Personal leadership competencies of Malaysian Matriculation College middle leaders

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Article Info	ABSTRACT
	This study obtained expert consensus on the constructs of personal leadership competencies for Malaysia Matriculation College middle leaders using the approach of the Fuzzy Delphi Method (FDM). A list of instruments containing the proposed construct and all the elements was given to 30 experts from various fields and backgrounds. This study's finding indicates that most of the experts agree with the proposed constructs and elements of the personal leadership competencies. The threshold values for all the 14 elements tested met the requirements of $d \leq 0.2$. All the expert agreements achieved the targeted percentage, which is between 75% and 100%. The Alpha-cut value also met the requirement needed between 0.878 and 0.950, which is the threshold of 0.5 (α-cut$\geq$0.5). Through FDM, the defuzzification process was carried out to rearrange all the elements based on the experts' ranking agreed. This study successfully presented a new construct by considering the crucial elements in middle leaders' competencies in the Malaysian context.

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1. INTRODUCTION

The key to the success of an excellent education system depends on two elements which are a stable teaching profession [1] and followed by an excellent educational leadership that can influence students' achievements [2], [3]. The Malaysian government had paid special attention to these components to be applied in the Malaysia Education Blueprint 2013-2025 [4]. Therefore, the scope of educational leadership research should be shifted from the principals' or headmasters' role to the middle leaders' role and involvement [5], [6]. The prominent role of the middle leaders in ensuring smooth organizational operations, effectiveness, empowerment, and educational attainment is crucial in achieving the organizational goals in education. Their position in the organization demanded them to be a more effective liaison between the top leaders and the educators [7]–[9].

As middle leaders, they need to lead their groups at the department or unit level, and also the curriculum in schools [10]. The appointment of these middle leaders is usually called the Head of Departments or the Unit leader as they have a different role other than the regular teachers [5], [11]. They need to equip themselves with additional skills that are not pedagogical [12]. Therefore, to perform their tasks well as a middle leader, they need leadership and management competencies skills [5], [11], [13], [14].

Thus, the need to develop these middle leaders' competencies skills is crucial to cope with the challenging educational environment [15], alongside the adaptation to the culture and multiple tasks they need to carry out [16]. The outstanding middle leaders will have a strong personal leadership competency [17], [18].

In the challenging of the 21st-century education system, middle leaders' competence is seen to be increasingly important in driving and achieving the vision and mission of the organization [5], [8], [19]. Competency based on human resource management is crucial, especially in education [20]. Every organization needs to empower and improve its human resources, especially involving the middle leaders. However, studies related to these middle leaders' functions, roles, needs and competencies are still scarce compared to the study on principals or headmasters [8], [19], [21]. Studies related to middle leaders in the Scopus database only yielded 49 articles between 2007 and 2017 covering Europe, Asia, the Middle East, North America, and other countries [22]. Therefore, additional and extensive research should be carried out to highlight these middle leaders' roles, especially in the educational context.

In everyday tasks, these middle leaders are struggling between implementing the top manager's instructions and, at the same time, maintaining their relationships with other colleagues [23]–[25]. They also need to perform their daily teaching routine in the classroom [8], [26], [27]. There was a need to juggle between these different roles and challenges, so a set of competencies was required to align their management and teaching tasks. Some scholars stated that appropriate attention should be given to increase the competencies among these leaders to preserve the quality of education [25], [26], [28]. In line with the previous scholarly research, there is a need to study the middle leaders' competencies [5], [12], as well as to examine the aspects of their professional and personal competencies [29]. The development of specific competency models needs to be done for these middle leaders as a guideline in their daily tasks [8], [11], [26], [27], [30]. Therefore, this study aimed to fill the existing gap in this field with the development of a specific competency model for middle leaders in the Malaysian educational context.

2. RESEARCH METHOD

The objective of this study was to develop the Matriculation College Middle Leaders Competency Model. An approach using design and development research (DDR) was used by applying three phases: the analysis phase, the design and development phase, and the usability assessment phase [31]. However, this paper only discusses the second phase, which is the design and development phase. This study design and development phase involved data collection using the Fuzzy Delphi Method (FDM) to obtain an expert's agreement based on the elements in the model constructs developed.

