The Validity and Reliability Constructs of the 4T1R Model and Islamic Education Management Practices of People's Religious School Management, Southern Thailand

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ABSTRACT

In the modern era of education, the People's Religious Schools in the southern provinces of Thailand function as important Islamic educational institutions, providing students with religious and academic knowledge in line with the Ministry of Education curriculum. These institutions not only impart knowledge, but also play a role in shaping individuals who are moral and competitive. To achieve this goal, school leadership and management must implement effective management practices, based on the 4T1R model, which includes planning, organizing, guiding, supervising and surrendering. The structured supervision mechanism is still not stable, resulting in unbalanced and resilient curriculum implementation. These factors affect the learning process which should focus on strengthening students' morals and life skills. In addition, the concepts and principles of teaching and learning in the 21st century require teachers to have qualifications beyond just teaching. They also need to have the ability to guide students in navigating the world of learning and learning from real experiences. This study was conducted to develop and validate an instrument based on the Exploratory Factor Analysis (EFA) process for measuring the 4T1R Model (based on Planning, Organize, Guiding, Surrender, Supervise) and Islamic Education Management Practices people's Religious School Management, Southern Thailand. 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, 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 (CA), have met all the required values.

Keywords Exploratory Factor Analysis (EFA), Validity, Total Variance Explained, Factor Loading, Reliability

INTRODUCTION

In the 21st century, many countries are implementing a development paradigm by focusing on solving various problems to achieve excellence in politics, economics, and education. Thongchai (2006) stated that society now has unlimited access to information, making cultural change possible quickly through sophisticated communication tools. Education is an important element in the process of societal success, requiring the existence of educational institutions and the role of teachers to educate a balanced, knowledgeable, and morally upright generation (Pitchaya, 2016). Islamic education must be based on the Quran and Sunnah as the main source of knowledge. Every Muslim is required to seek knowledge throughout his life, with teachers as the disseminators of religious knowledge to the community (Aminah, 2000). Islam emphasizes the importance of education, starting from an early age, to build a good community culture and have a high impact. In

Thailand, there is freedom of religion and Islam is the second largest religion with 3.6 million people consisting of Muslims, especially in southern Thailand (National Statistics Office Ministry of Digital Economy and Society, 2024). Malay is widely spoken among the local population of Malay descent and Muslims, especially in the provinces of Pattani, Narathiwat, Yala, and parts of Satun. The 1999 Thai Education Constitution defines education as a process that develops individuals and society (Muhamatsakree, 2008). In this context, Islamic education demands that its followers be highly educated and knowledgeable, especially in matters that do not conflict with Islamic law. However, education management in southern Thailand faces challenges in balancing academic aspects and religious education.

Residents in southern Thailand tend to enroll their children in religious schools rather than national schools. There are administrative differences between national primary schools and religious schools influenced by the density of the Muslim population. The government has tried to divide the education sector to meet the needs of the community, but this is still not enough (Adnan, 2010). To meet learning needs, the Thai government has set guidelines that require the teaching of Islamic education for two hours a week, but the community expects a more balanced education (Yala District Education Office, 2007). In addition, changes to the Islamic education curriculum in religious schools include more modern teaching aspects, ensuring continuity from the pondok study system. The purpose of this research is to identify the influence of 4T1R Model (based on Planning, Organize, Guiding, Surrender, Supervise) on Islamic Education Management Practices of people's Religious School Management, Southern Thailand.

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.

This study uses items in an instrument that has been built by the researcher himself. According to Chik and Abdullah (2018), Chik, Abdullah, Ismail and Mohd Noor (2024), Awang (2012) and Hoque et al. (2017), if a researcher adapts an item that has been built by a previous researcher or builds a new item in the instrument or modifies the statement to fit the current study, then they need to re-run the EFA (Exploratory Factor Analysis) 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. Therefore, 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. Thus, researchers need to recalculate the Internal Reliability value for the current instrument, which is the new Alpha Cronbach value (Chik et al., 2024, Awang, 2012; Hoque et al., 2017).

