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# The Development of Emotional Quotient Evaluation for Thai University Students

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## Abstract

In this study, we designed an evaluation form to assess the emotional quotient of Thai university students. The indicators and components of the evaluation were developed from theories and principles regarding emotional intelligence. After the process of content validity assessment, the evaluation consists of 80 indicators in 5 components of Self-awareness, Self-regulation, Self-Motivation, Recognizing Emotions in Others, and Social Skills. In detail, the evaluation was found to have an index of congruence (IOC) of 0.50–1.00, discrimination of 0.472–0.817, and reliability of 0.991. It was later tested for construct validity with 200 Thai university students selected by stratified sampling method. The method of confirmatory factor analysis was employed. The results of the study indicate the evaluation construct validity as the goodness of fit indices passed the criteria and the evaluation model fits the empirical data. Chi – Square = 87.436, df = 73, Chi-Square /df = 1.197, p-value = 0.119, CFI = 0.997, TLI = 0.995, RMSEA = 0.031, and SRMR = 0.021.

**Keywords:** emotional quotient, evaluation development, confirmatory factor analysis

## 1. Introduction

The 21<sup>st</sup> century ushered in a desire for skills and abilities to handle difficulties never encountered by humanity. The advancement of digital technology has nearly eliminated international borders. The problems associated with global warming also compel humanity to develop innovations that could sustain economic growth in ways that are less destructive to the environment. Consequently, talents such as computer engineering, alternative energy innovation, artificial intelligence development, etc., made individuals competitive in the employment market. The school system cultivates these hard skills as the focus of human growth.

However, one equally important qualification is the ability to process soft skills as learners also need to be equipped with skills to deal with the complexity of human society (Dean & East, 2019; Van Pham & Thi Thu Dao, 2021). Soft skills are the personality qualities, social graces, communicative skills, personal habits, friendliness, and optimism that distinguish individuals to varying degrees (Chute, 2012; Ellis et al., 2014). This set of supplementary skills is needed skills in career development as they help people deal with human factors to maintain interpersonal relationships in the workplace. According to Dean and East (2019), soft skills in the 21st-century workforce include communication, interpersonal relationship management, and working flexibility.

It could be noted that soft skills are the foundation for a high emotional quotient (EQ) (Johar, 2018). In detail, EQ is defined as the capacity to recognize, comprehend, and control one's own emotions, as well as to recognize, comprehend, and influence the emotions of others (Goleman, 1995; Salovey & Mayer, 1990). Therefore, emotionally intelligent people create win-win situations while engaging with others. Such people develop a magnetic field of emotional attraction and an ever-expanding network of social interactions and emotional support structures. In contrast, low-EQ individuals engage in counterproductive emotional exchanges and develop, often unwittingly, a field of emotional repulsion that shrinks and distances their social networks (Kunnanatt, 2004). The author also introduced the framework showing the relationship between emotional



quotient and social interaction as a set of soft skills.

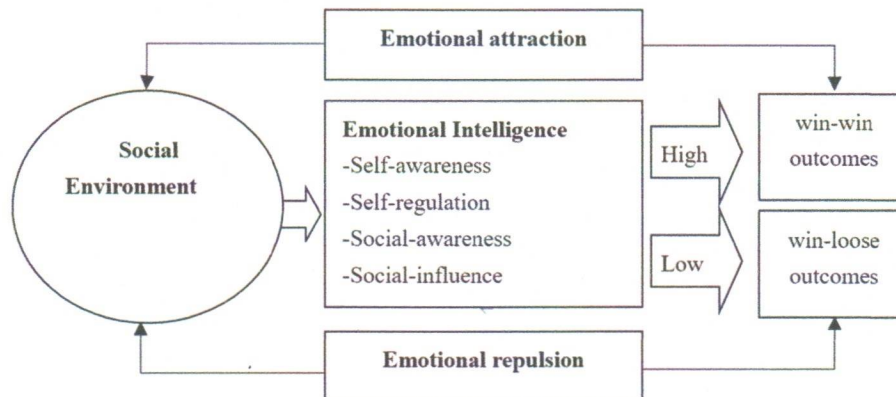


Figure 1. Emotional quotient and social interaction (Kunnanatt, 2004, p. 490)

Therefore, the study of emotional quotient may be advantageous to the development of soft skills. Goleman 1995 identified self-awareness, self-regulation, motivation, empathy, and social skills as EQ components. In social and educational situations, an individual traverses a variety of pathways. Consequently, each factor may influence the development of emotional quotient differentially across contexts and learners. Examining the impact of these variables on the EQ of learners in a particular setting could aid stakeholders in developing an appropriate plan for their students.