The FDM approach applied in this study has followed the guidelines introduced by Murray, Pipino and Gigch [32] and reviewed by Kaufman and Gupta [33]. FDM is a combination of a fuzzy set theory, which is applied in traditional Delphi techniques. This technique is an improved and rebranded measurement based on the conventional Delphi method [34], [35]. Therefore, this method is not new, but it has been widely used in various research fields such as technology, medicine and education, which requires the agreement of experts in the fields studied [34]–[36].

Zadeh [37] introduced the concept of 'linguistic variable,' which is to convert words into quantitative values that are easy to measure, especially in solving critical problems [7], [34], [35]. The fuzzy set theory allows linguistic variables to be interpreted gradually for each element in the set. The values contained in this Fuzzy set range from 0 to 1 or within intervals (0,1) [7], [34], [37]. FDM's strength in interpreting linguistic variables to quantitative values allows it to be a useful measurement tool in solving the study's uncertainty problems [34], [35]. Many researchers widely used this approach in various fields, including human resources when dealing with decision-making [7]. There are two main components in FDM, namely Triangular Fuzzy Number and Defuzzification Process. Triangular Fuzzy Number has three values (m_1, m_2, m_3): minimum value, most reasonable value, and maximum value. Meanwhile, defuzzification allows ranking based on the priority given to elements based on expert agreement.

2.1. Sample size

This study was conducted using FDM techniques involving 30 experts in the field of leadership and competence [38], [39]. These experts were purposefully selected based on their experience in middle leadership. Sampling in Delphi-based techniques cannot be obtained statistically because it requires the experts' preliminary identification [40]. After the expert identification, a set of questionnaires contained the elements of competence administered to the university lecturers, Malaysia Educational Ministry senior officers, senior officers from the State and District Education Departments, Teacher's College lecturers, Vocational College Directors, Matriculation middle managers and Form 6 Colleges leaders. These experts came from various institutions to obtain a wider view of the instruments and to avoid bias. This selection of an experienced panel of experts is necessary as they are the experts in the fields and as the source of

reference [41]. Panel experts were asked to give their level of agreement on the main construct based on the 7-point Likert Scale ranging from not agree to most agree. Further, the data was translated to the Fuzzy scale and analyzed using the fuzzy Delphi linguistic scale.

2.2. Research instrument

Instruments are formed based on the literature review, pilot studies, or experiences using FDM techniques [42], expert interviews, or nominal group techniques [34], [35]. Based on this suggestion, a set of questionnaires was formed based on the literature review and expert agreements' findings in the first phase of this study. The Fuzzy linguistic scale used a 7-point Likert scale to illustrate the value. Fuzzy sets provide individual interpretations of each of the elements contained within them in unit intervals ranging from 0 to 1 [7]. The term Triangular fuzzy numbers refer to the values m1, m2, and m3. These values represent the minimum value (m1), reasonable value (m2) and maximum value (m3), as stated in Table 1.

Based on Table 1, the selected value in the instrument scale translated to the Fuzzy scale based on the values of m1 (0.9=likely 90% agree), m2 (1.0=likely 100% agree), and m3 (1.0=likely 100% agree). In other words, the higher the Fuzzy scale selected, the higher the level of agreement and accuracy of the data obtained [43], [44]. Therefore, the questionnaire presented evaluates the expert agreement on the primary constructs formed on the matriculation college middle manager's competency model. All the elements for the personal leadership competencies construct of this study are listed in Table 2.