FINDINGS

Exploratory Factor Analysis (EFA) for 4T1R Model Based on Planning

The 4T1R Model based on Planning which uses as many as 12 items and is labeled as MR1 to MR12. Next, the use of an interval scale for the measurement of items is between one (1) to 10. Principal Component Analysis (PCA) in the EFA process using varimax rotation for the 4T1R Model based on Planning for the measurement of 12 items. Table 1 below shows the Bartlett's test results that are significant for P values less than 0.05 (P < 0.05). Next, the value for the measurement of sampling adequacy from Kaiser-Meyer-Olkin (KMO) is 0.886. The value obtained has exceeded the minimum limit value of 0.6 and the achievement of both

of these tests (Bartlet's test is significant and KMO value > 0.6), showing that the data used in this study is appropriate according to the EFA procedure (Chik et al., 2024; Hoque et al., 2017; Awang, 2012).

Table 1: KMO Values and Bartlet's Test for 4T1R Model Based on Planning

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.886
Bartlett's Test of Sphericity	Approx. Chi-Square	577.771
	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. Reading from Table 2 below found that 4T1R Model based on Planning measured using 12 items in one (1) component can measure 4T1R Model based on Planning as much as 70.207%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik et al., 2024; Hoque et al., 2017).

Table 2: Total Variance Explained for 4T1R Model Based on Planning

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	5.025	70.207	70.207

Thus, the researcher wants to know the selected items to measure the component. Table 3 below shows the distribution of items accepted to measure 4T1R Model based on Planning. 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 et al., 2024).

Table 3: Factor Loading for One (1) Component 4T1R Model Based on Planning

Component Matrix	
Items	Component
MR1	0.814
MR2	0.798
MR3	0.711
MR4	0.770
MR5	0.738
MR6	0.761
MR7	0.706

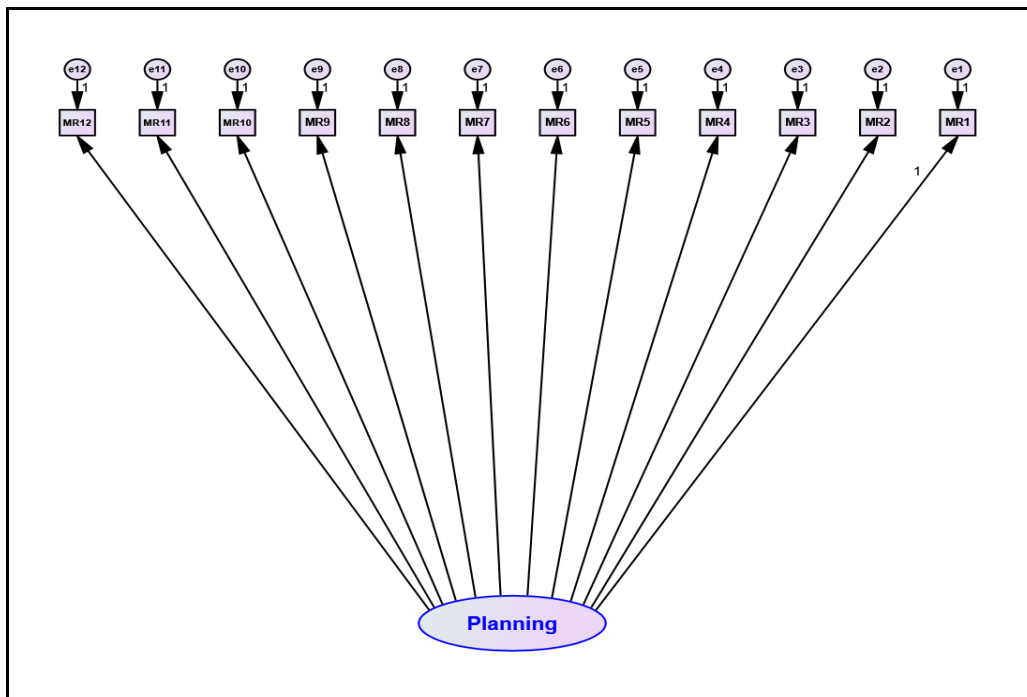|	
MR8	0.760
MR9	0.725
MR10	0.739
MR11	0.775
MR12	0.714

Figure 1: Position of Components and Items for 4T1R Model Based on Planning (Before and 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 4T1R Model based on Planning that exceeds 0.7 and can be used in this study (Chik et al., 2024).

