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EFA for Principal Instructional, Technology Acceptance and Competency Teaching East Coast Boarding School in Malaysia

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Abstract

The principal is an individual who plays a very important role in steering the school towards an effective school. In the field of leadership there are many models that principals can use in leading schools. It was found that the Principal who uses the instructional leadership model has managed to steer the school so brilliantly. The model built by Hallinger and Murphy (1985) has been seen as a very easy model to be used as a guide for principals because this model contains dimensions that are easy to understand and easy to use as a guide for principals and school leaders. Before the actual study is carried out, a pilot study needs to be carried out to ensure that the questionnaire taken from the original questionnaire can be used after going through the validity and reliability process, the EFA process needs to be carried out to ensure that the questionnaire that will be used is valid in terms of validity and reliability before it is distributed to the respondents research. In this EFA process there are three construct namely Prinsipal Instructional Leadership, Aplication Of Technology Acceptance And Teacher Teaching Competency. This study uses quantitative research methods based on Structural Equation Modeling (SEM) to analyze various relationships between variables in the study model. Before the data is analyzed using SEM, Exploratory Factor Analysis (EFA) is carried out to identify the appropriateness of the items used in the research instrument. This study describes in detail the procedure of conducting EFA analysis for each construct. The findings of this study show validity values based on Kaiser-Meyer-Olkin (KMO), Total Variance Explained (TVE), Factor Loading (FL) and reliability values based on Cronbach's Alpha (AC), have met all the required values.

Keywords: Exploratory Factor Analysis (EFA), Validity, Reliability

Introduction

Developments in technology, especially in the world of education, have caused competition among countries in the world to become countries that use technology in the field of

education (Cambridge Assessment International Education, 2018). This development has caused the country's education system to change towards a technological country and the country strives to meet the demands of technology in order not to fall behind in the current of modernity, especially changes in the field of education (Cambridge Assessment International Education, 2018). In realizing the government's desire to make the country informative, the role of school principals is very important to ensure that all members of the school organization use technology and teachers use technology in teaching and learning in the classroom. The principal's leadership plays a very important role in realizing the planned vision and mission (Ismail, Ahmad Fauzi & Othman, 2012), Leaders who have a clear vision in mobilizing the use of ICT in schools are able to influence teachers to apply technology in teaching (Norakmar et al., 2020).

According to the Malaysian Education Development Plan (MEDP), Principals and head teachers who focus on instructional leadership rather than administration have successfully increased student achievement by up to 20% (Ministry of Education Malaysia, 2013). This shows that the principal plays the most important role in steering a school. To ensure the effectiveness of school management, principals are advised to use the Instructional Leadership model introduced by Halingger and Murphy (1985) in managing the administration of a school because this model is still relevant and used as a reference even though it was introduced by Halingger and Murphy since 1985.

In ensuring the effectiveness of the Principal's Instructional Leadership influence on Teacher Teaching Competence especially in 21st century learning, the teacher's acceptance of technology plays an important role in creating a strong relationship between Instructional Leadership and Teacher Teaching effectiveness. Based on the highlights of previous studies, there are many factors that affect the effectiveness of technology application such as Teachers' Attitudes and Acceptance of Technology (Indu, 2017; Siti Hajar & Suguneswary, 2016), Teachers' Readiness in 21st Century Learning and Teaching (Apak & Suhaimi, 2018), The Relationship Between The Attitude And Skills Of School Leaders Towards The Use Of Ict (Pokirthanan, Mohd Faiz & Hapini, 2019; Siti Hajar & Suguneswary, 2016), Teacher Support, Infrastructure And Ict Competence (Ismail et al., 2012). The level of teacher commitment in integrating ICT in implementing School Based Assessment (PBS) is low. This is due to teachers not being ready to accept any changes involving the application of technology in teaching and assessment (Azni, 2015), teachers' lack of ICT skills, weak internet networks, weak technical support, lack of time, teachers not being efficient in using computers, teacher motivation low (Talirkodi, 2016), teachers' beliefs and intentions play a very important role in ensuring that teachers use technology in teaching, government policy, encouragement, infrastructure facilities provided and monitoring implemented in today's education system (Ani, 2016), competency factors teachers and school infrastructure support (Ismail et al., 2012) and knowledge, attitude, innovation attributes, teacher personality and organizational support.

