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Development of the self-awareness scale for secondary school students

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Abstract

This research aimed to explore the quality, develop scoring criteria for the self-awareness scale, and develop a manual for the use of the self-awareness scale for secondary school students. Participants consisted of 966 secondary school students. Quantitative data analysis was conducted using descriptive statistics and confirmatory factor analysis (CFA). To analyze the qualitative data, content analysis was performed. The results were as follows: (1) The self-awareness scale consisted of 3 components: emotional awareness, accurate self-assessment, and self-confidence, consisting of 30 items. The item discrimination power ranged between 0.205 and 0.645. The construct validity using an empirical approach found that the model was consistent with the empirical data. The total score for each component was significantly related to the total score at the .05 level, the correlation coefficients were 0.845, 0.876, 0.895, and the reliability was 0.963; (2) For the norms of the self-awareness scale for secondary school students, the T-scores were in the range of 19.34 to 76.69; and (3) The manual for the use of the self-awareness scale for secondary school students contains the objectives, structure, characteristics, and quality of the scale, time required for the test, test procedures, scoring instructions, and scoring criteria. The instructions are clear and understandable. Teachers can use the manual to arrange tests in actual conditions. Self-awareness scale instrument to measure self-awareness has strong internal consistency reliability.

Introduction

Self- awareness refers to one's ability to recognize one's own emotions, thoughts, personalities, likes, goals, attitudes, perceptions, feelings, and other aspects related to one's self (Ben-Artzi et al., 1995), and is the foundation for self-confidence as it involves knowing one's capabilities and limitations (Lojananont & Ruyaporn, 2000).

Self-awareness is one of the key components of emotional intelligence (EI). Goleman (1998), identified self-awareness as being made up of emotional awareness, accurate self-assessment, and self-confidence. In other words, it is all about knowing your emotions, your personal strengths and weaknesses, and having a strong sense of your own worth. A synthesis of papers and related research reveals that self-awareness is the most pressing problem of emotional intelligence among

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adolescents, such as the lack of self-understanding of the problems they face, being unable to solve the problems and choosing goals in life on their own. (Goleman, 1998). Self-awareness benefits children, adolescents, and students making them more productive in the workplace, in the classroom and at home, better communication with teachers and peers, more confidence, and more satisfaction with performance can all lead to happier, healthier students. Moreover, such leads to a better understanding of one's strengths and capabilities along with a boost to emotional intelligence in students (James, 2011).

In Thailand, a self-awareness scale has not been created specifically for students in grades 1–6. There is only a self-awareness scale, which has been created as a research tool in research studies. There is no standardized self-awareness scale, and such self-awareness scales should be comprehensive and up-to-date in academics and in life.

Conceptual Framework

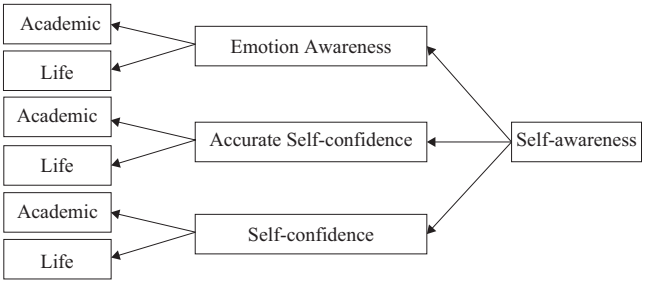

Figure 1 Conceptual framework

Methodology

This research aimed: (1) To explore the quality of the developed self-awareness scale in terms of the item discrimination power, construct validity, and scale reliability; (2) To develop scoring criteria for the self-awareness scale; and (3) To develop a manual for the use of the self-awareness scale for secondary school students. The major steps of the research process are detailed below.

