

THE USE OF EXPLORATORY FACTOR ANALYSIS (EFA) FOR TESTING THE VALIDITY OF KNOWLEDGE SHARING INSTRUMENTS

Noor Jeffri Abdul Wahab

Senior Lecturer at Faculty of Business Innovation & Technology, Universiti Melaka (UNIMEL)

Corresponding author email : jeffri@unimel.edu.my

Article History :

Received : 21 November 2022

Accepted : 9 January 2023

Published : 19 January 2023

ABSTRACT

Knowledge sharing has a significant impact on employee performance. Institutions need to pay more attention to things that can be used to adapt in challenging times. That is why knowledge sharing is very important as an added value for lecturers at Private Higher Education Institution (PHEI) to ensure the competitiveness and productivity of the institution. Therefore, this study focuses more on knowledge sharing instruments built on the basis of previous studies. The reliability and validity of the test tool was tested using data from a pilot study conducted involving 104 respondents from population of 28,570 PHEI lecturers using Exploratory Factor Analysis (EFA). Finding shows that 12 items representing knowledge sharing have a loading factor exceeding (0.60). Therefore according to previous scholars' views, this instrument is valid and has high reliability and validity. This instrument can be used for actual and future studies.

Keywords: Knowledge sharing, validity, Factor Exploratory Analysis

PENGUNAAN ANALISIS FAKTOR PENEROKAAN (EFA) BAGI PENGUJIAN KESAHAN INSTRUMEN PERKONGSIAN PENGETAHUAN

ABSTRAK

Perkongsian pengetahuan mempunyai kesan yang signifikan terhadap prestasi pekerja. Institusi perlu memberi lebih perhatian kepada perkara yang boleh digunakan untuk menyesuaikan diri dalam suasana yang mencabar. Sebab itu perkongsian ilmu amat penting sebagai nilai tambah kepada pensyarah Institusi Pengajian Tinggi Swasta (IPTS) ini bagi memastikan daya saing dan produktiviti institusi berkenaan. Oleh itu, kajian ini lebih memfokuskan kepada instrumen perkongsian ilmu yang dibina berdasarkan kajian lepas. Kebolehpercayaan dan kesahan alat ujian telah diuji menggunakan data daripada kajian rintis yang dijalankan melibatkan 104 responden daripada populasi 28,570 orang pensyarah IPTS menggunakan Exploratory Factor Analysis (EFA). Dapatan menunjukkan bahawa 12 item yang mewakili perkongsian pengetahuan mempunyai faktor muatan melebihi (0.60). Oleh itu menurut pandangan pengkaji terdahulu, instrumen ini adalah sah dan mempunyai kebolehpercayaan dan kesahihan yang tinggi. Instrumen ini boleh digunakan untuk kajian sebenar dan akan datang.

Kata kunci: *Perkongsian pengetahuan, kesahan, Analisis Faktor Penerokaan*

INTRODUCTION

Knowledge sharing has a significant impact on employee performance. The world has become knowledge-oriented with an increase in the creation and rapid dissemination of information and knowledge (Eshak et al., 2022). Knowledge management in organizations is a necessity that needs to be adopted by the “brains” of the organization, as it is the main key for individuals to improve their learning and become more productive (Yassmin Diab, 2021). Based on the previous study conducted by Laily & Ernawati (2020) and Jarrah et al. (2020), they mentioned that knowledge sharing play an important role in give an impact to the employee performance. Although knowledge sharing is important, most individuals are reluctant to share their knowledge because of fear of criticism, panic of losing power, losing ownership of knowledge, unfair rewards, and time constraints (Szulanski, 1996). As a result, people tend to keep their knowledge and if there is a hoarding of knowledge then that knowledge is lost. Valuable human and knowledge resources will be depleted unless management recognizes efforts to collect, transform, record, and share knowledge (Smith, 2001). Therefore, organizations need to find ways to involve employees in knowledge sharing (Nonaka & Takeuchi, 1995). This matter needs to be emphasized for players in the education industry, especially from the private higher education sector.

RESEARCH OBJECTIVE

This study was conducted to test the validity of knowledge sharing instrument.

LITERATURE REVIEW

Knowledge sharing refers to the process of making individual knowledge, ideas, experiences, or technologies available through the conversion into a form that can be understood and used by other individuals or communities according to their real knowledge needs (Eshak et al., 2022; Smith, 2001). In today's rapidly changing environment, simply using traditional resources does not guarantee long-term institutional survival (Sánchez, Marín, and Morales 2015). Institutions need to pay more attention to things that do not harm them in order to adapt in challenging times (Sánchez, Marín, and Morales 2015). According to Barney (1991) knowledge and human resources are the most critical strategic assets for every institution. Therefore, institutions need to implement various activities to ensure the effective use of these assets called human resource management (HRM) practices. Among the methods may be to increase the competitiveness or human capital of the lecturers in the institution. This can result in increased commitment and knowledge sharing behavior among university lecturers.