Table 4: Cronbach's Alpha Value for Each Item in the 4T1R Model Based on Planning

Component	Number of Items	Cronbach's Alpha
1	12	0.906

Exploratory Factor Analysis (EFA) for 4T1R Model Based on Organize

The 4T1R Model based on Organize which uses as many as nine (9) items and is labeled as MT1 to MT9. Next, the use of an interval scale for the measurement of items is between one (1) to 10. Principal Component Analysis (PCA) in the EFA process using varimax rotation for the 4T1R Model based on Organize for the measurement of nine (9) items. Table 5 below shows the Bartlett's test results that are significant for P values less than 0.05 (P < 0.05). Next, the value for the measurement of sampling adequacy from Kaiser-Meyer-Olkin (KMO) is 0.888. The value obtained has exceeded the minimum limit value of 0.6 and the achievement of both of these tests (Bartlet's test is significant and KMO value > 0.6), showing that the data used in this study is appropriate according to the EFA procedure (Chik et al., 2024; Hoque et al., 2017; Awang, 2012).

Table 5: KMO Values and Bartlet's Test for 4T1R Model Based on Organize

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.888
Bartlett's Test of Sphericity	Approx. Chi-Square	514.876
	df	36
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Reading from Table 6 below found that 4T1R Model based on Organize measured using nine (9) items in one (1) component can measure 4T1R Model based on Organize as much as 79.543%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik et al., 2024; Hoque et al., 2017).

Table 6: Total Variance Explained for 4T1R Model Based on Organize

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	5.359	79.543	79.543

Thus, the researcher wants to know the selected items to measure the component. Table 7 below shows the distribution of items accepted to measure 4T1R Model based on Organize. 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 et al., 2024).

Table 7: Factor Loading for One (1) Component 4T1R Model Based on Organize

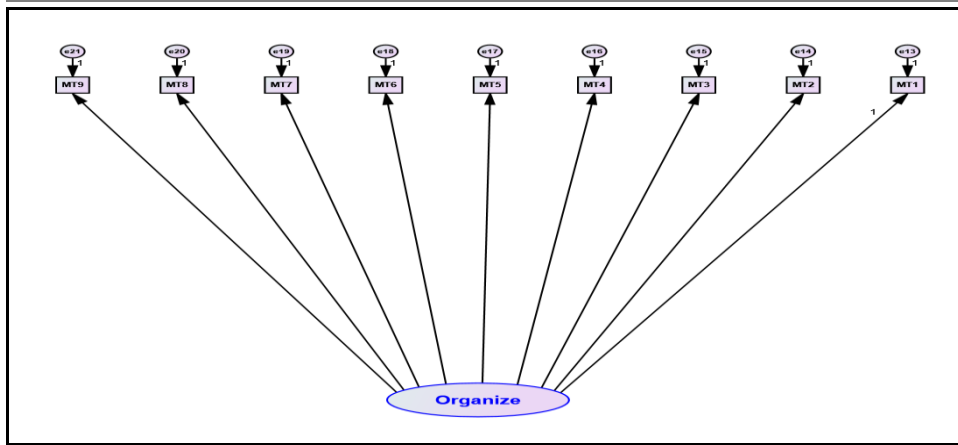| Component Matrix	
Items	Component
MT1	0.771
MT2	0.765
MT3	0.760
MT4	0.819
MT5	0.739
MT6	0.816
MT7	0.798
MT8	0.742
MT9	0.729

Figure 2: Position of Components and Items for 4T1R Model Based on Organize (Before and 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 4T1R Model based on Organize that exceeds 0.7 and can be used in this study (Chik et al., 2024; Hoque et al., 2017).

Table 8: Cronbach's Alpha Value for Each Item in the 4T1R Model Based on Organize

Component	Number of Items	Cronbach's Alpha
1	9	0.915

Exploratory Factor Analysis (EFA) for 4T1R Model Based on Guiding

The 4T1R Model based on Guiding which uses as many as 11 items and is labeled as MB1 to MB11. Next, the use of an interval scale for the measurement of items is between one (1) to 10. Principal Component Analysis (PCA) in the EFA process using varimax rotation for the 4T1R Model based on Guiding for the measurement of 11 items. Table 9 below shows the Bartlett's test results that are significant for P values less than 0.05 (P < 0.05). Next, the value for the measurement of sampling adequacy from Kaiser-Meyer-Olkin (KMO) is 0.879. The value obtained has exceeded the minimum limit value of 0.6 and the achievement of both of these tests (Bartlet's test is significant and KMO value > 0.6), showing that the data used in this study is appropriate according to the EFA procedure (Chik et al., 2024; Hoque et al., 2017; Awang, 2012).

