Principal and Teacher Leadership Competencies and 21st Century Teacher Learning and Facilitating Practices: Instrument Development and Demographic Analysis

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Abstract

The skills of principal and teachers play an essential part in the Malaysian world of education, which is working to achieve quality education in pedagogy, curriculum, management and management of an educational organisation. This survey was conducted to refine and validate the principal leadership competencies and teacher leadership competencies and 21st Century learning and facilitating practices of teachers in secondary schools. The validity and reliability of the principal and teacher leadership competences and 21st century learning and facilitating practices of teachers' instrument have been tested in the exploratory factor analysis and reliability analysis. For the whole scale, the Cronbach Alpha coefficient was 0.98. Demographics revealed that the principal leadership competencies and teacher leadership competencies as well as 21st Century learning and facilitating practices of teachers was at a high level.

Keywords

Competencies, Leadership, 21st Century Teacher Learning and Facilitating, Principal

1. Introduction

Education is one of the key areas in the National Key Result Areas (NKRA). In this regard, the Ministry of Education Malaysia (MOE) has set the Key Performance Index (KPI) to expand quality and effective education to every school throughout Malaysia. Along with the development of the country, education in the 21st Century has encouraged every school leader and teacher to improve

their knowledge in various fields so that they can meet the challenges of globalization. To strengthen the education system in Malaysia, the Ministry of Education Malaysia (MOE) has made a comparison between national education system standards and global education standards and launched the Malaysian Education Development Plan (PPPM) which describes the aspirations and direction of education in Malaysia 2013 to 2025 (MOE, 2020). The national education direction that has been formulated by the Ministry of Education Malaysia has outlined a goal that is to make education in Malaysia a world-class education.

In an educational organization, school leaders (headmasters and principals) assume the responsibility of managing and leading all school people according to their respective needs. In addition, school leaders are liaison agents to realize the directives of stakeholders and policy makers such as the Ministry of Education, State Education Offices and District Education Offices. To perform this responsibility, school leaders need to have the competence and ability to administer the school (Mahmud, 2010).

School leaders and administrators, especially headmasters and principals are the driving force behind the success of the changes made. They have an important role in an educational institution because leadership style influences the level of acceptance of a change and can support continuous improvement in the school (Fullan, 2015). At the same time, change is closely linked to the leadership of a school. According to Bush (2007), administrators determine the changes that need to be made in a school and play an important role in determining the effectiveness of those changes. Fullan (2007) states that the leadership of the principal to some extent determines the success of a change.

The Interstate School Leaders Licensure Consortium (2008) explains that the leadership competencies of school administrators are based on knowledge of organizational formation, working with stakeholders, providing feedback and influencing others. Mahmood (1989) described competence as an important element in school excellence because it is closely related to the initiative of administrators in setting school mission, curriculum and pedagogy knowledge, school administration skills and relationships with external parties.

The leadership competencies of principals need to be emphasized in ensuring the effectiveness of secondary schools. Every principal must be efficient and have high leadership competencies in carrying out their duties as school leaders. He needs to emphasize aspects of learning and facilitating, school improvement improvement, and student performance and well-being (Hallinger & Murphy, 1985; Kotter, 1990; Katz, 1993; Leithwood et al., 2004; Interstate School Leaders Licensure Consortium, 2008).

The study of Junita and Wan Mohd Rashid (2018) discusses the role of teachers as leaders in the education system. Teachers are given the responsibility to realize the policies and goals of the national curriculum. All educational planning cannot proceed without the support of teachers. Therefore, teacher competence is an important aspect that helps Malaysia achieve progress. Teachers are

the implementers of the curriculum in setting standards, quality and effectiveness of the education system (Siraj and Ibrahim, 2012). Education is the process of disseminating knowledge and skills passed down from generation to generation. Thus, in education, teachers play an important role in disseminating knowledge and skills through formal education (Siraj and Ibrahim, 2012).

According to Kanak & Kiflee (2017), effective leadership begins with the mastery of administrators in theoretical and practical skills in the field of administration and the overall process of management. In this regard, excellent leaders can inspire other school people to succeed. At the same time, school leaders should have skills and knowledge in areas of knowledge application and pedagogy such as 21st Century learning. Therefore, school administrators should be proactive in improving the competencies, skills and expertise of teachers. High expertise will give more power and opportunities to lead effectively.

In this regard, teacher leadership competencies play a role in ensuring that students are educated with pedagogical approaches and elements in 21st century education. The Ministry of Education Malaysia (MOE) is also working to increase teacher autonomy in Learning and Facilitating. This aspect of autonomy will be applied to all schools by Wave 3 of PPPM (2021-2025). Teachers will be given autonomy in setting 21st century Learning and Facilitating practices and applying elements of creativity and innovation in the classroom. Teacher autonomy needs to be emphasized in encouraging teachers to improve knowledge of 21st century skills, improve Learning and Facilitating practices and find best methods to incorporate 21st century skills in Learning and Facilitating (Arbaa, 2015).