Meanwhile, teacher competence in teaching is seen as the main factor in improving student achievement. Highly competent teachers will try to improve their competence in teaching (Yusri & Ismail, 2015). However, in reality, principals do not encourage teachers to integrate ICT, especially the use of mobile technology in teaching because principals are not skilled in ICT, causing principals to not try to encourage teachers to apply the use of technology in teaching and learning (Abidin et al., 2017). Statement this is supported based on a study by Norhaini (2016) who found that principals are often busy with attending meetings and outside activities and that much time is used by principals to do work that is not related to teaching and learning. The effect of the principal's busyness has had an impact on the teaching

competence of teachers, teachers do not have sufficient competence especially in terms of teaching (Yusri & Ismail, 2015; Yusof et al., 2019).
Based on existing problems, this study was conducted to see the exploratory factor analysis for the three constructs, namely the principal's instructional leadership, the acceptance of technology applications and the teacher's teaching competence.

Exploratory Factor Analysis (EFA)

EFA is conducted to identify some components that exist in the set of questionnaires that have been formed. EFA is a statistical technique that transforms a set of original construct data linearly into a set of smaller constructs that can give a comprehensive picture of all the information contained in the original construct (Duntemen, 1989). The purpose of EFA is to reduce the dimensions of the original data to several smaller components that can be interpreted more easily and meaningfully (Duntemen, 1989; Lewis-Beck, 1994 & Field, 2006). According to Tabachnick and Fidell (2007), EFA needs to go through several stages. The first stage calculates the correlation matrix between all the factor-analyzed constructs. The next stage involves extracting some factors from the correlation matrix and determining the number of factors formed. The rotation of the factors is done to improve the interpretation so that the factors are more meaningful and can be interpreted. The final and most important stage in factor analysis is to interpret the results of the factors obtained and give an appropriate name to each factor.
According to Chik and Abdullah (2018); Hoque et al (2017), if a researcher adapts an instrument that has been built by previous researchers and modifies the statement to fit the current study, then they need to re-run the EFA procedure. This is because the current study area may be different from previous studies, or the current study population is much different from previous studies in terms of socio-economic status, race and culture. Thus, there may be some items that were built before, no longer suitable for the current study or there may also be a different item structure in the current study compared to the structure in the previous study. Therefore, researchers need to recalculate the Internal Reliability value for the current instrument, which is the new Cronbach's Alpha value (Chik & Abdullah, 2018; Hoque et al., 2017). In this study, the researcher conducted a pilot study on 125 teacher in east coast boarding school in Malaysia and re-conducted EFA on the items that measure the construct.

Findings

Exploratory Factor Analysis (EFA) for Principal Instructional Leadership Base On Define School Mission Construct

Each item in the Principal Instructional Leadership base on Define School Mission construct uses a total of 12 items and is labeled MMS1 to MMS6 and MRM1 to MMS6. Next, the use of an interval scale for measuring the items is between one (1) (Strongly Disagree) to 10 (Strongly Agree). The EFA procedure using the Principal Component Analysis (PCA) method with Varimax Rotation was conducted on 12 items that measure the Principal Instructional Leadership base on Define School Mission construct. The results of Table 1 below show that the value of Bartlet's Test is significant (P-Value < 0.05). Measure of Sampling Adequacy by Kaiser-Meyer-Olkin (KMO) is 0.941 which is above the minimum value of 0.6 (Chik & Abdullah, 2018; Hoque et al., 2017). Both of these achievements (Bartlet's Test significant, & KMO value>0.6) reflect the observed data is suitable for the next procedure in EFA (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 1
KMO Values and Bartlet's Test for Principal Instructional Leadership Base On Define School Mission Construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.941
Bartlett's Test of Sphericity	Approx. Chi-Square	1809.066
	df	66
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Table 2 below shows the total variance value estimated by the items used to measure the Principal Instructional Leadership base on Define School Mission construct. Reading from Table 2 below found that Principal Instructional Leadership base on Define School Mission construct measured using 12 items in one component can measure Principal Instructional Leadership base on Define School Mission construct as much as 81.778%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 2
Total Variance Explained for Principal Instructional Leadership base on Define School Mission Construct

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	8.156	67.968	67.968
2	1.657	13.809	81.778

Findings from Table 2 above show that Principal Instructional Leadership base on Define School Mission construct is measured by only two components. Thus, the researcher wants to know the selected items to measure the component. Table 3 below shows the distribution of items accepted to measure Principal Instructional Leadership base on Define School Mission construct. All items have a factor loading value exceeding the minimum limit of 0.6 and items that are less than 0.6 should be discarded because they do not contribute to the measurement of the construct (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 3
Factor Loading for Two (2) Component Principal Instructional Leadership Base On Define School Mission Construct

Items	Component	
	1	2
MRM1	0.880	
MRM2	0.902	
MRM3	0.850	
MRM4	0.667	
MRM5	0.885	
MRM6	0.878	
MMS1		0.900
MMS2		0.957
MMS3		0.896
MMS4		0.857
MMS5		0.823
MMS6		0.891