That is why in the study of Aksoy, Ayranci & Gozukara (2016), Kwah & Park (2016) mentioned the importance of knowledge sharing which can make productivity and work performance in the organization more and more drive towards excellence. Yassmin Diab (2021) added that nowadays, organizations need to sustain their competitive advantage and to do so, organizations need to promote a culture of organizational learning that encourages knowledge-sharing behaviors among colleagues. This culture requires support from top management as this would encourage knowledge-sharing behavior among employees.

Knowledge sharing is a reciprocal process between individuals exchanging knowledge (tacit and explicit knowledge) and co-creating new knowledge (solutions) (Hamzah & Wardana, 2018). Therefore, the research of Kipkosgei, Kang & Choi (2020) shows that in most organizations, knowledge is of high value, can be used to increase competitive advantage, subsequently it is an important tool to create organizational sustainability and effectiveness.

INSTRUMENT

The instrument used in this study is an adaptation from previous studies by Ayesha Naeem, Neelam Hanan Mirza, Rana Muhammad Ayyub & Rab Nawaz Lodhi (2017), Yong Woon Kim and Jaekwon Ko, (2014) & Muhammad Shukri Bakar, Rosli Mahmood, Azahari Ramli and Rosli Mohd Saad (2016).

METHODOLOGY

The pilot study used a total of 102 respondents who have the same characteristics as actual respondents. A population of 28,570 IPTS lecturers according to data from the Private Standards Division, Department of Higher Education as of December 31, 2021. Data collected being analyse by using SPSS software. According to Awang (2016) to use EFA analysis, researchers need to use a sample of 100 people. This was also mentioned in a study conducted by Moktar et al. (2022) & Puteh et al. (2022). This pilot study uses a simple random sampling method on lecturers serving in selected Private Higher Education Institutes (PHEI) in Malaysia. The Likert Five Point Scale Five with the anchors being “Strongly Agree” to “Strongly Disagree” was utilized for outlining the inquiries in the survey. Survey questions using Google Form and distributed via PHEI Webmaster email as to formally apply for permission to the PHEI management and also using the Whatsapp application.

Exploratory Factor Analysis

Factor analysis is an important procedure to identify, reduce and rearrange questionnaire items based on the strength of correlation between items into certain constructs under the study variable (Chua, 2014). According to Hair (2018), there are several things to confirm the items are valid for use. Through factor analysis some indices will be identified and should have the values as recommended by (Hair, 2018) in the table below:

Table 1: Goodness-of-fit model using fit index for exploratory factor analysis (EFA).

Exploratory Factor Analysis (EFA) Model Index	Suggested value*
Bartlett’s test of sphericity/ (sig. <0.05)	<0.05
Kaiser-Meyer-Olkin (KMO) of sampling adequacy	> 0.50
The value of factor loading for each item	≥ 0.40
The measure of communalities	≥ 0.30
The eigenvalue	≥ 1.00
% contribution of variance on factors	≥ 3.00

*Hair et al. (2018).

It is important to ensure that inappropriate questionnaire items are removed and that the items are organized under one construct. In this study, considering that all the test tools are taken completely from the original source, the researcher only takes into account the load factor aspect in the exploratory factor analysis process because the researcher wants to maintain the original dimensions by the original researcher. In EFA, factor loading values less than 0.6 will be discarded. This is because Habsah et al. (2018) said that loading factors less than 0.6 are not good and is supported by Hair et al. (2018). Items with a factor loading value of less than 0.6 are considered unimportant to the measurement of the construct and can be removed (Awang 2014; 2015; Awang et al. 2015; Hoque et al. 2017; Kashif et al. 2016).

In general, there are 12 items used in this study. Factor analysis testing is done separately according to the construct of knowledge sharing. The results of the factor analysis refer to the results of the Kaiser-Meyer-Olkin (KMO) test and the Bartlett Test of Sphericity is implemented to determine the appropriateness of the factors as a whole. The KMO test exhibits multi-collinearity while the Bartlett's Test of Sphericity is used for the purpose of identifying whether the correlation between items is sufficient for factor analysis. If the same correlation value exists between two or more items, the items measure the same aspect. This test helps the researcher to identify whether the item is suitable or not for factor analysis.

