

# HIERARCHICAL RELATIONSHIPS AND MICMAC ANALYSIS STRATEGY IMPLEMENTATION OF GLOBAL LEADERSHIP COMPETENCY USING INTERPRETIVE STRUCTURAL MODELLING

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**Abstract:** *The complex and emergent globalization demand current and future public sector educational leaders to lead with different set of skills and competencies. However, domestic leadership competency is inadequate for public sector educational leaders to meet the challenges of global trend. Public education sector should adopt global leadership competency and assimilate it in the leadership competency training and development to enhance leadership performance. Thus, the central aim of the study is to investigate and examine the strategy implementation of global leadership competencies in the training and development of public sector educational leaders leading the education system. The paper analyses the strategy implementation of global leadership competency training and development by using Interpretive Structural Modelling (ISM). ISM utilizes a systems approach to decision-making by experts' consensus. The driving and dependence power of each strategy implementation was ascertained and classified based on cross-impact matrix multiplication applied to classification (MICMAC) analysis. The hierarchical model developed through ISM yielded 20 strategy implementation and compartmentalized into pre, while and post-programme for educational leaders' global leadership competency training and development. The model proposed could be used for stakeholders and decisions makers to prepare and develop educational leaders' competency upskilling to be on par with global trend.*

**Keywords:** *global leadership competency; strategy implementation; training and development; educational leaders; public sector; globalization*

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## Introduction

Globalization demands organizational leaders to adapt to changes which requires them to master global leadership competencies. Global trends such as demographic imbalance, political instability, democratic erosion, social fragmentation, technological advancement,

environmental and climate change and affects countries across the globe. Leadership training and development have to be on par with global trend in order to develop and build global leadership competency. The COVID-19 pandemic has caught every organization by surprise especially the health and education sector (Baimyrzaeva & Meyer, 2020). It was a chaotic unplanned scenario that affects educational leaders who are leading and administering the education system. Hence, there has to be some strategy implementation in leadership training and development of global leadership competencies for public sector educational leaders.

Malaysia is amongst the country that practices a centralize education system where all pivotal decisions and strategies encompassing budget, textbook, curriculum, professional development for teachers, head of school training, school operation and etc. are made by the Ministry of Education (MoE) (UNESCO, 2018). In light of the above, educational leaders leading and administering the education system in Malaysia are recruited and selected based on seniority and little is known on the selection process, criteria, what competencies are they being chosen on? as well as the content of leadership training and development for recruitment and selection (Lee & Rezaei, 2019).

Public service organizations such as the MoE continues to be confronted with globalization endeavours and challenges similar to private sectors. The circumstances demand public sectors to not only prepare strategic leadership development and training plan in improvising knowledge, abilities and skills for current and future leaders but to commit to it (Norzailan et al., 2016;). However, there is lack of focus on the leadership training and development literature on the public sector as the private sector's effort are the bedrock of leadership competency research (Lues, 2020). In furtherance there are limited empirical studies of public organisations that could link the enhancement of global leadership competencies to global leadership training and development (Cumberland et al., 2016). The development of public service leaders is crucial towards the effectiveness of government organizations in providing services and overcoming issues that impacted the community at large.

Despite the effort made by the Malaysia MoE in setting up target in the Malaysia Education Blueprint (Ministry of Education, 2013) to improve leadership capabilities, skills and attributes as change leaders at every level by 2025, there are still hindrances that affects the leadership training and development of current and future leaders. The first hindrance, there is no comprehensive leadership competency model for educational leaders administering and leading the education system based on global leadership competencies which is much needed to address global trends (Baimyrzaeva & Meyer, 2020; Saltsman & Shelton, 2019). Recruitment of individuals with proven desired competencies and abilities required to administer and lead the education system, as well as retaining the talent for leadership training and development is quite a challenge due to lack of budget and financial resources. Mau (2019) posit that many Asian countries face the constraint of ensuring that individuals who has the capabilities in the public organizations receive sufficient leadership training and development at every level. It was easier for financial department to forgo expenditures on training and development due to scarcity of budget as public sector leaders and in this case, educational leaders are succumbed to political and external pressures, demands as well as decisions that were made earlier, interrupted (Seidle et al., 2016).

Little is known on the leadership training and development for educational leaders (middle and top leaders) who are administering the education system except that the training is conducted by the National Institute of Public Administration (INTAN) (Poocharoen & Lee, 2013).

INTAN's focus was more on the administrative and diplomatic scheme instead of having a distinctive training and development for educational leaders leading the education system (Lee & Rezaei, 2019). Leadership training and development for educational leaders should be focused and structured with short- and long-term interventions that conform to global trends (Kragt & Day, 2020). Development of global leadership competencies for educational leaders are more individualized to adapt to the complex, political, organizational and legal environment. Hence, the study proposes strategy implementation in preparation for global leadership competency training and development plan for educational leaders in the public service such as the Malaysia MoE.

The purpose of this paper is to investigate and examine the strategy implementation (SI) of global leadership competencies in the training and development of current and future educational leaders administering and leading the MoE. This study adopts an empirical analysis by utilizing Interpretive Structural Modelling (ISM) to identify the strategy implementation of leadership training and development for educational leaders and Matrice d'impacts croisés multiplication appliquée á un classment or a cross-impact matrix multiplication applied to classification (MICMAC) analysis in order to classify these strategy implementations. Hence, the objectives of this study are:

- 1) To determine the strategy implementation (SI) based on global leadership competency for educational leaders' training and development at the Malaysia Ministry of Education through experts' consensus.
- 2) To propose strategy implementation model for educational leaders' leadership training and development on global leadership competency based on experts' consensus.

In the remainder of this paper, we first review the literature of global leadership competency training and development. This is followed by presentation methodology consisting of study design and analytic approach. The final section of the paper will present the discussion and conclusion which delve into the study contribution, limitation and future recommendations.

