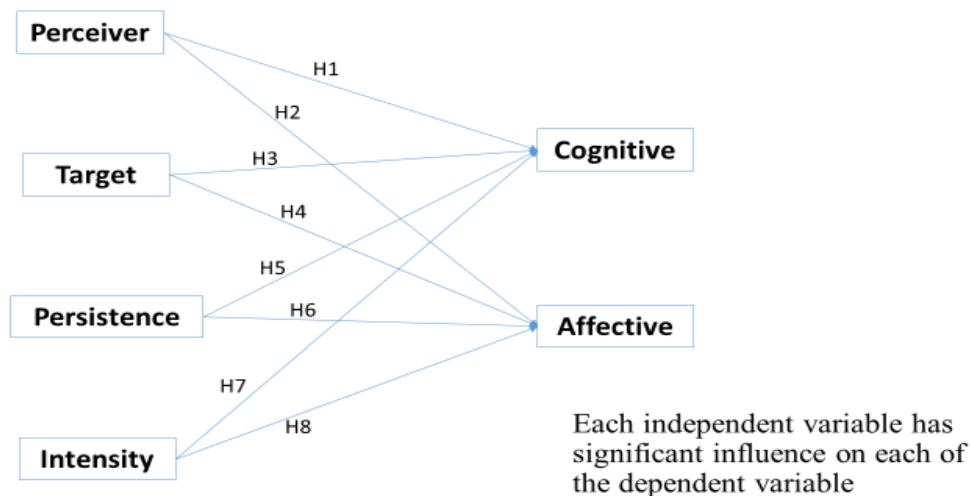


Figure 1 Theoretical Model of the Research

3.0 METHODOLOGY

This study adopted a quantitative research approach. Quantitative approach was used because of the advantages it has over other approaches, like being practical, measuring incidence of various views, opinions in a chosen sample, and quantifying of data and make the result general from a sample to the interest of the population. A total of six latent variables (perceiver, target, intensity, persistence, cognitive and affective) were identified through literature. The latent variables were broken down into measurable factors that represent each of the latent variable. A total of 24 indicators were identified and assessed through questionnaire survey. The questionnaire was administered to 174 construction practitioners in Abuja, Kaduna and Lagos. Some of the construction Practitioners answered the survey online (via the use of Google forms). The states were selected because most construction firms and Practitioners are predominant there in Nigeria. Thus, Oyowole (2019) reported that Lagos state is one of the most populated; economically sound and vibrant; and the main nerve Centre of construction activities in the southwest region of Nigeria.

The questionnaire for this research was divided in to Three sections. Sections A, B and C. Section A which asks the respondents information about Perception and Motivation. The first part seeks information about the respondents’ perception of KS and asked the respondent to kindly indicate the extent they Agree or disagree to the statements provided using the scales: SD “Strongly Disagree”, DL “Disagree to a lesser extent”, ND “Neither agree nor disagree”, AL “Agree to a lesser extent” and SA “Strongly agree”. The second part seeks information about Motivation and the respondents were asked to the extent to which the listed statements describe them using the

scales VU “Very untrue of me”, UL “Untrue of me to a lesser extent”, NU “Neither untrue/true, TL “True of me to a lesser extent” and VT “Very true of me”. Section B seeks information about Knowledge Sharing Attitude and asks the respondents to kindly indicate the extent each of the statements describes them or their belief, using the scales: VU “Very untrue of me”, UL “Untrue of me to a lesser extent”, NU “Neither untrue/true”, TL “True of me to a lesser extent” and VT “Very true of me”. Section C gathered general information which was also subdivided into Background information about the respondent which include profession, employment and position in their firm. The other subdivision asks information about project and project organisation asking questions like type of project, time spent in the project organisation, service provided, members of the project organisation, etc.

The questionnaire was designed in a closed ended pattern because all the questions were stated for the respondents to indicate the extent they Agree or disagree to the statements provided using a five-point Likert scale which according to literature on previous studies forces choices and gives a more a reliable data. The scales were: SD “Strongly Disagree”, DL “Disagree to a lesser extent”, ND “Neither agree nor disagree”, AL “Agree to a lesser extent” and SA “Strongly agree”. This is in line with previous studies carried out on Knowledge sharing Attitude (Chedid et al., 2022; Javaid et al., 2020; Chandran and Alammari, 2021) The populations used for this study are construction practitioners particularly architects, builders, engineers and quantity surveyors (QS). According to Lawal and Adeyeye (2006), population is the total number of objects, units, or individuals used for the research which could be finite/limited or infinite/uncountable. There were a total 54,585 construction practitioners. Since the population size, N is known, and the type of data is categorical, Yamane (1967) provides a simplified formula to calculate the sample size with a 95% confidence level and precision level (e) of +/-5%.

