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Analyzing the Factorial Structure of English Language Teaching Aptitude Questionnaire: A Structural Equation Modeling Approach

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ABSTRACT

Educational systems fundamentally rely on competent teachers who possess high levels of teaching aptitude. Yet, despite the significance of measuring teachers' aptitude, few studies have tried to develop a valid/reliable instrument that could examine teaching aptitude. Contributing to the literature, this study which is a correlational survey, validated the English Language Teaching Aptitude questionnaire (ELTAQ). The participants of this study were selected through simple random sampling. ELTAQ included 54 items representing the eight components of the theoretical construct. The reliability of ELTAQ was measured via Cronbach's alpha, which was 0.958 for the whole instrument. The factorial structure of this questionnaire was investigated in a two-stage process using the higher-order factor analysis method. Primarily, the factorial structure of each of the 8 components of the questionnaire was evaluated through confirmatory factor analysis (CFA). Next, the 8 components were validated through exploratory factor analysis (EFA) and then CFA. With some modifications, the results of the study generally confirmed the validity of ELTAQ. According to the results, affective factors, creativity, moral factors, general intelligence, knowledge, communication, professional factors, and memory were the eight ELTAQ components that could measure English teachers' teaching aptitude. The findings of this research will help future researchers and institutes in better evaluation of teaching aptitude. ELTAQ can be useful for both teachers and institutions. Teachers can assess themselves and find their strengths and weaknesses in teaching English Language.

KEYWORDS: Confirmatory Factor Analysis; English Language Teaching Aptitude; Structural Equation Modeling; Validation

INTRODUCTION

In today's world, where the foundation of society is based on education, the importance of teachers and especially good quality teachers cannot be ignored. Good and qualified teachers are essential for efficient functioning of educational systems and for enhancing the quality of learning. Research supports this notion that a good teacher and actions to be taken on his part in the classroom play a vital role in provoking effective and efficient learning on the part of the students (Markley, 2004). English language teachers are by no means an exception and their key role in effective language learning cannot be overlooked. Special attention must be paid to this link between teachers and learners in countries like Iran where language learning happens mainly in formal classroom settings (Kariminia &

Salehizadeh, 2007), and teachers, as the main source of language input to students, affect the students‟ learning directly (Ghasemi & Hashemi, 2011). Getting to know that a teacher is qualified needs time and can be difficult. If there be an instrument to help those who hire teachers such as universities, schools, and institutes, it will be much easier to realize whether the teacher is good and qualified or not. For the first time, such an instrument to assess the qualification of English Language Teachers was developed by Rezvani and Mansouri (2013). Despite the importance of this instrument, so far, no one has attempted to investigate the validity and reliability of this instrument. Accordingly, it has been decided to investigate the validity and reliability of this instrument -ELTAQ- in this research. Supporting the previous research of Rezvani and Mansouri (2013), the findings of this research provided some modifications on the questionnaire which will help future teachers, researchers, and institutes that will be using this questionnaire for better evaluation of teaching aptitude.

REVIEW OF THE RELATED LITERATURE

A considerable part of an effective educational system rests on the competence and qualities of the teachers who control, shape and develop the process of learning. Qualified teachers are thought to possess what is technically called “teaching aptitude.” Generally speaking, aptitude can be defined as the "quality of being fit for a purpose or position"; this suggests that teacher aptitude refers to the quality of being fit for the teaching profession (Babu & Rao, 2007, p. 6). Many researchers have delved into the notion of teaching aptitude, proposing factors that may contribute to the formation of a teacher’s aptitude. For instance, Ekstrom (1978) proposed five classes of aptitudes, namely verbal, numerical, reasoning, memory, and divergent production, which could prove to be significant in teachers’ performance.

Aptitude may involve natural or acquired capacities/abilities that direct an individual toward learning or developing a trait or behavior (Webster's Medical Dictionary, 2002). According to Warren's Dictionary definition, "[a]ptitude is a condition or a set of characteristics regarded as symptomatic of an individual's ability to acquire with some training, some knowledge, skills or set of responses such as ability to speak a language". Aptitude is "a measure of the probability of success of an individual with training in a certain type of situation" (Bingham, 1930, p. 11).

TEACHING APTITUDE AND ITS COMPONENTS

In a study on teaching aptitude, Harmeet (2014) tried to determine the impact of location on teaching aptitude and to discover the effect of gender differences on the teaching aptitude. The results of this study showed no significant difference in teaching aptitude in terms of gender. In another study, Chugh (2012) examined the teaching aptitude of prospective teachers analyzed according to five components: mental ability, attitude towards children, professional information, interest and adaptability. Chugh’s second objective was to compare teaching aptitudes of males and females to find a correlation between aptitude and achievement. The results revealed no statistically significant difference in the teaching aptitudes of male and female student teachers. Furthermore, Chugh (2012) showed that there was a weak correlation between teaching aptitude and achievement in boards, and between mental ability scores and achievement scores. Kalaivani and Pugalenthi (2015) investigated the teaching aptitude of high school teachers in Coimbatore District in India by employing Teaching Aptitude Test Battery (TATB), standardized by Shamim Karim and Ashok Kumar Dixit (1986). The result of their study indicated that there is no significant difference between high school teachers towards teaching aptitude regarding their demographic variables. Sonawane (2020) investigated the teaching aptitude in high school teachers. The goal of this research was to explore the characteristics of teacher aptitude and see whether teacher aptitude is correlated with teaching stress. According to the results, teaching aptitude and stress were correlated in a significant way. Moreover, professional development, teaching quality and success were identified as the characteristics of teacher aptitude. In another study, Ramesh and Ambuchelvan (2022) determined the normality of high school teachers' teaching aptitude in the Tamilnadu districts using TATB. Based on the results, high school teachers' normal distribution scores deviated negligibly from normality. The teaching aptitude of trained and untrained secondary school teachers was investigated in a study by Abdullah et al. (2022). The results of the study revealed that the teaching aptitude in trained secondary school teachers was more than the teaching aptitude in untrained secondary school teachers.

Researchers have identified contributing factors, such as affective elements, intelligence, creativity, communication, and knowledge, which seem to influence teaching aptitude. Among these factors, affective elements and knowledge have been rigorously studied. Affective factors can be considered to be the most important factor in English language teaching aptitude. Emotion, feeling, mood, manner, and attitude are components of in this factor, and they can determine the input and output of second language acquisition. Therefore, the affective factor is directly associated with English language teaching aptitude. Ni (2012), following the Affective Filter Hypothesis, surveyed advanced English majors by culling and analyzing research data. The objective of his study was to improve methods of English teaching. Ni (2012) concluded that affective factors could help the teachers to improve their teaching quality.