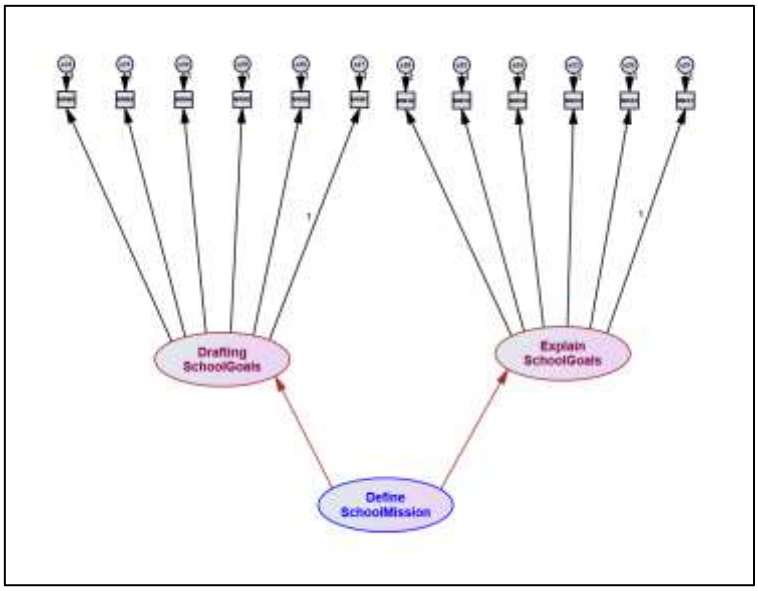

Figure 1: Position of Components and Items for Principal Instructional Leadership Base On Define School Mission Construct (After EFA)

Another piece of information that researchers need to report is the reliability value of the items that have been built to measure that construct. The measure of instrument reliability is estimated through Cronbach's Alpha value that exceeds the minimum limit of 0.7 to be adopted in the study. Table 4 below shows the Cronbach's Alpha value for each item in the Principal Instructional Leadership base on Define School Mission construct that exceeds 0.7 and can be used in this study (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 4
Cronbach's Alpha Value for Each Item in the Principal Instructional Leadership Base On Define School Mission Construct

Component	Number of Items	Cronbach's Alpha
1	6	0.956
2	6	0.892

Exploratory Factor Analysis (EFA) for Principal Instructional Leadership Base On Program Management Instructional Construct

Each item in the Principal Instructional Leadership base on Program Management Instructional construct uses a total of 26 items and is labeled MKS1 to MKS7, PPI1 to PPI11 AND MKM1 to MKM8. Next, the use of an interval scale for measuring the items is between one (1) (Strongly Disagree) to 10 (Strongly Agree). The EFA procedure using the Principal Component Analysis (PCA) method with Varimax Rotation was conducted on 12 items that measure the Principal Instructional Leadership Base On Program Management Instructional construct. The results of Table 5 below show that the value of Bartlet's Test is significant (P-Value < 0.05). Measure of Sampling Adequacy by Kaiser-Meyer-Olkin (KMO) is 0.959 which is above the minimum value of 0.6 (Chik & Abdullah, 2018; Hoque et al., 2017). Both of these achievements (Bartlet's Test significant, & KMO value>0.6) reflect the observed data is suitable for the next procedure in EFA (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 5
KMO Values and Bartlet's Test for Principal Instructional Leadership Base On Program Management
Instructional Construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.959
Bartlett's Test of Sphericity	Approx. Chi-Square	5278.328
	df	235
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Table 6 below shows the total variance value estimated by the items used to measure the Principal Instructional Leadership base on Program Management Instructional construct. Reading from Table 6 below found that Principal Instructional Leadership base on Program Management Instructional construct measured using 26 items in three components can measure Principal Instructional Leadership base on Program Management Instructional construct as much as 85.696%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 6
Total Variance Explained for Principal Instructional Leadership base on Program Management Instructional Construct

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	11.498	44.224	44.224
2	7.764	29.860	74.084
3	3.089	11.612	85.696

Findings from Table 6 above show that Principal Instructional Leadership base on Program Management
Instructional construct is measured by three components. Thus, the researcher wants to know the selected items to measure the component. Table 7 below shows the distribution of items accepted to measure Principal Instructional Leadership base on Program Management Instructional construct. All items have a factor loading value exceeding the minimum limit of 0.6 and items that are less than 0.6 should be discarded because they do not contribute to the measurement of the construct (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 7
Factor Loading for Three (3) Component Principal Instructional Leadership Base On Program Management
Instructional Construct

