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Measuring the Content Validity of Middle Leadership Competence Model using Content Validity Ratio (CVR) Analysis

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Abstract: *This study aims to examine the content validity of Middle Leadership Competence Model using Lawshe's CVR analysis. The study was carried out quantitatively using survey method. The four main competency constructs comprise of Leadership, Instructional, Governance and Self-emotional. A total of 109 items were formed and evaluated by nine field experts. The experts were purposely selected based on their expertise in educational leadership, competency development and psychometric. The results showed that 91 items met the minimum CVR value of 0.78 and were retained. While, 18 items were rejected from the item pool. The mean judgement of 0.89 (CVI) for the retained items shows that the instrument has the potential to be promoted as an effective tool to measure the middle leadership competence in school. Subsequently, in the future, it is recommended to conduct more sophisticated statistical analysis such as exploratory factor analysis (EFA) to scrutinize the factor structure and Structural Equation Modelling (SEM) for model development.*

Keywords: Competency Model, Middle Leadership, Content Validity Ratio

1. Introduction

The validity and reliability of an instrument need to be test empirically before it can been used in the field or in the real study. Fraenkel and Wallen (2009) defined validity as a process to confirm the usability of the instrument. Meanwhile, according to Campbell and Fiske (1959), validity is the agreement between two attempts to measure the same trait with different methods. As in general, the validity of an instrument is very important to maintain its accuracy.

2. Background of the study

Instrument that has been used in this research is mapped from the theoretical framework of School Internal System (Hoy & Miskel, 2008), Curriculum Area Middle Management (White, 2000) and Model of Effective Performance (Boyatzis, 1982). It is also combined with items that have been agreed upon by expert through the Fuzzy Delphi Method (FDM) in the previous phase. Once all the evidence based items been gathered, a content validity is conducted to the proposed instrument.

3. Literature

Research in the scope of the role and function of middle leaders in organizations especially schools has always been given attention by education scholars around the world (Harris, et al., 2018; Lipscombe, et al., 2021). They play a dual role that act as teachers in the classroom and also as leaders responsible for curriculum management (Bryant & Rao, 2019; Grice, 2019; Lipscombe, et al., 2020) and school administration (Bryant, 2019). Their presence is also often associated with school achievement (Boyaci & Oz, 2017; Leithwood, et al., 2020). This situation causes them to face difficulties (Bush, 2019; Gurr, 2019), to be burdened between administrative tasks (Jarvis, 2008; Beram, et al., 2020) and duties as lead teachers. Suhaili, et al. (2020) investigated that the burden of teaching and managing the curriculum at the same time had disrupted with the focus on their role as leaders which ultimately led to stress and made them to be less motivated (Clarence et al., 2020; Wan Mohamed et al., 2023). In fact, they may not even be an expert pedagogically or managerially (Nehez, et al. (2021). Therefore, Forde, et al. (2019) suggest that middle leader needs to refocus on the roles and tasks of middle leadership practices related to teaching and learning, because they are simply a conduit for policy reform on school. Thus, it is necessary to be provide a model for development of middle leadership competencies as a guide to the potential impact (Bryant & Rao, 2020; Gurr, 2019) and maintenance of school excellence in the long term (Manaf, 2017).

The actual competency requirements of this middle leadership need to be examined so that the development training built will be successfully meets the needs of the organization (Aminuddin Baki Institute, 2020). Proper training plan can have a positive impact on the Malaysia Ministry of Education (KPM) and even be able to guarantee the best return on investment (ROI) (Momin, 2018; Lokman, et al., 2021). The competency model for Principals and Headmasters cannot be used as a standard measure for middle leaders because each position requires different competencies (Lipscombe, et al., 2020).

Meanwhile, the use of special competency models for middle leaders has been widely practiced abroad. Singapore with the Management and Leadership in Schools Program, Brunei with the Competency Model-based Middle Leader Development Program and The National Professional Qualification for Middle Leadership (NPQML) is been used as middle leaders' preparation training in the United Kingdom. There are also many studies in the development of middle leader competencies in Vietnam (Duong & Lam, 2020), Hong Kong (Bryant, 2018), Slater-sanchez, et al. (2020) in California which covers educational matters. Clearly, this study is an effort to identify and develop a competency model of middle leaders according to their actual grades and accountability (Momin, 2018).

4. Content Validity Ratio (CVR)

In the content validity process, Lawshe's Content Validity Ratio (CVR) analysis method is used (Lawshe, 1975). The CVR method has been widely used in the health study, educational field, organizational development etc (Wilson, et al., 2012). Researchers believe that this method is more concise, transparent and focused according to the importance level ranking of items based on expert evaluation. It is also proved that CVR analysis able to filter items in the instrument empirically. This further justifies the popularity of CVR among researchers worldwide (Mohd Matore, et al., 2017, Mohd Noor, et al., 2016).

