International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 03, 2020
ISSN: 1475-7192

The Future of Leadership Framework in Malaysia Education Systems

[1]Irdayanti Mat Nashir, [2]Dwi Esti, [3]Nurul Nazirah Mohd Imam Ma'arof, [4]Mohamed Nor Azhari bin Azman, [5]Moh Khairudin

Abstract*---The research aims to discover the perspective of the Technical and Vocational Education and Training(TVET) experts on the innovative instructional leadership. The methodological approach used in developing the questionnaires is the Modified Delphi Technique. For this purpose, the interviews with 11 experts were conducted to obtain the data analysis. Next, the results obtained were analysed using the exploratory factor analysis (EFA) to acquire the constructs and items prior in technical and vocational education leadership. Based on the findings of the analysis result, there were found 13 out of 17 constructs that were proposed in the beginning of the interview. Researchers hope the findings of these constructs will improve the leadership performance among the technical and vocational leaders in leading TVET organisation as the centre of attention in the future.*

Keywords*---vocational and technical leadership, experts' perspective, leadership framework, technical and vocational education, interview, factor analysis; exploratory factor analysis; items reduction; needs analysis; Delphi techniques; modified Delphi*

I. Introduction

Many leaders have debated on the responsibility and roles of leaders today and onwards are critical and challenging. It is supported by (Adams et.al, 2018; Ghasemy et.al, 2017; Jalil et.al, 2018; Maheshwari & Yadav, 2018; Osman & Kamis, 2019). Leadership possesses by a leader is also a pillar of the organisation development. However, there is no specific instrument to evaluate the leader's criteria. Thus, a specific instrument needs to be developed as the guideline to the authority in evaluating the capability of individuals as well as the leaders on how to organise the organisation such as vocational and technical particularly. A checklist with inventory of interview protocols were developed to explore and analyse the needs of constructs and items before the actual interview with the experts executed.

The Delphi Technique

The research uses the Modified Delphi Technique which is a framework based on the congregation and analysis of experts' opinions in the field of study. Thus, this technique is similar to the original Delphi, however the modification made at the first round of interview which using a set of carefully pre-selected items. The purposes of

[1,3,4]Faculty of Technical and Vocational, Universiti Pendidikan Sultan Idris, Tanjong Malim, Perak.
[2, 5]Department of Electrical Engineering, Universitas Negeri Yogyakarta, Karangmalang, Yogyakarta, Indonesia
Correspondence author email:irdayanti@ftv.upsi.edu.my

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

using these pre-selected items are to guide those experts to improve their responses, more controlled, be focused on the research at hand and to save time. The fundamental of technique started with a group of thinkers from RAND Corporation, Santa Monica, California, and the United States in 1952 to develop the potential in military field especially in the air force. At first, the technique used to forecast the capabilities and development might be used in the future. In 1962, the technique was introduced to public and since that, it has been developed and used widely in various fields such as economy, politics, education and science technology. The orientation of technique also keeps changing as many modifications and refinements made based on the needs and objectives of one's research.

Interm of education field, Helmer (2002) and Thomas, Nelson and Silverman (2011) opined that the technique was excellent and outstanding to indicate the items of educators' competency, curriculum needs or contents and specific goal direction as an educational system. This is because, the technique could give many points of view from various fields compared to the typical techniques such as observation and questionnaire.

The observation and questionnaire not only provide limited response and information; besides, they are restricted to sole area due to the constraint of questions. On the other hand, the modified version enables researchers to acquire more detailed opinions. In short, the Modified Delphi technique could assist researchers in obtaining thorough information as a whole. It emphasizes the aspects those have not been widely explored yet and have limited references from previous researches. Thus, evaluations, opinions and responses from a group of experts are the best method to acquire accurate and adequate data under certain circumstances.

The Modified Delphi Technique is said as a unique method especially in congregating and refining information, next to re-evaluate all those responses from the selected experts. So, the technique comprises 3 main sources as the determiners of the final research result. These sources are knowledge, suggestion and speculation made by each expert. By these three, the consensus made by experts would be more accurate and reliable. Knowledge is the main source in making decision because it can be a basis of expressing opinion and form precise information. Using knowledge also enables us to predict speculation and we could make it as a source of information even though it comes from the least credible source. Thus, the use of speculation, suggestion and knowledge among the experts were the most suitable method to forecast one development in the future (Helmer, 2002).