Population and sample

The population consisted of 241,184 secondary school students from schools under the Secondary Educational Service Area Office, Bangkok. The sample consisted of secondary school students from schools under the Secondary Educational Service Area Office, Bangkok. The researchers divided the classes into clusters because classes in the same year level are similar in terms of academic performance distribution, student behavior, etc. but different from classes in other year levels, and then randomly selected classes using the simple random sampling. Two samples were obtained as follows:

1. Sample for quality examination of the research instrument. The sample consisted of 120 secondary school students in Term 2, Academic Year 2016. The researchers investigated the item discrimination power, construct validity using the confirmatory factor analysis, and internal consistency reliability of the scale.

2. Sample for examination of the self-awareness scale's construct validity. The sample consisted of 966 secondary school students in Term 2, Academic Year 2016. The researchers investigated the scale's construct validity using the confirmatory factor analysis and the developed norms.

Research Instrument

This consisted of the self-awareness scale for secondary school students. The steps involved in the research instrument development are detailed below.

Development of the self-awareness scale

Reviewed concepts, theories, documents, and research studies related to self-awareness, determined components of self-awareness, developed a self-awareness scale, created items according to the test blueprint for the self-awareness scale for secondary school students and the conceptual framework of the operational definition. The developed scale was a 5-point scale (highest, high, moderate, low, and lowest), consisting of 60 items, assessing 3 components: emotional awareness, accurate self-assessment, and self-confidence. Each component comprised 20 items, twice the number of items included in the completed scale.

Quality testing of the research instrument

1. The self-awareness scale for secondary school students was tested for content validity using the index of item objective congruence (IOC) by 5 experts in psychology, and educational research and evaluation.

2. The used item were reviewed by the experts to develop a 5–point self-awareness scale for secondary school students. The self-awareness scale for secondary school students was first tested on 120 secondary school students in Term 2, Academic Year 2016. According to the results, secondary school students were able to understand the given instructions and all of the question items, and the appropriate amount of time for completing the scale was 10–15 minutes. The responses were scored according to the scoring criteria. The obtained scores were used to examine the item quality and test the quality by checking each item and the whole test to investigate the scale's construct validity using the confirmatory factor analysis retesting the self-awareness scale for

secondary school students on 966 secondary school students in Term 2, Academic Year 2016.

Development of the scoring criteria

The researchers used the results of the completed self-awareness scale to develop the scale's norms, and then converted the raw scores obtained from the sample into normalized T-scores primarily based on the area transformation.

Development of the manual for the use of the self-awareness scale for secondary school students

1. The manual was drafted and tested for the use of the self-awareness scale and the self-awareness scale on 4 teachers.

2. Teachers' opinions regarding the manual were explored for the use of the self-awareness scale and the self-awareness scale by interviewing teachers and improved the manual according to the results of the qualifying examination.

Data Analysis

1. The quality of the items was analyzed by calculating the item discrimination power using the item total correlation.

2. The construct validity was analyzed by using an empirical approach by analyzing the relationship between the total score of each component and the total test score using the Pearson product-moment correlation coefficient.

3. The scale's reliability and internal consistency was analyzed by calculating Cronbach's alpha coefficient.

4. The scale's construct validity were analyzed by using the confirmatory factor analysis.

Results

1. The results of the quality testing of the developed self-awareness scale for secondary school students with regard to the item discrimination power, construct validity, and scale reliability:

The self-awareness scale for secondary school students consisted of 3 components: emotional awareness, accurate self-assessment, and self-confidence, and was divided into 2 parts: academic self-awareness and self-awareness regarding to life. The developed scale was a 5-point scale (highest, high, moderate, low, and lowest), consisting of 30 items.

1) To investigate the quality of the self-awareness scale for secondary school students, content validity, item discrimination power, construct validity using an empirical approach, and scale reliability were analyzed.

2) The results of the item quality testing of the self-awareness scale for secondary school students showed that the item discrimination power ranged between 0.205 and 0.645. For content validity, the results showed that the scale items were consistent with the operational definition. In addition, all items had an IOC ranging from 0.80–1.00 and the number of items was consistent with the components determined according to the test blueprint for the self-awareness scale.