## Literature Review

This study premise itself within the Complex Leadership Theory (CLT) (Uhl-Bien & Marion, 2009). CLT reflect the complex nature of leadership as it occurs in practice. Public organization such as the MoE need to improve on their performance and capabilities by modifying their strategies, procedures, practices, adapt and adjust to various situation due to global trend. Complexity does not mean complicated but it addresses various issues that occurred around and within organizations by understanding new things, creative, invention, innovative and learning from interactions and various sources. CLT is focussed on the process of leadership being adaptive, enabling and administrative. Through the leadership process leaders and organizational communities are adaptive in a complex environment by being emergent with the presence of interactive and dynamic communication, mutual influence, creative learning, problem solving and sustainable relations amongst leaders and organizational communities (Uhl-Bien & Marion, 2009; Zeynep, 2020).

Leadership training and development for competency development of educational leaders has to follow the ebb and flow of current environment and expectancy of future needs. The education sector is much affected by the changing environment of global trend (Onyeaka et al., 2021). The literature of global leadership competencies addresses the need to design and mould leadership training and development according to global trend (Mendenhall et al., 2018). This

study is based on the cognitive process model for leadership training and development (CPMLTD) by McClellan (2021). The CPMLTD is not prescriptive or culture bound but instead descriptive on how leadership is being practiced. The model could be adapted and practiced in any given situation. It is flexible in various cultural context, types of organizations and different levels of leadership. The reason being is that the model is based on the complex leadership theory (CLT) (Uhl-Bien & Marion, 2009; Zeynep, 2020).

The CPMLTD emphasized on the functions of human brain during the leadership process in various situations which are universal in any organizational culture. The cognitive competencies of CPMLTD are awareness, attention, decision-making, relationships, communication and action. These competencies are culture dependent and applicable in various circumstances between leader and other entity i.e., leaders' self-transformation, leader and other individuals, organizations, communities, political and social communities (McClellan, 2021). In a similar note as McClellan (2021), a recent study by Baimyrzaeva and Meyer (2020) recommended that in order for current and future public sector leaders to stay relevant, leadership and training development should be designed based on these global leadership competencies: (1) system thinking and big picture; (2) scenario planning, future thinking and forecasting; (3) problem solving in a complex environment; (4) networking and collaboration across the globe; (5) innovation and research skills; and (6) values and ethics. Therefore, leadership training and development should cater succession planning, building and sustaining intellectual capacity, sharpen skills and knowledge. Hence, in the context of this study it is important to discuss how the global leadership competencies mentioned should be taught or mastered.

### **Experiential Approach**

Experiential approach delves into giving exposure to leaders or future leaders in the form of andragogic practices or (McClellan, 2021) or deliberate practice which could be accomplished through working abroad, exchange programme between organizations, international assignments, immersive cultural foreign programme (Cumberland et al., 2016) and project-based or problem-based assignments (Norzailan et al., 2016). These methods will help leaders and future leaders to build their personal and professional competencies. Exposing them to a different cultural environment with challenging assignments or problems to solve will help them handle unfamiliar situations and learn from mistakes. In furtherance, these methods are part of learning process that help them go through the decision-making process and develop psychological resilience, build up communication and negotiation skills, collaboration and creative thinking (Fey, 2020).

### **Facilitation Approach**

Executive education or what was normally called classroom education based on facilitation approach is necessary for leaders and future leaders to unpack what they know on leadership through their real experiences and reboot with the comprehension of relating real leadership experiences with leadership theories, competencies, principles and practices (McClellan, 2021). Facilitation approach could be conducted in various means such as identification and analysis of own leadership success and failures followed by discussion on the leadership theories and competencies involved (Tourish, 2014), dialogue, discussion, visualization and role play, and cross-cultural oriented scenarios (Cumberland et al., 2016; Tabak & Lebron, 2017). These approaches would expose leaders to relate to practices and experiences, communicate the course of action he or she would adopt and overcome future anticipated scenarios. Reflective learning should occur in the approaches mentioned for leaders and future leaders to assesses

and reassess their style of leadership, the past decision made, build up and repair their relationship with organizational communities, self-improvement, interpersonal, social and political community.

### **Coaching and Mentoring**

On-going coaching and mentoring are important for leaders to groom future talented leaders by sharing experiences, sharing skills between another, providing moral support and seeking advice or opinions (Seidle et al., 2016). The process should be reciprocal by learning from each other instead of a senior dictating a junior. Coaching and mentoring assist leaders and future leaders to have better self-awareness in identifying weaknesses that could be improved in terms of relationships and communication amongst organisational communities (Caligiuri & Tarique, 2014). Group coaching could be another avenue in order to improve team work, collaboration, to avoid working in silo, increase creativity and increase open communication (Kets de Vries & Rook, 2021).

### **System Thinking**

System thinking is an approach that leaders across the globe in any public sector need to absorb to overcome the complex everchanging environment. It is a holistic approach that adopts analytics and data modelling based on real public service problem (Baimyrzaeva & Meyer, 2020). The interrelatedness of different components in terms of implications and consequences, influences, active engagement, understanding the big picture and handling big data in order to govern change should be part of training and development of leaders. System thinking should not be influence by thoughtless red tape procedures which can impede innovation and creativity as well as prevent agility (Lues, 2020).

