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The Analysis of Self-Concept Scale in Engineering Faculty: A Rasch Model Analysis

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***Abstract*— Self-concept is a way of how we perceive ourselves in terms of physical or individual's characteristics regarding the strengths and the weaknesses. Self-concept needs to be measured by an instrument that needs to be identified the reliability to measure the college student's self-concept. Engineering students are often faced with practical lectures and rarely have a dominant social world because of their daily activities are often spent to interacting with lab tools and materials. This article is going to discuss about the result of instrument's item analysis in the form of self-concept scale given to the engineering faculty college students. The analysis includes; difficulty level analysis, item distribution, instrument's consistency, consistency of the item on measuring self-concept, consistency of the engineering students in answering the items, and overall reliability using RASCH analysis model. This is conducted to evaluate the existing self-concept scale, so that the instrument's performance can be developed. Method used in this research is literature study and quantitative descriptive. In this method, evaluation and instrument identification in the form of developed self-concept scale has been conducted. The self-concept scale used has reliability in the moderate category, consistency of student's in answering and item's reliability is in high category, the average engineering student answered the question below the question's difficulty level. It can be concluded that average items in self-concept scale is difficult to be comprehend by students and less able to measure student's self-concept and the difficulty level need to be simplified. This can be performed by re-testing the instruments to the same students to test the reliability through test-retest.**

Keywords—self-concept, engineering faculty, adolescent, RASCH Model Analysis

I. INTRODUCTION

Students in engineering faculty known as active and creative students in practicum fields with machines and often work in the fields. This fact makes engineering students considered less socializing with world of friendship and known as tactical in solving personal problems. Self-concept is part of the self-adjustment and self-esteem [1]. Moreover, self-concept is the result of social interaction in the environment [2]. Based on that statement, engineering student's self-concept according to their socialization result during in the university need to be identified to recognize their ability to adapt in their social environment as well.

Self-concept is a variable related to self-esteem. However, self-concept and self-esteem are separate factors with unique associations for self-adjustment numbers in respondents. Self-concept is part of the realm of affection or feeling which is the determinant of the value of behavior and individual psychological adjustment [1] Self-concept influences the development of individual interests and decision making [2] Self-concept refers to one's thinking in evaluating himself and giving an assessment of himself.

Self-hatred, self-neglect, and self-blame include negative self-concept [3] Self-concept will affect individual academic achievement, when a teenager has a high self-concept, he will have good academic achievement [4,5] Good achievements will lead to a good career too. A good career will provide a positive self-image so that the individual will be more highly actualized.

The self-concept of adolescents is not affected by age and gender. Antisocial adolescents have negative and autonomous self-concepts. Teenagers who are autonomous means that women have hatred compared to other groups. The results showed that normal adolescents will have a self-concept that is not chaotic, so negative self-concept is only possessed by adolescents who have an antisocial lifestyle [6]. Students who get special treatment in inclusive schools will reduce the student's self-concept. In regular classroom conditioning in learning it is necessary to apply social interaction that develops students 'self-concepts and does not cause mild interference with students' self-concept [7].

Self-concept is individual's self-image, whether in form of physical, social, or psychological that becomes expectation of their self in the future and will form interactions with their environment and personal experience [8] This statement explains that the primacy of self-concept in daily life determines the future. If the students in engineering faculty often practice with tools or innanimate objects such as machines, etc. How will their self-concept going to be?

This become a big question in social science. It is actually not easy to make judgement on a problem with only common sense, but in this study, one if the goal is to measure the ability of engineering faculty college student's self- concept variable. In addition, in this article will be described the evaluation result of self-concept scale that the researcher used to measure the self-concept of engineering s

tudents in terms of difficulty level, consistency, and self-concept scale measurement.

II. MATERIALS AND METHODS

This study conducted at the engineering faculty of University of PGRI Adi Buana (UNIPA), Surabaya – Indonesia. This study was conducted on students with age range of 18-21 years old or in adolescent category. This study used a quantitative approach with evaluation method to identify the self-concept scale performance that used to identify UNIPA engineering student's self-concept level.

The data analysis technique use RASCH model analysis. RASCH model analysis is a modern analysis theory developed by B. Sumintono and W. Widhiarso recently. RASCH model analysis has several advantages, one of them is able to identify the instrument's ability to measure a variable accurately [10].