Knowledge has also been regarded as one of the most important contributing factors to teaching aptitude. The term "pedagogical knowledge" was first proposed by Shulman in the 1980s. Shulman (1987) associated seven types of knowledge to teachers: content knowledge, pedagogical content knowledge, general pedagogical knowledge, curriculum knowledge, knowledge of students, knowledge of learning environments, and knowledge of educational purposes, values and their origins.

VALIDATING APTITUDE INSTRUMENTS

According to Rezvani and Mansouri (2013), components of knowledge could be divided into three sub-categories based on the interviewees' responses: general, pedagogical, and content (language) knowledge. These sub-categories might represent the cornerstone of the seven knowledge-related factors proposed by Shulman. Rezvani and Mansouri's (2013) English Language Teaching Aptitude (ELTA) questionnaire was examined through structural equation modeling (SEM). The questionnaire was meant to identify the constituents of language-teaching aptitude. The first step was to check the internal consistency of the items on the ELTAQ. Next, the construct validity of the ELTAQ was evaluated. This study validated the questionnaire through an assessment of both the individual components and the fitness of the whole model through using SEM.

METHODOLOGY

The purpose of this research was to investigate the reliability and validity of the ELTAQ. In doing so, the internal consistency and Cronbach's alpha method were employed to examine the reliability and computed corrected item-total correlation and Cronbach's Alpha if Item Deleted were used for investigation of the items of the ELTAQ. To assess the construct validity of the questionnaire and confirm the factorial structure, Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were utilized.

PARTICIPANTS

The participants were randomly selected from English language teachers teaching Basic, Intermediate, High and Advanced levels with at least three years of teaching experience in different institutes in Shiraz, Tehran, Esfahan and Ahvaz. As such, 140 English teachers were participated in the study. Figure 1 illustrates the detailed demographic information of the participants.

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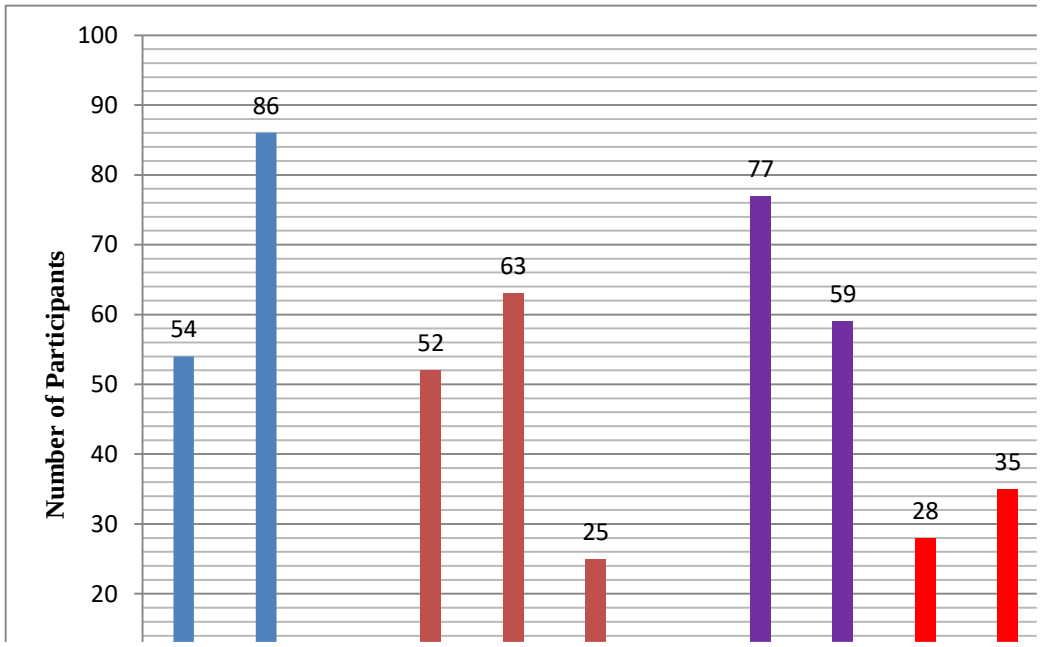

Figure 1
General specifications of the participants

INSTRUMENT

English Language Teaching Aptitude (ELTA) questionnaire developed by Rezvani and Mansouri (2013) was used as the instrument. The main purpose of the ELTAQ was to assess language teachers' perception of different components of the ELTAQ. The ELTAQ consisted of two parts. The first part included 54 questions all starting with the pattern "How important is it for capable language teachers to...?" All questions belonged to 8 sub-scales of the ELTAQ. The second part addressed demographic information of the participant (e.g., gender, age, level of education, field of study, and teaching experience) (see the Appendix). Table 1 shows the 8 sub-scales of the ELTAQ and their related items.

Table 1
Sub-scales and related Items of the ELTAQ

Factor	Number of Items	Items
Affective	5	1-5
Creativity	3	6,7,8
Moral	3	9,10,11
General Intelligence	3	12,13,14
Knowledge	18	15-32
Communication	13	33-45
Professional	5	46-50
Memory	4	51-54

DATA COLLECTION PROCEDURE

One hundred and forty ELTAQ were paper-printed and distributed among the English language teachers participating in the study. Out of these questionnaires, however, five ones were lost, as they were not returned by the participants. Moreover, the ELTAQ was uploaded to the Google Forms by the researcher. The link to the questionnaire (http://goo.gl/forms/2dliYh7csa) was shared online so that more English teachers could take part in the research. Yet, only 14 teachers filled out the electronic version of the questionnaire. Of course, within an

introductory paragraph, both versions included instructions and ensured the confidentiality of the information shared by the participants.

DATA ANALYSIS PROCEDURE

Because this research sought to investigate the reliability and validity of the ELTAQ, the internal consistency and Cronbach's alpha method were employed to investigate the reliability. Computed corrected item-total correlation and Cronbach's Alpha if Item Deleted were used for investigation of the items of the ELTAQ. In order to assess the construct validity of the questionnaire and confirm the factorial structure, EFA and CFA were utilized. These analyses were performed in SPSS 22 and in LISREL 8.8 software**.**

RESULTS AND DISCUSSION

RELIABILITY ANALYSIS

One of the main goals of this research was to assess the reliability of the ELTAQ. In doing so, Cronbach's alpha coefficient was used to calculate the reliability of the whole scale and its components. In fact, Cronbach's alpha coefficient showed whether the scale or its sub-scale had the necessary internal consistency to measure its intended construct (Dörnyei, 2003; Urbina, 2004). Furthermore, the internal relationships between items were investigated to reach the highest value of reliability. To this end, the two following indices were used: (a) corrected item-total correlation; and (b) Cronbach's alpha if Item Deleted. Using these indices helped to verify how well an individual item was consistent with the scale or the relevant items.