In studying such a matter, factor analysis can be used to provide statistical evidence for the claim. According to Kim and Mueller (1978), the method is defined as a multivariate statistical technique applied to a single set of variables to determine the independence of subsets from one another. To simplify, the premise underlying factor analysis is that all variables correlate to some degree. The variables must be measured at the ordinal level minimum (Gorsuch, 2014). Therefore, factor analysis identifies the variables' underlying components by grouping related variables in the same factor (Harman & Harman, 1976; Rummel, 1988).

Moreover, the method is useful for various kinds of research purposes. For example, factor analysis yields interpretable results with the presence of coefficients that indicate the contribution of each input feature to each transformed feature, or factor (Ather & Balasundaram, 2009; Cooper, 1983). In addition, it can be used to identify input features that contain similar amounts of data (Plucker, 2003). Similar information-sharing input characteristics would typically contribute to the same converted features. Still, some factor analysis implementations ensure uncorrelated features. This is useful in feeding results in an algorithm that cannot handle uncorrelated information (Bryant & Yarnold, 1995; Yu & Richardson, 2015).

Utilizing the process of factor analysis, scholars have studied factors that affect emotional quotient (EQ) in various contexts (e.g., Acoci et al., 2022; Andrade et al., 2014; Arifin & Yusoff, 2016). For instance, Acoci et al. (2022) investigated the relationship between emotional quotient and academic performance. The factors utilized were self-awareness, self-recognition, motivation, empathy, and social skill. There is a modest association between emotional intelligence and the academic accomplishment of pupils, as self-awareness, self-monitoring, and social skills influence academic achievement while self-competence does not.

Andrade et al. (2014) conducted a study to outline the procedure for validating the Emotional Intelligence Measurement (MIE) Scale for older adults in Portugal. To evaluate construct validity, i.e., to determine whether the variables that comprise the factors measure the same ideas, exploratory factor analysis was conducted. The study included 1084 participants with an average age of 72.98 years. The findings led to the development of the Emotional Intelligence Measurement Scale (MIE), which consists of 33 items and five components (Empathy, Self-motivation, Self-awareness, Self-control, and Sociability).

USM Emotional Quotient Inventory (USMEQI) validity and construct validity were investigated by (Arifin & Yusoff, 2016). The measurement is used to evaluate medical school applicants' Emotional Quotient. There were 453 examples selected. The findings indicate that the proposed model is incompatible with the research sample data. Due to non-positive definite issues, EI factors and FI variables needed to be evaluated individually. After adjustments to the model, the CFA of EI factors suggested the two-factor model rather than the seven-factor model given. Awareness, Maturity, and Command (CoMaCt). CFA of the FI factor retained a one-factor model and is likewise valid from a construct perspective.



Therefore, factors analysis could be beneficial in studying factors affecting emotional intelligence and developing measurement used in assessing it. The current study was purposed to develop an emotional quotient measurement and apply the process of factor analysis to provide its construct validity. The developed emotional quotient measurement should be beneficial in assessing university students' emotional quotient in the Thai context.

## **2. Method**

### *2.1 Population and Samples*

The population was 1,300 students at Rajabhat Petchabul University, Thailand. The samples were selected using stratified random sampling. The stratum of major was employed, and 200 samples were selected. The size of 200 was selected as it covers every faculty in the university. Hence, the sample included an equal number of students from the humanities and social sciences, the natural sciences, and the education field.

### *2.2 Instrument*

The instrument was an Emotional Quotient Evaluation for Thai University Students. The evaluation was designed in a 5-level assessment. There are 80 items in 5 parts designed considering the component of emotional quotient. In detail, part 1 consists of 15 items regarding self-awareness, part 2 consists of 20 items regarding self-regulation, part 3 consists of 15 items regarding self-motivation, part 4 consists of 15 items regarding recognizing emotions in others, and part 5 consists of 15 items regarding social skills.