Table 1. Fuzzy linguistic variable scale

Instrument scale	Linguistic variable	Triangular fuzzy numbers
7	Strongly agree	(0.90, 1.00, 1.00)
6	Somewhat agree	(0.70, 0.90, 1.00)
5	Agree	(0.50, 0.70. 0.90)
4	Slightly agree	(0.30, 0.50, 0.70)
3	Disagree	(0.10, 0.30, 0.50)
2	Somewhat disagree	(0.00, 0.10, 0.30)
1	Strongly disagree	(0.00, 0.00, 0.10)

Table 2. Elements of personal leadership competency construct

No.	Elements of personal leadership competency construct	No.	Elements of personal leadership competency construct
1	Self-confidence	8	Emotional control
2	Self-control	9	Proactive attitude
3	Self-motivation	10	Accountability
4	Logical thinking	11	Role Model
5	Reflective thinking	12	Self-skills
6	Conceptual thinking	13	Responsive
7	Self-initiative	14	Empathy

3. RESULTS AND DISCUSSION

The selection of experts in this study is based on their educational background, experiences and present job in the administration. The panel of experts who agreed to participate in this study has more than ten years of management experience. Overall, 12 experts have more than 20 years of experience, and 10 of them had experience between 16 to 20 years. Among them, 12 expert panels held the highest management positions in the organization as Directors or Deputy Directors, while 18 panels were among the middle managers. Their demographic background is presented in Table 3.

Table 3. Experts' qualifications and background

Aspects	Category	Numbers
Experience in management	5-10 years	0
	11-15 years	8
	16-20 years	10
	More than 20 years	12
Current position	Top management	12
	Middle management	18
Current employer	Ministry of Education in Malaysia	10
	University	5
	Matriculation College	8
	State/District/Teachers College	5
	Vocational College/Form 6	2
Academic qualification	Doctorate	9
	Masters	11
	Degree	10

To obtain a comprehensive view of the middle managers' leadership competencies in educational institutions, the panel experts involved various educational institutions in Malaysia. The institutions selected ranged from the teachers at secondary schools, form six colleges, vocational colleges, and Teachers Colleges to the top management at the district level, state level, Matriculation College, university, and Ministry of Education Malaysia. These comprehensive selected panel experts ensure that the result is not biased and covers all educational institutions' views. All these experts also have suitable academic qualifications.

3.1. Expert consensus

The instruments obtained from the panel experts were analyzed according to the process suggested in FDM. In the first stage, the data were analyzed to obtain a threshold value of d≤0.2. The distance of differences of opinion between experts must be small. The result of this analysis is presented in Table 4. The average threshold value of 'd' for each element tested met the requirement of d≤0.2. The threshold value for the "Self Confidence" elements is at 0.075, "Self-Control" element at 0.068, 'Self-motivation" element at 0.075, "Logical Thinking" elements at 0.147, "Reflective Thinking" element at 0.103, "Conceptual-Thinking" element at 0.123, "Self-initiative" element at 0.079, "Emotional control" element at 0.083, "Proactive attitude" element at 0.075, "Accountability" element at 0.042, "Role Model" element at 0.071, "Self-Skills" element at 0.133, "Responsive" element at 0.093 and "Empathy" element at 0.131. All these elements had shown a value of less than 0.2. Therefore, all these elements are accepted as the final elements for matriculation of middle leaders' personal competency constructs. Overall, the threshold value (d) for the personal leadership competency construct is 0.093. This value also met the requirement needed at less than 0.2. These values indicated that the expert had reached an agreement for the constructs and elements tested.