However, as the background of the studies showed, there were no definite rules which could precisely determine the degree of the correction item-total correlation while singling out an item to be omitted or retained. Of course, some studies suggested conventions that guided the analysis in this research. For instance, according to Hatch and Lazaraton (1991) and Spada et al. (2009), the corrected item-total indices lower than 0.40 and lower than 0.30, can be considered to be the criteria for omitting an item in this index. Furthermore, as far as the second index (Cronbach's alpha if Item Deleted) is concerned, Spada et al. (2009) believe that if the omission of an item leads to an increased alpha value of 0.01 of the corresponding scale, the item in question should be doubted and picked out as a candidate to be removed from the questionnaire.

In this research, the two values 0.35 and 0.01 were used respectively as the criteria for using the two indices of corrected item-total correlation and Cronbach's alpha for the omission of an item (Rezvani, 2010). As Table 2 shows, in the last column, the value of none of the items was higher than the alpha value; therefore, the omission of none of the items would result in an increase of the alpha value. Moreover, for all items the corrected item-total correlation was higher than 0.35. As a result, there were no weak items in the affective component and all the items were desirable. A Cronbach's alpha of 0.80 represented the good reliability of the affective component in the ELTAQ.

Table 2
Descriptive statistics, corrected item-total correlation, alpha if item deleted and Cronbach's alpha of the affective items

Item No.	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ELTA 1	20.63	6.940	0.584	0.769
ELTA 2	20.27	7.580	0.563	0.775
ELTA 3	20.11	6.893	0.617	0.758
ELTA 4	20.38	6.625	0.628	0.754
ELTA 5	20.18	7.443	0.558	0.776
Alpha	0.804			
Standardized item alpha	0.805			
Mean	25.39			
Std. Deviation	3.251			

The knowledge component in the ELTA questionnaire included 18 items. The indices related to internal consistency and the items of knowledge component were calculated. The investigation of the initial results of this analysis showed that according to the two indices specified, item 21 (*Be familiar with common societal problems*) of this scale was less than the first criterion. The value of the corrected item-total correlation of this item was 0.33. However, in the index of "Cronbach's Alpha if item deleted", the increase in the alpha value was negligible and the omission of item 21 resulted in an increase Alpha value (from 0.891 to 0.895). However, it was decided to remove this item from the knowledge items. As it can be seen in Table 3, after item 21 was omitted, the value of corrected item-total correlation for all items was greater than 0.35. Additionally, the value of none of the items was greater than the alpha value; therefore, if any of the items were removed, the alpha value would not be increased. As a result, all items of the knowledge component showed a desirable status. Furthermore, Cronbach's alpha coefficient of 0.89 showed the good reliability of the knowledge component of the ELTA questionnaire.

Table 3
Descriptive statistics, corrected item-total correlation, alpha if item deleted, and Cronbach's alpha of knowledge items

Item No.	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ELTA 15	80.11	68.283	0.541	0.889
ELTA 16	80.26	67.649	0.488	0.892
ELTA 17	79.95	66.882	0.584	0.887
ELTA 18	79.53	67.949	0.690	0.884
ELTA 19	79.44	68.046	0.626	0.886
ELTA 20	79.79	69.321	0.469	0.892
ELTA 22	79.59	70.662	0.499	0.890
ELTA 23	79.34	70.270	0.542	0.889
ELTA 24	79.29	70.565	0.519	0.890
ELTA 25	79.30	68.931	0.616	0.886
ELTA 26	79.78	70.979	0.495	0.890
ELTA 27	79.51	69.820	0.548	0.889
ELTA 28	79.81	69.951	0.444	0.892
ELTA 29	79.80	68.578	0.542	0.889
ELTA 30	79.33	69.042	0.632	0.886
ELTA 31	79.49	70.050	0.548	0.889
ELTA 32	79.18	70.090	0.594	0.888
Alpha	0.895			
Standardized item alpha	0.899			
Mean	84.59			
Std. Deviation	8.812			

The values of Cronbach's alpha if item deleted for the items of each of the remaining components were calculated in the same manner that the two components of affective and knowledge were measured above. The value of this index for each item was lower than that of the standardized item alpha of the related component. Therefore, all the eight components displayed acceptable degrees of reliability.

ELTAQ RELIABILITY ASSESSMENT

Table **4** shows that the consistency of each of the items of the ELTAQ with the whole scale lay within an acceptable but variable range (0.35 to 0.71). The value of alpha if item deleted was in accordance with the criteria. Finally, it was concluded from Cronbach's alpha coefficient of 0.95 that this questionnaire had a very desirable reliability.

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Table 4
Descriptive statistics, corrected item-total correlation, alpha if item deleted, and Cronbach's alpha of all items