These individuals who fulfil the criteria of expertise in the field of study were selected to form a group. They were needed to respond on the issue respectively in numerous times repeatedly. This means, there was no face-to-face meeting between those experts, in fact, the interaction only occurs through the consensus analysis by the researchers using questionnaire. According to Dalkey (1971b), the idea of isolated experts was crucial to verify the validity of research.

Researchers chose the technique after considering several opinions by the previous researches who already used the technique to strengthen the instruments in the making. Besides, several advantages of the Modified Delphi Technique attracted researchers' passion to execute it which(i) the technique enables researchers to obtain the consensus of opinion by the recognised expert panels because they do not know each other. (ii) The consensus of opinion can be achieved without bias, influences and pressure from any (iii) Expert panels able to voice out their

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

consistent opinion in their expertise respectively. (iv) The technique is suitable for future forecast.(v) The technique is used effectively to acquire many opinions on complex issue. The respondent selection must be done meticulously because if there was any mistake, itcaused the result occurred converselyand affected the quality of research. (Lanford, 1972; Martino, 1972; Helmer, 2002; O"Halloron et al., 1999).

The number of Experts

Several past researchers had opined about determining the number of selected experts using the technique. According to Loo (2002), a group of 7 to 100 experts was very suitable to obtain the solid findings. However, Linstone dan Turoff (1975) differed because they believed too many numbers of experts only made the process more complicated and negative implications occurred during the field research. Next, they suggested the number of experts those considered suitable and adequate was between 5 to 10 solely to achieve the highlighted objectives. While, Dalkey (1971b) suggested that every research must involve more than 10 experts to obtain solid findings. At the same time, according to Delbecq and Van de Ven, (1975) and Ludwig (1997) affirmed that 3 to 5 experts were too small in number and forbade to respond reliably. Next, they suggested to use between 10 to 20 experts who had mutual expertise in their field.

In line with Dalkey (1971b), Linstone et al. (1975), Delbecq et al. (1975), Ludwig (1997) and Loo (2002) so the researchers decided to fix the number of experts which was 11 experts. The research was conducted for 4 rounds, yet it could be done more or lesser depended on information and consensus needed. Delbecq and Van de Ven (1975). 11 experts were appointed consisted of six academics at IPTA and five are from the top management at KPT. Letters of appointment from the university were sent to the experts as shown in Attachment E and F.

The criteria of Experts' Selection

The technique used because it was designed to optimise inputs from the individuals in the expert's group. The most essential element in the research is the experts' selection. Based on Helmer (2002) defined an expert had highly trained and competent within his area until he abled to respond swiftly (sometimes he didn't need to think longer and could be done at a glance). Besides, Dalkey (1971b) defined an expert who was knowledgeable in his field. While, Babbie (2000) suggested several criteria as the guideline to determine an expert; by possessing superior appearance, acknowledged by the professionals, numbers of paperwork published and presented to the public at the international conferences or in the country, and the quantity of researches conducted. Based on those suggestions, the sampling technique aimed all criteria discussed in the beginning. According to two definitions of expert above, researchers identified the selection of experts must be based on these criteria(i) possess knowledge, competent and experience in leadership and the needs of PTV over 10 years (ii) willingly to take part in the research which conducted more than 2 rounds. According to Zainudin (2012) and Collins (2015) emphasised that the selection of individuals as the experts depended on the objectives of research. The pivotal principle was the quality must over quantity of the experts. While, Fraenkel and Wallen (2009) explained the experts' willingness and capabilities of responding to the topic discussed and possessed wide experience of it were crucial.

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

II. The Development of Research Methodology

The research needs analysis was identified up to 17 constructs that adapted from the researcher's past research and document review analysis. The checklist had been arranged using the five-point likert scale from the most important construct to the least important one before distributed. The most important scale was labelled with the value of 1 until the value of 5 for the least. (Cheryl (2018); Donna (2018); Jennifer, (2018); Kristina & Goran (2017); Pat (2018); Sarah and Nina, (2018)). Hence, the Modified Delphi Technique was used in the research. The checklist was distributed to 11 experienced experts who are knowledgeable in the area of technical and vocational education during the interview. During the first round, the researchers conducted the phase of interview needs analysis with the experts. The interview was carried out along with the checklist that was developed based on the previous research and scientific writing of the study. The face-to-face interview is essential to be conducted to gain accurate screening and clear understanding of the experts on the research. (Jennifer, 2018; Kristina and Goran, 2017; Pat, 2018). After the Delphi technique was carried out twice and the checklist was collected, the findings as shown in Table 1.