In the perspective of teacher practice, schools with effective 21st century Learning and Facilitating are schools that can empower teachers and give teachers autonomy to them to produce learning innovatively and creatively (Roebuck, 2011; Cranston, 2002). Teacher leadership competencies need to be nurtured so that teachers can increase their competence and professionalism. It can also help teachers strengthen their daily Learning and Facilitating practices. Teachers will feel autonomy over their tasks and be able to reduce control and disruption over their tasks (Kimwarey, Chirure, & Omondi, 2014).

The objective of this study is to improve and modify a measurement scale to refine and validate principal leadership competencies and teacher leadership competencies as well as 21st Century learning and facilitating practices of teachers in secondary schools. Four aspects of principal leadership competencies have been identified, namely personal and social skills, managing skills, leading skills and transformative skills. As for teacher leadership competencies, there are three main dimensions, namely ethic and spirituality skills, managing skills and transformative skills. While the practice of learning and facilitating has one dimension. These dimensions for principal and teacher leadership competencies were adapted based on the Razak School of Government (RSOG, 2017), Theory of Competence Boyatzis, The Trait Theory, Transformational Leadership Theory and Constructivism Theory for learning and facilitating practices of teacher. Thus,

the main goals of this paper are:

1) To refine, adjust, and validate the principal and teacher leadership competencies as well as 21st Century learning and facilitating practices of teacher's scale based on a data representation of Seberang Perai District Education Penang.

2) To ascertain the views of the principal and teacher leadership competencies on aspects ethics and spirituality, personal and people skills, managing skills, leading skills, transformative skills and 21st Century learning and facilitating practices of teachers.

1.1. Principal Leadership Competencies and Teacher Leadership Competencies

Competence refers to the experience, skills or competencies required to work more efficiently and effectively (Dewan, 2004). In this study, competencies refers to the leadership competencies of principals and teachers which refers to ethics and spirituality, personal and social skills, leading skills, managing skills and transformative skills.

Based on RSOG (2017), ethic and spirituality elements include integrity, humanity, justice, transcendence and relationships with others. Personal and social skills are important skills in leadership. Both of these skills are associated with the concepts of emotional intelligence, in particular, personal skills and social skills.

For leading skills refers to an individual's ability to lead and be an inspiration to others to achieve organizational goals. For this study will refer to RSOG (2017), i.e. employees who are dedicated in improving performance, and more committed to their organization. At the same time, they dare to compete and show high commitment compared to other colleagues. Key skills refer to inspiring, winning hearts, empowering and engaging others (stakeholders).

Managing skills are the ability of the principal in managing, coordinating, using and controlling the resources needed by the school to achieve its goals. Management skills in the study refers to RSOG (2017), management skills consist of four constructs namely planning and organizing, implementing and improving, achieving goals and guidance and mentoring.

Transformative skills are the skills of school leaders to inspire, motivate and work with teachers to implement change in the organization. For this study referring to RSOG (2017), there are five sub-domains in transformative skills namely inspiration, risk taking, anticipation, cultural literacy, and diversity of influence.

1.2. 21st Century Teacher Learning and Facilitating Practices

The above term refers to a teacher's ability to manage learning and facilitating in and outside the classroom. In addition, it refers to the ability to lead the teacher community in achieving effective learning and facilitating. The ability to manage learning and facilitating can ensure that students can achieve all learning objectives.

The quality of learning and facilitating is measured based on standard 4 under SKPMg2 KPM 2017 which focuses on Learning and Facilitating based on 21st Century Learning. 21st Century Learning is a student-centered learning process and is based on aspects of communication, collaboration, critical and creative thinking as well as the application of pure values and ethics.

2. Method

2.1. Research Design

Based on two phases of the study which involve the elements of development and collection according to the instruments applied in this research. This report improvises a non-experimental design which classify as a survey design to analyze the personal behaviour of this study. Due to a "numeric description of trends, attitudes, or opinions of a population, researchers could obtain the all variables needed to support a sample of that population" (Creswell, 2014). This group of people of the study was meant to include teachers of the Seberang Perai County Education in Penang. As this study seeks to collect validation data on the application of the tool developed for the main study alone, data were collected from 100 in-service teachers. The study was conducted in two phases: instrument development and collection.