Therefore, the total sample size required is 174 as computed from the formula and the most appropriate sampling technique adopted for this study is the Stratified Random Sampling was adopted because it establishes population in strata and takes samples from each stratum at convenience. The relevant CPs were gotten across through email addresses and some via online (using google forms). The data collected from the field survey was analysed using descriptive and inferential analysis. The latter included testing hypotheses and development of model using SmartPLS version 3.0. Descriptive analysis was performed using SPSS while structural equation modelling (SEM) analysis was performed using SmartPLS 3. In other to determine the influence amongst the constructs, Structural Equation Modelling was used. SEM is a suitable technique for discovering directional relationship among Variables (Zhao et al. 2018). It’s a technique that model relationship among observed and latent constructs. There are two types of SEM that exists in the Literature: covariance-based structural equation modelling (CB-SEM) and partial least squares structural equation modelling (PLS-SEM). There is not much difference in the result obtained from the two approaches (Hair et al. 2014).

This study deploys the use of PLS-SEM. According to (Henseler et al., 2009 and Hair et al., 2019), characteristics of data such as non-normal data, minimum sample size, scale of measurement, formative constructs, secondary data, theory testing, exploratory research and focus on prediction are amongst the most often stated reasons for using PLS-SEM. Small sample size, non-normal data and exploratory research informed the decision for choosing PLS-SEM over CB-SEM. According to Barclay et al. (1995), the minimum sample for a PLS model should be equal to the larger value of ten times the largest number of variables used to measure a latent construct; or ten times the largest number of paths directed at a latent construct in the structural model. This rule was also utilized by (Zhao et al., 2018). In this study, the largest number of variables used to measure a construct was 5 and the largest number of paths directed at a latent construct was 4 in each model and thus, the minimum sample size for the former was 50 and for the latter is 40. The derived sample size for this study is 174 which is even larger than the sample size in all the instances.

■ 4.0 RESULTS

4.1 Characteristics of Surveyed Respondents

A total 174 was derived as the sample size, a total of 68 responses were obtained. Table 1 reveals that most of the respondents were quantity surveyors and they spent more than 2 years in the project organisation. Most responses are also coming from the middle management followed by senior management which helps ensure the reliability of responses obtained.

Table 1 Characteristics of Surveyed Respondents

S/N	Variables	Categories	Frequency	Percent (%)
1	Profession	Architect	9	13.2
		Quantity Surveyor	58	85.3
		Mechanical and Electrical Engineer	1	1.5
2	Employment	Client Organisation	25	36.8
		Consultancy	31	45.6
		Construction	12	17.6
3	Position in the firm	Partner	21	30.9
		Executive	6	8.8
		Senior Management	20	29.4

	Middle Management	21	30.9
4	Type of project	Building	53
		Roads	7
		Bridges	4
		Others	4
5	Time spent in the project organisation	Less than 1 year	9
		1-2 years	3
		Over 2 years	56
6	Service Provided	Consultancy	28
		Construction	16
		Project management	15
		Others	9

4.2 Assessment of the Influence of Determinants on KS Attitude using PLS-SEM

4.2.1 The Model Specification

The PLS-SEM was set up with reflective measurement models, and the structural model. The measurement model has six constructs which include perceiver with four (4) indicators, Target with four (4) indicators, Persistence with three (3) indicators, Intensity with three (3) indicators, Cognitive with five (5) indicators and Affective with five (5) indicators. In all, the original model was made up of Twenty-four (24) reflective indicators associated with the six constructs. Figure 2 captures the consequent model.