RASCH model analysis is capable to identify item's difficulty level with it's distribution, respondents consistency in answering, item's reliability, and respondent's reliability on answering the question. In addition, this analysis can be used to identiry the respondent's ability to answer the questions that has been presented.

```
     SUMMARY OF 232 MEASURED PERSON
-------------------------------------------------------------------------------
|          TOTAL                          MODEL          INFIT        OUTFIT    |
|          SCORE     COUNT     MEASURE    ERROR      MNSQ   ZSTD   MNSQ   ZSTD |
|-----------------------------------------------------------------------------|
| MEAN     275.6      53.0       -4.47      .13       .68    -.6   1.26    -.4 |
| S.D.      25.0        .0         .43      .03      1.10     .8   1.71    2.5 |
| MAX.     370.0      53.0       -3.63      .15      9.51    3.3   9.90    9.9 |
| MIN.     212.0      53.0       -5.65      .03       .07   -2.0    .27   -5.6 |
|-----------------------------------------------------------------------------|
| REAL RMSE    .14 TRUE SD     .41  SEPARATION  2.85  PERSON RELIABILITY  .89 |
|MODEL RMSE    .14 TRUE SD     .41  SEPARATION  3.00  PERSON RELIABILITY  .90 |
| S.E. OF PERSON MEAN = .03                                                   |
-------------------------------------------------------------------------------
PERSON RAW SCORE-TO-MEASURE CORRELATION = .97
CRONBACH ALPHA (KR-20) PERSON RAW SCORE "TEST" RELIABILITY = .67

     SUMMARY OF 53 MEASURED ITEM
-------------------------------------------------------------------------------
|          TOTAL                          MODEL          INFIT        OUTFIT    |
|          SCORE     COUNT     MEASURE    ERROR      MNSQ   ZSTD   MNSQ   ZSTD |
|-----------------------------------------------------------------------------|
| MEAN    1206.6     232.0         .00      .08      1.70     .8   1.83     .9 |
| S.D.    4269.8        .0        1.42      .02      2.37    3.7   2.47    3.9 |
| MAX.   31975.0     232.0        2.30      .11      9.15    9.9   9.90    9.9 |
| MIN.     335.0     232.0       -5.52      .01       .10   -7.5    .06   -9.9 |
|-----------------------------------------------------------------------------|
| REAL RMSE    .12 TRUE SD    1.41  SEPARATION 11.91  ITEM   RELIABILITY  .99 |
|MODEL RMSE    .08 TRUE SD    1.41  SEPARATION 16.90  ITEM   RELIABILITY 1.00 |
| S.E. OF ITEM MEAN = .20                                                     |
-------------------------------------------------------------------------------
UMEAN=.0000 USCALE=1.0000
ITEM RAW SCORE-TO-MEASURE CORRELATION = -.57
12296 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 25944.55 with 11829 d.f. p=.0000
Global Root-Mean-Square Residual (excluding extreme scores): 1.0547
```

Fig. 1. Test of Reliability

In figure 1 can be seen the student's consistensy in answering all self-concept scale's item is very high which has the reliability coefficient of 0.89 and item's consistency on the respondent's answer is really high with coefficient 0.99. It can be concluded from the analyzes above that the instrument has low ability to measure self-concept because the respondents couldn't answer the questions according to the difficulty standard level of the questions contructed by Elisa Margania [11].

B. Item Maps

Self-concept scale has item distribution with high and low difficulty level according to RASCH model anaysis which illustrated by the map items as follows.

III. RESULTS AND DISCUSSION

The discussion of result will be divided into four analyzes which will be explained in detail as follows:

A. Test of Reliability

Data analysis showed the reliability of overall self-concept scale in moderate category with reliability coefficient of 0.67. The reliability analysis result using RASCH model analysis overall can be seen in the following figure.

```
          PERSON - MAP - ITEM
              <more>|<rare>
  3                 +
                    |T
                    |  VAR00050
  2                 +  VAR00020  VAR00024  VAR00026  VAR00048
                    |  VAR00018  VAR00019  VAR00022  VAR00023  VAR00044
                       VAR00046
                    |S VAR00008  VAR00014  VAR00016  VAR00025
  1                 +  VAR00009  VAR00013  VAR00028
                    |  VAR00030  VAR00034  VAR00039  VAR00051
                    |  VAR00043  VAR00047  VAR00052
  0                 +M
                    |  VAR00031
                    |  VAR00001  VAR00032  VAR00035  VAR00036  VAR00040
                       VAR00042  VAR00045  VAR00049
 -1                 +  VAR00004  VAR00012  VAR00017  VAR00021  VAR00029
                       VAR00037  VAR00038
                    |S VAR00002  VAR00003  VAR00005  VAR00006  VAR00007
                       VAR00010  VAR00011  VAR00015  VAR00027  VAR00033
                       VAR00041
                    |
 -2                 +
                    |
                    |T
 -3                 +
                    |
             .#### T|
 -4          .#### S+
       .########## M|
      .###########  |
 -5        .###### S+
               .# T|
                .  |
 -6                 +
              <less>|<frequ>
```

Fig. 2. Item Maps

Based on picture above, the question that have the highest difficulty level is the question number 50, 20, 24, up to number 52. Whereas the question that include as the easy question to answer is question number 31, 01, 32, up to number 41. On figure 2, there is a has sign (in the blue box) to reflect the position of the respondent on answering self-concept scale item constructed by Elisa [11].

In that box, the hash sign are not parallel with the item's distribution, so it can be concluded that the self- concept scale items still cannot be used to measure engineering faculty college student's self-concept. In other words, this instrument still has a low measuring performance category when applied to engineering faculty college students in UNIPA. This can also prove that when this instrument applied to the engineering faculty student is not appropriate, therefore, it needs further testing with different subject groups to identify the usefulness of the self-concept scale developed by Elisa.

C. The Analysis of Students Ability

The next data analysis aims to identify the respondent's ability through self-concept score tha thas been achieved, through the figure of the answer's consistency from the following skalogram.

GUTTMAN SCALOGRAM OF RESPONSES:

PERSON	ITEM	5	3					4	1	1	2	1	3		1	1	2	3	2	3	3		4	3	
		3	6	3	7	2	3	5	1	1	0	7	5	8	4	2	7	9	7	1	6	5	1	5	2	
36	+185	4	3	4	4	3	4	4	3	3	3	4	3	4	4	3	4	4	4	4	4	4	4	3	00036P
34	+174	2	4	4	4	3	3	4	3	3	4	3	3	3	4	4	4	3	4	1	2	4	4	4	00034P
186	+174	3	3	3	3	3	3	4	3	3	3	3	4	3	3	3	3	4	3	4	3	3	3	3	00186P
52	+170	3	3	4	4	4	3	3	4	4	4	3	3	4	4	4	4	3	4	3	4	4	4	2	00052P
166	+169	4	4	4	4	4	4	4	3	3	4	4	4	4	3	2	4	4	4	4	4	4	4	3	00166P
39	+168	4	4	4	4	4	3	4	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	2	00039P
50	+167	4	4	4	4	4	3	4	4	4	4	4	4	3	4	3	4	4	4	4	4	4	4	2	00050P
58	+167	3	3	4	3	3	2	3	4	3	4	3	3	4	3	3	4	4	3	3	2	4	4	3	00058P
179	+165	4	3	4	2	4	4	4	3	4	3	3	3	3	2	1	4	4	3	4	3	3	3	2	00179P
55	+164	4	4	4	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	00055P
152	+163	4	4	4	4	4	4	4	4	4	4	3	4	3	4	4	3	4	3	4	4	4	3	3	00152P
56	+162	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	00056P
65	+162	2	4	3	3	4	3	2	3	3	3	4	4	4	3	3	4	3	3	3	3	4	4	3	00065P
91	+162	4	3	4	3	3	4	3	4	4	4	4	3	3	4	4	3	4	1	3	3	3	4	3	00091P
121	+162	4	4	4	4	4	3	4	4	4	3	4	4	3	4	4	4	4	4	4	4	4	3	3	00121P
101	+160	4	3	4	4	4	4	4	4	4	4	4	4	3	4	3	4	3	4	4	3	3	4	4	00101P
202	+160	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4	3	3	4	4	4	3	00202P
180	+159	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	00180P
33	+158	3	2	3	4	4	3	3	3	2	4	3	4	4	4	2	3	4	3	3	2	4	1	2	00033P
53	+158	3	2	4	3	3	2	4	3	2	3	3	2	3	3	4	3	3	3	2	2	4	4	4	00053P
116	+158	4	4	3	3	3	4	3	3	4	3	3	3	3	3	4	3	3	2	3	3	2	3	3	00116P
41	+156	4	4	3	4	4	3	4	3	3	3	3	3	3	3	3	3	3	3	3	4	3	3	3	00041P
57	+156	3	3	4	3	1	3	3	3	3	3	2	2	4	2	3	3	3	2	4	2	2	3	4	00057P
85	+156	4	4	4	4	4	4	4	4	4	4	4	3	4	4	3	3	4	4	3	3	3	4	4	00085P
129	+156	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	00129P
30	+155	3	3	3	3	2	2	2	4	2	2	3	3	3	3	4	3	4	3	3	3	4	3	4	00030P
163	+155	2	4	4	4	4	4	4	4	4	3	1	2	3	4	2	3	1	3	4	3	2	2	3	00163P
231	+154	3	4	3	3	3	3	4	3	2	2	3	3	3	3	2	4	4	3	4	3	3	3	3	00231P
31	+153	2	3	3	3	4	2	3	3	3	3	3	2	3	4	4	3	3	4	2	2	3	3	2	00031P
54	+152	4	3	3	4	3	3	3	3	4	4	3	3	3	2	3	3	4	3	3	3	4	3	2	00054P
114	+152	4	3	4	4	3	4	4	3	3	4	3	3	4	3	4	3	3	3	3	4	3	4	4	00114P
190	+152	4	4	4	4	4	4	4	4	4	4	2	3	4	3	4	4	3	4	4	4	4	4	3	00190P
29	+151	4	4	4	4	4	4	4	4	3	3	3	4	4	4	4	4	3	4	4	3	3	3	4	00029P
80	+151	3	3	3	3	3	3	3	2	3	3	3	2	3	3	3	2	3	2	2	3	3	3	2	00080P