Table 1

Future Innovative Instructional Leadership Domain	**Expertise**	**Curriculum Analysis**	**Literature Review**
Personality			
Setting vision and mission			
Strategic thinking	√	√	
Innovative thinking	√	√	Hallinger
Managing changes	-	√	(1985), McEwan
Self-personality	√	√	(1998), Murphy
Endurance	-	√	(1990), NASSP
Organization			(2001), Liedtka
Creating a conducive environment	√	√	(1990), Sloane
Managing educational management functions	√	√	(2007), Grayson
Promoting the academic climate of learning	√	√	& Baldwin
Organizing abilities	√	√	(2007) dan Moss
Monitor the teaching and learning process	√	√	& Jerome (1994)
Class supervision	-	√	
Clear pedagogical presentation	-	√	
Networking dominion	√	√	
Staffing			
Providing necessities and verification	√	√	
Concerns	√	√	
Teamwork	√	√	

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

III. Findings and Discussion

In order to determine the most important innovative instructional leadership domain to the least important one, each domain needs to be tested and calibrated using the exploration factor analysis. The developed questionnaires were distributed to 473 respondents comprises five zones in Malaysia prior to the research factor analysis. After collecting the questionnaires, the data was analysed to obtain the value of validity and reliability of each construct and item. The exploratory factor analysis was executed to find out the discriminant and credible relationships between domains and validity to evaluate the effectiveness of future leadership. Based on Table 2, the number of respondents in the research were 473 people in total. Majority of the respondents were female who had over 10 years of working experience.

Table 2

Respondent (N= 473)	
Category	**Percent**
Gender	
Male	35.8
Female	62.7
Experience	
Less than 1 year	-
1-5 years	11.6
6-10 years	40.6
More than 10 years	47.8
Age	
25 - 30	8.5
31 - 35	34.8
36 – 40	21.9
41 – 45	11.9
46 – 50	9.7
51 – 55	4.6
56 – 60	1.4
Above 60	7.2

The Exploratory Factor Analysis (EFA)

The statistics analysis used to confirm the validity of the constructs and items is the Exploratory Factor Analysis (EFA). Before EFA conducted, Kaiser-Meyer-Olkin (KMO) and Bartlett test were carrried out earlier to indicate all those factors. In KMO test, the high values (close to 1.0) generally indicate that a factor analysis may be very useful

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

with data. While, in Bartlett's test, small values (less than 0.05) of the significance level indicate that a factor analysis may be very useful with data. And the findings is the KMO measure of sampling adequacy was 0.922 and the Bartlett's test of sphericity was less than 0.001, which means EFA could be used on the data set because the tests showed all the underlying factors and variables were useful and related in this research. Hence, both tests confirmed all factors and variables. The EFA was conducted with the data obtained to extract the new factors structure and to study the validity of the constructs. Factors were extracted by maximum-likelihood method and varimax rotation. The number of factors indicated the scree plots, cumulative variance explained, interpretation and Kaiser criterion. (Albuquerque et.al. (2019); Goodman dan Santos (2006); Wiktorowicz (2017). Three (3) factors were extracted and rotated, and cumulative variance explained was 51.81%. The result of EFA factor structure simplified as shown in Table 3.

Internal Consistency

One of the most well-known estimates of internal consistency is Cronbach's. Generally, if the internal consistency is considered excellent, then all extracted factors have good internal selection too. According to Table 3, no items removed because all items had loading factor values which greater than 0.5 (Bonnafous and Kryvobokov, (2011); Dhall, (2019)). Table 4 shows the item values for the three constructs which are (i) personality, (ii) organization and (iii) staff. The internal consistency values tested using Alpha Cronbach for the three constructs are highly reliable with values ranged from 0.938 to 0.971. While loading factor values for each item ranged from 0.735-0.894 for the construct factor, Furthermore, for the loading factor organisation loading factor was between 0.651 - 0.734 and for the construction staff, the loading factor was 0.717 to 0.771 consist of four items.