Lawshe (1975) outlined the evaluation of items based on three scales, namely (1) Essential, (2) Useful but not essential and (3) Not necessary. Only items rated at the Essential scale will be analyzed according to the formula;

$$\text{CVR} = \frac{n_e - \frac{N}{2}}{\frac{N}{2}} \quad (1)$$

$$\text{CVI} = \frac{n_e}{N} \quad (2)$$

where;

ne = Number of experts who rated Essential
N = Number of expert panels

CVR values ranges from -1 to +1, where value +1 indicates the experts' agreement to the importance of the item and would be retained in the instrument. While the CVR value less and closer to -1 explains that less than half of the experts rather disagree and this particular item is dropped or eliminated from the item pool. Nevertheless, the possibility to drop an item depends on the CVR minimum value which determined by the number of experts involved as shown in Table 1.

Table 1: Minimum Values of CVR

Number of Experts	Min value*
5	0.99
6	0.99
7	0.99
8	0.75
9	0.78*
10	0.62
11	0.59
12	0.56
13	0.54
14	0.51
15	0.49
20	0.42
25	0.37

Note: 9 experts were involved in the study

Table 1 shows the critical value of CVR computed based on the number of experts. When the assessment consists of 9 members, a minimum CVR of 0.78 is required to retain the item or else the item is rejected from the final form. CVR provides validity for each individual item, while Content Validity Index (CVI) describes the percentage of expert agreement for overall items in the instrument. According to Tilden et al. (1990), CVI of 0.7 is acceptable. But for new instrument, CVI of 0.80 is preferred (Davis, 1992). Polit et al. (2007) added that a low CVI value indicates that the instrument might have problems with the items, unclear instruction to the experts, improper expert selection or the expert himself is biased. They recommend a CVI value of 0.9 or higher worth as an excellent content validity which is consistent with Waltz et al. (2005).

5. Research Problem

The number of studies of middle leader competence models have been extensively conducted abroad (Grootenboer et al., 2019). However, in Malaysia, this issue is still considered new and receives less attention compared to the study on the roles of Principal or Headmasters (De Nobile, 2018). This issue leads to difficulties of obtaining references on instrument validation. Therefore, content validity ratio (CVR) analysis proposed by Lawshe (1975) is used to validate the accuracy of the item.

6. Research Objective

This study aims to analyse the content validity of Middle Leadership Competence Model using Lawshe's CVR analysis based on field experts' assessment.

7. Materials and Methods

The research design was carried out quantitatively. Selection of the experts are based on the expertise in the field of study (Rubio et al., 2003). Lawshe (1975) suggested at least 5 experts field. Lynn (1986) proposed number of expert set between 5 to 10 and more than 10 members are not necessary. In this research, 9 experts were selected. The experts were purposively selected based on their expertise in educational leadership, competency development and psychometric measurement.

Table 2: CVR Experts

Panelist Code	Expertise
P1	Educational Leadership & Competency Development
P2	Educational Leadership
P3	Educational Leadership
P4	Educational Leadership
P5	Educational Leadership
P6	Educational Leadership & Psychometric Measurement
P7	Educational Leadership & Psychometric Measurement
P8	Educational Leadership
P9	Educational Leadership & Psychometric Measurement

Table 2 shows the list of panelist in CVR assessment. All panels are expert in educational leadership with more than 10 year experience in their respective area. The instrument consists of four main constructs namely Organizational Leadership, Instructional Leadership, Governance Leadership and Self-Emotional Leadership. Lists of items in the instrument are shown in Table 3.

Table 3: List of Items

Main Construct	Element	Number of Item
Leadership	Positive thinking Team work Accountability Self-confident Communication Self-appearance Problem solving Decision making	20

	Alert Strategic thinking Change adaptability Vision- school direction Initiative Building bonds Influence Creative Innovative Empathy Educational policy Conceptual thinking	
Instructional	Teacher support Teaching observation Supervision Mentoring Coaching Assessment Curriculum learning area School learning area Student management Student achievement Consultation Teaching Evaluation Vision learning direction Achievement orientation Program effectiveness Sharing knowledge Technology literacy Promote professional learning Community	18
Governance	Staff performance appraisal Information management Conflict management Staff management and professional development Customer service orientation Learning environment Financial Educational resources Documentation School assets and facilities	10
Self-Emotional	Sensitive to other people's emotions Emotional self-control Self-motivation Intrapersonal Skills Sensitive to the needs of others Self-strength Self-development orientation Self-limitation Self-weakness Spiritual Intelligence Self-achievement drive	11

Table 3 shows a total of 59 competency elements which were then transformed into 109 items in the questionnaire. A 3-point Likert scale is used with (1) Essential, (2) Useful but not essential and (3) Not necessary. The experts were asked to respond and were allowed to write comments. Based on evaluations from 9 expert panels at a significant level of p=0.05 (5 percent), the minimum CVR value of 0.78 is set. Items with a CVR value equal to or greater than 0.78 will be retained and the rest were dropped from the model.