Table 9: KMO Values and Bartlet's Test for 4T1R Model Based on Guiding

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.879
Bartlett's Test of Sphericity	Approx. Chi-Square	758.172
	df	55
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Reading from Table 10 below found that 4T1R Model based on Guiding measured using 11 items in one (1) component can measure 4T1R Model based on Guiding as much as 70.358%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik et al., 2024; Hoque et al., 2017).

Table 10: Total Variance Explained for 4T1R Model Based on Guiding

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.639	70.358	70.358

Thus, the researcher wants to know the selected items to measure the component. Table 11 below shows the distribution of items accepted to measure 4T1R Model based on Guiding. 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 et al., 2024).

Table 11: Factor Loading for One (1) Component 4T1R Model Based on Guiding

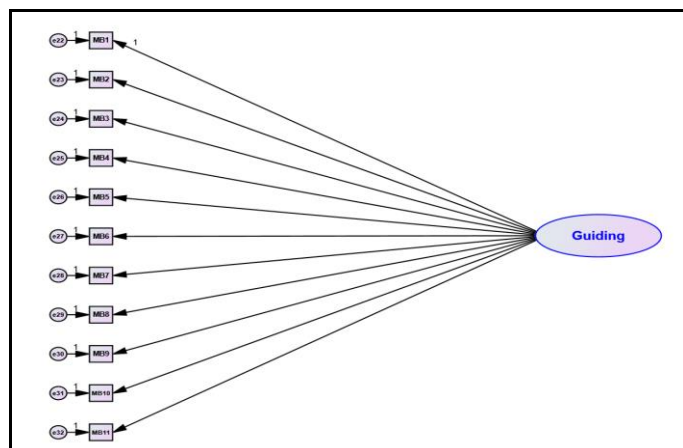| Component Matrix	
Items	Component
MB1	0.811
MB2	0.805
MB3	0.854
MB4	0.778
MB5	0.768
MB6	0.790
MB7	0.764
MB8	0.794
MB9	0.783
MB10	0.837
MB11	0.791

Figure 3: Position of Components and Items for 4T1R Model Based on Guiding (Before and 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 4T1R Model based on Guiding that exceeds 0.7 and can be used in this study (Chik et al., 2024).

Table 12: Cronbach's Alpha Value for Each Item in the 4T1R Model Based on Guiding

Component	Number of Items	Cronbach's Alpha
1	11	0.932

Exploratory Factor Analysis (EFA) for 4T1R Model Based on Surrender

The 4T1R Model based on Surrender which uses as many as 10 items and is labeled as MH1 to MH10. Next, the use of an interval scale for the measurement of items is between one (1) to 10. Principal Component Analysis (PCA) in the EFA process using varimax rotation for the 4T1R Model based on Surrender for the measurement of 10 items. Table 13 below shows the Bartlett's test results that are significant for P values less than 0.05 ($P < 0.05$). Next, the value for the measurement of sampling adequacy from Kaiser-Meyer-Olkin (KMO) is 0.900. The value obtained has exceeded the minimum limit value of 0.6 and the achievement of both of these tests (Bartlet's test is significant and KMO value > 0.6), showing that the data used in this study is appropriate according to the EFA procedure (Chik et al., 2024; Hoque et al., 2017; Awang, 2012).

Table 13: KMO Values and Bartlet's Test for 4T1R Model Based on Surrender

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.900
Bartlett's Test of Sphericity	Approx. Chi-Square	668.820
	df	45
	Sig.	0.000

Table 14 below found that 4T1R Model based on Surrender measured using 10 items in one (1) component can measure 4T1R Model based on Surrender as much as 79.600%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik et al., 2024; Hoque et al., 2017).

Table 14: Total Variance Explained for 4T1R Model Based on Surrender

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.960	79.600	79.600

Thus, the researcher wants to know the selected items to measure the component. Table 15 below shows the distribution of items accepted to measure 4T1R Model based on Surrender. 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 et al., 2024).