Item No.	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
ELTA 1	252.39	802.701	0.366	0.958
ELTA 2	252.04	806.466	0.350	0.958
ELTA 3	251.88	802.539	0.379	0.957
ELTA 4	252.14	791.908	0.558	0.957
ELTA 5	251.94	803.464	0.398	0.957
ELTA 6	252.11	797.521	0.474	0.957
ELTA 7	252.44	789.284	0.601	0.957
ELTA 8	252.19	795.951	0.503	0.957
ELTA 9	252.21	796.544	0.496	0.957
ELTA 10	252.79	784.572	0.572	0.957
ELTA 11	252.30	790.082	0.566	0.957
ELTA 12	252.78	790.375	0.553	0.957
ELTA 13	252.46	793.099	0.531	0.957
ELTA 14	252.81	785.332	0.569	0.957
ELTA 15	252.67	789.891	0.594	0.957
ELTA 16	252.83	784.776	0.594	0.957
ELTA 17	252.51	785.475	0.629	0.956
ELTA 18	252.09	794.373	0.610	0.957
ELTA 19	252.00	797.885	0.491	0.957
ELTA 20	252.35	793.913	0.515	0.957
ELTA 21	253.22	792.116	0.450	0.957
ELTA 22	252.15	804.215	0.407	0.957
ELTA 23	251.91	805.466	0.385	0.957
ELTA 24	251.85	805.064	0.396	0.957
ELTA 25	251.86	801.600	0.451	0.957
ELTA 26	252.34	799.436	0.540	0.957
ELTA 27	252.08	801.526	0.455	0.957
ELTA 28	252.38	794.640	0.518	0.957
ELTA 29	252.36	795.025	0.514	0.957
ELTA 30	251.89	799.636	0.514	0.957
ELTA 31	252.05	800.724	0.488	0.957
ELTA 32	251.74	803.286	0.464	0.957
ELTA 33	252.29	795.834	0.504	0.957
ELTA 34	251.99	795.388	0.493	0.957
ELTA 35	252.09	795.811	0.578	0.957
ELTA 36	252.24	788.718	0.638	0.956
ELTA 37	252.26	792.696	0.593	0.957
ELTA 38	252.32	789.500	0.611	0.957
ELTA 39	252.44	782.938	0.706	0.956
ELTA 40	253.07	778.829	0.672	0.956
ELTA 41	252.76	783.822	0.715	0.956
ELTA 42	252.99	778.755	0.654	0.956
ELTA 43	252.91	781.403	0.614	0.957
ELTA 44	252.89	787.377	0.554	0.957
ELTA 45	252.84	784.066	0.627	0.956

ELTA 46	251.94	803.522	0.364	0.958
ELTA 47	252.77	782.580	0.580	0.957
ELTA 48	252.77	789.214	0.534	0.957
ELTA 49	252.19	795.754	0.529	0.957
ELTA 50	252.21	793.465	0.548	0.957
ELTA 51	252.76	783.333	0.550	0.957
ELTA 52	253.29	776.683	0.563	0.957
ELTA 53	252.59	792.272	0.545	0.957
ELTA 54	252.89	785.233	0.609	0.957
Alpha	0.958			
Standardized item alpha	0.958			
Mean	257.16			
Std. Deviation	28.678			

VALIDITY ASSESSMENT

One of the main objectives of the present study was to verify the factorial structure of the ELTAQ. According to Rezvani and Mansouri (2013), the factorial structure of the instrument (ELTAQ) represents eight components: affective factors, creativity, moral, intelligence, knowledge, communication, professional factors, and memory. As such, the present study sought to explore the underlying componential structure of ELTAQ, trying to evaluate its validity.

In this study, due to a limitation of access to the required number of participants, it was not possible to perform factorial analysis simultaneously over all of the items. Given statistical criteria and the assumptions of factorial analysis, the number of items (54 items), and the minimum required participants for each item (5 individuals), at least 270 people were required to perform factorial analysis (for a review on different types of determined criteria for the adequate sample size see Meyers, Gamst, & Guarino, 2006). As a result, the researchers decided to investigate the factorial structure of this questionnaire in a two-stage process through the higher-order factor analysis method. In the first stage of this method, the factorial structure of each of the 8 components of the questionnaire was examined via the CFA method. In the next step, the 8 components (not over their items) were examined through EFA and then CFA were. It should be noted that some parts of this analysis, especially the first step of factorial analysis, are called *analysis of item parcels* by some researchers and experts. This analysis is advised when the sample size is small (Kline, 2011).

Factorial structure of the ELTA questionnaire: First-Order Analysis

The ELTAQ comprised 8 components, the factorial structures of which were assessed through the CFA method and analyzed in LISREL software.

Affective component

In order to verify the validity of the one-dimensional (one factor-model of the affective component of the ELTAQ, CFA was conducted on this component's 5 items. Table 5 shows the initial results of this analysis including standardized and unstandardized factor-loadings and the t-value.

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Table 5
Estimations of CFA for the affective component

Item No.	unstandardized factor loadings	Standardized factor loadings	t
ELTA 1	0.91	0.64	6.54
ELTA 2	0.73	0.61	6.25
ELTA 3	1	0.72	–
ELTA 4	1.08	0.73	7.26
ELTA 5	0.81	0.64	6.55

Table 5 shows that all of the items had a good factor-loading and the range of the standard factor-loading of the affective component of the ELTAQ was between 0.61 and 0.73. The values of t-tests were greater than 1.98, which indicated the desirability and significant loading of each of the 5 items of the affective component. Therefore, all of the items displayed significant and meaningful relations with their components. It should be noted that in measurement models, the evaluation of latent variables (here the affective component) are performed indirectly through observable variables (the related items). The problem could be solved by setting the factor loading of one of the observable variables to 1 (Kline, 2011). As Table 5 reports, item three (*Love language teaching job*) was fixed to 1. Under such circumstances, the t-value of the item was not calculated. To assure the degree of validity or the fitness of model to the data, the fitting indices of the model were calculated

Table **6**. The results of this analysis showed a lack of model fitness. In order to fit the model, the corrections proposed by LISREL software were implemented in the agenda and the fitted model was verified by estimating the error covariance between the first and the second items.

Table **6** shows the results of evaluating the initial fitness and applying the corrections to the measurement model of the affective component of the ELTAQ.

Table 6
The fit indices for the one-dimensional model of the affective subscale

Indexes	RMSEA	AGFI	GFI	CFI	IFI	χ^2	χ^2/df
Primary Model	0.208	0.72	0.91	0.90	0.90	35.10	7.02
Corrected Model	0.001	0.97	0.99	1	1	2.78	0.695

As

Table **6** indicates, the comparison between the newly fit indices and the fit indices before correction was implemented marks desirable fitness of the model. The value of χ^2 was considerably reduced. The result of dividing this index into a degree of freedom considerably decreased (from 7.02 down to 0.695) and fell within the determined range (below 2.5). Although the value of IFI and CFI indices were equal to 0.90, which is an acceptable value, in the initial model, after the corrections were implemented to the model, these two indices improved and became more favorable. The value of the GFI index relatively rose from 0.91 to 0.97. The value the AGFI index, which was far from the intended criteria (0.90) in the initial model (0.72), was raised after the corrections were implemented and reached an appropriate level. Finally, the RMSEA index, which was equal to 0.208 in the initial model, was considerably reduced after the corrections were implemented and reached 0.001. The closeness of the value of this index to zero indicated the rather perfect fitness of the model.

It should be noted that in the ultimately fitted model, factor-loadings underwent partial changes. Loadings of some items declined while those of other items increased. Figure 2 and Figure 3 respectively illustrate the initial and the ultimate model of affective component of the ELTAQ.