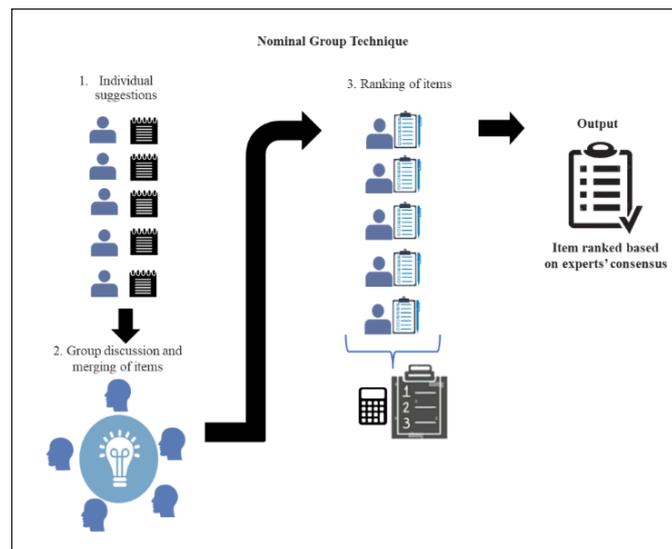
### **Methodology**

This study utilizes ISM and MICMAC analysis by incorporating the experts' opinion in order to identify and decipher the relationship amongst the strategy implementation for educational leaders' training and development. These processes will lead to the development of hierarchical relationship amongst the variables identified by experts. ISM was augmented by Warfield (1974) and Sage (1977) in order to aid and solve complex issues or system that is made up of variety of elements and their interactions with one another. ISM works best in a group solving techniques such as Nominal Group Technique (NGT), Focus Group Technique (FGT), brainstorming, focus group and etc. that employ structured debate in order to solve the problem (Prasad et al., 2020).

The ISM technique is capable of creating a systematic hierarchical model from a set of variables or elements which may directly or indirectly affects one another (Attri, Singh, & Mehra, 2017). ISM is interpretive as it a process that involves group-based interpreting and decision making. ISM is structural as it converts the complex structure system or issue into a simplified one. ISM is modelling process as the structure formed is depicted in the specific model or diagraph. ISM is being employed in various field such as education (Muhammad Ridhuan et al., 2014), policy (Kumar et al., 2018), environment (Chandramowli et al., 2011), aircraft industry (Pitchaimuthy et al., 2019), manufacturing (Singh & Khamba, 2011) and etc. The following procedures depict the steps involved in the ISM technique:

1. Identifying strategy implementation of leadership training and development through extensive review and discussion with experts. In this case, modified Nominal Group Technique (NGT) was utilized as classic NGT demands longer time and it is iterative (Varga-Atkins et al., 2017). Modified NGT took about 90 minutes. The experts were

presented with a short survey of pre-listed strategy implementation in the leadership training and development for global leadership competencies at the beginning of NGT session. The list act as a starting point for experts to delve further and discuss. During the discussion experts were allowed to disagree, agree, make changes or present additional ideas (Harvey & Holmes, 2012). The final list was then presented to the experts for consensus. The experts will rank the list of variables based on a linguistic scale of one (1) to seven (7) to indicate the degree of preference of each variable. The NGT process is depicted in Figure 1.



**Figure 1: Nominal Group Technique Process**

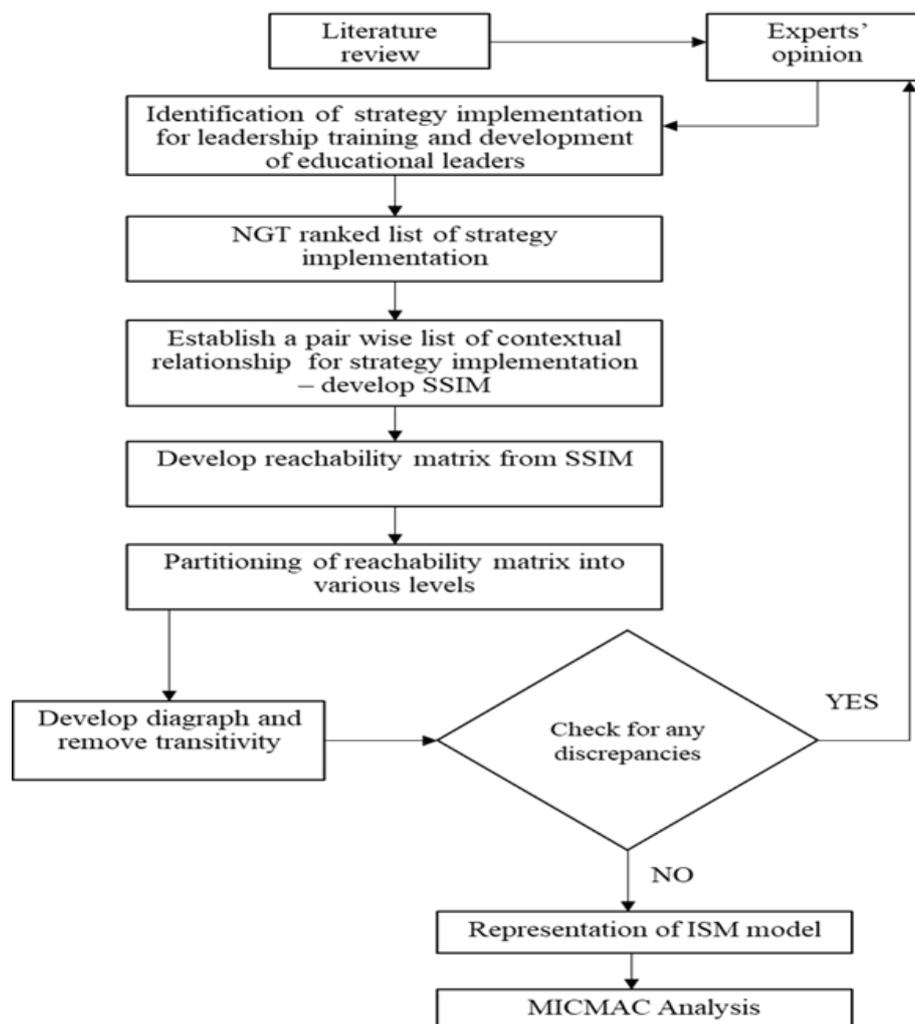
2. A contextual relationship i.e., pair-wise analysis is formed amongst the variables through structural self-interaction matrix (SSIM). The relationship amongst the variables is represented by V, A, X and O. The symbols V, A, X and O represent the direction of relationship amongst variables represented by  $i$  and  $j$ :