Table 15: Factor Loading for One (1) Component 4T1R Model Based on Surrender

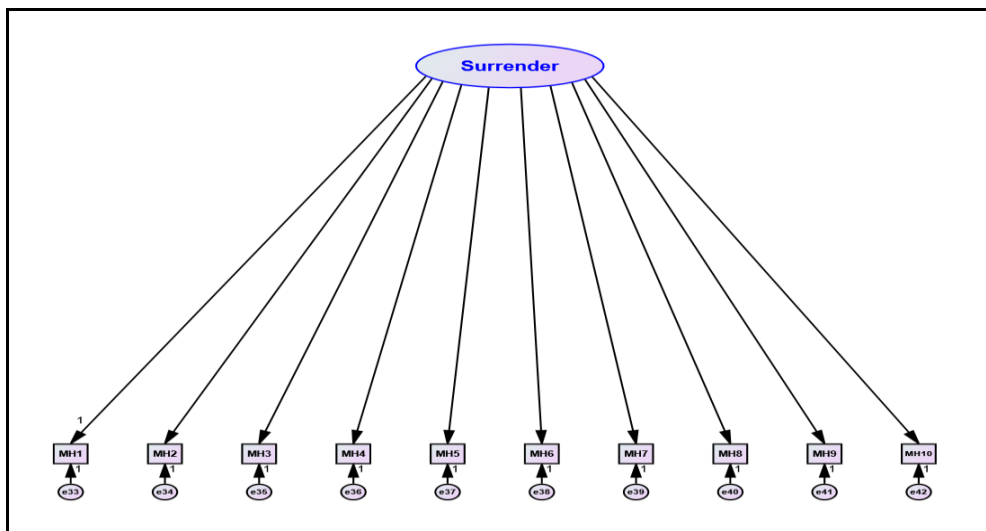| Component Matrix	
Items	Component
MH1	0.812
MH2	0.822
MH3	0.817
MH4	0.810
MH5	0.819
MH6	0.807
MH7	0.809
MH8	0.829
MH9	0.864
MH10	0.810

Figure 4: Position of Components and Items for 4T1R Model Based on Surrender (Before and 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 4T1R Model based on Surrender that exceeds 0.7 and can be used in this study (Chik et al., 2024).

Table 16: Cronbach's Alpha Value for Each Item in the 4T1R Model Based on Surrender

Component	Number of Items	Cronbach's Alpha
1	10	0.921

Exploratory Factor Analysis (EFA) for 4T1R Model Based on Supervise

The 4T1R Model based on Supervise which uses as many as 10 items and is labeled as MG1 to MG10. Next, the use of an interval scale for the measurement of items is between one (1) to 10. Principal Component Analysis (PCA) in the EFA process using varimax rotation for the 4T1R Model based on Supervise for the measurement of 10 items. Table 17 below shows the Bartlett's test results that are significant for P values less than 0.05 ($P < 0.05$). Next, the value for the measurement of sampling adequacy from Kaiser-Meyer-Olkin (KMO) is 0.931. The value obtained has exceeded the minimum limit value of 0.6 and the achievement of both of these tests (Bartlet's test is significant and KMO value > 0.6), showing that the data used in this study is appropriate according to the EFA procedure (Chik et al., 2024; Hoque et al., 2017; Awang, 2012).

Table 17: KMO Values and Bartlet's Test for 4T1R Model Based on Supervise

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.931
Bartlett's Test of Sphericity	Approx. Chi-Square	738.209
	df	45
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Reading from Table 18 below found that 4T1R Model based on Supervise measured using 10 items in one (1) component can measure 4T1R Model based on Supervise as much as 76.088%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik et al., 2024; Hoque et al., 2017).

Table 18: Total Variance Explained for 4T1R Model Based on Supervise

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.609	76.088	76.088

Thus, the researcher wants to know the selected items to measure the component. Table 19 below shows the distribution of items accepted to measure 4T1R Model based on Supervise. 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 et al., 2024).