Items	Component		
	1	2	3
MKS1		0.688	
MKS2		0.764	
MKS3		0.784	
MKS4		0.736	
MKS5		0.765	
MKS6		0.777	
MKS7		0.609	
PPI1	0.730		
PPI2	0.713		
PPI3	0.745		
PPI4	0.823		
PPI5	0.729		
PPI6	0.691		
PPI7	0.695		
PPI8	0.802		
PPI9	0.730		
PPI10	0.761		
PPI11	0.668		
MKM1			0.634
MKM2			0.625
MKM3			0.784
MKM4			0.803

MKM5	0.828
MKM6	0.817
MKM7	0.792
MKM8	0.740

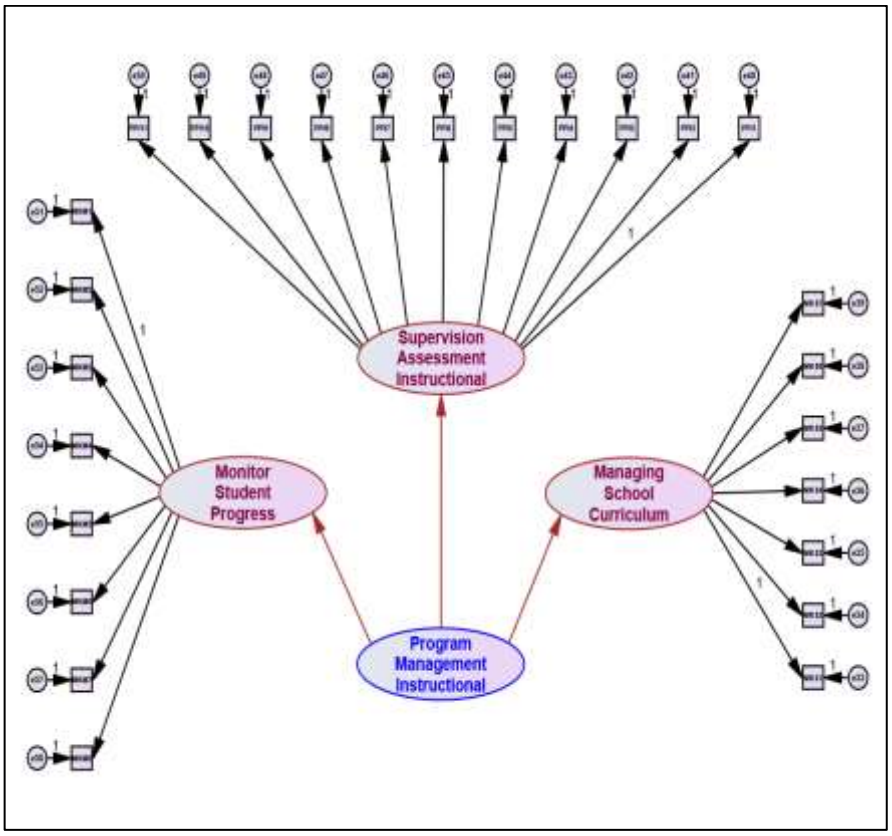

Figure 2: Position of Components and Items for Principal Instructional Leadership Base On Program Management

Instructional Construct (After EFA)

Another piece of information that researchers need to report is the reliability value of the items that have been built to measure that construct. The measure of instrument reliability is estimated through Cronbach's Alpha value that exceeds the minimum limit of 0.7 to be adopted in the study. Table 8 below shows the Cronbach's Alpha value for each item in the Principal Instructional Leadership base on Program Management Instructional construct that exceeds 0.7 and can be used in this study (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 8

Cronbach's Alpha Value for Each Item in the Principal Instructional Leadership Base On Program Management Instructional Construct

Component	Number of Items	Cronbach's Alpha
1	7	0.975
2	11	0.976
3	8	0.973

Exploratory Factor Analysis (EFA) for Principal Instructional Leadership Base On Creating Climate Positive School Construct

Each item in the Principal Instructional Leadership base on Creating Climate Positive School construct uses a total of 23 items and is labeled MG1 to MG4 and MMI1 to MMI5, KT3 to KT5, MPP1 to MPP8, MSA1 to MSA5, MGG2 to MGG4. Next, the use of an interval scale for measuring the items is between one (1) (Strongly Disagree) to 10 (Strongly Agree). The EFA procedure using the Principal Component Analysis (PCA) method with Varimax Rotation was conducted on 23 items that measure the Principal Instructional Leadership base on Creating Climate Positive School construct. The results of Table 9 below show that the value of Bartlet's Test is significant (P-Value < 0.05). Measure of Sampling Adequacy by Kaiser-Meyer-Olkin (KMO) is 0.962 which is above the minimum value of 0.6 (Chik & Abdullah, 2018; Hoque et al., 2017). Both of these achievements (Bartlet's Test significant, & KMO value>0.6) reflect the observed data is suitable for the next procedure in EFA (Chik & Abdullah, 2018; Hoque et al., 2017).