Table 4. Threshold value 'd' based on expert agreement

Expert	Elements													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	0.053	0.051	0.053	0.050	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.041
2	0.100	0.102	0.053	0.050	0.084	0.110	0.051	0.056	0.053	0.025	0.105	0.047	0.078	0.041
3	0.100	0.102	0.100	0.050	0.071	0.051	0.103	0.098	0.100	0.127	0.105	0.047	0.078	0.041
4	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
5	0.053	0.051	0.053	0.122	0.084	0.110	0.341	0.056	0.053	0.025	0.048	0.118	0.076	0.129
6	0.100	0.102	0.053	0.050	0.071	0.051	0.051	0.056	0.100	0.025	0.105	0.047	0.076	0.264
7	0.340	0.051	0.340	0.560	0.071	0.110	0.103	0.337	0.100	0.025	0.105	0.566	0.318	0.556
8	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
9	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
10	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
11	0.100	0.102	0.100	0.050	0.071	0.282	0.103	0.098	0.100	0.127	0.105	0.047	0.078	0.041
12	0.053	0.102	0.100	0.122	0.084	0.051	0.051	0.056	0.053	0.025	0.105	0.274	0.078	0.041
13	0.053	0.051	0.053	0.122	0.071	0.051	0.051	0.098	0.053	0.025	0.048	0.047	0.078	0.041
14	0.100	0.102	0.100	0.050	0.309	0.574	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
15	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
16	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
17	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
18	0.053	0.051	0.053	0.050	0.071	0.051	0.051	0.337	0.340	0.127	0.048	0.274	0.078	0.041
19	0.053	0.051	0.053	0.122	0.084	0.051	0.341	0.056	0.053	0.025	0.048	0.118	0.076	0.129
20	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
21	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.274	0.318	0.264
22	0.100	0.051	0.053	0.050	0.071	0.051	0.051	0.056	0.100	0.127	0.048	0.047	0.076	0.041
23	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.041
24	0.053	0.051	0.053	0.122	0.084	0.051	0.051	0.056	0.053	0.025	0.048	0.047	0.076	0.129
25	0.100	0.102	0.100	0.270	0.071	0.051	0.103	0.098	0.100	0.127	0.105	0.047	0.078	0.041
26	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
27	0.053	0.051	0.053	0.122	0.084	0.110	0.051	0.056	0.053	0.025	0.048	0.118	0.076	0.129
28	0.100	0.102	0.100	0.560	0.309	0.051	0.051	0.098	0.100	0.025	0.048	0.047	0.078	0.556
29	0.053	0.102	0.100	0.270	0.071	0.282	0.051	0.056	0.053	0.025	0.345	0.274	0.078	0.041
30	0.053	0.102	0.100	0.270	0.309	0.282	0.103	0.098	0.100	0.025	0.048	0.118	0.078	0.041
Average 'd' item	0.075	0.068	0.075	0.147	0.103	0.123	0.079	0.083	0.075	0.042	0.071	0.133	0.093	0.131

Total 'd' for each item 1.298; Value 'd' of the construct 0.093

3.2. Elements ranking

Next, the analysis of the percentage of expert agreement was conducted [34], [35]. Table 5 summarizes an expert agreement analysis based on the constructs and elements of personal leadership competencies for Matriculation College middle leaders. Two elements, "self-control," and "accountability," scored 100% agreement among the experts from the analysis. Six elements scored 97%, which are "self-

confidence," "self-motivation," "conceptual thinking," "proactive attitude," "role model," and "self-skills." Five elements scored 93% on the agreement, which is "logical thinking," "self-initiative," "emotional control," "responsive," and "empathy." Overall, the expert agreement showed a high percentage of the agreement between 93 and 100 percent. This result indicated that all the elements passed the expert agreement requirements at 75% or higher. All the elements are accepted for further analysis.

Table 5. Formulation of construct expert agreement analysis and elements of personal leadership competencies

Elements	Percentage of the expert group agreement (≥75%)	Defuzzification process				Expert agreement	Ranking
		m1	m2	m3	Fuzzy score (A)		
Self-confidence	97	0.833	0.963	0.997	0.931	Accepted	5
Self-control	100	0.833	0.967	1.00	0.933	Accepted	3
Self-motivation	97	0.833	0.963	0.997	0.931	Accepted	5
Logical thinking	93	0.767	0.910	0.970	0.882	Accepted	13
Reflective thinking	90	0.800	0.940	0.990	0.910	Accepted	10
Conceptual thinking	97	0.773	0.920	0.980	0.891	Accepted	11
Self-initiative	93	0.840	0.963	0.993	0.932	Accepted	4
Emotional control	93	0.833	0.960	0.993	0.929	Accepted	8
Proactive attitude	97	0.833	0.963	0.997	0.931	Accepted	7
Accountability	100	0.867	0.983	1.00	0.950	Accepted	1
Role Model	97	0.840	0.967	0.997	0.934	Accepted	2
Self-skills	97	0.767	0.913	0.977	0.886	Accepted	12
Responsive	93	0.807	0.947	0.993	0.916	Accepted	9
Empathy	93	0.753	0.907	0.973	0.878	Accepted	14