In the developing processes, the evaluation was designed to have 100 items. The items were tested for their content validity using the index of congruence (IOC) from 5 raters. 95 items passed the determining criteria with the IOC of 0.50–1.00. The evaluation was employed on 60 samples in a preliminary study to find its item-total correlation. 80 items passed the criteria with a discrimination of 0.472–0.817. Cronbach alpha correlation shows the reliability of the evaluation of 0.991. The evaluation was employed on the samples to find construct validity in the current study.

### *2.3 Data Collection and Data Analysis*

The evaluation was employed in the data collection in October 2022. The samples were given the form in person. The researchers explained the background of the evaluation for 10 minutes before the samples started filling out the form. The data were analyzed by confirmatory factor analysis.

## **3. Results**

In terms of Emotional Quotient Evaluation components, 80 indicators in 16 sub-components within 5 main components were developed. The detail can be seen below.

Component 1, Self-awareness consists of 15 indicators in total. 3 sub-components are self-confidence, self-assessment, and humor. Each component consists of 5 indicators.

Component 2, Self-regulation consists of 20 indicators in total. 4 sub-components are self-control, trust, adaptability, and ability to change. Each component consists of 5 indicators.

Component 3, Self-Motivation consists of 15 indicators in total. 3 sub-components are achievement motivation, initiation, and optimism. Each component consists of 5 indicators.

Component 4, Recognizing Emotions in Others consists of 15 indicators in total. 3 sub-components are sensitivity, empathy, and service mind. Each component consists of 5 indicators.

Component 5, Social Skills consists of 15 indicators in total. 3 sub-components are effective communication, Expertise in collaborative working, and conflict management. Each component consists of 5 indicators.

The evaluation development shows its content validity as discussed in the methodology part. The construct validity can be seen below.

Table 1. Factor loading, standard errors of means, and construct reliability of sub-component confirmatory factor analysis

Variables	Sub-components	( $\lambda_v$ )	(SE $\lambda_v$ )	(Z)	(R <sup>2</sup> )
SEA	1. Self-awareness				
SCD	1.1 Self-confidence	0.853**	0.022	39.069	0.728
SAM	1.2 Self-assessment	0.943**	0.015	62.390	0.890
HUM	1.3 Humor	0.982**	0.012	79.055	0.964
SER	2. Self-regulation				
SCT	2.1 self-control	0.908**	0.013	70.383	0.825
TRU	2.2 trust	0.973**	0.006	151.775	0.946
ADA	2.3 adaptability	0.871**	0.018	47.603	0.758
ABC	2.4 ability to change	0.873**	0.019	45.758	0.762
SMT	3. Self-Motivation				
ACM	3.1 Achievement motivation	0.960**	0.008	114.202	0.922
INI	3.2 Initiation	0.904**	0.014	65.717	0.818
OPT	3.3 Optimism	0.900**	0.015	58.087	0.810
REO	4. Recognizing Emotions in Others				
SEN	4.1 Sensitivity	0.920**	0.014	66.700	0.846
EMP	4.2 Empathy	0.921**	0.012	78.165	0.848
SEM	4.3 Service mind	0.937**	0.012	77.626	0.877
SOS	5. Social Skills				
EFC	5.1 Effective communication	0.897**	0.015	58.090	0.805
EXP	5.2 Expertise in collaborative working	0.863**	0.019	44.718	0.745
COM	5.3 conflict management	0.927**	0.012	78.110	0.860

Table 1 indicates that factor loading ( $\lambda_v$ ) was 0.853–0.982 while the standard error of means (SE  $\lambda_v$ ) was 0.006–0.022. All sub-components are correlated with a statistical significance of .01. The construct reliability (Squared multiple correlations: R<sup>2</sup>) was 0.728–0.964.

Table 2. Factor loading, standard errors of means, and construct reliability of component confirmatory factor analysis

Variables	Components	( $\gamma$ )	(SE $\gamma$ )	(Z)	(R <sup>2</sup> )
SEA	Self-awareness	0.902**	0.017	53.856	0.814
SER	Self-regulation	0.957**	0.008	114.795	0.916
SMT	Self-Motivation	0.983**	0.007	144.349	0.966
REO	Recognizing Emotions in Others	0.948**	0.009	106.466	0.899
SOS	Social Skills	0.984**	0.007	132.418	0.968

Construct reliability ( $\rho_c$ ) = 0.981, The average variance extracted ( $\rho_v$ ) = 0.913

Table 2 indicates that factor loadings of the components Self-awareness, Self-regulation, Self-Motivation, Recognizing Emotions in Others, and Social Skills are 0.902, 0.957, 0.983, 0.948, and 0.984 respectively. The standard errors of means are 0.017, 0.008, 0.007, 0.009, and 0.007 respectively. All components are correlated at a statistical level of .01. The construct reliability of the components is 0.814, 0.916, 0.966, 0.899, and 0.968 respectively. Therefore, the construct reliability of the Emotional Quotient Evaluation is 0.981, and the average variance extracted is 0.913.