Table
KMO Values and Bartlet's Test for Principal Instructional Leadership Base On Creating Climate Positive School Construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.962
Bartlett's Test of Sphericity	Approx. Chi-Square	5914.526
	df	528
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Table 10 below shows the total variance value estimated by the items used to measure the Principal Instructional Leadership base on Creating Climate Positive School construct. Reading from Table 10 below found that Principal Instructional Leadership base on Creating Climate Positive School construct measured using 23 items in three component can measure Principal Instructional Leadership base on Creating Climate Positive School construct as much as 85.384%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 10
Total Variance Explained for Principal Instructional Leadership Base On Creating Climate Positive School Construct

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	9.024	27.345	27.345
2	6.552	19.854	47.199
3	3.777	11.446	58.645
4	3.237	9.808	68.453
5	3.099	9.392	77.845
6	2.488	7.539	85.384

Findings from Table 10 above show that Principal Instructional Leadership base on Creating Climate Positive School construct is measured by six components. Thus, the researcher wants

to know the selected items to measure the component. Table 11 below shows the distribution of items accepted to measure Principal Instructional Leadership base on Creating Climate Positive School construct. All items have a factor loading value exceeding the minimum limit of 0.6 and items that are less than 0.6 should be discarded because they do not contribute to the measurement of the construct (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 11
Factor Loading for Six (6) Component Principal Instructional Leadership Base On Creating Climate Positive School Construct

Items	Component					
	1	2	3	4	5	6
MG1					0.645	
MG3					0.622	
MG4					0.793	
MMI2		0.722				
MMI3		0.709				
MMI4		0.722				
KT3						0.819
KT4						0.872
KT5						0.818
MPP1			0.766			
MPP2			0.675			
MPP4			0.693			
MPP6			0.651			
MPP7			0.656			
MPP8			0.742			
MSA1	0.656					
MSA2	0.633					
MSA3	0.604					
MSA4	0.693					
MSA5	0.662					
MGG2				0.605		
MGG3				0.780		
MGG4				0.702		

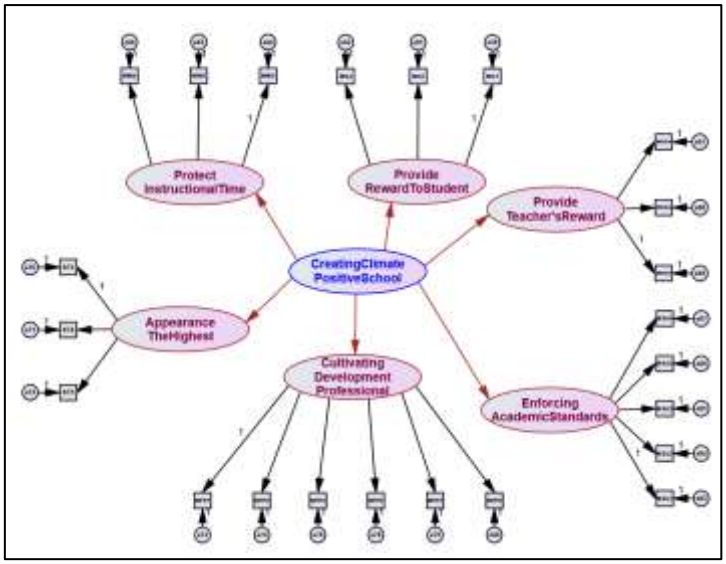

Figure 3: Position of Components and Items for Principal Instructional Leadership Base On Creating Climate Positive School Construct (After EFA)

Another piece of information that researchers need to report is the reliability value of the items that have been built to measure that construct. The measure of instrument reliability is estimated through Cronbach's Alpha value that exceeds the minimum limit of 0.7 to be adopted in the study. Table 12 below shows the Cronbach's Alpha value for each item in the Principal Instructional Leadership base on Creating Climate Positive School construct that exceeds 0.7 and can be used in this study (Chik & Abdullah, 2018 and Hoque et al., 2017).