Table3

Construct and Measurement Items	**Factor Loading**
Personality (Cronbach Value α= 0.971; 16 items)	Eigen Value = 1.61% Variance = 64.11
Setting vision and mission	0.735
Strategic thinking	0.894
Innovative thinking	0.843
Managing changes	0.759
Self-personality	0.824
Endurance	0.799
Organization (Cronbach Value α= 0.938; 8 items)	Eigen Value = 1.59% Variance = 62.84
Creating a conducive environment	0.734
Managing educational management functions	0.651
Promoting the academic climate of learning	0.653
Organizing abilities	0.736

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

Construct and Measurement Items	Factor Loading
Monitor the teaching and learning process	0.680
Class supervision	0.729
Clear pedagogical presentation	0.676
Networking dominion	0.664
Staffing (Cronbach Value α= 0.941;4 items)	Eigen Value = 1.76% Variance = 61.99
Providing necessities and verification	0.771
Concerns	0.717
Teamwork	0.749
Empathy	0.765

Besides, a paired sample t-test was carried out to identify the differences between each contruct. Based on the Table 4 where the significant value of the organisation and staffing shows greater than 0.05 which means a harmony organisation is formed when the staff were excellent.

Table 4

P values	***Personality***	***Organization***	***Staffing***
Personality	-	*.033*	*.472*
Organization	*.033*	-	*.081*
Staffing	*.472*	*.081*	-

IV. Conclusion

Based on the research objectives, the study has come out with a reliable and valid checklist. In addition, the research used the Modified Delphi Technique in developing the checklist. The technique underwent three steps of method with those experts which were interview and questionnaire. The first round began with the attached 17 constructs. However, at the final round, there were only 13 constructs left. Then, these remaining constructs were analysed using the Exploratory Factor Analysis (EFA) to acquire the value of validity and reliability between constructs and items in the checklist. The paired t-test also was carried out to find out the relationship between those constructs. The findings showed the organisational construct terribly influenced by staffing. The conclusion can be made is the strong and stable organisation is formed by the good staff and harmony.

V. Acknowledgement

The authors would like to thank all the respondents who participated as the panels in this research. This study is supported by the Matching Grant Research (2019-0239-107-01)which funded by Universiti Pendidikan Sultan Idris.

References

[1] Adams, J., Kawchuk, G., Breen, A. et al. Chiropr Man Therap (2018) 26: 5. https://doi.org/10.1186/s12998-018-0173-3

[2] Alahlafi, A. and Burge, S. (2005), “What should undergraduate medical students know about psoriasis? Involving patients in curriculum development: modified Delphi technique”, British Medical Journal, Vol. 330 No. 7492, pp. 633-636

[3] Albuquerque, P., Demo, G., Alfinito, S. and Rozzett, K. (2019), "Bayesian factor analysis for mixed data on management studies", *RAUSP Management Journal*, Vol. 54 No. 4, pp. 430-445. https://doi.org/10.1108/RAUSP-05-2019-0108

[4] Bonnafous, A. and Kryvobokov, M. (2011), "Insight into apartment attributes and location with factors and principal components", *International Journal of Housing Markets and Analysis*, Vol. 4 No. 2, pp. 155-171. https://doi.org/10.1108/17538271111137930

[5] Bogdan, R.C & Bliken, S. (2002). *Qualitative Research in Education: AnIntroduction to the Theory and Methods* (4th Ed.). Boston: Allyn Bacon.

[6] Cheryl, N. P., (2018). *Innovation in Mixed Methods Research*. London, England: Sage.

[7] Clibbens, N., Walters, S. and Baird, W. (2012), “Delphi research: issues raised by a pilot study”, Nurse Researcher, Vol. 19 No. 2, pp. 37-44.

[8] Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and MixedMethods Approaches*. (Thousand Oaks, Ed.) (3rd Ed.). Sage Publications.

[9] Dhall, P. (2019), "Quantitative Data Analysis", Subudhi, R. and Mishra, S. (Ed.) *Methodological Issues in Management Research: Advances, Challenges, and the Way Ahead*, Emerald Publishing Limited, pp. 109-125. https://doi.org/10.1108/978-1-78973-973-220191008

[10] Donna, M. M., (2018). *Mixed Method Design in Evaluation*. London, England: Sage.