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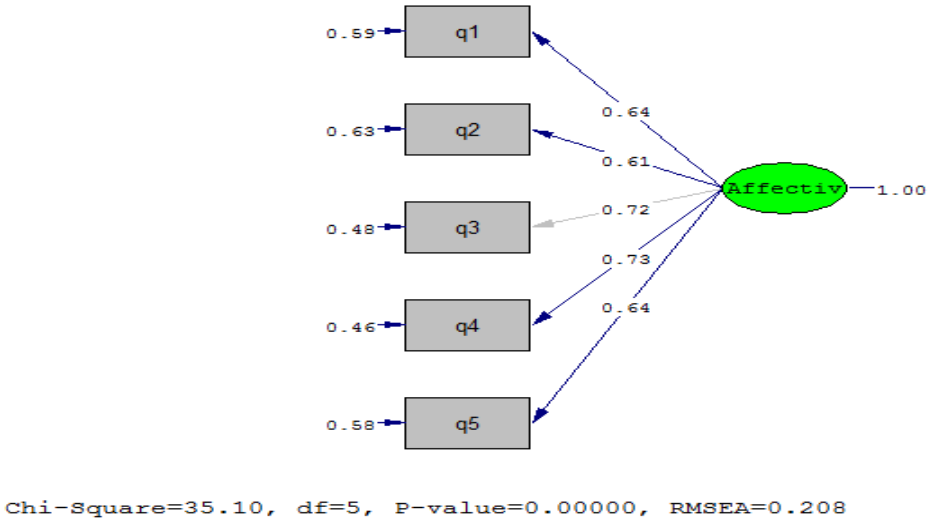

Figure 2
Initial standardized factor-loadings of affective component

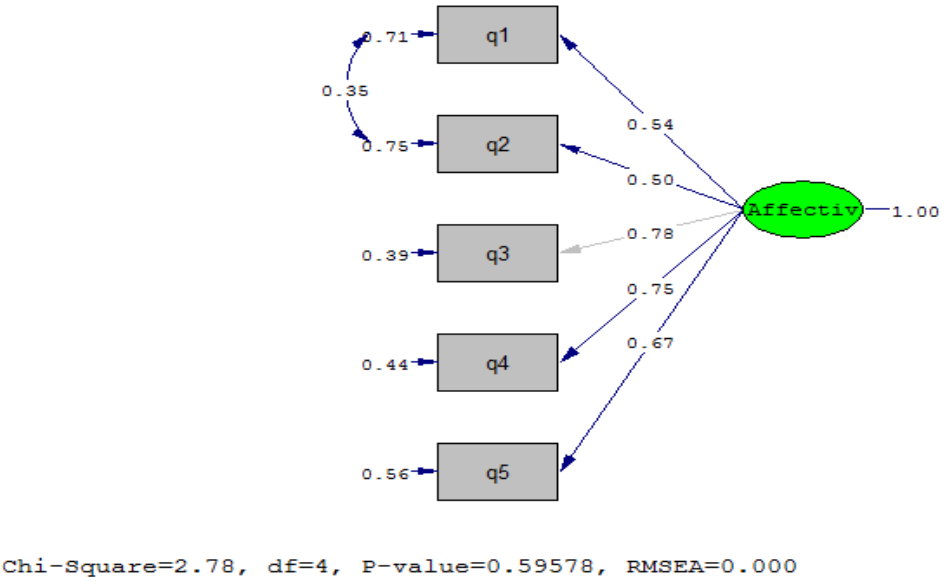

Figure 3
The ultimate model of affective subscale

The standardized factor-loadings and t-values of creativity items exhibited significant relations between the three items with their underlying factor. The calculated fitting indices for the creativity component revealed the fitness of its model Figure 4.

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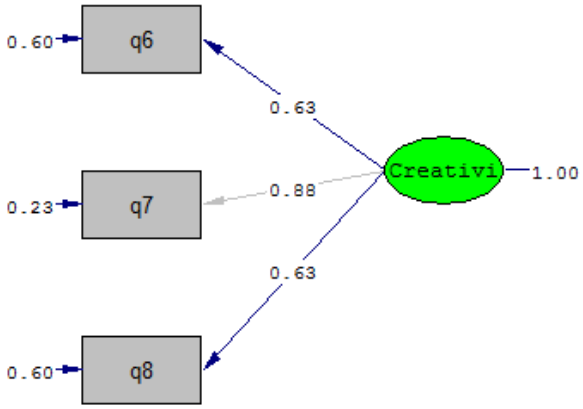

Figure 4
The ultimate model of the creativity subscale

The standardized factor-loadings and t-values of Moral items showed that the three items had significant relations with their underlying factor. The calculations also revealed the fitness of the model Figure 5.

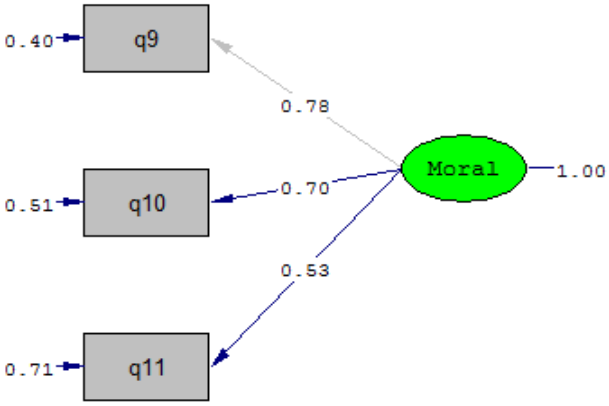

Figure 5
The ultimate model of the moral subscale

The results indicated that the observed values of the standardized factor-loadings for the items of the general intelligence component were very good as they ranged from 0.76 to 0.82. The investigation of the calculated values of t-test showed that the factor-loadings were significant, and thus, items 12, 13 and 14 had significant associations with their underlying factor. The ultimate model of the general intelligence component is depicted in Figure 6.