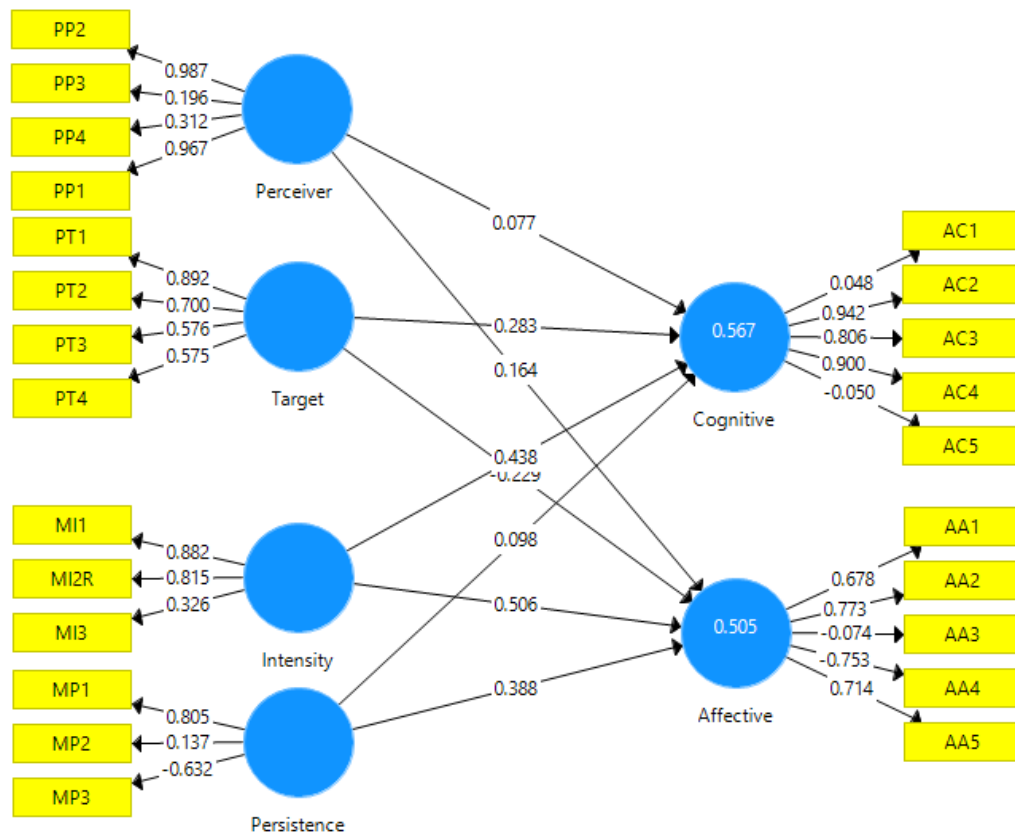


Figure 2 Partial Least Square Structural Equation Model(s) with 24-Indicators

Figure 2 above shows the outer loadings of the measurement models. Table 1 below shows that some number of the indicators or manifest variables loaded reliably on their assigned constructs while some do not. The square of the loading should ideally be equal to 0.70 or higher for reflective models.

When conducting SEM, it is essential to assess the quality of the measurement model using variable loadings, AVE, discriminant validity, and composite reliability. These criteria ensure that the model accurately represents the relationships between latent constructs and their observed indicators and that the constructs are distinct from one another. Adequate measurement model assessment is crucial for drawing valid and reliable conclusions from SEM analyses (Hair et al.,2014).

Table 2 Construct reliability and validity

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Affective	0.3	0.745	0.385	0.428
Cognitive	0.604	0.879	0.726	0.470
Intensity	0.504	0.647	0.738	0.516
Perceiver	0.67	0.979	0.756	0.511
Persistence	0.515	0.078	0.048	0.355
Target	0.666	0.823	0.786	0.487

The measurement model assesses quality of the manifested variables. Model evaluation was done through the assessment of both measurement and structural models. The Cronbach’s alpha, composite reliability and Dijkstra-Henseler’s rho_A are measures of internal consistency reliability, and all are expected to be 0.70 or higher, hence, they evaluate the measurement model. However, the Average Variance Extracted (AVE) is acceptable at 0.50. The scores of (AVE) show that convergence validity has been achieved. In order words, the indicators with which the latent variables are measured do converge on their associated constructs.

According to Hair et al., (2014) asserts that measurement of reflective models is different from that of formative models. Reflective models are measured based on the individual loadings of each indicator which ranges from 0 to 1. The threshold for each indicator loading to ascertain its contribution to the model is 0.70. From Table 1, it shows that 14 of the indicators of the reflective models were far above the 0.70 threshold and 10 were below the threshold. Hence, there is need to drop the 10 indicators of the reflective models in order to strengthen the model as shown in Figure 3.

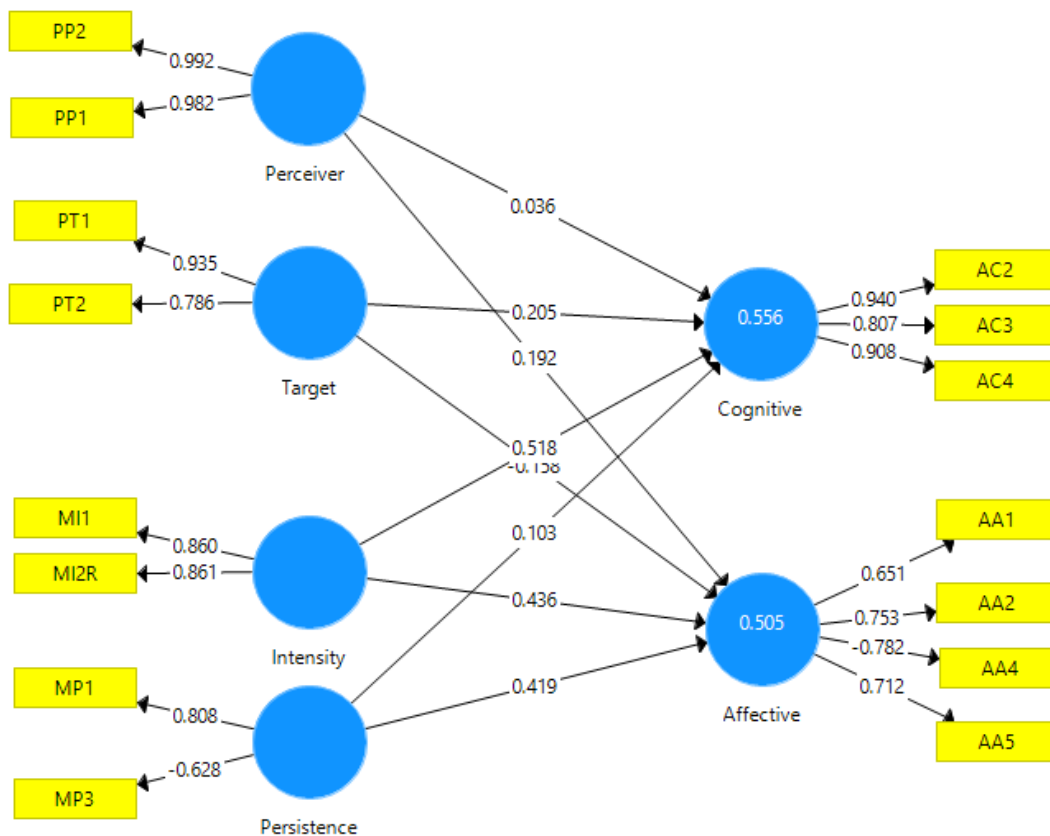


Figure 3 Partial Least Square Structural Equation Model(s) with 15-Indicators

Table 3 Construct reliability and validity (2)