While according to Hair et al. (1998) been suggested that a suitable sample size should be used to produce reliable estimates for studies involving factor analysis. At least five participants, per construct and about 100 individuals per data analysis were recommended by Gorsuch (1983) and Kline (1979). Even when the number of variables is under 20 no sample should be less than 100 persons (Gorsuch, 1974).

2.2. Sample

The pilot test included the basic variables and supporting respondents in high school and in-service teachers in Penang District Education, Seberang Perai. After approval by the Educational Planing, Research Division (EPRD), Malaysia's Ministry of Education, this questionnaire was distributed via Google Form, WhatsApp and Telegram. 7498 secondary school teachers in Penang, a total of 100 in the Seberang Perai district education population (KPM, 2020) responded to the questionnaire. For the pilot study of this study, the researcher involved 100 respondents from three schools in the district of Seberang Perai Tengah. The selection of a pilot study sample of 100 people was based on the views of methodologists who suggested that the selection of a pilot study was 10% of the sample. The maximum sample size is 500 respondents from the sample size determination table of Krejcie and Morgan (1970). Thus, 10% of the sample the maximum number of samples proposed is 50 respondents. Yet the researcher selects a sample that exceeds the number recommended by the expert so as not to pose a problem in determining the reliability through the calculation of the Cronbach's Alpha coefficient (Hin, 2007). On the basis of their understandings,

all participants were instructed to answer the questionnaire while at the same time relating the significance of each element to their experience.

Based on recent respondents there were 27 (27.0%) men and 73 (73.0%) women. All collected respondents had a minimum age of 31 and a maximum age of 60. In addition, the majority of those interviewed (n = 41.41%) were aged 41 - 50, 32 (32.0%) were aged 31 - 40, with 27 (27.0%) intervals between 51 and 60 years.

Based on different aspects, 26 respondents (26.0%) had 21 to 25 years of teaching experience, while 22 respondents (22.0%) had 26 to 30 years of teaching experience. Nonetheless, there have approximate 20 respondents (20.0%) who had 16 to 20 years of teaching experience simultaneously have 20 (20.0%) respondents had 11 to 15 years of teaching experience, 11 (11.0%) respondents had 6 to 10 years of teaching experience, and only 1 (1.0%) respondents had one to five years of teaching experience.

2.3. Instrument Development

The instrument of this study was adapted from the Leadership Competency Instrument (LCI, 2017) questionnaire by Razak School of Government (RSOG, 2017). Razak School of Government (RSOG) (2017) has defined the leadership competencies of principals and teachers referring to the ethic and spirituality, personal and social skills, leading skills, managing skills and transformative skills.

Moreover, in this study using 21st Century Learning Module (2017) and SKPM (Kementerian Pendidikan Malaysia, 2017) were combined for Teacher Learning and Facilitating practice based on five constructs, teachers as 1) Planner, 2) Guards, 3) Supervisor 4) impeller and 5) appraiser.

The survey instrument for this study has four parts. Items in Section A revolve around respondents demographic information such as work experience, gender and age. The items in Section B contain items of principal leadership competencies. Next, items in Section C measure teacher leadership competencies and items in Section D measure aspects of 21st century teacher learning and facilitating practices. Items were adapted and translated from existing questionnaires. Each item has been checked by the translator, lecturer in the field of leadership and management education and lecturer Malay.

The researcher has appointed six experts according to the field to verify the content of the research instrument, namely content validity. The experts consisting of experts in the field of education and leadership in educational institutions as the Institute of Teacher Education (IPG), Institution of Higher Education and District Education Office. The validity of the content of the questionnaire can only be determined by experts in the field (Gay et al., 2009).

2.4. Data Analysis

According to 100 respondents that have completed the validated questionnaire. Reliability tests, EFA tests and Cronbach's Alpha tests were done by means of

the Statistical Package for Social Sciences (SPSS) software version 25.0 to answer the research question. Reliance testing was performed. In two steps, data analyses were performed. The first stage examined problems of data screening relating to the management of missing data, multi-channel identification and outliers and normality. The skewness and kurtosis value of each item is between −1.96 and +1.96 at significant level of 0.05 for normality assessment (Hair, 2010) were used. In the second phase the descriptive statistics and alpha of Cronbach have been performed. The alpha of Cronbach was calculated to measure the instrument's reliability (total and subconstructs). Alpha values between 0.60 and 0.70 have been recorded by Hair et al. (2010).

3. Result

In order for this instrument to be approved and applicable, the study must satisfy specific criteria. The item's suitability is to measure the construct and the reliability of the product utilised are among the standards. To test the applicability of the constructs and items utilised, EFA and Cronbach's Alpha reliability analyses were used.