3) The results of validation of the theory by the empirical method found emotional awareness, accurate self-assessment, and self-confidence. There was a significant correlation with the total score at the .05 level. The emotional awareness component and the total score had a correlation coefficient of 0.845, the accurate self-assessment component. with the total score having a correlation coefficient of 0.876, and the self-confidence component with the total score having a correlation coefficient of 0.895, indicating that each component could measure the same attribute, namely, self-awareness.

4) The results of the scale reliability testing showed that the scale's internal consistency reliability was 0.963, consistent with the researchers' criterion of 0.80. Therefore, it could be summarized that the self-awareness scale for secondary school students had reliability and could be put to use.

5) The scale's construct validity was investigated using the confirmatory factor analysis (CFA). The results of the confirmatory factor analysis are presented in Table 2 and Figure 1.

The scale's construct validity was examined using an empirical approach by analyzing the relationship between the total score of each component and the total test score to determine whether the items could measure the components according to the concept of the research instrument development by calculating the correlation coefficient of the total score of each component (emotional awareness, accurate self-assessment, and self-confidence) and the total test score. The details were presented in Table 1.

Table 1 Pearson product-moment correlation coefficient of the total score of each component and the total test score

Relationship between variables	Emotional awareness	Accurate self-assessment	Self-confidence	Total test score
Emotional awareness	1	0.606*	0.635*	0.845*
Accurate self-assessment	0.606*	1	0.683*	0.876*
Self-confidence	0.635*	0.683*	1	0.895*
Total test score	0.845*	0.876*	0.895*	1

Note: * $p < .05$.

Table 2 Results of the confirmatory factor analysis of the self-awareness scale for secondary school students

Component/Factor	Factor loading	R^2	Factor score coefficient
Academic emotional awareness (Semo)	2.71	0.66	0.149
Emotional awareness in regard to life (Lemo)	1.93	0.36	0.061
Academic self-assessment (Sacc)	2.52	0.44	0.063
Self-assessment in regard to life (Lacc)	2.55	0.62	0.124
Academic self-confidence (Sself)	2.60	0.57	0.103
Self-confidence in regard to life (Lself)	2.83	0.56	0.091
Emotional awareness (emo)	0.86	0.75	
Accurate self-assessment (acc)	0.94	0.88	
Self-confidence (self)	0.88	0.78	
Chi-square Goodness of Fit = 10.12 df = 6 p = .11977			
RMSEA = .0759 CFI = 0.988 GFI = 0.972 AGFI = 0.904			

According to Table 1, the total score of each component was associated with the total test score at a significance level of .05. The correlation coefficient of emotional awareness total score and the total test score was 0.845. The correlation coefficient of accurate self-assessment total score and the total test score was 0.876. The correlation coefficient of self-confidence total score and the total test score was 0.895, all of which indicated the construct validity of the self-awareness scale for secondary school students.

As presented in Table 2, the second order confirmatory factor analysis of the self-awareness scale for secondary school students revealed the following results: Chi-Square = 10.12, Degree of Freedom (df) = 6, p = .11977, GFI = 0.972, AGFI = 0.904, and RMSEA = .0759, all of which indicated that the self-awareness scale for secondary school students was consistent with the empirical data, had construct validity in accordance with Goleman's self-awareness concept, and could be used to assess secondary school students' self-awareness, as shown in Figure 2.