*In order to produce an appropriate strategy implementation model for educational leaders' training and development of global leadership competency,*

- V for strategy implementation  $i$  is more important than strategy implementation  $j$ ;
  - A for strategy implementation  $j$  is more important than strategy implementation  $i$ ;
  - X for strategy implementation  $i$  and  $j$  equally related and important; and
  - O for strategy implementation  $i$  and  $j$  are unrelated.
3. Development of reachability matrix from SSIM after transitivity is being checked (if variable A is related to B and B is related to C, then A is related to C). The relationship of variables represented by V, A, X, O is substituted with 1 and 0 as per the rule of a binary matrix:
    - If the  $(i, j)$  entry in the SSIM is V, then the  $(i, j)$  entry in the reachability matrix becomes 1 and the  $(j, i)$  entry becomes 0.
    - If the  $(i, j)$  entry in the SSIM is A, then the  $(i, j)$  entry in the reachability matrix becomes 0 and the  $(j, i)$  entry becomes 1.
    - If the  $(i, j)$  entry in the SSIM is X, then the  $(i, j)$  entry in the reachability matrix becomes 1 and the  $(j, i)$  entry also becomes 1.

- If the  $(i, j)$  entry in the SSIM is 0, then the  $(i, j)$  entry in the reachability matrix becomes 0 and the  $(j, i)$  entry also becomes 0.
4. Partitioning of reachability matrix into different levels.
  5. Development of hierarchical diagram based in the relationships given after the reachability matrix into an ISM model.
  6. Review of the developed model for any inconsistency, if there is any, necessary modifications are made based on experts' consensus.
  7. A MICMAC analysis is found based on the cluster of the variables' driving and dependency power.

Figure 2 depicts the steps of ISM mentioned above. As mentioned before, the ISM technique employs the use of experts' opinion through various group techniques (Attri et al., 2017). In the present study a total of 15 experts from various education field were consulted to participate in the NGT and ISM session. A total of 11 experts agreed to participate in the study (Prasad et al., 2020). Table 1 depicts the experts profile based on their field of expertise, academic qualification and working experience from various education divisions as well as institutions in the public sector.



**Figure 2: Interpretive Structural Modelling Process**

**Table 1: Experts’ Profile Based on Academic Qualification, Field of Expertise and Working Experience**

Experts	Academic Qualification	Field of Expertise	Working Experience
E1	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Education Management</li> <li>• Leadership</li> <li>• Coaching and Mentoring</li> </ul>	16 years
E2	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Leadership</li> <li>• Education Management</li> </ul>	21 years
E3	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Model Development</li> <li>• Education Management</li> <li>• Research and Development</li> </ul>	13 years
E4	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Leadership</li> <li>• Competency</li> <li>• Assessment and Evaluation</li> </ul>	22 years
E5	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• ICT</li> <li>• Curriculum Development</li> <li>• Education Management</li> </ul>	17 years
E6	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Research and Development</li> <li>• Technical Vocational</li> </ul>	22 years
E7	Masters	<ul style="list-style-type: none"> <li>• Education Management</li> <li>• Coaching and Mentoring</li> </ul>	11 years
E8	Masters	<ul style="list-style-type: none"> <li>• Education Management</li> <li>• Curriculum Development</li> </ul>	22 years
E9	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Leadership</li> <li>• Education Management</li> <li>• Leadership Training</li> </ul>	24 years
E10	Masters	<ul style="list-style-type: none"> <li>• Policy Development</li> <li>• Education Management</li> </ul>	18 years
E11	Doctor of Philosophy (PhD)	<ul style="list-style-type: none"> <li>• Language and Technology</li> <li>• Education Management</li> </ul>	23 years

## Results

### Findings from Step 1

The NGT session revealed that the experts collectively discussed and agreed on 20 SI for educational leaders’ global leadership competency training and development. The experts consensually further suggested and agreed that the SI is compartmentalized into three sections made up of pre-programme, while programme and post-programme as shown in Table 2. The pre-programme comprises of 6 SI, whereas while-programme is made of 8 SI and finally post-programme consist of 6 SI. The variables were arranged according to its ranking position for pair-wise list of SSIM.

### Findings of Step 2

The SSIM in the form of pair-wise list shows the contextual relationship amongst the variables. It also represented the voting of experts based on the ranked NGT list in Table 2. The experts decide and vote based on the pair-wise list of the variables. The process is iterative until all variables were paired and voted accordingly. Table 3, 4 and 5 of SSIM represent the pre, while and post SI of SSIM. The following example explains the usage of symbols V, A, X and O for pre-programme of SI. For SI 3 of pre-programme, ‘Global Educational Leaders (GEL) is assessed to have high integrity based on the aspect knowledge, skills, values, and attitude’ is more important and should be achieved before SI 6 i.e., ‘GEL is chosen to participate in the leadership competency development programme on merit of achievement’. Hence, the relationship is represented by ‘V’ in Table 3. SI 6 is more important and should be achieved

before SI 1 ‘GEL go through a rigorous selection process for competency development’. Therefore, the pair is represented by ‘A’. SI 4 ‘GEL collaborate with other sectors/ division to implement competency development programme’ is unrelated to and does not affect SI 5 ‘GEL self-assess on his/her performance holistically based in the aspect of physical, emotional, spiritual, intellectual and social aspects’. Thus, ‘O’ represents their relationship. SI 1 influence itself or any other SI that influence itself to be achievable are therefore represented by ‘X’. The same logic holds for Table 4 and 5.