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Affective	0.212	0.765	0.485	0.527
Cognitive	0.865	0.903	0.917	0.787
Intensity	0.649	0.649	0.851	0.740
Perceiver	0.975	1.097	0.987	0.974
Persistence	-0.103	0.097	0.033	0.524
Target	0.68	0.826	0.853	0.746

From Table 3 above, it shows that all 14 of the indicators of the reflective models were far above the 0.70 threshold and hence, there is no need to drop any of the indicators of the reflective models

4.3 Evaluation of the Structural Model

The techniques associated with the evaluation of the structural model include assessing collinearity of predictor latent variables, assessment of path coefficient/significance for hypothesis testing, and assessment of the predictive power of the model.

4.3.1 Collinearity of latent predictor variables

Table 4 shows the variance inflation factor (VIF) for the structural construct's variables. The variance inflation factor (VIF) scores are all below 5.0, which indicates that collinearity does not pose any problem in the structural model, as opined by Hair et al., (2014).

Table 4 Collinearity of Latent Predictor Variables

	Affective	Cognitive	Intensity	Perceiver	Persistence	Target
Affective						
Cognitive						
Intensity	2.217	2.217				
Perceiver	1.290	1.290				
Persistence	1.222	1.222				
Target	2.240	2.240				

4.4 Path Coefficients structural equation modelling

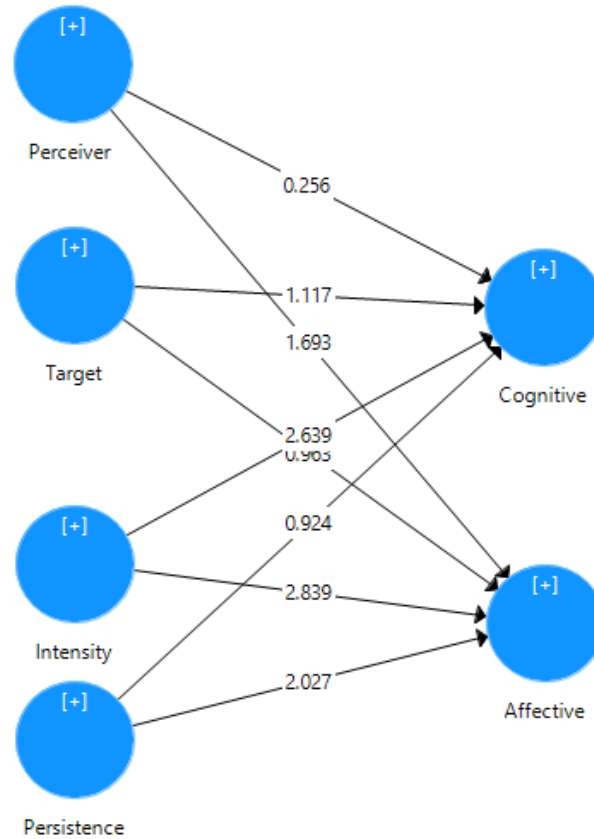


Figure 4 Path Coefficient Structural Equation Modelling

Table 5 below shows the path coefficient between the factors. Factors has a strong positive effect on one another for having values close to +1 as shown in the path algorithm and Table 5 below.

Table 5 Path coefficients of determinants of KS attitude

	Affective	Cognitive
Affective		
Cognitive		
Intensity	0.436	0.518
Perceiver	0.192	0.036
Persistence	0.419	0.103
Target	-0.158	0.205

4.4.1 Coefficient of determination (R2) values

The predictive power or accuracy of a partial least square structural equation model is measured by the coefficient of determination (R²). The values for the endogenous variables are far above 0.3 and were found significant. The R² values are the values in the blue circles in the structural model in Figure 3.

4.5 Assessing path Significance for Hypothesis Testing

To further ascertain the significance of these relationships, bootstrapping was deployed on the Smart PLS software using an alpha protection level of 5% and 5,000 independent subsamples. The conservative no sign change option of the bootstrapping algorithm was used. The standardized confidence interval estimation method was chosen at 95% confidence level. Significant value = p<0.01.

Figure 4.3 shows the relationships effect of (Perceiver, Target on Cognitive), (Intensity, Persistence on Cognitive), (Perceiver, Target on Affective), and (Intensity, Persistence on Affective) respectively. The numbers on the arrows (0.256, 1.117), (1.693, 2.639), (0.963, 0.924), (2.839, 2.027) represent the path coefficients. The path coefficients, having standardized values from -1 to +1, represent the hypothesized relationships among the constructs. Path coefficients close to +1 represent strong positive relationships and estimated path coefficients close to -1 represent strong negative or mediating relationships (Hair et al., 2014).