Table 3. Goodness of fit indices

Fit indices	Index	Criteria	Interpretation
1. Chi-Square	87.436	-	-
2. df	73	-	-
3. Relative Chi-Square	1.197	$\chi^2/df < 2.00$	Fit
4. p-value	0.119	$p > .05$	Fit
5. CFI	0.997	CFI > .95	Fit
6. TLI	0.995	TLI > .95	Fit
7. RMSEA (Root Mean Square Error of Approximation)	0.031	RMSEA < .05	Fit
8. SRMR (Standardized Root Mean Square Residual)	0.021	SRMR < .05	Fit



Table 3 shows secondary order confirmatory factor analysis. It indicates that the fit indices of  $\chi^2$ ,  $\chi^2/df$ , Relative Chi-Square, p-value, CFI, TLI, RMSEA, and SRMR show the goodness of fit between the model and the data. Considering the construct reliability, average variance extracted, factor loading, correlation of the construct reliability, internal consistency, and convergent validity, we can draw a structural model of Emotional Quotient components below.

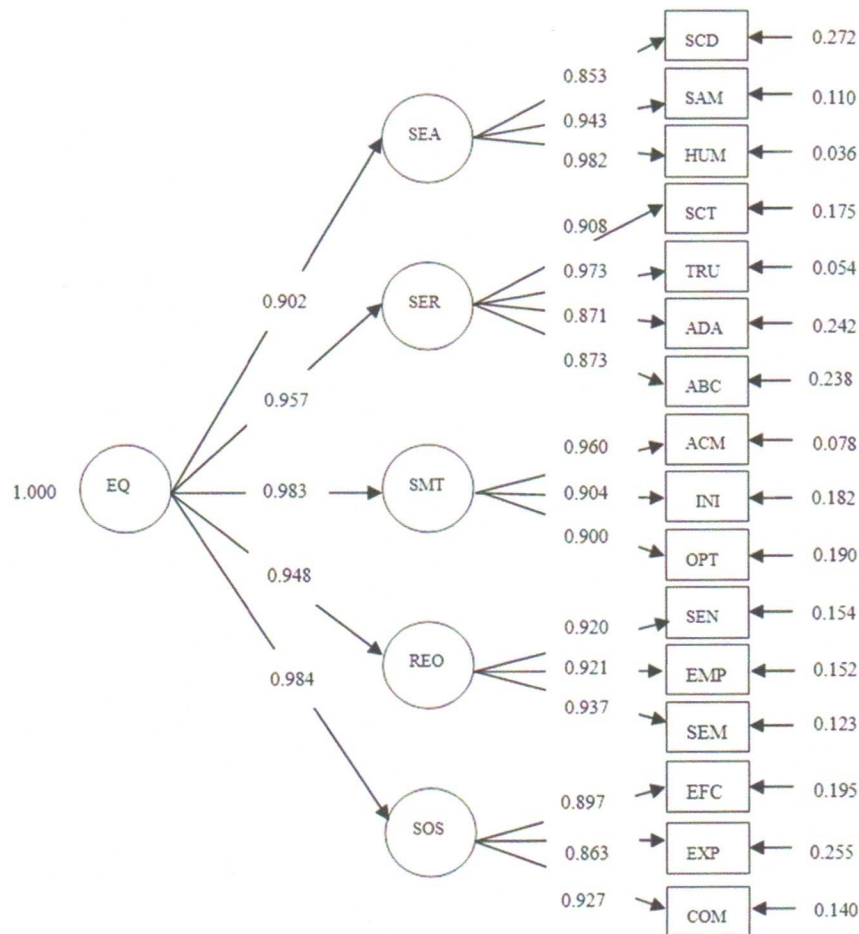


Figure 2. The model of confirmatory factor analysis on Emotional Quotient Evaluation Discussion

Note. Chi-Square = 87.436, df = 73,  $\chi^2/df$  = 1.197, p-value = 0.119, CFI = 0.997, TLI = 0.995, RMSEA = 0.031, and SRMR = 0.021.