8. Results and Discussion

The results of CVR analysis are listed as in Table 4, Table 5, Table 6 and Table 7 and the CVR analysis calculated according to the four main construct of the instrument.

Table 4: CVR Analysis for Organizational Leadership (OL) Construct

Elements/Experts	P1	P2	P3	P4	P5	P6	P7	P8	P9	N_e	CVR	Result
OL1	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL2	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL3	1	1	1	1	1	1		1	1	8	0.78	Accepted
OL4	1	1	1	1		1	1	1	1	8	0.78	Accepted
OL5	1	1	1	1	1	1		1	1	8	0.78	Accepted
OL6	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL7	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL8	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL9	1	1	1	1	1	1		1	1	8	0.78	Accepted
OL10	1	1	1	1	1	1		1	1	8	0.78	Accepted
OL11		1	1	1	1	1	1	1	1	8	0.78	Accepted
OL12	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL13		1	1		1	1	1	1	1	7	0.56	Rejected
OL14	1	1	1	1	1	1		1	1	8	0.78	Accepted
OL15	1	1	1		1	1	1	1	1	8	0.78	Accepted
OL16	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL17	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL18		1	1	1	1	1		1	1	7	0.56	Rejected
OL19		1	1	1	1	1	1	1	1	8	0.78	Accepted
OL20	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL21		1	1	1	1	1		1	1	7	0.56	Rejected
OL22	1	1	1	1	1	1		1	1	8	0.78	Accepted
OL23	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL24	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL25	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL26	1	1	1	1	1		1	1	1	8	0.78	Accepted
OL27	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL28		1	1	1	1	1	1	1	1	8	0.78	Accepted
OL29	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
OL30	1	1	1	1	1		1	1	1	8	0.78	Accepted
										CVI	0.864	

** The number of experts rated Essential. ** For 9 experts (N = 9), items of CVR 0.78 and above were retained.*

Table 5: CVR Analysis for Instructional Leadership (IL) Construct

Elements/Experts	P1	P2	P3	P4	P5	P6	P7	P8	P9	N_e	CVR	Result
IL1	1	1	1	1	1	1		1	1	8	0.78	Accepted
IL2		1	1	1	1	1	1	1	1	8	0.78	Accepted
IL3	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL4	1	1	1	1	1	1		1	1	8	0.78	Accepted
IL5	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL6	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL7	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL8		1	1		1	1	1	1	1	7	0.56	Rejected
IL9	1	1	1	1	1		1	1	1	8	0.78	Accepted
IL10	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL11		1	1	1	1	1		1	1	7	0.56	Rejected
IL12		1	1	1	1	1		1	1	7	0.56	Rejected
IL13	1	1	1	1	1		1	1	1	8	0.78	Accepted
IL14		1	1	1	1	1		1	1	7	0.56	Rejected
IL15	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL16	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL17		1	1	1	1	1	1	1	1	8	0.78	Accepted
IL18	1	1	1	1	1		1	1	1	8	0.78	Accepted
IL19		1	1	1	1	1	1	1	1	8	0.78	Accepted
IL20		1	1	1	1	1	1	1	1	8	0.78	Accepted
IL21	1	1	1	1	1	1		1	1	8	0.78	Accepted
IL22	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL23	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL24	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL25	1	1	1	1	1	1		1	1	8	0.78	Accepted
IL26	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL27	1	1	1	1	1			1	1	7	0.56	Rejected
IL28	1	1	1	1	1	1		1	1	8	0.78	Accepted
IL29	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
IL30	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
										CVI	0.867	

** The number of experts rated Essential. ** For 9 experts (N = 9), items of CVR 0.78 and above were retained.*

Table 6: CVR Analysis for Governance Leadership (GL) Construct

Elements/Experts	P1	P2	P3	P4	P5	P6	P7	P8	P9	N_e	CVR	Result
GL1	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL2		1	1	1	1			1	1	6	0.33	Rejected
GL3	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL4	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL5	1	1	1	1	1			1	1	7	0.56	Rejected
GL6		1	1	1	1			1	1	6	0.33	Rejected
GL7	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL8	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL9		1	1	1	1	1	1	1	1	8	0.78	Accepted
GL10	1	1	1	1	1		1	1	1	8	0.78	Accepted
GL11		1	1	1	1			1	1	6	0.33	Rejected