**Table 2: Ranking and Prioritization Strategy Implementation for Global Educational Leaders’ (GEL) Training and Development of Global Leadership Competency**

Strategy Implementation	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	Total	Percentage	Ranking
<b>(a) Pre-programme</b>														
1. GEL go through a rigorous selection process for competency development	7	7	7	7	6	7	7	5	6	7	7	73	94.8	1
2. GEL is proactive in developing his/her competency	7	6	7	7	7	7	7	5	6	7	7	73	94.8	1
3. GEL is assessed to have high integrity based on the aspect of knowledge, skills, values and attitude	7	6	7	7	7	7	7	6	6	6	7	73	94.8	1
4. GEL collaborate with other sectors/division to implement competency development programmes (Eg: expertise)	7	6	7	7	7	7	7	4	6	7	7	72	93.5	4
5. GEL self-assess on his/her performance holistically based on the aspect of physical, emotional, spiritual intellectual and social aspects	7	6	7	7	7	6	7	6	6	6	7	72	93.5	4
6. GEL is chosen to participate in the leadership competency development programme based on merit of achievement	7	6	7	7	7	6	7	5	5	6	7	70	90.9	6
<b>(b) While Programme</b>														
1. GEL is exposed to grooming leadership programme across the globe	7	6	7	7	7	7	7	5	6	7	7	73	94.8	1
2. GEL is given training in efficient and effective communication	7	6	7	7	7	7	7	5	6	7	7	73	94.8	1
3. GEL is given training on the latest knowledge (skills and values) based on global trend especially information technology skills	7	6	7	7	7	7	7	5	6	6	7	72	93.5	3
4. GEL is given training on futuristic skills (Example: Risk management in the organisation)	7	6	7	7	6	7	7	6	6	6	7	72	93.5	3
5. GEL is involved in the attachment programme other than the field of education	7	5	7	7	6	6	7	6	6	6	7	70	90.9	5
6. GEL is given training using problem-based approach (Example: Leading organisation in real context)	7	6	7	7	6	7	7	6	5	4	7	69	89.6	6
7. GEL is given training on higher order/system thinking skills	7	6	7	2	7	7	7	6	6	6	7	68	88.3	7
8. GEL master the English Language proficiency	7	6	7	7	6	7	7	6	6	4	2	65	84.4	8
<b>(b) Post Programme</b>														
1. GEL create talent management system in order to groom new leaders to replace retired leaders	7	7	7	7	7	7	7	6	6	7	7	75	97.4	1
2. GEL is appointed to hold leadership position base on merits, competencies and abilities instead of time-based seniority	7	7	7	6	7	7	7	6	6	7	7	74	96.1	2
3. GEL collaborate with various industry by involving them in the competency development programmes (Example: expertise)	7	5	7	7	7	7	7	7	6	6	7	73	94.8	3
4. GEL groom the next leadership successor in the education sector	7	5	7	7	6	7	7	6	6	7	7	72	93.5	4
5. GEL make the effort to develop competency of organisational communities as part of organisational culture	7	6	7	7	6	7	7	6	5	7	7	72	93.5	4
6. GEL reflect his/her performance holistically based on the aspect of physical, emotional, spiritual intellectual and social aspects	7	6	7	6	7	7	7	6	6	6	7	72	93.5	4

### Findings from Step 3

Reachability matrix is developed from SSIM by substituting the symbols V, A, X and O into binary digits of 1 and 0. The incorporation of transitivity took place in order to fill in the cells of initial reachability matrix by inference. Table 6 of reachability matrix depicts the driving power and dependence power of each SI. The driving power for each SI is the total number of SI including itself which it may help achieve. Whereas, dependence power is the total number of SI including itself which help achieving it. For example, a3 (GEL is assessed to have high integrity based on the aspect knowledge, skills, values, and attitude) carry the maximum driving power of 6 and therefore ranked the first in Table 6. On the other hand, a1 (GEL go through rigorous selection process for competency development) carry the least driving power and was given the fifth rank. Dependence power holds the same justification. Based on Table 6, a1 holds the maximum dependence power of 5. Hence, it is ranked the first. Whereas, a3 holds the least dependence power of 1 and therefore ranked the fifth. Driving power and dependence will be explained in depth for MICMAC analysis.

**Table 3: Structural Self-Interaction Matrix (SSIM) of Strategy Implementation (Pre-Programme)**

		<i>j</i>					
		6	5	4	3	2	1
<i>i</i>	No.	Strategy Implementation (Pre-Programme)					
	1.	A	A	O	A	A	X
	2.	A	O	V	A	X	
	3.	V	V	V	X		
	4.	A	O	X			
	5.	A	X				
6.	X						

**Table 4: Structural Self-Interaction Matrix (SSIM) of Strategy Implementation (While-Programme)**

		<i>j</i>							
		8	7	6	5	4	3	2	1
<i>i</i>	No.	Strategy Implementation (While-Programme)							
	1.	V	A	A	O	O	A	V	X
	2.	V	A	A	O	A	A	X	
	3.	V	V	A	V	V	X		
	4.	V	A	O	V	X			
	5.	V	A	A	X				
	6.	V	V	X					
	7.	V	X						
8.	X								

**Table 5: Structural Self-Interaction Matrix (SSIM) of Strategy Implementation (Post-Programme)**

No.	Strategy Implementation (Post-Programme)	<i>j</i>					
		6	5	4	3	2	1
1.	GEL create talent management system in order to groom new leaders to replace retired leaders	V	A	V	A	V	X
2.	GEL is appointed to hold leadership position base on merits, competencies and abilities instead of time-based seniority	V	A	V	A	X	
3.	GEL collaborate with various industry by involving them in the competency development programmes (Example: expertise)	V	V	V	X		
4.	GEL groom the next leadership successor in the education sector	V	A	X			
5.	GEL make the effort to develop competency of organizational communities as part of organizational culture	V	X				
6.	GEL reflect his/her performance holistically based on the aspect of physical, emotional, spiritual intellectual and social aspects	X					

**Table 6: Reachability Matrix of Strategy Implementation for Educational Leaders' Training and Development of Global Leadership Competency**