Table 6 Path coefficients and significance testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Intensity -> Affective	0.436	0.432	0.154	2.839	0.005
Intensity -> Cognitive	0.518	0.511	0.196	2.639	0.009
Perceiver -> Affective	0.192	0.184	0.113	1.693	0.091
Perceiver -> Cognitive	0.036	0.052	0.140	0.256	0.798
Persistence -> Affective	0.419	0.397	0.207	2.027	0.043
Persistence -> Cognitive	0.103	0.100	0.111	0.924	0.356
Target -> Affective	-0.158	-0.160	0.164	0.963	0.336
Target -> Cognitive	0.205	0.197	0.184	1.117	0.265

■5.0 DISCUSSION

This paper through extensive literature review identified six determinants of KS attitude in construction projects: perceiver, target, intensity, persistence, cognitive and affective. The result of the PLS-SEM shows paths with strongest positive influence and therefore the strongest influence was found to be paths from measures of CPs' motivation do have higher influences on KS attitude compared to paths of measures of CP's perception and the strongest influence is between CPs intensity and their cognitive. This indicates that motivation (Intensity and Persistence) is what encourages construction practitioners to share knowledge rather than their perception (perceiver and target).

Motivation refers to the processes that account for an individual's intensity, direction, and persistence of effort toward attaining a goal (Robbins and Judge, 2013). In this definition, the three key elements that makes up motivation are intensity, direction and persistence. Intensity describes how hard a person tries and it is the element most of us focus on when we talk about motivation. However, it is unlikely that intensity alone will lead to favourable, (knowledge sharing) outcomes unless the effort is channelled in a direction that benefits the organisation. Knowledge sharing occurs only when members are motivated to share their knowledge. This finding is in line with the findings of (Chedid, et al., 2022) in their study titled Individual factors affecting attitude towards knowledge sharing, they found out that motivation was the factor that positively affects knowledge sharing attitude but it is in disagreement with the findings of Chandrann and Alammari (2021) because they found out that the relationship between people self-motivation and knowledge sharing attitude is insignificant. A major and important factor that affects knowledge sharing are individual factors, in which it has been ascertained and supported by the findings of (Jayaid, et al., 2020) where those factors played a vital role in enhancing the knowledge sharing attitude of construction practitioners.

The research established 24 reflective indicators from the Structural Equation Model and the Measurement model validated Six Latent Variables (Perceiver, Target, Intensity, Persistence, Cognitive and Affective) that influences Knowledge sharing Attitude. The study made significant contributions to academia, practice, and policy within the context of the Nigerian construction industry, ultimately leading to improvements in project delivery and sectoral performance.

■6.0 CONCLUSION

The study was aimed at assessing construction practitioners' knowledge sharing attitude in construction projects in Nigeria. Knowledge sharing Attitude was explored, and the determinants of Attitude were identified from literature and assessed by construction practitioners based on their level of agreement the extent to which the factors describing the determinant of attitude are true of them. The determinants (Perception, Motivation and Attitude) were then classified in to (perception: perceiver and target; motivation: intensity and persistence; Attitude: cognitive and affective). A hypothetical and theoretical model for the research was developed and the hypotheses were confirmed using PLS-SEM. It was then confirmed that hypotheses 2, 5, 6 and 8 are supported or accepted while hypotheses 1, 3, 4 and 7 were not supported or are rejected.

The study offers relationship between the constructs Perception and Motivation to Knowledge Sharing Attitude through the measurement model, as well as the significance of each determinant and their relationships through the structural model. The Measurement Model validated the constructs (Perceiver, Target, Intensity Persistence, Cognitive and Affective). The structural model showed empirical support for the interrelationships between the constructs and contributed to the knowledge of the influence/significance of the independent variables (Perceiver, Target, Intensity and Perception) on the dependent variable (Cognitive and Affective) and concludes that Construction Practitioners' Perception do not affect their Knowledge Sharing Attitude, instead motivation does.

The academic contribution of this research is that it provides empirical insights into knowledge-sharing attitudes among construction practitioners in Nigeria which enriches the academic literature and advanced theoretical understanding of collaboration in construction projects. Additionally, by identified gap in current knowledge, it also guides future scholarly inquiries into knowledge sharing within the Nigerian construction industry. The study enables further studies to be directed at these determinants to be able to improve on knowledge sharing attitude. The practical contribution of this study is that the findings provide valuable insights for construction practitioners, project managers and policy makers in Nigeria by highlighting the current attitudes towards knowledge sharing within the industry. It is expected that the insights gained from this research will contribute to the development of effective knowledge sharing strategies, which, in turn, will lead to improved project outcomes, increased competitiveness, and sustainable growth in the Nigerian construction sector. Furthermore, the study may serve as a model for understanding knowledge sharing dynamics in construction industries in other developing economies facing similar challenges.