3.1. Exploratory Factor Analysis (EFA)

Based on the literature reference, principal leadership competencies consists of four sub components namely personal and social skills, managing skills, leading skills and transformative skills components. The total number of items involved for all these sub constructs was 24 items. EFA procedure using Major Component Analysis via Varimax Rotation method, only 24 items measuring four sub constructs have remained to form four dimensions. The items involved are as in Table 1. The Kaiser-Meyer-Olkin (KMO) test was used to test the factorability of study items (Pallant, 2010). The KMO value in this study exceeded the desired level exceeding the minimum level of 0.60 (Awang, 2010; Hoque and Awang, 2016; Hoque et al., 2017) as per Table 1.

Referring to Bartlett's Test, this test is significant with a p-value of 0.000. While according to both KMO test and the Bartlett's Test all ratio had been able to met the set criteria. This illustrates, for the development of dimensions only for 24 items factor analysis performed with the Principal Component Analysis (PCA) method is significant. Extraction of a total of 24 items from 4 constructs via the Varimax Rotation Method remained yielding four dominant

Table 1. Kaiser-Meyer-Olkin (KMO) and Bartlett's test.

Construct	Kaiser-Meyer-Olkin Measure of Sampling Adequacy > 0.6	Bartlett's Test of Sphericity < 0.05	Items	Number of Items
Personal and Social skills	0.940	0.000	PS1, PS2, PS3, PS4, PS5, PS6, PS7	7
Leading skills	0.980	0.000	M1, M2, M3, M4, M5, M6	6
Managing skills	0.942	0.000	U1, U2.U3, U4, U5, U6, U7	7
Transformative skills	0.871	0.000	TR1, TR2, TR3, TR4	4

factors based on eigenvalue values exceeding 1. The criteria in the extraction of these factors were based on the recommendations of Hair et al., (2010).

Table 2 Total Variance Explained explains that a total of 24 items formed four single dimensions and were able to measure 87.524% (Personal and Social Skills), 85.394% (Leading Skills), 92.33% (Managing Skills) and 92.437% (Transformative Skills). This value is sufficient because it has passed the minimum level of 60% (Awang, 2010; Hoque and Awang, 2016; Hoque et al., 2017).

Based on **Table 3**, the results show that there is one (1) component for all constructs under the leadership competence of the principal. The loading factor must exceed the minimum value limit (0.6) to identify the items that can be used for the component. Items with loading factor values less than 0.6 should be dropped from the study because they do not contribute to construct measurement (Hoque and Awang, 2016; Hoque et al., 2017; Chik & Abdullah, 2018).

Based on the literature reference, teacher leadership competencies consists of three sub components, namely ethic and spirituality skills, managing skills and transformative skills. The total number of items involved for all these sub constructs was 21 items. EFA procedure using Major Component Analysis via Varimax Rotation method, 21 items measuring three sub constructs have remained three dimensional form. The items involved are as in **Table 4**. The Kaiser Meyer-Olkin (KMO) test was used to test the factorability of study items (Pallant, 2010). The KMO value in this study exceeded the desired level exceeding the minimum level of 0.60 (Awang, 2010; Hoque and Awang, 2016; Hoque et al., 2017) as per **Table 4**.

Referring to Bartlett's Test, this test is significant with a p-value of 0.000. Both the KMO test and the Bartlett's Test, have met the set criteria. This illustrates, the factor analysis performed with the Principal Component Analysis (PCA) method is significant on the formation of dimensions only for the 21 items. Extraction of a total of 21 items from three constructs via the Varimax Rotation Method remained yielding three dominant factors based on eigenvalue values exceeding 1. The criteria in the extraction of these factors were based on the recommendations of Hair et al., (2010).

Table 2. *Total variance explained* principal leadership competencies.

		Total Variance Explained		
		Rotation Sums of Squared Loadings		
Construct	Component	Total	% of Variance	Cumulative %
Personal and Social skills	1	6.127	87.524	87.524
Leading skills	1	5.124	85.398	85.398
Managing skills	1	6.456	92.233	92.233
Transformative skills	1	3.697	92.437	92.437

Table 3. Principal component analysis (PCA) of the rotated component matrix.