Strategy Implementation	1	2	3	4	5	6			Driving Power (DP)	Ranking of DP
<b>Pre-Programme (a)</b>										
1	1	0	0	0	0	0			1	V
2	1	1	0	1	0	0			3	III
3	1	1	1	1	1	1			6	I
4	0	0	0	1	0	0			1	V
5	1	0	0	0	1	0			2	IV
6	1	1	0	1	1	1			5	II
<b>Dependent Power (DEP)</b>	5	3	1	4	3	2				
<b>Ranking of DEP</b>	I	III	V	II	III	IV				
<b>While-Programme (b)</b>	1	2	3	4	5	6	7	8	Driving Power (DP)	Ranking of (DP)
1	1	1	0	0	0	0	0	1	3	V
2	0	1	0	0	0	0	0	1	2	VI
3	1	1	1	1	1	0	1	1	7	II
4	0	1	0	1	1	0	0	1	4	IV
5	0	0	0	0	1	0	0	1	2	VI
6	1	1	1	1	1	1	1	1	8	I
7	1	1	0	0	1	0	1	1	5	III
8	0	0	0	0	0	0	0	1	1	VII
<b>Dependent Power (DEP)</b>	4	6	2	3	5	1	3	8		
<b>Ranking of DEP</b>	IV	II	VI	V	III	VII	V	I		
<b>Post-Programme (c)</b>	1	2	3	4	5	6			Driving Power (DP)	Ranking of (DP)
1	1	1	0	1	0	1			4	III
2	0	1	0	1	0	1			3	IV
3	1	1	1	1	1	1			6	I
4	0	0	0	1	0	1			2	V
5	1	1	0	1	1	1			5	II
6	0	0	0	0	0	1			1	VI
<b>Dependent Power (DEP)</b>	3	4	1	5	2	6				
<b>Ranking of DEP</b>	IV	III	VI	II	V	I				

### Findings from Step 4

From the final reachability matrix, the reachability and antecedent set are yielded for each SI. The reachability set consist of the SI itself and other SI it may help achieve. The antecedent set comprise of the SI itself and other SI that may impact it. Based on the mentioned rules, the intersection and level of each SI are derived. The SI that yielded similar reachability and intersection will be at the top position in the ISM hierarchy. The process is repeated until all the levels are obtained. Based on Table 7, SI (a1) and SI (a4) for pre-programme is at level 1 i.e., the lowest level in the hierarchy of ISM and SI (a3) is at level 4 i.e., the highest level. As for while-programme, SI (b8) is at the lowest level (level 1) in the hierarchy, whereas SI (b6) is at the highest level (level 7) in the hierarchy of ISM. Table 7 further revealed that the SI (c6) for post-programme is at the lowest level i.e., level 1, whereas SI (c3) at the top of the hierarchy of ISM i.e., level 6.

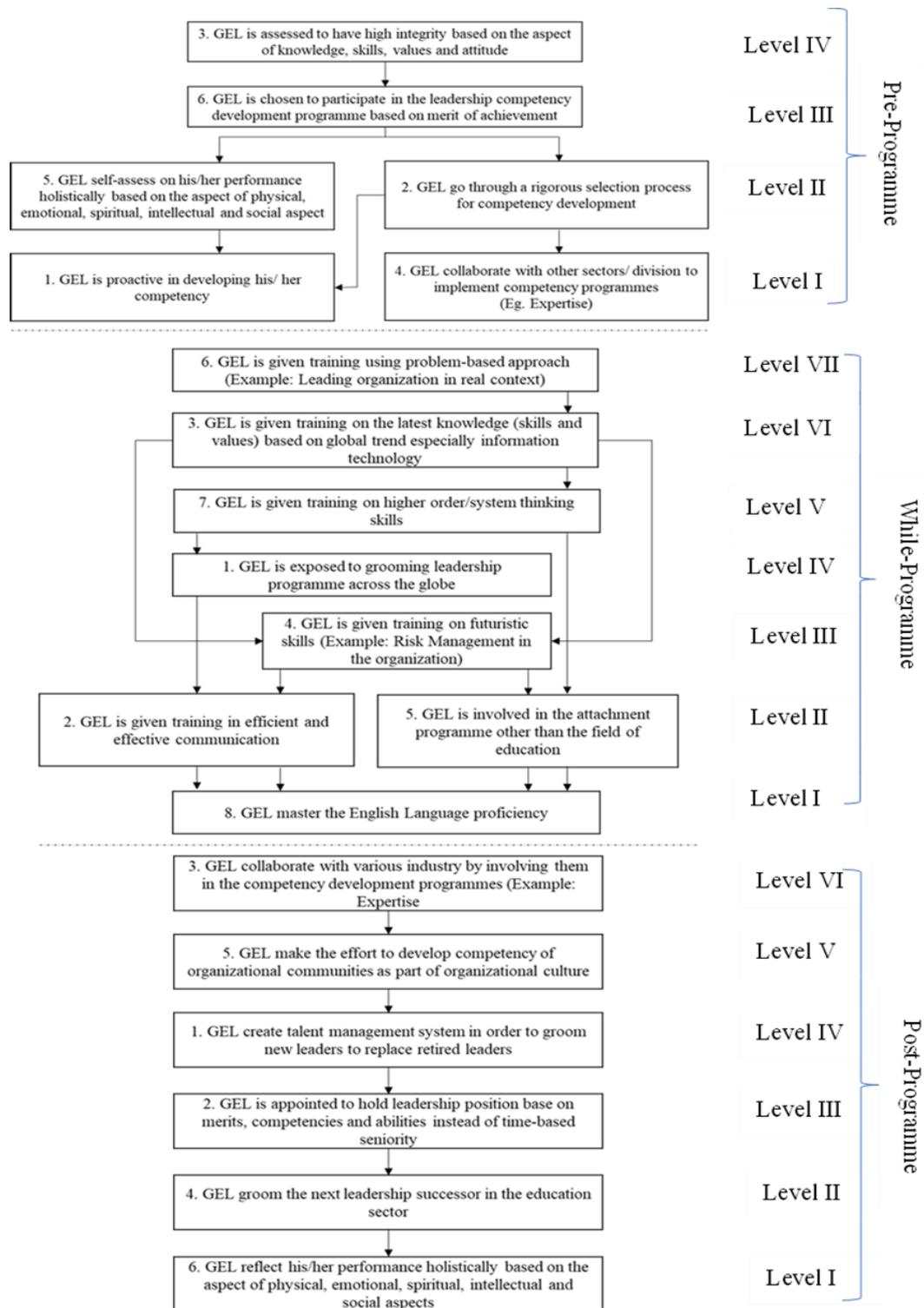
**Table 7: Partitioning of Reachability Matrix of Strategy Implementation**