The research informed the development of policies or guidelines by relevant governmental or industry bodies in Nigeria aimed at promoting knowledge sharing and collaboration within the construction sector. The Policymakers may use the findings to advocate for initiatives that incentivize or reward knowledge-sharing behaviours among construction practitioners, potentially leading to the adoption of industry-wide best practices. The study also provides a basis for assessing the influence of determinants of attitude on knowledge sharing attitude of construction practitioners and recommends that CPs should be educated about their perception of KS.

The study also recommends that construction Practitioners' level of motivation should be increased because Motivation is what derives them to share Knowledge rather than perception. Practical recommendations derived from the research could be implemented by construction companies to foster a more collaborative and knowledge-sharing culture among practitioners, potentially leading to improved project outcomes, increased efficiency, and reduced errors. Since the study employed a cross-sectional research design, which limits implications on influence and relationships. It is therefore recommended that longitudinal studies be carried. The study did not cover all the Practitioners of the Construction Projects Organisation, it is also recommended to widen the coverage of the research to other construction Practitioners not covered by this research (such as Contractors), in order to compare and justify the recent findings.

Lastly, since not all the determinant of KS Attitude were considered, further research could look into the ones not captured by this study (e.g. Emotions and Moods, Decision making). There were three components that made up of each of Perception, Motivation and Attitude, only two of each were considered, further study could consider the ones not considered by this study.

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References

- Abuezhayeh, S.W., Ruddock, L., and Shehabat, I. (2022). Integration between knowledge management and business process management and its impact on the decision-making process in the construction sector: A case study of Jordan. *Construction Innovation*, 22(4), 987–1010.
- Adebakin, A. B. (2015). Does internship experience beget academic relevance and employment prospects: An assessment of graduate interns from a Nigerian university. *Bulgarian Journal of Science and Education Policy*, 9(1).
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Ajzen, I., and Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Alavi, M., and Leidner, D. (2001). Review: Knowledge management and knowledge management systems: *Conceptual foundations and research issues*. *MIS Quarterly*, 25(1), 107–136.
- Al-Busaidi, K., and Olfman, L. (2017). Knowledge sharing through interorganizational knowledge sharing systems. *VINE Journal of Information and Knowledge Management Systems*, 52(1), 1–17.
- Allen, K. (n.d.). Explaining Cronbach's alpha. Presentation presented at University of Oklahoma Dept. Of Industrial Engineering Explaining Cronbach's alpha. Retrieved from [Internet]: Available from: <http://www.scribd.com/document/209124558/>
- Aminbeidokhti, A., Jamshidi, L., and Mohammadi Hoseini, A. (2016). The effect of the total quality management on organisational innovation in higher education mediated by organisational learning. *Studies in Higher Education*, 41(7), 1153–1156.
- Anand, A., Muskat, B., Creed, A., Zutshi, A. and Csepregi, A. (2021). "Knowledge sharing, knowledge transfer and SMEs: evolution, antecedents, outcomes and directions", *Personnel Review*, Vol. 50 No. 9, pp. 1873-1893.
- Avusgil, S. T., Calantone, R. J., and Zhao, Y. (2003). Learning orientation, firm innovation capability and firm performance. *Industrial Marketing Management*, 3(6), 515–524.
- Babin, B. J., Anderson, R. E., and Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Prentice Hall.
- Barbiero, G. (2002). *Strategic management: Text and cases*. John Wiley and Sons.
- Bartol, K., and Srivastava, A. (2002). Encouraging knowledge sharing: The role of organisational reward systems. *Journal of Leadership and Organizational Studies*, 9(1), 64–76.
- Baumgartner, G., Hans, J., and Steenkamp, J. (1996). Exploratory consumer buying behaviour: Conceptualization and measurement. *International Journal of Research in Marketing*, 13(1), 121–137.
- Bhatt, G. D. (2001). Knowledge management in organizations: Examining the interaction between technology, techniques and people. *Journal of Management*, 5(1), 68–75.
- Bock, G., and Kim, Y. (2002). Breaking the myths of rewards: An exploratory study of attitude about knowledge sharing. *Information Resources Management Journal*, 15(2), 14–21.
- Bock, G., Zmud, R., Kim, Y., and Lee, J. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, socio-psychological forces, and organizational climate. *MIS Quarterly*, 29(1), 87–111.
- Brown, J. S., and Duguid, P. (2000). Balancing act: How to capture knowledge without killing it. *Harvard Business Review*, 78(30), 73–80.
- Cabrera, A., and Cabrera, E. (2002). Knowledge-sharing dilemmas. *Organization Studies*, 23(5), 687–710.