Table 19: Factor Loading for One (1) Component 4T1R Model Based on Supervise

Component Matrix	
Items	Component
MG1	0.761
MG2	0.855
MG3	0.842

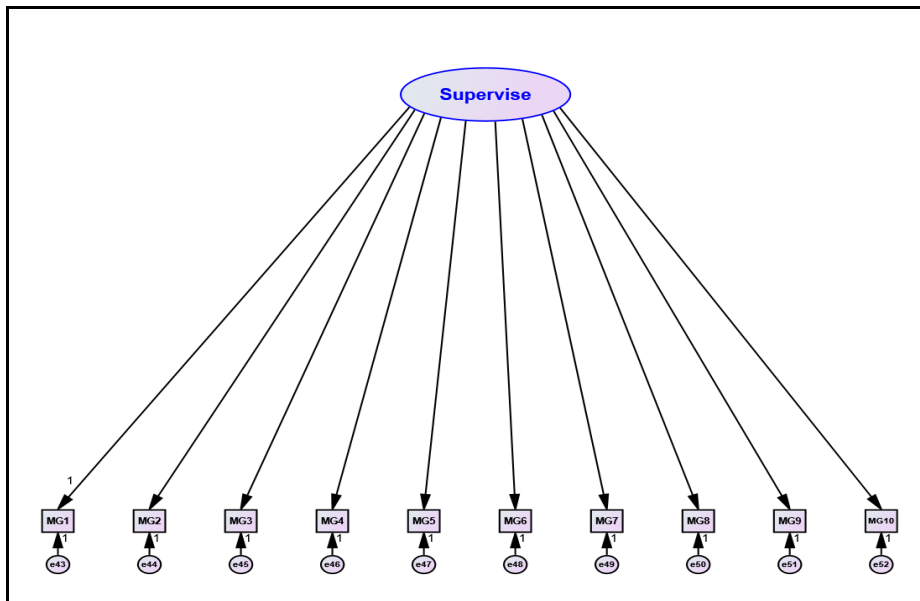|	
MG4	0.831
MG5	0.839
MG6	0.825
MG7	0.793
MG8	0.812
MG9	0.805
MG10	0.759

Figure 5: Position of Components and Items for 4T1R Model Based on Supervise (Before and 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 4T1R Model based on Supervise that exceeds 0.7 and can be used in this study (Chik et al., 2024; Hoque et al., 2017).

Table 20: Cronbach's Alpha Value for Each Item in 4T1R Model Based on Supervise

Component	Number of Items	Cronbach's Alpha
1	10	0.943

Exploratory Factor Analysis (EFA) for Islamic Education Management Practices

The Islamic Education Management Practices which uses as many as 10 items and is labeled as APP1 to APP10. Next, the use of an interval scale for the measurement of items is between one (1) to 10. Table 21 below shows the Bartlett's test results that are significant for P values less than 0.05 (P < 0.05). Next, the value for the measurement of sampling adequacy from Kaiser-Meyer-Olkin (KMO) is 0.931. The value obtained has exceeded the minimum limit value of 0.6 and the achievement of both of these tests (Bartlet's test is significant and KMO value > 0.6), showing that the data used in this study is appropriate according to the EFA procedure (Chik et al., 2024; Hoque et al., 2017; Awang, 2012).

Table 21: KMO Values and Bartlet's Test for Islamic Education Management Practices

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.931
Bartlett's Test of Sphericity	Approx. Chi-Square	713.389
	df	45
	Sig.	0.000

Total Variance Explained (TVE) is important for researchers to know what percentage of the items used can measure a research construct. Reading from Table 22 below found that Islamic Education Management Practices measured using 10 items in one (1) component can measure Islamic Education Management Practices as much as 75.249%. This value is sufficient because it exceeds the minimum requirement of 60% (Chik et al., 2024; Hoque et al., 2017).

Table 22: Total Variance Explained for Islamic Education Management Practices

Component	Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	6.525	75.249	75.249

Thus, the researcher wants to know the selected items to measure the component. Table 23 below shows the distribution of items accepted to measure Islamic Education Management Practices. 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 (Chik et al., 2024).

Table 23: Factor Loading for One (1) Component Islamic Education Management Practices

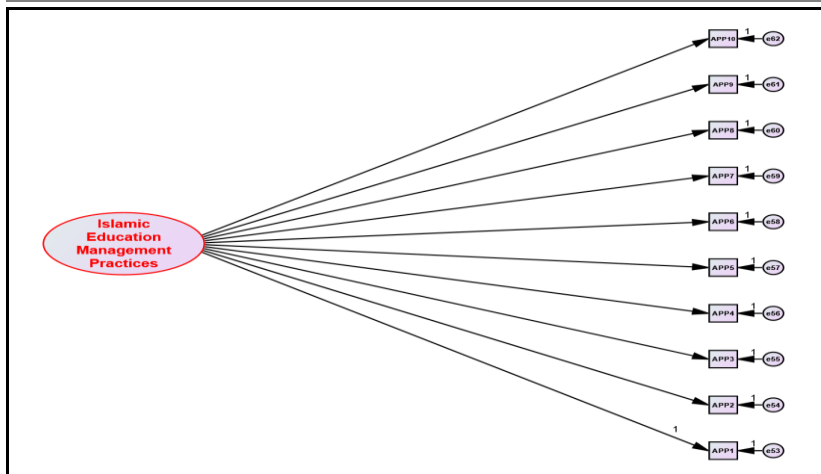| Component Matrix	
Items	Component
APP1	0.800
APP2	0.847
APP3	0.813
APP4	0.801
APP5	0.786
APP6	0.815
APP7	0.800
APP8	0.799
APP9	0.804
APP10	0.811