Strategy Implementation	Reachability Set	Antecedent Set	Intersection Set	Level
a1	1	1,2,3,5,6	1	I
a2	1,2,4	2,3,6	2	II
a3	1,2,3,4,5,6	3	3	IV
a4	4	2,3,4,6	4	I
a5	1,5	3,5,6	5	II
a6	1,2,4,5,6	3,6	6	III
b1	1,2,8	1,3,6,7	1	IV
b2	2,8	1,2,3,4,6,7	2	II
b3	1,2,3,4,5,7,8	3,6	3	VI
b4	2,4,5,8	3,4,6	4	III
b5	5,8	3,4,5,6,7	5	II
b6	1,2,3,4,5,6,7,8	6	6	VII
b7	1,2,5,7,8	3,6,7	7	V
b8	8	1,2,3,4,5,6,7,8	8	I
c1	1,2,4,6	1,3,5	1	IV
c2	2,4,6	1,2,3,5	2	III
c3	1,2,3,4,5,6	3	3	VI
c4	4,6	1,2,3,4,5	4	II
c5	1,2,4,5,6	3,5	5	V
c6	6	1,2,3,4,5,6	6	I

### Findings from Step 5 and 6

A hierarchical diagram is developed based on the reachability matrix (Table 6) and level partitioning (Table 7). The diagram is than converted into ISM of strategy implementation in the development and training of global leadership competency for educational. The ISM model is compartmentalized into pre, while and post-programme as depicted in Figure 3. The model was presented to the panel of experts to be reviewed for any discrepancies. The experts consensually agreed with all the three ISM model of pre, while and post-programme. ISM hierarchical diagram dictates that the higher the level of a variable the more importance it carries. Based on Figure 3, the pre-programme SI has 4 levels, whereas the while-programme of SI has 7 levels and lastly the post programme consists of 6 levels. As for pre-programme, SI 3 (GEL is assessed to have high integrity based on the aspect of knowledge, skills, values and attitude are the most top priority of importance. The lowest level i.e., level 1 of pre-programme comprises of SI 1 (GEL is proactive in developing his/her competency) and SI 4 (GEL collaborate with other sectors/division to implement competency programmes) are the least importance. It does not mean that SI 1 and S1 4 under pre-programme are not important to be

taken into account or implemented but its priority is the lowest as compared to other SI within the pre-programme.



**Figure 3: Strategy Implementation Model for Educational Leaders' Global Leadership Competency Training and Development**

The SI model further revealed that the top most priority SI within while-programme is SI 6 (GEL is given training using problem-based approach) which is at level 7. The lowest SI is SI 8 (GEL master the English language proficiency) at level 1. Figure 3 further revealed that the most important top priority SI for post-programme is SI 3 (GEL collaborate with various industry by involving them in the competency development programme), whereas the lowest level of importance is SI 6 (GEL reflect his/her performance holistically based on the aspect of physical, emotional, spiritual, intellectual and social aspects. the lowest level of importance is SI 6 (GEL reflect his/her performance holistically based on the aspect of physical, emotional, spiritual, intellectual and social aspects.

### Findings from Step 7

A cross-impact matrix multiplication applied to classification (MICMAC) analysis for this study is similar to what have been implemented by Attri et al. (2017) and Pitchaimuthu et al. (2019). The main objective of MICMAC analysis is to identify key SI (variable) that drive the system. Hence, the driving power and dependence power of each SI is plotted accordingly on Y-axis and X-axis accordingly. Each SI is being classified on the basis of driving power and dependence power it holds classified accordingly based on these categories:

- Autonomous SI: These SI hold weak driving power and weak dependence power. They are relatively disconnected from the system and have few links which may be strong.
- Dependent SI: These SI hold weak driving power but strong dependence power.
- Linkage SI: These SI hold strong driving power and strong dependence power. However, they are unstable whereby any action on the SI affects other SI and a feedback effect on itself.
- Independent SI: These SI hold strong driving power and weak dependence power. They are the key SI that other SIs depend on.

For further illustration and based on Figure 4 of SI for pre-programme, SI 3 and SI 6 are classified within the Independent cluster. SI 3 holds the driving power of 6 and dependence power of 1 whereas SI 6 holds the driving power of 5 and dependence power of 2. Both this SI are the key variables that drives other SIs. Without SI 3 and SI 6, other SIs could not be achievable and should be applied or implemented first. There are no SI being classified within the Linkage cluster under pre-programme. SI 2 holds the driving power of 3 and dependence power of 3. SI 5 carries the driving power of 2 and dependence power of 3. Thus, SI 2 and 5 are classified withing the Autonomous cluster. They have no connection with each other and hold weak driving power and weak dependence power. Figure 4 further revealed that SI 4 holds driving power of 1 and dependence power of 4. SI 1 holds driving power of 1 and dependence power of 5. SI 4 and SI 1 are both holding high dependent power and weak driving power. They depended on other SIs in order to be achievable and thus, classified within the dependent cluster. Likewise, all other SIs for while programme (Figure5) and post programme (Figure 6) are classified based on their driving power and dependence i.e., conforming to their clusters.