Consequently, the developed Emotional Quotient Evaluation in the current study was proved to have content validity provided by discrimination and reliability of the evaluation form. Moreover, confirmatory factor analysis also indicates its construct validity as the goodness of fit indices passed the criteria. It could be interpreted that the Emotional Quotient Evaluation model fits the empirical data, and it contributes to the internal consistency and the construct validity of the model. Therefore, the components of evaluation are likely to assess participants' emotional quotient. The results of the study could be discussed below.

It was found that self-awareness can be used as a component of Emotional Quotient Evaluation. According to Bratton et al. (2011), a person with high emotional intelligence must accurately perceive and comprehend their own emotions. This requires exceptional self-awareness. Additionally, self-awareness is necessary for managing and regulating one's emotions effectively. The results of the study went in line with (Acoci et al., 2022) and (Andrade et al., 2014) who also recognized self-awareness as an indicator of EQ development.

Self-regulation can also be used as a component of emotional intelligence assessment in the current study. Self-regulation is a crucial component of emotional intelligence and is necessary for properly managing and controlling one's emotions to attain one's goals and communicate with others (Siregar et al., 2018). For example, a person who can manage their emotions can stay calm and attentive in high-stress situations, leading to superior



decision-making and problem-solving. Andrade et al. (2014) also found a relationship between self-regulation and emotional intelligence.

Self-motivation was also found to be a component of emotional quotient assessment by the result of the study. This could be explained by the relationship between the two components. While self-motivation enables people to pursue their goals and realize their full potential, emotional intelligence enables them to develop and maintain strong relationships, communicate effectively, and deal with difficult situations in a healthy and productive manner (Trigueros et al., 2019). The result of the study is consistent with Andrade et al. (2014) who also found a relationship between self-motivation and their participants' emotional intelligence.

The ability to recognize emotions in others also influences the emotional quotient as found by the research findings. This is because empathy is the capacity to see and comprehend the feelings of others, to feel what they feel, and to respond with caring and compassion to their emotions [8]. Empathy is essential for creating and maintaining meaningful relationships because it enables individuals to connect with others on a deeper level and to comprehend their needs and emotions. Therefore, it can be an important component of emotional intelligence since it enables individuals to perceive and respond appropriately to the emotions of others (Anderson & Caldwell, 2021; Ioannidou & Konstantikaki, 2008). Empathy is also found to be related to emotional quotient in previous studies (e.g., Andrade et al., 2014; Arifin & Yusoff, 2016).

Lastly, social skill is found to be another factor indicating the emotional quotient of Thai university students. Trigueros et al. (2020) urged that having strong social skills is important for building and maintaining positive relationships, as it allows individuals to communicate effectively, understand the perspectives of others, and respond to the needs and feelings of others in a thoughtful and appropriate way. Social skills also involve being able to read social cues, manage conflict, and build rapport and trust with others. Social skill is also found to be a factor indicating emotional quotient in previous studies (Acoci et al., 2022; Andrade et al., 2014)

#### 4. Conclusion

In this study, we designed an evaluation form to assess the emotional quotient of Thai university students. The indicators and components of the evaluation were developed from theories and principles regarding emotional intelligence. After the process of content validity assessment, the evaluation consists of 80 indicators in 5 components of Self-awareness, Self-regulation, Self-Motivation, Recognizing Emotions in Others, and Social Skills. It was later tested for construct validity with 200 Thai university students using the method of confirmatory factor analysis. The results of the study indicate the evaluation construct validity as the goodness of fit indices passed the criteria and the evaluation model fits the empirical data.

The results of the study can be implicated in educational contexts as educators could use the developed evaluation form to assess their student's emotional quotient. However, ones should consider the social context of Thai education where the evaluation was developed. It should be noted that components of the evaluation might not fit the emotional intelligence of students in different contexts. Further studies could study emotional intelligence in other aspects. The variables of the location of study places, genders, and socio-economic conditions could be added.

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A handwritten signature in blue ink, consisting of a stylized 'N' followed by a flourish.