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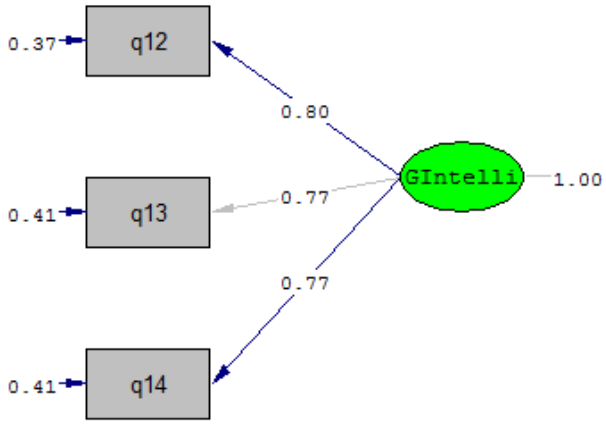

Figure 6
The ultimate model of the general intelligence subscale

The validation of the estimated fitting indices for the model of knowledge revealed a lack of fitness. Therefore, to fit the model, the proposed corrections of the LISREL software were taken into consideration and the fitness of the model was configured by sketching the error covariance between the items of this scale. The ultimately fitted model for the the knowledge component is illustrated in figure 7.

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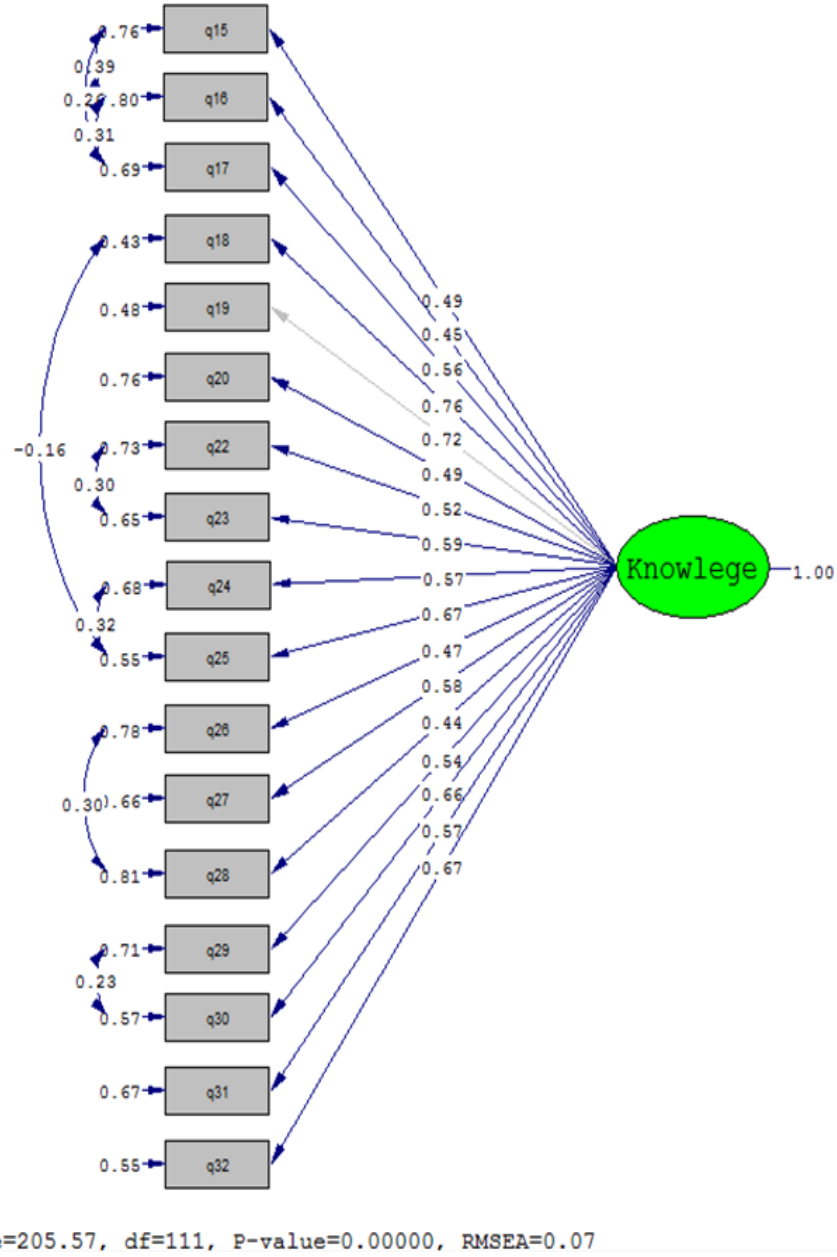

Figure 7
The ultimate model of the knowledge component

The results of the t-test of the communication component showed that all of the estimated factor-loadings were greater than the critical value of t (1.98); therefore, the items of this component had significant relations with their underlying factor. The results of the fit test, however, showed that this model did not fit the data. To establish the fitness of the model, the corrections proposed by the LISREL software were incorporated and the fitness was implemented by sketching the error covariance between the items of this scale. Figure 8 shows the ultimate model of this component.

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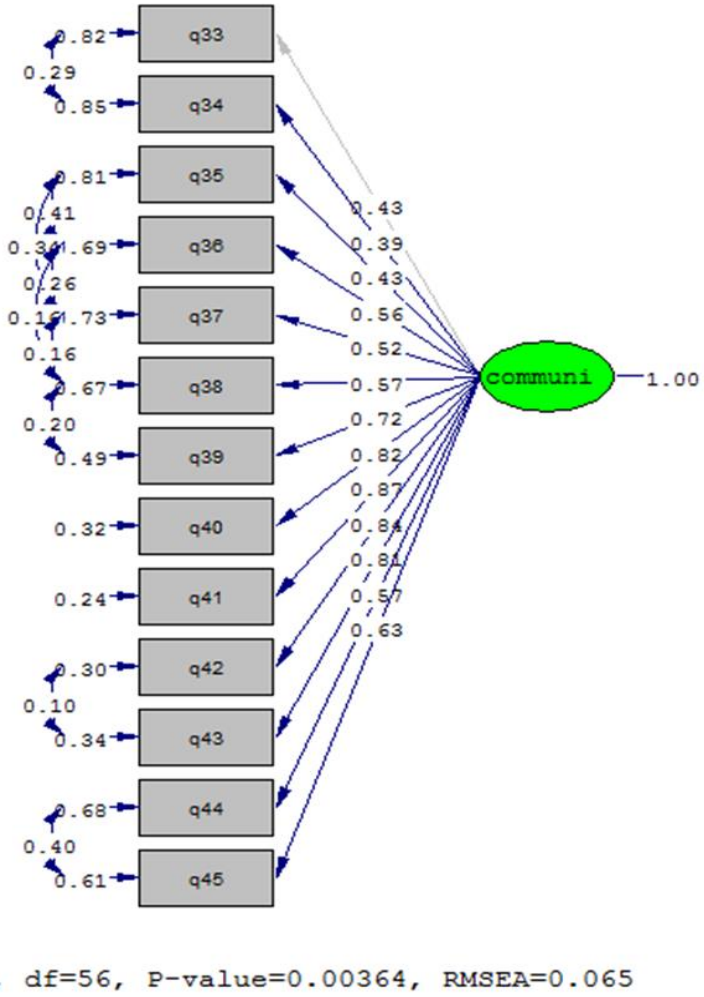

Figure 8
The ultimate model of the communication subscale

According to the results, the estimated standardized factor-loadings for each of the five items of the professional component appropriately ranged from 0.43 to 0.79. The values of t-test, which were all greater than 1.98, showed that the items of the professional component had significant relations with their underlying factor. The results of the fitting test showed a lack of model fitness. Therefore, in order to establish the fitness of the model, the corrections proposed in the LISREL software were implemented on the model by sketching the error covariance between some items of this scale. The ultimate model is presented in Figure 9.