Figure 6: Position of Components and Items for Islamic Education Management Practices (Before and 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 24 below shows the Cronbach's Alpha value for each item in the Islamic Education Management Practices that exceeds 0.7 and can be used in this study (Chik et al., 2024; Hoque et al., 2017).

Table 24: Cronbach's Alpha Value for Each Item in Islamic Education Management Practices

Component	Number of Items	Cronbach's Alpha
1	10	0.940

Overall Results of Exploratory Factor Analysis (EFA)

Based on the results of the EFA analysis on the questionnaire items, no items were excluded. Table 25 below shows the overall latest position of the items after the EFA analysis was carried out.

Table 25: Overall EFA Analysis

No	Constructs	Validity				Reliability
		Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO>0.6)	Bartlett's Test of Sphericity (Sig.< 0.05)	Total Variance Explained (>60%)	Items Factor Loading (>0.60)	Cronbach's Alpha (>0.70)
1	4T1R Model					
	a) Planning	0.886	0.000	70.207	12 item > 0.60	0.906
	b) Organize	0.888	0.000	79.543	9 item > 0.60	0.915
	c) Guiding	0.879	0.000	70.358	11 item > 0.60	0.932
	d) Surrender	0.900	0.000	79.600	10 item > 0.60	0.921
	e) Supervise	0.931	0.000	76.088	10 item > 0.60	0.943
2	Islamic Education Management Practices	0.931	0.000	75.249	10 item > 0.60	0.940

CONCLUSION

Overall, the requirements of the items in each 4T1R Model (based on Planning, Organize, Guiding, Surrender, Supervise) and Islamic Education Management Practices people's Religious School Management, Southern Thailand, 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 et al., 2024; Hoque et al., 2017). Figure 7 shows all the items in the study model after EFA.
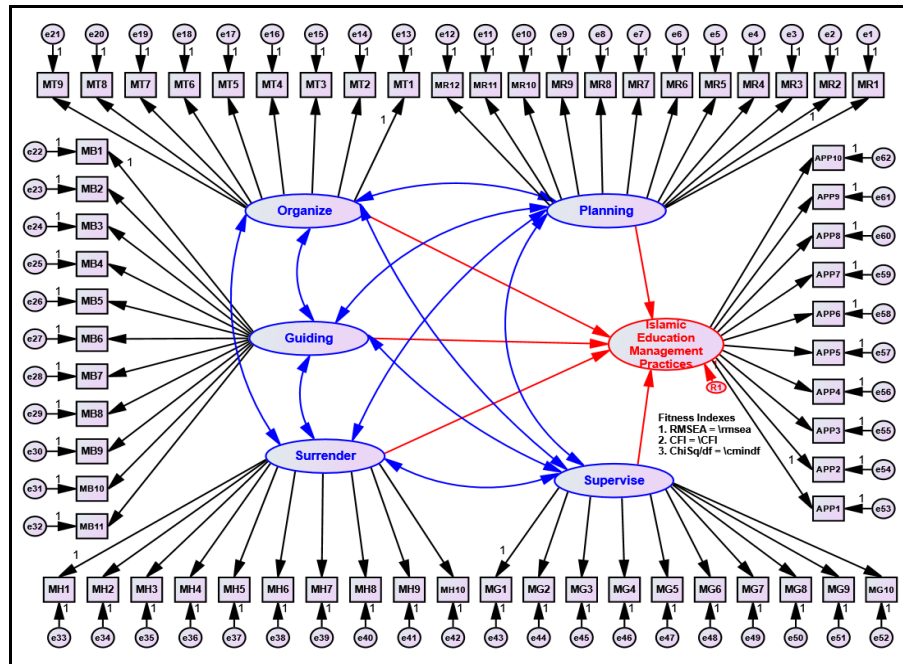

Figure 7: Overall 4T1R Model and Islamic Education Management Practices

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