Factor Analysis For Knowledge Sharing Instruments

Table 2: The results of the Kaiser-Meyer-Olkin (KMO) sample adequacy test and Bartlett's Test Of Sphericity χ^2

Exploratory Factor Analysis Model Index	Recommended Value*	Results
Sample adequacy test Kaiser-Meyer-Olkin (KMO)	.920	As suggested by Hair et. al. (2018)
Bartlett's Test Of Sphericity χ^2	.000	As suggested by Hair et. al. (2018)

When the value of Kaiser-Meyer-Olkin (KMO) sample adequacy test and Bartlett's Test Of Sphericity χ^2 is at a good value that has been suggested by Hair et al. (2018), Tabachnick and Fidell (2013). Next, the percentage value test for the measurement of a construct for all the items used, is based on the total variance explained. Table 2 displays in detail the total variance explained based on the knowledge sharing instrument. The value for the total explained variance of the knowledge sharing instrument is 77.094%, which is above the minimum value of 60% as set by (Hair, 2018; Muda et al. 2018) and used in the study of Yusoff & Tengku Faekah (2021).

Table 3: Total Variance Explained

Variable	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	9.251	77.094	77.094	9.251	77.094	77.094

*Extraction Method: Principal Component Analysis

According to Hair et al. (2018). and Hoque et al. (2017) to identify the items that are used (selected) for one component, the loading factor value must exceed the minimum value limit (0.6). If the factor loading value is less than 0.6, then the item should be removed from being used in the study. The table below will explain in detail the load factor analysis for each item. The table below also displays the overall factor loading value for one component in the knowledge sharing instrument.

Table 4: Exploratory Factor Analysis (Factor Loading)

No. item	Items	Factor Loading
1	I willingly share my knowledge with colleagues within my department.	.871
2	I voluntarily share my knowledge with colleagues outside of my department.	.887
3	I willingly share my skills with colleagues within my department, when they asked me about it.	.913
4	The people I work with work together to get the job done.	.859
5	Employees in my work unit share job knowledge with each other.	.834
6	I share my experience or know how to work with other team members.	.930
7	I share my knowledge about know-where or know-how at the request of other team members.	.933
8	I share work reports and documents with my team members.	.903
9	I share relevant knowledge gained from other media.	.854
10	I share report templates, models and design methodologies with my team members.	.904
11	I share success and failure stories about my work in documents with my team members.	.757
12	I share my expertise gained from my education or training with other team members.	.876

DISCUSSION AND CONCLUSION

The factor analysis carried out has proved that the knowledge sharing instrument in this study can be used in actual studies. Based on Table 5, the analysis shows that all the values proposed by Hair (2018) were successfully achieved.

Table 5: Summary of EFA Model Indexes

Exploratory Factor Analysis (EFA) Model Indexes	Recommended Value*	Results
Bartlett's Test of Sphericity/ (sig. <0.05)	<0.05	Successfully Achieved
Kaiser-Meyer-Olkin (KMO) of Sampling Adequacy	> 0.50	Successfully Achieved
The value of factor loading for each item	≥ 0.40	Successfully Achieved
The measure of communalities	≥ 0.30	Successfully Achieved
The eigenvalue	≥ 1.00	Successfully Achieved
% contribution of variance on factors	≥ 3.00	Successfully Achieved
Cronbach alpha	> 0.70	Successfully Achieved

*Hair et al. (2018).

Factor analysis has proven that this instrument is valid and fit to use as mentioned in the study of Mokhtar et al. (2022): Puteh et al. (2022): Yusoff. et al. (2021).