GL12	1	1	1	1	1			1	1	7	0.56	Rejected
GL13	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL14		1	1	1	1	1	1	1	1	8	0.78	Accepted
GL15	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL16		1	1	1	1	1	1	1	1	8	0.78	Accepted
GL17		1	1	1	1	1	1	1	1	8	0.78	Accepted
GL18	1	1	1	1		1	1	1	1	8	0.78	Accepted
GL19	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL20	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL21	1	1	1	1	1	1		1	1	8	0.78	Accepted
GL22	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL23		1	1	1	1	1	1	1	1	8	0.78	Accepted
GL24		1	1	1	1	1	1	1	1	8	0.78	Accepted
GL25	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
GL26		1	1	1	1			1	1	6	0.33	Rejected
GL27	1	1			1		1	1	1	6	0.33	Rejected
GL28		1			1			1	1	4	-0.11	Rejected
GL29		1			1			1	1	4	-0.11	Rejected
										CVI	0.930	

** The number of experts rated Essential. ** For 9 experts (N = 9), items of CVR 0.78 and above were retained.*

Table 7: CVR Analysis for Self-Emotional Leadership (SEL) Construct

Elements/ Experts	P1	P2	P3	P4	P5	P6	P7	P8	P9	N_e	CVR	Result
SEL1	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 2	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 3	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 4	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 5	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 6	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 7	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL 8		1	1	1	1	1	1	1	1	8	0.78	Accepted
SEL 9	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL10		1	1	1	1	1	1	1	1	8	0.78	Accepted
SEL11	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL12	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL13	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL14		1	1	1	1	1	1	1	1	8	0.78	Accepted
SEL15	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL16		1	1	1	1	1	1	1	1	8	0.78	Accepted
SEL17	1	1	1	1	1	1	1	1	1	9	1.00	Accepted
SEL18		1	1	1	1	1	1		1	7	0.56	Rejected
SEL19	1	1	1		1	1	1	1	1	8	0.78	Accepted
SEL20		1	1	1	1	1	1	1	1	8	0.78	Accepted
										CVI	0.930	

** The number of experts rated Essential. ** For 9 experts (N = 9), items of CVR 0.78 and above were retained.*

It was found that 91 out of 109 items with the CVR threshold value of 0.78 were retained. While 18 items were rejected from the instrument. An analysis of mean value for CVR called Content Validity Index (CVI) is shown in the Table 8 below.

Table 8: Content Validity Index (CVI) Analysis

Main Construct	Number of Retained Item	Number of Omitted Item	CVI	CVI mean
Organizational Leadership	27	3	0.864	0.890
Instructional Leadership	25	5	0.867	
Governance Leadership	20	9	0.900	
Self-Emotional Leadership	19	1	0.930	
Total	91	18		

Self-Emotional shows the highest consensus rate among experts with a CVI value of 0.930 followed by Governance leadership with CVI of 0.9. Instructional and Organizational construct with the CVI values of 0.867 and 0.864 respectively. Self-Emotional and Governance constructs are considered excellent content validity as recommended by Polit et al. (2007). In addition to having the highest CVI value, the analysis showed that more than 50 percent of the total of 18 deleted items were from these two constructs as well. This scale indicates that all experts rated the item at a high agreement rating. The mean judgement analysis gives a CVI value of 0.890 which is in high category and close to 0.9. Overall, it can be concluded that, the instrument has excellence content validity that reflects the strength in the item specification, clear instruction to the expert and with the right experts' involvement.

9. Conclusion

This study aims to analyze the content validity of the proposed instrument using Lawshe's CVR method. The rating was evaluated by nine experts. Based on CVR analysis, a total of 18 items were rejected and gave a CVI value of 0.89 for items retained in the instrument. This result shows that Lawshe' CVR and CVI analysis promotes a useful and simple technique to determine the content validity of the instruments used. This instrument has the potential to be promoted as an effective tool to measure middle leadership competence in school.

The next step is to make item improvements based on experts' suggestions. A thorough review should be done especially on overlapping items that may cause confusion to respondents. The mapping of items in the correct competency construct should also be discussed in detail. Lastly, it is also recommended to conduct more sophisticated statistical analysis such as exploratory factor analysis (EFA) to examine the factor structure of the instrument and Structural Equation Modelling (SEM) for model development.

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