	Items	Factor			
		Personal and social skills	Leading skills	Managing skills	Transformative skills
PS3	My Principal: think clearly even under stress	0.959			
PS1	ensuring his thoughts are not influenced by feelings and emotions	0.951			
PS2	assess the impact of his leadership style	0.940			
PS6	remain calm even in difficult circumstances	0.939			
PS4	Understand his personality	0.933			
PS7	trying to understand my views and feelings	0.919			
PS5	seeking feedback on his leadership style	0.906			
M2	encouraging me to exceed expectations in the field of work		0.951		
M3	set a good example to motivate me		0.945		
M5	celebrate my accomplishments		0.941		
M4	encourage creativity among teachers to showcase their talents		0.913		
M6	pay attention to each teacher individually		0.902		
M1	share information with all teachers		0.892		
U1	scrutinize work processes to ensure service quality			0.973	
U3	develop strategies for performing tasks			0.973	
U2	ensuring new ideas are in line with established work procedures			0.972	
U6	take clear measures (quality, quantity, cost, timeliness, and frequency of completion) at all levels to ensure successful results			0.966	
U7	ensure that I adhere to work standards			0.959	
U5	taking into account customer feedback (parents, PTAs and students) when developing new services			0.956	
U4	meet customer satisfaction (parents, PTAs and students) by meeting their expectations			0.924	
TR1	recognizing my work performance from different backgrounds				0.975
TR3	harness my skills, talents and potential				0.974
TR4	accept/consider the contribution of ideas from different perspectives				0.968
TR2	stressed that it is impossible to be a high-performing school				0.928

Table 4. Kaiser-Meyer-Olkin (KMO) and Bartlett's test.

Construct	Kaiser-Meyer-Olkin Measure of Sampling Adequacy > 0.6	Bartlett's Test of Sphericity < 0.05	Items	Number of Items
Ethic and Sprirituality skills	0.938	0.000	ER1, ER2, ER3, ER4, ER5, ER6, ER7	7
Managing skills	0.952	0.000	US1, US2, US3, US4, US5, US6, US7	7
Transformatif skills	0.901	0.000	TF1, TF2, TF3, TF4, TF5, TF6, TF7	7

Table 5 Total Variance Explained explains that a total of 21 items have formed three single dimensions and were able to measure 81.326% (Ethic and Spritiuality

Table 5. *Total variance explained* teacher leadership competencies.

| Construct | Component | Total Variance Explained | | |
| | | Rotation Sums of Squared Loadings | | |
		Total	% of Variance	Cumulative %
Ethic and Spritiuality skills	1	5.693	81.326	81.326
Managing skills	1	5.915	84.505	84.505
Transformative skills	1	5.417	77.388	77.388

skills), 84.505% (Managing skills) and 77.388% (Transformative skills). This value is sufficient because it has passed the minimum level of 60% (Awang, 2010; Hoque and Awang, 2016; Hoque et al., 2017).

Based on **Table 6**, the results show that there is one (1) component for all constructs under the leadership competencies of the teacher. The loading factor must exceed the minimum value limit (0.6) to identify the items that can be used for the component. Items with loading factor values less than 0.6 should be dropped from the study because they do not contribute to construct measurement (Hoque and Awang, 2016; Hoque et al., 2017; Chik & Abdullah, 2018).

The EFA process was performed on seven items during the 21st century learning and facilitating practices of teachers constructs by rotating varimax via Principal Component Analysis (PCA). According to **Table 7** shows the result values of the Bartlet Test with significant values for P values less than 0.05 ($P < 0.05$). The sample adequacy value for Kaiser-Meyer-Olkin (KMO) was 0.934, which is above the minimum 0.6 limit. Both these tests (significant bartlet test equivalent and KMO values > 0.6) show that EFA procedures are consistent with the data from this study (Hoque and Awang, 2016; Hoque et al., 2017; Chik & Abdullah, 2018).

Based on literature references, 21st century teacher learning and facilitating has one dimensions only. Therefore, this study used only seven items. The EFA process using the Varimax Rotation Method, Major Component Analysis, confirm that the 21st century teacher learning and facilitating construct consists of one dimension only. The factorability test for test items was used with the Kaiser-Meyer-Olkin (KMO) test (Pallant, 2010). The KMO value in this study exceeded the required level of 0.934 exceeding the minimum level of 0.60 (Awang, 2010; Hoque and Awang, 2016; Hoque et al., 2017). Factor extraction to one dimension only is supported by the Total Variance Explained criterion. **Table 8** Total Variance Explained explains that a total of 7 items have formed one dimension and were able to measure 78.957%.

Based on **Table 9**, the results show that there is one (1) component for all constructs under the 21st century teacher learning and facilitating practice. The loading factor must exceed the minimum value limit (0.6) to identify the items that can be used for the component. Items with loading factor values less than 0.6 should be dropped from the study because they do not contribute to construct measurement (Hoque and Awang, 2016; Hoque et al., 2017; Chik & Abdullah, 2018).

Table 6. Principal component analysis (PCA) of the rotated component matrix.