REFERENCES

- Aksoy, Y., Ayranci, E., & Gozukara, E. (2016). A research on the relationship between knowledge sharing and employee performance: The moderating role of unethical behaviors in organizational level. *European Scientific Journal*, 12(4).
- Ayesha Naeem, Neelam Hanan Mirza, Rana Muhammad Ayyub & Rab Nawaz Lodhi. (2017). HRM practices and faculty's knowledge sharing behavior: Mediation of affective commitment and affect-based trust. *Studies in Higher Education*. Volume 44, 2019 - Issue 3.
- Awang, Z., Afthanorhan, A., & Mamat, M. (2016). The Likert scale analysis using parametric based Structural Equation Modeling (SEM). *Computational Methods in Social Sciences*, 4(1), 13.
- Awang, Z. (2015). *SEM Made Simple: A Gentle Approach to Learning Structural Equation modelling*. Bandar Baru Bangi: MPWS Rich Resources.
- Baharudin Puteh, Muhammad Yasin Omar Mukhtar, Siti Marhamah Kamarul Arifain, Nor Ainee Idris, & Wan Norhayati Wan Othman (2022). The Validation of Psychological Capital Instrument: An Exploratory Factor Analysis (EFA) in Research Involving Lecturers in Private Institutes of Higher Learning in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 12(5), 713 – 723.
- Eshak et al., (2022). Factors Influencing Knowledge Sharing: A Survey Of Literature. *International Journal of Accounting, Finance and Business*, Volume: 7 Issues: 42. Special Issues pp. 26 - 31.
- Hoque, A.S.M.M., Awang, Z., Jusoff, K., Salleh, F., & Muda, H. (2017). Social business efficiency: Instrument development and validation procedure using structural equation modelling. *International Business Management*, 11(1), 222-231.
- Hamzah & Wardana (2018). Knowledge sharing sebagai mediasi antara employee engagement terhadap kinerja pengemudi gojek di Yogyakarta. *Briliant: Jurnal Riset dan Konseptual*, 3(4), 411-424.
- Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2018). *Multivariate data analysis*. 8th Ed. United Kingdom: Cengage Learning.
- Kipkosgei, F., Kang, S. W., & Choi, S. B. (2020). A team-level study of the relationship between knowledge sharing and trust in Kenya: Moderating role of collaborative technology. *Sustainability*, 12(4), 1615.
- Kwah, K. Y., & Park, D. H. (2016). The effects of network sharing on knowledge-sharing activities and job performance in enterprise social media environments. *Computers in Human Behavior*, 55, 826-839.
- Jarrah, M. A. A., Hadi, W. E., Karadsheh, L., & Alhawari, S. (2020). A model for measuring the direct and indirect impact of organizational culture factors and knowledge-sharing on the success of employee performance (field study in Jordanian Islamic banks sector). *International Journal of Management Practice*, 13(1), 103-128.
- Laily, N., & Ernawati, D. P. (2020). The effect of knowledge sharing and innovation behavior on the performance of batik entrepreneurs. *Jurnal Manajemen*, 24(2), 194-209.
- Muhammad Shukri Bakar, Rosli Mahmood, Azahari Ramli and Rosli Mohd Saad, "Knowledge Sharing Behaviour and Performance of Academic Leaders: Mediating Role of Corporate Entrepreneurship" (2016). *Middle-East Journal of Scientific Research*, 24 (6): 2028-2035.
- Muhammad Yasin Omar Mokhtar, Mohd Nasir Saludin Siti Marhamah Kamarul Arifain & Wan Norhayati Wan Othman. (2021). Exploring The Items for Organizational Citizenship Behavior (OCB) Instrument In Malay Version: An Exploratory Factor Analysis (EFA). *Journal Of Positive Psychology*. Vol. 6, No. 4, 3496 – 3502.
- Muda, H., Lognathan, N., Awang, Z., Jusoh, H., & Baba, Z. S. (2018). *Application of Theory, Methodology and Analysis in Conducting Research: A Practical guide to Quantitative Research and Thesis Writing*. Terengganu: Unisza Publisher.
- Nonaka, I., & Takeuchi, H. (1995). *The knowledge creation company: How Japanese companies create the dynamics of innovation*. New York: Oxford University Press.
- Sánchez, Antonio Aragón, Gregorio Sánchez Marín, and Arleen Mueses Morales. (2015). The Mediating Effect of Strategic Human Resource Practices on Knowledge Management and Firm Performance. *Revista Europea de Dirección Economía de la Empresa* 24 (3): 138–48.

- Smith, E. A. (2001). The role of tacit and explicit knowledge in the workplace. *Journal of Knowledge Management*, 5(4), 311-321.
- Szulanski, G. (1996). Exploring internal sickness: Impediments to the transfer of best practices within the firm. *Strategic Management Journal*, 27-43.
- Barney, Jay. (1991). Firm resources and sustained competitive advantage. *Journal of Management*. 17 (1): 99–120.
- Yassmin Diab. (2021). The concept of knowledge sharing in organizations (Studying the personal and organizational factors and their effect on knowledge management). *Management Studies and Economic Systems (MSES)*, 6 (1/2), 91-100.
- Yong Woon Kim and Jae kwon Ko. (2014). HR Practices and Knowledge Sharing Behavior: Focusing on the Moderating Effect of Trust in Supervisor. (2014). *Public Personnel Management*. Vol. 43(4) 585-607.
- Yusoff, S. M., & Ariffin. T. F. T. (2021). Development and Validation of Contextual Leadership Instrument for Principals in Malaysian School Context (MyCLIPS). *Leadership and Policy in Schools*, DOI: 10.1080/15700763.2021.1971259.