- Cabrera, A., Collins, W., and Salgado, J. (2006). Determinants of individual engagement in knowledge sharing. *The International Journal of Human Resource Management*, 17(2), 254–264.
- Cabrera, E., and Cabrera, A. (2005). Fostering knowledge sharing through people management practices. *The International Journal of Human Resource Management*, 16(5), 720–735.
- Chandran, D., and 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, 1563–1572.
- Chedid, M., Alvelos, H., and Teixeira, L. (2022). Individual factors affecting attitude toward knowledge sharing: An empirical study on a higher education institution. *VINE Journal of Information and Knowledge Management Systems*, 52(1), 1–17.
- Connelly, C. E., Zweig, D., Webster, J., and P., T. J. (2011). Knowledge hiding in organizations. *Journal of Organizational Behavior*, 33(1), 64–88.
- Connelly, C., and Kelloway, E. (2003). Predictors of employees' perceptions of knowledge sharing cultures. *Leadership and Organization Development Journal*, 24, 294–301.
- Corbin, R. D., Dunbar, C. B., and Zhu, Q. (2007). A three-tier knowledge management scheme for software engineering support and innovation. *Journal of Systems and Software*, 80(9), 1494–1505.
- Drucker, P. (1998). Management's new paradigms. *Forbes*, 162(7), 152–177.
- Drucker, P. F. (1993). *Post-capitalist society*. Harper and Collins.
- Egbu, C. O. (2004). Managing knowledge and intellectual capital for improved organizational innovations in the construction industry: An examination of critical success factors. *Engineering, Construction and Architectural Management*, 11(5), 301–315.
- Esan, C., and Okafor, R. (1995). *Basic statistical methods*. Lagos: JAS Publications.
- Esan, E. O. (1995). *Basic statistical methods*. Lagos: University of Lagos.
- Fauzi, M. A., Nguyen, M., and Malik, A. (2023). Knowledge sharing and theory of planned behavior: A bibliometric analysis. *Journal of Knowledge Management*. Advance online publication.
- Ford, D. P., and Staples, S. (2010). Are full and partial knowledge sharing the same? *Journal of Knowledge Management*, 14(3), 394–409.
- Frimpong, Y., Oluwoye, J., and Crawford, L. (2003). Causes of delay and cost overruns in construction of groundwater projects in a developing country: Ghana as a case study. *International Journal of Project Management*, 21, 321–326.
- Fullwood, R., Rowley, J., and Delbridge, R. (2013). Knowledge sharing among academics in UK universities. *Journal of Knowledge Management*, 17(1), 123–136.
- Garvin, D. (1998). Building a learning organization. *Harvard Business Review*, 71(4), 78–91.
- Goforth, C. (n.d.). *Using and interpreting Cronbach's alpha*. Retrieved from <http://data.library.virginia.edu/using-and-interpreting-cronbach's-alpha/>
- Grant, R. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17, 109–122.
- Grove, S. K., Burns, N., and Gray, J. (2014). *Understanding nursing research: Building an evidence-based practice*. Elsevier Health Sciences.
- Gunnlaugsdottir, J. (2003). Seek and you will find, share and you will benefit: Organizing knowledge using groupware systems. *International Journal of Information Management*, 23(5), 363–380.
- Haider, S. A., Zubair, M., Tehseen, S., Iqbal, S., and Sohail, M. (2023). How does ambidextrous leadership promote innovation in project-based construction companies? Through mediating role of knowledge-sharing and moderating role of innovativeness. *European Journal of Innovation Management*, 26(1), 99–118.
- Hair, J. F., Hult, J. G., Ringle, C., and Sarstedt, M. (2013). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Thousand Oaks, CA: SAGE Publications.
- Hair, J., Anderson, R., Tatham, R. L., and Black, W. C. (1995). *Multivariate data analysis with readings*. Englewood Cliffs: Prentice-Hall.
- Hair, J., Anderson, R., Tatham, R., and Black, W. (1998). *Multivariate data analysis (5th ed.)*. Upper Saddle River, NJ: Prentice-Hall.
- Hansen, M., Nohria, N., and Tierney, T. (1999). *What's your strategy for managing knowledge?* Harvard Business Review, March–April, 106–116.
- Hansen, S., and Avital, M. (2005). Share and share alike: The social and technological influences on knowledge sharing behavior. *Sprouts: Working Papers on Information Systems*, 5(13), 5–13.
- Hendriks, P. (1999). Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge and Process Management*, 6(2), 91–100.
- Imam H., zaheer M.K (2021) *Shared leadership and project success: The roles of knowledge sharing, cohesion and trust in the team*. International journal of knowledge management
- Ipe, M. (2003). Knowledge sharing in organizations: A conceptual framework. *Human Resource Development Review*, 2(4), 337–359.
- Javaid, J., Soroya, S., and Mahmood, K. (2020). Impact of personal and organizational factors on knowledge sharing attitude of university teachers in Pakistan. *The Electronic Library*, 38(2), 317–336.
- Javernick-Will, A., and Levitt, R. E. (2010). Mobilizing institutional knowledge for international projects. *Journal of Construction Engineering and Management*, 136(4), 430–441.
- Kelloway, E. B. (2000). Knowledge work as organizational behavior. *International Journal of Management Reviews*, 2, 287–304.
- Kenis, P., and Knoke, D. (2002). How organizational field networks shape interorganizational tie-formation rates. *Academy of Management Review*, 27, 275–293.
- Kmieciak, R. (2021), "Trust, knowledge sharing, and innovative work behavior: empirical evidence from Poland", *European Journal of Innovation Management*, Vol. 24 No. 5, pp. 1832-1859.
- KPMG Management Consulting (2000). Knowledge management research report.
- Liebesskind, J. P. (1996). Knowledge, strategy, and the theory of the firm. *Strategic Management Journal*, 17(5), 93–107.
- Masa' deh, R., Gharaibeh, E., Tarhini, D., and Obeidat, D. (2015). Knowledge sharing capability: A literature review. SSRN Electronic Journal.
- Mason, D. A. (2003). Perception of knowledge management: A qualitative analysis. *Journal of Knowledge Management*, 7(4), 38–74.
- Mathers, N., Fox, N., and Hunn, A. (2009). Surveys and questionnaires.
- Muth, J. E. (2006). *Basic statistic and pharmaceutical statistical applications (2nd ed.)*. Boca Raton, FL: Chapman and Hall/CRC.
- Nachmias, C., and Nachmias, D. (1996). *Research methods in the social sciences (5th ed.)*. London: Arnold.
- Nguyen, T.-M. (2021), "Four-dimensional model: a literature review in online organisational knowledge sharing", *VINE Journal of Information and Knowledge Management Systems*, Vol. 51 No. 1, pp. 109-138.
- Nonaka, I. (1991). The knowledge creating company. *Harvard Business Review*, November–December, 96–104.
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37.
- Nonaka, I. (1998). The concept of 'Ba': Building a foundation for knowledge creation. *California Management Review*, 40(3), 40–54.
- Nonaka, I., and Takeuchi, H. (1995). *The knowledge creating company*. New York, NY: Oxford University Press.
- Nunes, D. (2005). *Developing business strategies*. John Wiley and Sons.
- Oliver, R. L. (1981). Measurement and evaluation of satisfaction processes in retail settings. *Journal of Retailing*, 57(3), 25–48.
- Osuala, E. (2005). *Research methodology*. Enugu: New Generation Books.
- Oyewole, E. O., and Dada, J. O. (2019). Training gaps in the adoption of building information modeling by Nigerian construction professionals. *Built Environment Project and Asset Management*, 9(3), 399–411.
- Plínio Silva de Garcia, Mirian Oliveira and Kathryn Brohman (2022) Knowledge sharing, hiding and hoarding: how are they related? *Knowledge Management Research and Practice*, 20:3, 339-351.
- Polanyi, M. (1996). *The tacit dimension*. Garden City, NY: Anchor Books Doubleday and Company Inc.
- Robertson, S. (2002). A tale of two knowledge-sharing systems. *Journal of Knowledge Management*, 6(3), 295–308.
- Ryle, G. (1984). *The concept of mind*. London: Hutchinson.
- Salkind, N. J. (1997). *Exploring research (3rd ed.)*. Upper Saddle River, NJ: Prentice Hall.
- Sanboskani, H., Kiomjian, D., and Srour, I. (2020). *Factors affecting knowledge sharing intentions among construction workers: The case of Lebanon*. In Construction Research Congress 2020.
- Särndal, C. E., Swensson, B., and Wretman, J. (2003). *Model-assisted survey sampling*. Springer Science and Business Media.