Table 12
Cronbach's Alpha Value for Each Item in the Principal Instructional Leadership Base On Creating Climate Positive School Construct

Component	Number of Items	Cronbach's Alpha
1	3	0.891
2	3	0.845
3	3	0.893
4	6	0.956
5	5	0.950
6	3	0.908

Exploratory Factor Analysis (EFA) For Acceptance of Technology Applications Construct

Each item in the Acceptance Of Technology Applications construct uses a total of 20 items and is labeled PKB1 to PKB10 and PMG1 to PMG10. Next, the use of an interval scale for measuring the items is between one (1) (Strongly Disagree) to 10 (Strongly Agree). The EFA procedure using the Principal Component Analysis (PCA) method with Varimax Rotation was conducted on 20 items that measure the Acceptance of Technology Applications construct. The results of Table 13 below show that the value of Bartlet's Test is significant (P-Value < 0.05). Measure of Sampling Adequacy by Kaiser-Meyer-Olkin (KMO) is 0.963 which is above the minimum value of 0.6 (Chik & Abdullah, 2018; Hoque et al., 2017). Both of these achievements (Bartlet's Test significant, & KMO value>0.6) reflect the observed data is suitable for the next procedure in EFA (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 13
KMO Values and Bartlet's Test for Acceptance of Technology Applications Construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.962
Bartlett's Test of Sphericity	Approx. Chi-Square	3997.2586
	df	190
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Table 14 below shows the total variance value estimated by the items used to measure the Acceptance of Technology Applications construct. Reading from Table 14 below found that Acceptance of Technology Applications construct measured using 20 items in two component can measure Acceptance of Technology Applications construct as much as 84.566%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 14
Total Variance Explained for Acceptance of Technology Applications Construct

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	12.517	62.583	62.583
2	4.397	21.983	84.566

Findings from Table 14 above show that construct is measured by six components. Thus, the researcher wants to know the selected items to measure the component. Table 15 below shows the distribution of items accepted to measure construct. All items have a factor loading value exceeding the minimum limit of 0.6 and items that are less than 0.6 should be discarded because they do not contribute to the measurement of the construct (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 15
Factor Loading for Two (2) Component Acceptance of Technology Applications Construct

Items	Component	
	1	2
PKB1		0.883
PKB2		0.881
PKB3		0.888
PKB4		0.899
PKB5		0.907
PKB6		0.921
PKB8		0.863
PKB9		0.892
PKB10		0.889
PMG1	0.784	
PMG2	0.781	
PMG3	0.738	
PMG4	0.881	

PMG5	0.814
PMG6	0.873
PMG7	0.797
PMG8	0.713
PMG9	0.878

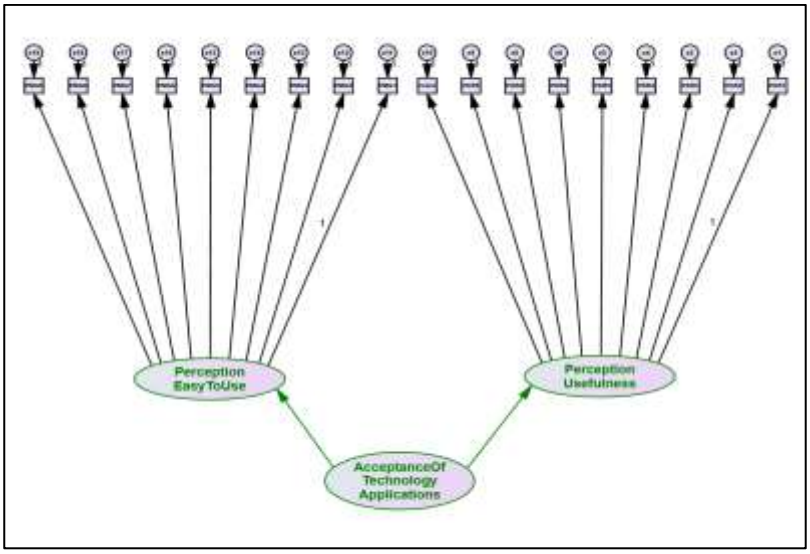

Figure 4: Position of Components and Items for Acceptance of Technology Applications Construct (After EFA)

Another piece of information that researchers need to report is the reliability value of the items that have been built to measure that construct. The measure of instrument reliability is estimated through Cronbach's Alpha value that exceeds the minimum limit of 0.7 to be adopted in the study. Table 16 below shows the Cronbach's Alpha value for each item in the Acceptance of Technology Applications construct that exceeds 0.7 and can be used in this study (Chik & Abdullah, 2018 and Hoque et al., 2017).