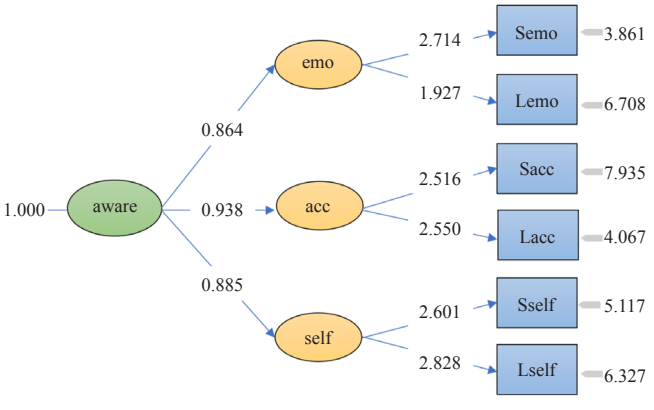

Figure 2 The second order confirmatory factor analysis model of secondary school students' self-awareness was consistent with the empirical data

The analysis found the chi-squared value was 10.12, which has a probability (p-value) of .11977 at degrees of freedom (df) 6, i.e., the chi-square is statistically insignificant. This demonstrated acceptance of the main hypothesis that research models were harmonious with empirical data. In addition, other indices judging criteria were found, which revealed that the harmonization index (GFI = 0.972), the revised harmonization index (AGFI = 0.904), the square root of the discrepancy in the estimation (RMSEA = .0759) showed that the model was similarly consistent with the empirical data. This shows that self-awareness consisted of emotional awareness, self-assessment ability and self-confidence, which is according to the theory.

2. Results of the development of norms and the interpretation of scores from the self-awareness scale for secondary school students:

1) Normative development: The researchers developed norms by converting raw scores into normalized T-scores primarily based on the area transformation. The highest and lowest possible scores were 150 and 30, respectively. A test was conducted in order to collect data for normative development. The highest and lowest scores achieved were 150 and 57, respectively. The researchers converted the raw scores into Z-scores first and then converted the Z-scores into normalized T-scores for convenient use. The results showed that the sample's scores ranging from 57 to 150 could be transformed into normalized T-scores ranging from 19.34 to 76.69, which could be used to compare the differences between individuals.

2) Score interpretation: To facilitate the use of the criteria for score interpretation, the researchers divided self-awareness into 5 levels: highest, high, moderate, low, and lowest using the following formula: 50±(SD × range), where range = (highest T scores – lowest T score)/Number of criteria = (76.69–19.34)/5 = 11.47, as shown in Table 3.

3. The results of the development of the manual for the use of the self-awareness scale for secondary school students:

Table 3 Interpretation of self-awareness levels from normalized T-scores and raw scores

Score level	Calculation	T-score	Score (X)
Excellent	50+(1.5*11.47) = 67.21	≥ T67	≥ 135
Good	50+(0.5*11.47) = 55.74	T56–T66	117–134
Moderate	50-(0.5*11.47) = 44.26	T44–T55	97–116
Poor	50-(1.5*11.47) = 32.80	T32–T43	78–96
Very poor		≤ T31	≤ 75

The results of the interviews with 4 teachers regarding the manual for the use of the self-awareness scale for secondary school students showed that all teachers agreed that the number of scale items was appropriate and the manual was understandable and easy to use. The manual contained clear test procedures, scoring instructions, and score interpretation, which could be used by teachers to arrange tests in actual conditions.

Discussion

1. Development and quality testing of the self-awareness scale for secondary school students:

Self-awareness, consisting of 3 components: emotional awareness, accurate self-assessment, and self-confidence, refers to one's ability to recognize one's own emotions, thoughts, personalities, likes, goals, attitudes, perceptions, feelings, and other aspects related to one's self (Ben-Artzi et al., 1995). This is consistent with Goleman (1998), who suggested the three components of self-awareness as emotional awareness, accurate self-assessment, and self-confidence, Suriyachai (2011), who divided a self-awareness scale into 3 parts: emotional awareness, accurate self-assessment, and self-confidence, and Ngoenyen (2015), who discovered three factors affecting secondary school students' self-awareness: emotional awareness, accurate self-assessment, and self-confidence, that emotional awareness is the ability to differentiate emotions, verbal sharing of emotions, not hiding emotions (Baroncelli et al., 2018). Accurate self-assessment was defined as people who can identify their own strengths and weaknesses (Blanch-Hartigan, 2011). and self-confidence was the ability of a person to enhance motivation, making it a valuable asset for doing something (Benabou & Tirole, 2002).