- Schacter, D. L., Gilbert, D. T., and Wegner, D. M. (2009). *Introducing psychology*. Macmillan.
- Seokyon Hwang (2022) Sharing tacit knowledge in small-medium regional construction companies in the U.S.: The current status and the impact of organizational ecology, *International Journal of Construction Management*, 22(9), 1746–1755.
- Sepani Senaratne, Xiaohua Jin and Kieren Denham (2023) Knowledge sharing through social networks within construction organisations: Case studies in Australia, *International Journal of Construction Management*, 23(7), 1223–1232.
- Shi, Q., Wang, Q., and Guo, Z. (2022). Knowledge sharing in the construction supply chain: Collaborative innovation activities and BIM application on innovation performance. *Engineering, Construction and Architectural Management*, 29(9), 3439–3459.
- Srikantaiah, T. K., and Koenig, M. (2000). *Knowledge management lessons learned: What works and what doesn't*. In American Society for Information Science and Technology for Information Today Inc., Medford, NJ, pp. 361–377.
- Tahir, M. B., Khan, K. I. A., and Nasir, A. R. (2021). Tacit knowledge sharing in construction: A system dynamics approach. *Asian Journal of Civil Engineering*, 22, 605–625.
- Teddie, C., and Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. London: Sage.
- Tiwari, S.P, *Emerging Technologies: Factors Influencing Knowledge Sharing* (March 09, 2022). World Journal of Educational Research, Available at SSRN: <https://ssrn.com/abstract=4066078>
- Wilson, J. (2001). Knowledge management: To be or not to be? *Information Management Journal*, 34(1), 64–67.
- Zabidin, N. S., Belayutham, S., and Che Ibrahim, C. K. I. (2023). *The knowledge, attitude and practices (KAP) of Industry 4.0 between construction practitioners and academicians in Malaysia: A comparative study*. Construction Innovation. Advance online publication. <https://doi.org/10.1108/CI-05-2022-0109>
- Zack, M. (1999). Managing codified knowledge. *Sloan Management Review*, 40, 45–58.