Items		Factor		
		Ethic and Spirituality skills	Managing skills	Transformative skills
ER2	I: cultivate a spiritual spirit	0.948		
ER1	am a person who has a sincere intention to work	0.939		
ER4	promoting a work culture as an act of worship	0.916		
ER5	treat fairly to fellow teachers	0.903		
ER3	am a forgiving person	0.899		
ER6	am obedient and believe in God	0.889		
ER7	learned from others	0.813		
US5	examine the 21st century learning and facilitating process to ensure service quality		0.947	
US3	make sure new ideas are in line with established work procedures		0.934	
US2	developed a clear 21st century learning and facilitating strategy to perform the task		0.933	
US6	make sure that i adhere to 21st century learning and facilitating standards		0.929	
US7	take clear measures (quality, quantity, cost, timeliness, and frequency of completion) at all levels to ensure successful results		0.915	
US1	analyze strategically to effectively realize 21st century learning and facilitating		0.901	
US4	meet customer satisfaction (parents, PTAs and students) by meeting their expectations		0.874	
TF1	leverage the skills, talents and potential of students			0.920
TF2	recognize the talents of students			0.911
TF3	inspire students to go beyond their capabilities			0.903
TF4	encourage the practice of current thinking			0.896
TF6	am looking for opportunities to improve myself			0.896
TF5	support/provide students with different work needs due to physical disabilities			0.841
TF7	emphasize that it is not impossible to be a high performing school			0.782

Table 7. Kaiser-Meyer-Olkin (KMO) and Bartlett's test 21st century learning and facilitating.

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.934
Bartlett's Test of Sphericity	Approx. Chi-Square	698.742
	df	21
	Sig.	0.000

Table 8. Total variance explained components of 21st century teacher learning and facilitating practice.

Total Variance Explained			
Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	5.527	78.957	78.957

Table 9. Principal component analysis (PCA) of the rotated component matrix.

Items		Factor
		21st century teacher learning and facilitating practice
PdPc3	I: provide guidance to master skills in learning activities	0.941
PdPc5	stimulate students to communicate	0.926
PdPc2	manage PdPc time in line with learning activities	0.891
PdPc4	help students make decisions to solve problems in learning activities	0.885
PdPc6	create opportunities for students to lead	0.870
PdPc1	plan activities in PdPc	0.862
PdPc7	use various assessment methods in PdPc	0.840

3.2. Reliability Analysis

Regards on the alpha reliability value in Cronbach was 0.98 for the whole scale. Cronbach's alpha coefficient for principal leadership competecies is 0.992, teacher Leadership competencies 0.976, while 21st century teacher learning and facilitating practice are 0.955. The resultant value shows an influential factor and a high-reliability value.

3.3. Multicollinearity Analysis

While based on multicollinearity issues occur if the correlation value is too high for the variables by 0.8 (Hair et al., 1998). In this study, the correlation values for the variables ranged between 0.183 to 0.788. This reflects that the correlation of the variables is lower than 0.9, and there are no multifocal problems.

3.4. Leadership Competency Levels of Principals, Teachers and 21st Century Teacher Learning and Facilitating (PdPc)

An analysis was performed to assess the level of principal, teacher leadership competencies and 21st century teacher learning and facilitating practice based on the dimensions identified in this study.

Tables 10-12 illustrates the results of the mean score analysis of the leadership competency levels of principals, teachers and 21st century teacher learning and facilitating practices by construct.

In this study, the level of leadership competence of principals was measured by four dimensions namely personal and social skills, leading skills, managing skills and transformative skills. The results of the study as shown in Table 10 above show that the four scores of principals' leadership competence dimensions are personal and social skills (mean = 8.44, SP = 1.161), leading skills (mean = 8.58, SP = 1.154), managing skills (mean = 8.61, SP = 1.117) and transformative skills (mean = 8.50, SP = 1.181) were at a very high level. Overall, the principal's leadership competency level score (mean = 8.53, SP = 1.104) among secondary school teachers in Penang is at a very high.

Table 10. The mean score of the level principal leadership competencies.

	Mean	Standard Deviation	Level
Personal and Social skills	8.44	1.161	Very high
Leading skills	8.58	1.154	Very high
Managing skills	8.61	1.117	Very high
Transformative skills	8.50	1.181	Very high
Overall (Principal leadership competence)	8.53	1.104	Very high

Table 11. The mean score of the level teacher leadership competencies.

	Mean	Standard Deviation	Level
Ethic and Sprirituality skills	9.13	0.776	Very high
Managing skills	8.40	1.032	Very high
Transformatif skills	8.67	0.896	Very high
Overall (Teacher leadership competence)	8.73	0.821	Very high

Table 12. The mean score of the level 21st century teacher learning and facilitating practice.

	Mean	Standard Deviation	Level
Overall (21st century teacher learning and facilitating practice	8.78	0.886	Very high

Table 13. Interpretation of the mean score.