The results showed that the self-awareness scale for secondary school students had item discrimination power ranging from 0.205 to 0.645 in accordance with the researchers' criteria, which is consistent with the criteria for discrimination power of Saiyod and Saiyod (2000, p. 196) suggesting that a scale should have discrimination power of greater than 0.20, and Sinlua (2019), whose developed organizational citizenship behavior test had an IOC ranging between 0.60–1.00, discrimination power ranging between 0.363–0.758, and overall reliability of 0.961.

Moreover, the self-awareness scale for secondary school students had overall reliability of 0.963 in accordance with the researchers' criteria. The results were consistent with Veerapongsanant et al. (2018), whose critical thinking disposition scale for secondary school students had reliability of 0.93, Johnson and Christenson (2012, p. 142), who suggested that a scale should have a reliability coefficient equal to 0.70 or higher, depending on the research objectives, Nunnally and Bernstein (1994), who proposed that an effective research instrument should have Cronbach's alpha coefficient of at least 0.90.

The confirmatory factor analysis found a very high level of consistency between the scale model and the empirical data, considering the fact that the indices used in the consistency investigation met the following criteria: a chi-square value indicating no significant difference, AGFI of greater than 0.90, RMSEA of less than 0.05, and the Standardized RMR of less than 0.05 (Angsuchoti et al., 2009, pp. 21–25). This was consistent with Kajornsin (2006, pp. 161–162), who suggested that construct validity was determined based on the consistency between a test's results and observable behaviors using selected theories as criteria; in other words, the consistency between a test's results and observable behaviors indicated construct validity. In addition, factor analysis could also be used to examine construct validity.

2. Results of the development of norms and the interpretation of scores from the self-awareness scale for secondary school students:

The results showed that the sample's scores ranging from 57 to 150 could be transformed into normalized T-scores ranging from 19.34 to 76.69, which were used to compare the differences between individuals, consistent with a study on the development of a reading habit test for Grade 4 students by Manosan et al. (2017) that indicated that the comparison of the test's scores with the norms could help interpret students' different levels of reading habits.

3. Manual for the use of the self-awareness scale for secondary school students:

The manual contained the objectives, structure, characteristics, and quality of the scale, time required for the test, test procedures, scoring instructions, and scoring criteria, which is consistent with Wongarchip et al. (2015), who developed a test for measuring desirable characteristics in relation to public-mindedness among secondary school students and a supporting manual consisting of the test's objectives, operational definition, characteristics, and

structure, as well as the test procedures, scoring instructions, and score interpretation using the test's norms; the results showed that the manual could help facilitate the proper use of the test, and was understandable and appropriate for use as it contained clear instructions and all important elements of the test with clear explanations, including norms that can interpret students' levels of desirable characteristics in relation to public-mindedness.

The survey form was appropriate to use to measure students in grades 1–6 because it was of good quality, had a small number of questions (30 items), took about 10–15 minutes to answer so students did not get bored answering questions, had short, concise questions, used language that was easy to understand and age-appropriate and corresponded to the real-life of students in both study and daily life allowing them to understand the questions well, as well as being a manual for the use of measurements. This allowed the guidance teachers to measure and evaluate the students themselves as a standard unlike previous self-awareness measures, which had a larger number of items and were created for research use only. There are no normal criteria of the measurement model

Conclusion and Recommendation

1. Teachers can help some students with reading difficulties by explaining how to measure self-awareness and reading questions for students to answer on their own.

2. Teachers must follow the manual strictly, for example, explaining to students that it is not related to grades in any subject to prevent plagiarism of students' answers.

3. Applying the self-awareness scale to assessing students that will help teachers to design activities for students in different groups to develop awareness appropriately.

Conflict of Interest

There is no conflict of interest.

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