Table 16
Cronbach's Alpha Value for Each Item in the Acceptance of Technology Applications Construct

Component	Number of Items	Cronbach's Alpha
1	9	0.986
2	9	0.946

Exploratory Factor Analysis (EFA) For Competence Teaching Teacher Construct

Each item in the Competency Teaching Teacher construct uses a total of 30 items and is labeled NPG1 to NPG10, PK1 to PK10 and PP1 to PP10. Next, the use of an interval scale for measuring the items is between one (1) (Strongly Disagree) to 10 (Strongly Agree). The EFA procedure using the Principal Component Analysis (PCA) method with Varimax Rotation was conducted on 30 items that measure the Competency Teaching Teacher construct. The results of Table 17 below show that the value of Bartlet's Test is significant (P-Value < 0.05). Measure of Sampling Adequacy by Kaiser-Meyer-Olkin (KMO) is 0.964 which is above the minimum value of 0.6 (Chik & Abdullah, 2018; Hoque et al., 2017). Both of these achievements (Bartlet's Test significant, & KMO value>0.6) reflect the observed data is suitable for the next procedure in EFA (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 17
KMO Values and Bartlet's Test for Competency Teaching Teacher Construct

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.964
Bartlett's Test of Sphericity	Approx. Chi-Square	5592.769
	df	435
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Table 18 below shows the total variance value estimated by the items used to measure the Competency Teaching Teacher construct. Reading from Table 18 below found that Competency Teaching Teacher construct measured using 30 items in three component can measure Competency Teaching Teacher construct as much as 83.051%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 18
Total Variance Explained for Competency Teaching Teacher Construct

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	11.017	36.722	36.722
2	7.948	26.493	63.215
3	5.951	19.836	83.051

Findings from Table 18 above show that construct is measured by three components. Thus, the researcher wants to know the selected items to measure the component. Table 19 below shows the distribution of items accepted to measure construct. All items have a factor loading value exceeding the minimum limit of 0.6 and items that are less than 0.6 should be discarded because they do not contribute to the measurement of the construct (Chik & Abdullah, 2018; Hoque et al., 2017)

Table 19
Factor Loading for Two (3) Component Competency Teaching Teacher Construct

Items	Component		
	1	2	3
NPG2			0.784
NPG3			0.834
NPG4			0.772
NPG5			0.761
NPG6			0.757
NPG7			0.708
NPG8			0.819
NPG9			0.736
NPG10			0.793
PK1	0.638		
PK2	0.611		
PK3	0.661		

PK4	0.644	
PK5	0.647	
PK6	0.704	
PK7	0.709	
PK8	0.614	
PK9	0.666	
PK10	0.852	
PP1		0.664
PP2		0.682
PP3		0.696
PP6		0.699
PP7		0.605
PP8		0.690
PP9		0.705
PP10		0.687

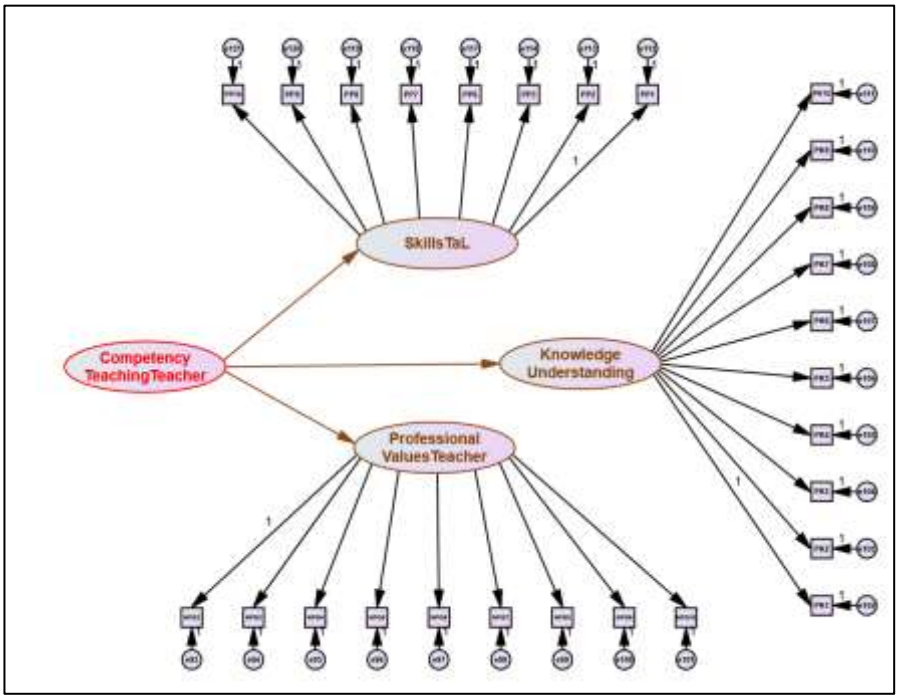

Figure 5: Position of Components and Items for Competency Teaching Teacher Construct (After EFA

Another piece of information that researchers need to report is the reliability value of the items that have been built to measure that construct. The measure of instrument reliability is estimated through Cronbach's Alpha value that exceeds the minimum limit of 0.7 to be adopted in the study. Table 20 below shows the Cronbach's Alpha value for each item in the Competency Teaching Teacher construct that exceeds 0.7 and can be used in this study (Chik & Abdullah, 2018; Hoque et al., 2017).