Mean Score	Interpretation
1.00 - 2.80	Very Low
2.81 - 4.60	Low
4.61 - 6.40	Medium
6.41 - 8.20	High
8.21 - 10.00	Very High

In this study, the level of teacher leadership competence is also measured by three dimensions namely ethic and spirituality, managing skills and transformative skills. The results of the study as shown in Table 11 show that the three dimensions of teacher leadership competence scores are ethic and spirituality (mean = 9.13, SP = 0.776), managing skills (mean = 8.40, SP = 1.032) and transformative skills (mean = 8.67, SP = 0.896) is at a very high level. Overall, the score of the level of teacher leadership competence (mean = 8.73, SP = 0.821) among secondary school teachers in Penang is at a very high.

In this study, the level of learning and facilitating practice of 21st Century teachers was measured by seven items. Table 12 shows that all seven items have very high scores with the mean range of items ranging from 8.83 to 8.72. Overall,

it shows that the score of the level of learning and facilitating practice of 21st Century teachers (mean = 8.78, SP = 0.886) among secondary school teachers in Penang is at a very high level.

The interpretation of mean scores is based on (Dawes, 2008; Awang, Afthanorhan, & Mamat, 2016) suggestion, as illustrated in Table 13.

This indicates that the overall level of principal, teacher leadership competencies and 21st century teacher learning and facilitating practice was very high.

4. Discussion

The study's primary purpose was to refine and validate the items in the principal and teacher leadership competencies and 21st century teacher learning and facilitating practice scale. Thus, an instrument was created with 52 items, with several items dropped by education experts during validation. These items were removed because their meaning was redundant, and survey fatigue among respondents was avoided. This instrument is valid and reliable in future studies with principal and teacher leadership competencies and 21st century teacher learning and facilitating practice. The four aspects of principal leadership competencies have been identified, namely personal and social skills, managing skills, leading skills and transformative skills. As for teacher leadership competencies, there are three main dimensions, namely ethical and spiritual skills, management skills and transformative skills. While the 21st century teacher learning and facilitating practice has one dimensions only.

The instrument is based on the Government Razak School (RSOG, 2017), Competency Theory Boyatzis, The Trait-Theory, Transformational Leadership Theory, and Constructivism Theory for learning and facilitating practices of teacher. Indeed, every component has an acceptable alpha value from Cronbach. The instrument had overall reliability of 0.98, with an internal consistency value of Cronbach alpha value of 0.95 to 0.99 for each factor. There were both excellent and high reliability values.

Furthermore, the initial validation of the principal and teacher leadership competencies and 21st century teacher learning and facilitating practice scale and the identification of its various components, this study also examined the level of principal and teacher leadership competence and 21st century teacher learning and facilitating practice. The analytical results showed that the level of leadership competencies of principal is very high. This study also corresponds to the Hitt et al. (2018) study, to elucidate key competencies that support an individual's ability to influence recovery as evidenced for increased student academic achievement. The study found seven competencies that highlighted the key characteristics and actions of principals. At the same time, the results of this study suggest ways to improve the competence and development of principals.

This study is also in line with the study conducted by Alias, Yussof, Mustapha, & Ibrahim (2010) studied the level of principal competence based on several aspects namely, skills, knowledge, personal qualities, financial management prac-

tices, curriculum, physical environment and facilities, student affairs, co-curriculum, school administration, external relations, and human resources. This study was conducted to support the findings of previous studies which stated that the direction of the school is greatly influenced by the skills and practices of principals. This study is based on the Malaysian School Principalship Competency Standards and the Welsh National Principals Standards.

Besides, the level of teacher leadership competencies was measured by three dimensions namely ethic and spirituality, management skills and transformative skills. The results obtained show that the three dimensions of teacher leadership competence scores are at a very high level to explain teachers' perceptions of their competencies. The results of this study in line with Serirama and Norizah (2019) determine the strength of the influence of teaching leadership of headmaster, teacher professionalism competence and teacher personal competence on teaching effectiveness among rural primary school teachers in Sabah. The results of the study found that the professionalism competencies of teachers are at a very high.

The findings of past studies also show that competent leaders can lead to organizational excellence because they are able to manage the organization effectively. Mansor and Hamzah (2015) researched the competencies needed to lead educational institutions effectively. There are five main competencies that a quality leader must have, namely knowledgeable, skilled, positive personality, contributing to the organization, and willingness to lead. These competencies can be used as a basis in the formation of quality leaders. The results of the study also contributed to the formation of a quality leadership competency model.