Step three in this analysis is to analyze the instruments' defuzzification to determine each element's ranking. From Table 5, the fuzzy score (A) obtained ranged from 0.878 to 0.950. All the values met the requirement, α-cut more than 0.5. Therefore, all the elements tested were accepted by these panel experts. Next, the elements ranking based on the fuzzy score result formulated, as shown in Table 5. The elements of "accountability" showed the highest fuzzy score in the middle leader's personal construction constructs with defuzzification at 0.950. It was followed by "role model" elements at 0.934, "self-control" element at 0.933, and "self-initiative" with a score of 0.932. The elements of "self-confidence" and "self-motivation" were given the same rank by the panel of experts with a value of defuzzification at 0.931. Both of these elements are positioned fifth in the construct ranking. Meanwhile, the elements of "proactive attitude," "emotional control," "responsive," "reflective thinking," "conceptual thinking," "self-skills," "logical thinking," and "empathy," are each positioned at rank 7 to 14.

Overall, this study was able to obtain the consensus of 30 experts on the elements needed to construct middle managers' personal leadership competencies compared to the previous studies, which only focused on the constructs and elements of individual competency or leaders in general without focusing on middle leadership competency. Panel experts agreed that middle leaders need personal leadership competency to face their daily tasks based on a fuzzy score between 0.042 to 0.147. The value of expert agreement on the construction of personal leadership competencies through FDM showed 0.093, which is less than the threshold value, d≤0.2. This result indicates that personal leadership competency is relevant to middle managers. The research questions formulated at the beginning of the research had been answered through this panel expert agreement.

This expert agreement also confirmed that personal leadership competencies are particularly significant to middle leaders. Essential elements such as self-control, self-motivation, reflective thinking, and conceptual thinking align with the previous scholars' suggestions [8], [16], [18]. However, in the previous research, these elements are only generalized to all management levels; either they are at the upper management level or the lower level of management. The finding of this study proved that these elements are not only important to the upper level or lower level of management personnel but it also important to be applied to the middle leaders as well. All these 14 elements agreed upon by panel experts are important in helping middle leaders' function effectively in educational institutions. It is clear that personal leadership competence is crucial in daily school management [26], and it is also important for the middle leaders at the matriculation college in Malaysia.

The development of personal leadership competencies in this study is in line with the view of McClelland [11], [15] who asserted that the success of an organization is highly dependent on certain personal characteristics and competencies possessed by organizational leadership. These personal competencies and skills by individual will differentiate the quality of leaders needed to fill in the role of leadership position in the organization [14], [26]. This will prevent the organization from appointing

incapable leaders, lack of quality, or based on seniority to fulfill the important task of middle managers. The development of a specific competency model for middle leaders also will help the Malaysian government to implement the Malaysia Education Blueprint 2013-2025 [4], [44] which emphasizes the developing capacity of middle leaders as a support group for the management of educational institutions.

4. CONCLUSION

In conclusion, this study proved that personal leadership competencies consisted of the elements of self-confidence, self-control, self-motivation, logical thinking, reflective thinking, conceptual thinking, self-initiative, emotional control, proactive attitude, accountability, role model, self-skills, responsive and empathy are important skills that must be posed by each middle leaders in schools. The empowerment of middle leaders with these skills and competencies will not just help them to excel in their daily tasks but at the same time will improve the management quality in schools. This study suggested that other competencies such as professional, social and spiritual, can be studied together with these personal competencies to strengthen this existing model. Furthermore, this study also needs to be re-examined in other educational populations as the world of education moves rapidly with the advancement of industrial revolution 4.0 technology and the latest pandemic COVID-19 challenges. Middle leaders need to play an active role during this challenging time to ensure our educational system can face the challenges and champion the educational changes. For future research, this study proposes a model for middle leadership in education based on expert consensus.

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