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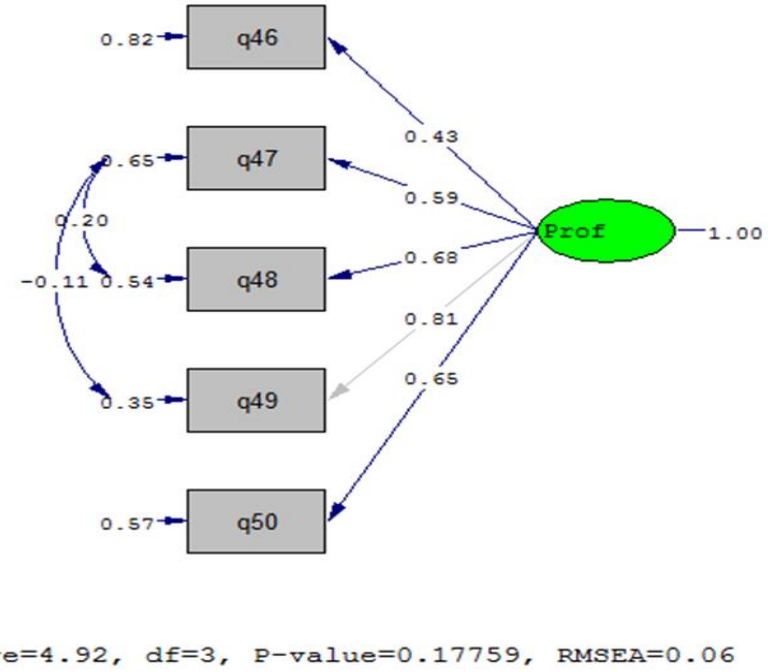

Figure 9
The ultimate model of the professional subscale

The results of the t-test showed that the factor-loadings for all items of the memory component were greater than the critical value of t (1.98); therefore, it was concluded that the items of the memory component had significant relations with their underlying factor. The results of this fitness test, however, revealed that the model did not fit. Therefore, in order to fit the model, the corrections proposed by LISREL software were applied, and model fitness was accomplished by sketching the error covariance between items 52 and 53. Figure 10 shows the ultimate model of memory component.

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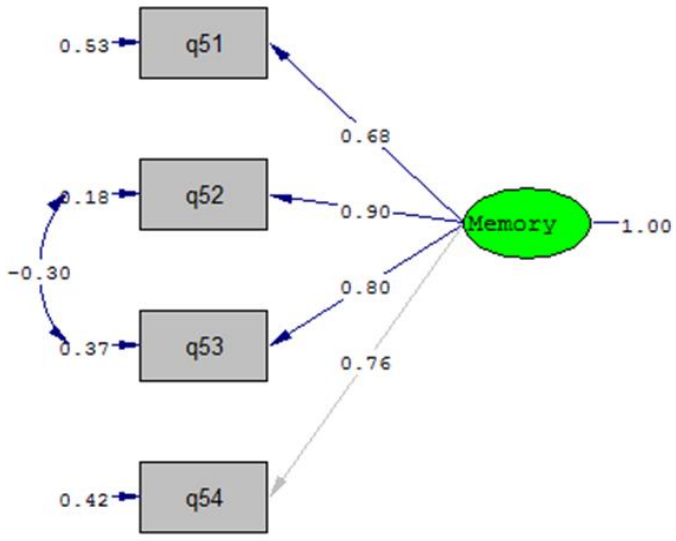

Figure 10
The ultimate model of memory subscale

Factorial structure of the ELTAQ components: Second-order analysis (higher-order analysis)
At this stage of the research, to conduct a higher order factorial analysis (meaning factorial analysis on the components, not on the items of the ELTAQ), both EFA and CFA were employed. It should be noted that conducting these two analyses on one sample simultaneously was not consistent with statistical logic; therefore, the cross-validation method was used to perform this analysis. In this method, the sample was divided into two halves, and the sufficient sample size was framed. Next, the factorial structure explored in the previous step was investigated through CFA (Tinsley & Brown, 2000). Considering these steps, the higher-order factorial structure of the ELTAQ was investigated.

Exploratory factor analysis of the components of the ELTAQ: A higher-order analysis
In this step of the analysis, EFA was used to identify the common aspects of the 8 components of the ELTAQ and extract the underlying latent variables of these components. In this research, EFA was conducted through the principal component method. Furthermore, before conducting the factorial analysis, the condition of sample sufficiency was taken into account. The value of Kaiser-Meyer-Olkin (KMO) index was 0.865, and the value of χ^2 in Bartlett's Test of Sphericity was 382.158, which was significant at the 0.0001significance level. These two indices showed the sufficiency of the sample in terms of the variables selected for conducting factorial analysis. In this analysis, the criteria for extracting the components were the slope of scree plot and eigenvalues greater than one. Figure 11 shows the results regarding the scree plot.