Table 20
Cronbach's Alpha Value for Each Item in the Competency Teaching Teacher Construct

Component	Number of Items	Cronbach's Alpha
1	9	0.976
2	10	0.974
3	8	0.957

Conclusion

Overall, the requirements of the items in each construct as a whole meet the achievement of Bartlet's Test (significant), KMO value (> 0.6), factor loading value exceeds the minimum limit of 0.6 and Cronbach's Alpha exceeds the minimum limit of 0.7 to be used in the study. This reflects that the items are not set aside and qualified to be used in this study (Chik & Abdullah, 2018 and Hoque et al., 2017). Figure 6 shows all the items in the study model after EFA.

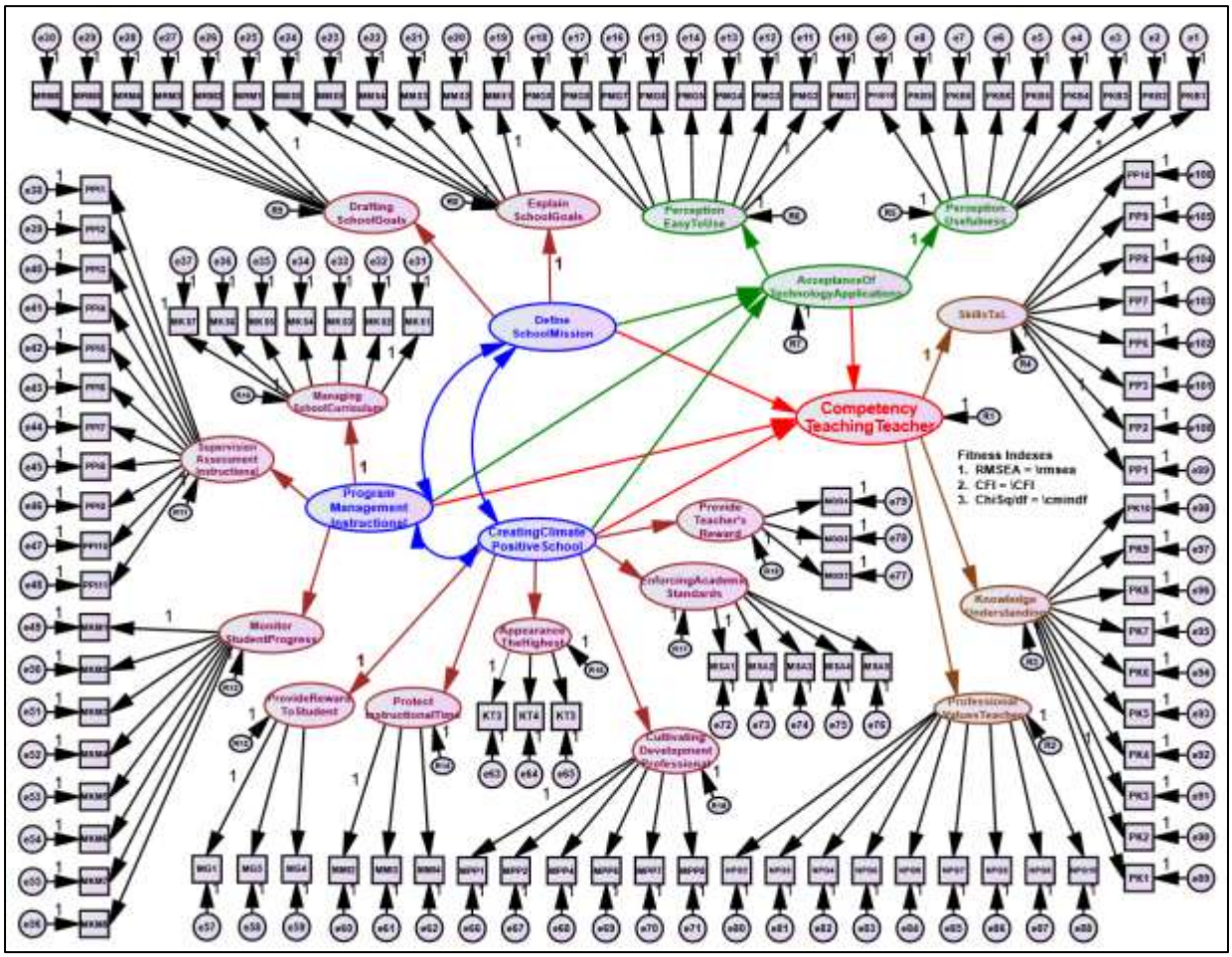

Figure 6: Overall Principal Instructional Leadership, Acceptance of Technology Applications and, Competency Teaching Teacher Constructs

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