[11] Fallon, K.E. and Trevitt, A.C. (2006). “Optimising a curriculum for clinical haematology and biochemistry in sports medicine: a Delphi approach”, British Journal of Sports Medicine, Vol. 40 No. 2, pp. 139-144.

[12] Ghasemy, M., Hussin, S.B., Daud, M.A.K.B.M. *et al.* (2017). Correction to: Pivotal qualities for effective university leadership on the basis of a modified Australian model: the application of FIMIX-PLS and IPMA in the Malaysian academic context. *Asia Pacific Educ. Rev.***18,** 519 (2017) doi: 10.1007/s12564-017-9510-9

[13] Goodman, M. and Santos, G. (2006), "Card sort technique as a qualitative substitute for quantitative exploratory factor analysis", *Corporate Communications: An International Journal*, Vol. 11 No. 3, pp. 288-302. https://doi.org/10.1108/13563280610680867

[14] Helen Sitlington, Alan Coetzer, (2015). "Using the Delphi technique to support curriculum development", Education + Training, Vol. 57 Issue: 3, pp.306-321, https://doi.org/10.1108/ET-02-2014-0010

[15] Irdayanti, M. N., Ramlee, M., and Abdullah, Y. (2015). Delphi Technique: Enhancing Research in Technical and Vocational Education. *International business*, *3*, 34.

[16] Irdayanti M. N., Abdullah, Y., Moh Khairudin, Muhammad Ridzuan, I., Nurul Nazirah, I. M. (2019). Delphi Method: The Development of Robotic Learning Survey in Tertiary Education. *Journal of Vocational Education Studies*, https://doi.org/10.12928/joves.v2i1.761

[17] Jalil, R., Soukup, T., Akhter, W. et al. World J Urol (2018) 36: 1031. https://doi.org/10.1007/s00345-018-2255-1

[18] Jennifer, M. (2018). *Qualitative Researching*. London, England: Sage.

[19] Keeney, S., Hasson, F. and McKenna, H.P. (2001), “A critical review of the Delphi technique as a research methodology for nursing”, International Journal of Nursing Studies, Vol. 38 No. 2, pp. 195-200.

[20] Kristina, B., & Goran, B. (2017). Analyzing Text and Discourse: Eight approaches for the Social Sciences. London, England: Sage.

[21] Linstone, H.A. & Turoff, M. (1975), the Delphi Method: Techniques and Applications, Addison-Wesley, London.

[22] Maheshwari, S. and Yadav, J. (2018), "Leadership development strategy: the missing links", *Development and Learning in Organizations*, Vol. 32 No. 1, pp. 11-14. https://doi.org/10.1108/DLO-04-2017-0038

[23] Okoli, C. and Pawlowski, S. (2004), “The Delphi method as a research tool: an example, design considerations and applications”, Information & Management, Vol. 42 No. 1, pp. 15-29

[24] Osman, N., & Kamis, A. (2019). Innovation leadership for sustainable organizational climate in institution of technical and vocational education and training (TVET) in Malaysia. Asian Journal of Assessment in Teaching and Learning, 9(1), 57-64.

[25] Pat, B. (2018). *Integrating Analysis in Mixed Methods Research*. London, England: Sage.

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020

[26] Peck, R., Olsen, C. & Devore, J.L. (2015). Introduction to Statistics and Data Analysis. (Brooks Cole, Ed.) (5th Ed.). Cengage Learning.
[27] Robert Loo. (2002). The Delphi method: a powerful tool for strategic management
[28] *Policing: An International Journal of Police Strategies & Management*, *25*(4),762–769. doi: 10.1108/13639510210450677
[29] Sarah, Q. & Nina, R. (2018). Understanding Research in the Digital Age. London, England: Sage.
[30] Wiktorowicz, J. (2017), "Competencies as a factor of economic deactivation: Application of exploratory factor analysis", *International Journal of Social Economics*, Vol. 44 No. 5, pp. 605-619. https://doi.org/10.1108/IJSE-08-2015-0198
[31] Soh, K.G., Raman, R.A., Soh, K.L., Japar, S., Ong, S.L., Ghiami, Z. Parents' perceptions of their children body fat percentage and weight(2018) International Journal of Pharmaceutical Research, 10 (4), pp. 53-57.

DOI: 10.37200/IJPR/V24I3/PR200764
Received: 10 Jan 2020 | Revised: 30 Jan 2020 | Accepted: 02 Feb 2020