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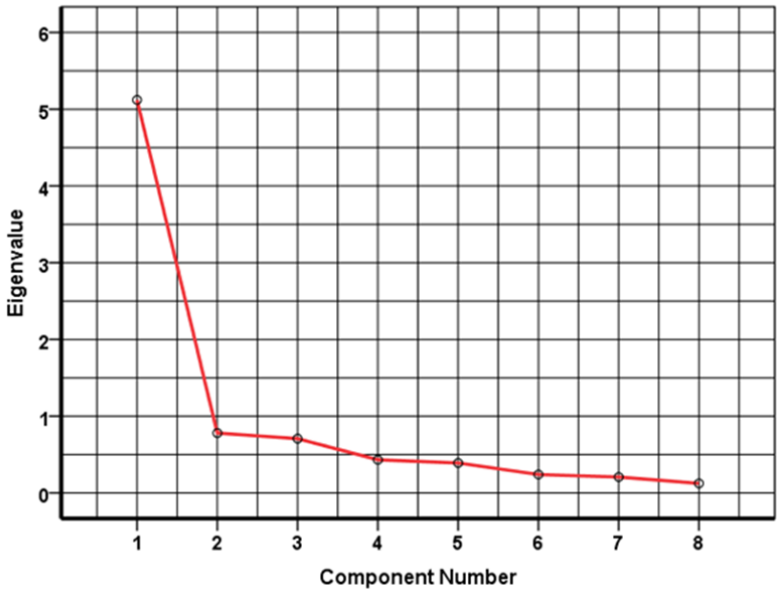

Figure 11
The scree plot of higher-order EFA

According to this criterion and the obtained eigenvalues, it was observed that the ELTAQ could only have one underlying factor, the eigenvalue of which was 5.12. This factor, in total, accounted for 64% of the total variance of the ELTAQ. Moreover, the estimated factor-loading for each of the 8 components of the questionnaire in this factor ranged from 0.73 to 0.90.

Table **7** shows the results of the factor-loadings, eigenvalue, and variance in detail.

As it can be seen in

Table **7**, the estimated factor-loadings show a good association between the 8 components of the questionnaire and their higher-order factor, teaching aptitude. In the following section, the validity of the extracted factorial structure is investigated.

Table 7
Results of EFA in higher-order level

Components (subscales)	Factor (s) n.
	1
Affective	0.735
Creativity	0.760
Moral	0.792
General intelligence	0.734
Knowledge	0.853
Communication	0.899
Professional	0.822
Memory	0.791
Eigenvalue	5.121
% of Variance	64.011

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Confirmatory factor analysis of teaching aptitude components: At higher-order

CFA was performed to evaluate the repeatability and confirm the factorial structure obtained in the previous section for the 8 components of the ELTAQ. The ultimate higher-order CFA model of the ELTAQ, after the modifications were incorporated, is shown in Figure 12.

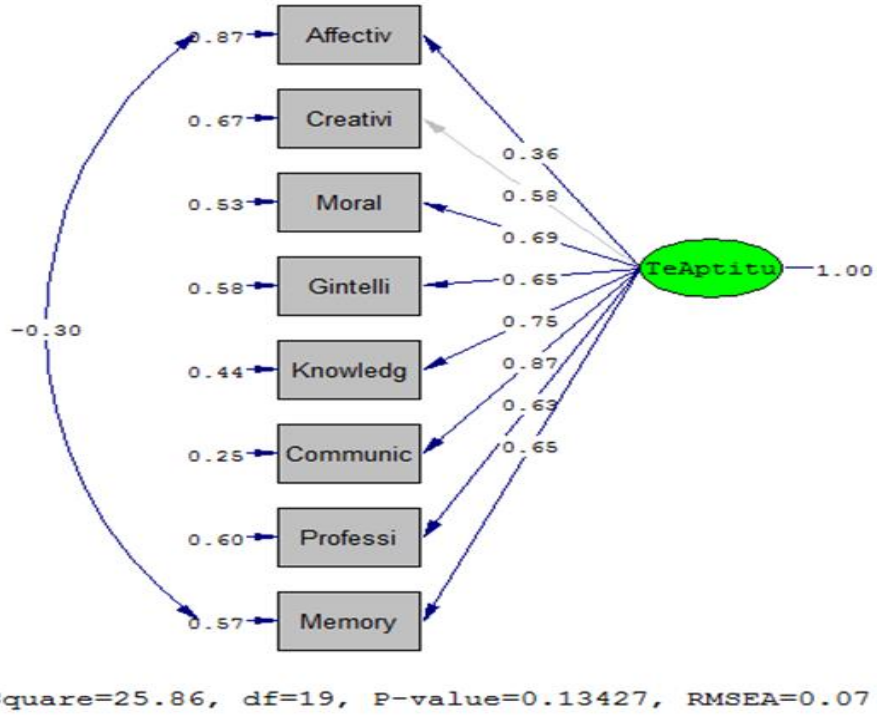

Figure 12
The ultimate higher order CFA model of ELTA

DISCUSSION AND CONCLUSION

This study examined the reliability and validity of the English Language Teaching Aptitude Questionnaire (ELTAQ), assessing its ability to measure various dimensions of teaching aptitude among English teachers. The results confirm that ELTAQ is both reliable and valid, providing a comprehensive framework for understanding and assessing key competencies in teaching aptitude. The eight components—affective factors, creativity, moral factors, general intelligence, knowledge, communication, professional factors, and memory—constitute an integrated approach to evaluating the complex skills that contribute to effective teaching. The high reliability score (Cronbach's alpha of 0.958) for ELTAQ reflects the instrument's internal consistency and its suitability for both research and professional use. This reliability implies that ELTAQ consistently measures the components of teaching aptitude across contexts, identifying specific strengths and areas for improvement among English language teachers. The factorial validation process using both confirmatory factor analysis (CFA) and exploratory factor analysis (EFA) has strengthened ELTAQ's structural credibility, confirming the relevance of each component in assessing teaching aptitude. A notable finding in this study is the relationship between affective factors and memory, suggesting a link between emotional engagement and cognitive processes. This finding could imply an unrecognized factor influencing this dynamic, which future research might investigate, considering whether factors like empathy or resilience impact teaching efficacy. The study's findings build on prior research (Rezvani and Mansouri, 2013) and refine ELTAQ for English language teaching, providing a clearer theoretical understanding of teaching aptitude. The refinements applied to ELTAQ ensure its effective use for self-assessment, professional development, and

recruitment in educational institutions. Practically, ELTAQ serves as a valuable tool for both educators and institutions. Teachers can evaluate their teaching skills, gain insights into strengths and weaknesses, and identify areas for professional growth. For institutions, ELTAQ offers a standardized method for evaluating teaching aptitude, which supports hiring, evaluations, and training programs, contributing to improved teaching quality and student outcomes. In conclusion, this study validates ELTAQ as an effective tool for assessing English language teaching aptitude, with implications for theoretical research and practical applications. ELTAQ provides a structured framework for evaluating multiple aspects of teaching aptitude. Future studies could examine ELTAQ's applicability in other contexts or its predictive power in relation to student outcomes, enhancing our understanding of effective teaching and professional development in education.

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