Furthermore, results that been analyzed according to the data based on the collection in SPSS found that the practices practiced by teachers at a very high level in terms of learning and facilitating of 21st century. This study is in line with the study that was conducted by Seman and Dahaman (2019) looking at self-practice in Secondary School teachers in the Northern Zone in Learning and Facilitating theory and practice of PAK-21. Studies have found that the overall application level of 4K 1N of PAV teachers is at a high level while the application of single aspect of communication and value is at a high level.

This study is also in line with the study conducted by Chien and Nor (2020), a study that aims to identify the level of readiness of teachers in implementing 21st Century PdP in the classroom and the level of teacher training needs to improve and enhance their knowledge and skills in the implementation of this PAK21. George and Izham (2020) looked at the relationship of students in the learning process and facilitation of teachers involving quantitative methods using a set of questionnaires. The results of data analysis show that there is a significant relationship between Learning and Facilitation planning with low level student achievement.

The results of the study can drive research on principal and teacher leadership competencies qualities as well as teacher learning and facilitating practice in the

21st century. The findings can also strengthen the body of knowledge (theory) and improve the top directors' management skills. The Malaysian Education Ministry has concluded that this theory will also improve the Education Ministry, considering all the aspects affecting leaders, instructors, learners, and practice 21st Century teachers. The results are expected to be more effective and accurate. The Principal and Teacher Leadership Competencies and 21st century teacher learning and facilitating practice scale assess teachers' beliefs, skills, readiness and motivation. This scale can be adapted to suit the needs and creativity of respondents from different backgrounds. Due to the uncertainty of payment between the construction and validation processes, the current scale is designed to measure Principal and Teacher Leadership Competencies and 21st-century teacher learning and facilitating practice.

Limitations

Based on the limitation issue, the end projected result of this research represent the views of the urban teachers and may not be a significant language of all teachers in Malaysia. At the same time, the study location was limited to ordinary secondary schools in the state of Penang only and did not involve religious secondary schools, Chinese secondary schools, vocational colleges, sports school and art schools.

5. Recommendations for Future Research

The Ministry of Education of Malaysia focuses on human resource development to improve the competence and competitiveness of personnel (Kementerian Pendidikan Malaysia, 2004). In this regard, the Malaysian Ministry of Education has developed a Key Performance Index (KPI) to extend quality and effective education to every school in Malaysia. In order to measure the leadership abilities of educational organizations, a questionnaire was developed to determine the leadership abilities of principals and teachers and the extent to which teachers in the 21st century learn and promote practice understand these abilities from a personal and social perspective, moral and spiritual skills, Management skills, leadership skills, transformation skills, and 21st century teacher learning and teaching practices.

This research is only conducted on the leadership abilities of principals and teachers in one state. Therefore, the results of this study cannot be generalized to the leadership skills of principals and teachers in other states in Malaysia. Therefore, it is recommended to conduct further research on the leadership capabilities of Malaysia as a whole. As a result, real models of the leadership skills of principals and teachers and comprehensive 21st century teacher learning and promotion practices can be developed.

This research only pays attention to the leadership ability of principals and teachers as the main construction of this research leadership ability. This was triggered when researchers discovered that in practice, 21st century school teach-

ers' learning and promotion practices were flawed. If thorough action is not taken, this approach will only become a routine affair that leads to a decline in student academic performance. However, for the next study, the researchers recommend that future researchers focus on other dimensions or structures of the leadership skills of principals and teachers, as suggested by Slocum and Hellriegel (2007).

This research also only involves the leadership skills of the principals and teachers of general day national secondary schools. Therefore, it is recommended to conduct further research in schools such as boarding schools, religious high schools, ethnic high schools and technical vocational high schools. In doing so, the results of the study can be compared with the results of this study.

6. Conclusion

The results confirm that the principal and teacher leadership competencies and 21st century teacher learning and facilitating practice scale are valid and reliable. There are 52 items consisting of four main dimensions of principals' leadership competencies, namely personal and social skills, managing skills, leading skills and transformative skills. As for teacher leadership competencies, there are three main dimensions, namely ethic and spirituality skills, managing skills and transformative skills. While the practice of learning and facilitating has one dimension only. These findings also confirm that the leadership competencies of principals, teachers and 21st century teacher learning and facilitating practices are very high which is very important in more effective and accurate implementation and improvement taking into account all factors influencing the leadership competence component among principals, teachers and further enhance 21st century teacher learning and facilitating practices. This study also concludes that the principal and teacher leadership competency scale and 21st century teacher learning and facilitating practice is a highly effective instrument to determine leadership skill levels amongst principal and teachers, and to provide guidance and references to the Malaysian School or Ministry of Education. The findings and the instrument can inform policymakers as well as help monitor implementation of principal leadership and teacher leadership competences and teacher-learning, teacher-facilitating practices of the 21st century.

Fund

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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