### Discussion

The paper addresses the identification of SI of leadership training and development in order to upskill educational leaders' global leadership competency at the Ministry of Education. The ISM model proposed in this study establishes a contextual relationship through a proper hierarchy amongst the SIs. For these purposes, the SIs were identified and selected based on experts' consensus opinion and recommendations. In regards to pre-programme, the experts consensually agreed that before an education leader is being selected for global leadership

competency training and development, they should be assessed based on the integrity that covers the aspect of knowledge, skills, values and attitudes. Public organization such as the MoE's main function is to provide service to the community and hence integrity is crucial (Mau, 2019).

Driving Power	Independent			Linkage		
	1	2	3	4	5	6
6	3					
5		6				
4						
3			2			
2			5			
1				4	1	
	1	2	3	4	5	6

Autonomous                      Dependent

Dependence Power

**Figure 4: MICMAC analysis of Strategy Implementation for Pre-Programme**

Driving Power	Independent				Linkage			
	1	2	3	4	5	6	7	8
8		6						
7		3						
6								
5			7					
4			4					
3				1				
2					5	2		
1								8
	1	2	3	4	5	6	7	8

Autonomous                      Dependent

Dependence Power

**Figure 5: MICMAC analysis of Strategy Implementation for While-Programme**

Driving Power	Independent			Linkage		
	1	2	3	4	5	6
6	3					
5		5				
4			1			
3			2			
2				4		
1						6
	1	2	3	4	5	6

Autonomous                      Dependent

Dependence Power

**Figure 6: MICMAC analysis of Strategy Implementation for Post-Programme**

Furthermore, current and future educational leaders administering and leading the MoE should be selected for global leadership competency training and development based on merit of achievement and they should go through a rigorous selection process. Part of being selected also depends on other variables such as educational leaders should be able to self-assess his/her performance holistically (Cumberland et al., 2016), pro-active to upskill their competencies and initiate collaboration with other divisions for competency development (McClellan, 2021). These SIs are crucial towards the development of global leadership competency. The experts consensually agreed that the global leadership competency training and development should cover SIs which could upskill the educational leaders to handle complex issues or situations of global trend. Those SIs include training using problem based approach (McClellan, 2021; Meyers et al., 2013), training on the latest knowledge such as information technology (Baimyrzaeva & Meyer, 2020), training on higher order thinking skills or system thinking (Norzailan et al., 2016), exchange programme across the globe (Fey, 2020), futuristic skills such as risk management, communication skills and attachment programme other than the field of education (Seidle et al., 2016). The results further revealed that the experts decided that mastering English Language proficiency should be part of the training and development of global leadership competency. This is because being part of globalization waves require educational leaders to communicate and negotiate well in English.

The SI for post-programme focus on the aftermath of the educational leaders if they were able to complete the global leadership competency training and development. The experts consensually agreed that post programme should cover SI that allow educational leaders opportunity to collaborate with various industry (not limited to educational field) in the competency development programme (McClellan, 2021; Seidle et al., 2016). This is to broaden their horizon and views in adapting and applying knowledge from other fields into leading the education field. Besides enhancing their own competency as leaders, educational leaders should make the effort to develop competency of organizational communities as part of organizational culture in order to improve organizational performance as a public organization (Mau, 2019). Public organizations need to be on par to tackle complex global issue that affects them. Educational leaders were recommended by experts to create a talent management system in order to groom future talented leaders. In furtherance, appointment of future educational leaders should be based on merits, competencies and abilities in order to overcome the gap of time-based appointment (seniority). Lastly, as mentioned in the literature that reflection and feedback after the competency development training are crucial. Reflection and feedback are important to assess successes and failures of real outcomes and to gather thoughts for improvement plan (Norzailan et al., 2016).

Effective leadership development for educational leaders that are based on global leadership competency focussing the cognitive process of human brain during leadership process and universally applicable in any organizational culture are much needed for educational leaders of the 21st century. Reliance on lecture-based training and for the sake of attendance requirement may no longer be adequate. Unexpected global trend such as the pandemic surge, war in Europe, economic inflation are evidences that affects education sector in many ways. Hence, educational leaders leading the education system must be prepared to upskill themselves with global leadership competency in the long run. Governments across the globe do struggle with scarcity of budget between training of employees and other demands. A cost benefit analysis on return of investment in the long run amongst stakeholders is recommended.

The ISM technique preserved the qualitative factors of variables as an integral part of the model by incorporating variables measured on ordinal scales. However, the model was reviewed based on the judgment of a panel of experts from various public education organisations, academic institutions, divisions and sectors. If a different panel of experts from various other organizations including private sectors were consulted, the result might have yielded differently. The ISM technique develops a structural and hierarchical relationship model amongst the variables. The model is not statistically validated and hence future research could be initiated by statistically validating the model using SEM-AMOS or Fuzzy Delphi Method (FDM) through another panel of experts. Comparison of results obtained between ISM and SEM-AMOS is highly recommended.

### Conclusion

In this study, an ISM model has been developed based on the experts' consensus in order to determine a hierarchy and establish contextual relationships amongst the strategy implementations identified. MICMAC analysis delved further by indicating and classifying the key strategy implementation that drives the system. Important approaches in the global leadership competency training and development such as problem-based assignments, exchange programme, higher order thinking skills or system thinking training, communication training and risk management were consensually agreed to be included by the experts to improve the competency of educational leaders according to ebb and flow of global trend.

The SIs that was classified into four clusters based on their driving and dependence power, may assist public organization such as the MoE to make strategic decision and prioritize which strategy implementation should be focussed in terms of practicality i.e., for further action to be taken to address the gap mentioned. The model would help the stakeholders, decision-makers and human resource management to uplift the domestic leadership competency of public sector educational leaders into global leadership competency in terms of training and development. This study further contributes to the literature of global leadership competency training and development. The strategy implementation suggested could be the bed rock of designing and developing leadership training and development module on global leadership competency.

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