Fig. 3. Scalogram of Self-Concept Engineering Students

In the scalogram above, it can be seen that students who have the top three self-concept score are respondents number 36. 38 and 184. While students who has the lowest three self-concept score are respondents number 142, 002, and 196.

The scalogram above can be used to identify the respondent's answe r, whether they answered consistently or not. In the score pattern obtained by respondents illustrated on the scalogram shows the seriousness of respondents in answering. For example the answer shown by respondent number 036 has a consistent score of 3 and 4 from question number 1 to 52, so the respondent answers the statement on the scale of self-concept seriously and can certainly not cheat or be influenced by friends, whether in anwering the difficult question or the easy one.

D. Item Fit

Some statements are considered difficult or easy by analyzing fit items which validity can be seen in the following figure.

ENTRY NUMBER	TOTAL SCORE	TOTAL COUNT	MEASURE	MODEL S.E.	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD	PT-MEASURE CORR.	PT-MEASURE EXP.	EXACT MATCH OBS%	EXACT MATCH EXP%	ITEM
50	335	232	2.30	.11	1.22	2.0	1.23	2.0	.30	.26	66.8	59.5	VAR00050
48	359	232	2.04	.10	1.13	1.4	1.11	1.1	.26	.28	52.2	52.4	VAR00048
20	367	232	1.97	.10	.94	-.6	.89	-1.2	.35	.28	50.0	49.5	VAR00020
24	371	232	1.93	.10	1.86	7.8	1.69	6.2	.31	.29	50.9	48.1	VAR00024
26	377	232	1.88	.09	.95	-.6	.90	-1.1	.36	.29	50.0	47.1	VAR00026
19	394	232	1.73	.09	.94	-.7	.89	-1.3	.43	.30	47.8	44.5	VAR00019
22	401	232	1.67	.09	.92	-.9	.88	-1.4	.45	.30	51.3	43.1	VAR00022
23	407	232	1.62	.09	1.17	2.0	1.12	1.4	.37	.31	40.1	42.5	VAR00023
44	407	232	1.62	.09	.95	-.6	.95	-.6	.40	.31	49.1	42.5	VAR00044
46	416	232	1.55	.09	1.16	1.9	1.13	1.6	.20	.31	47.0	42.3	VAR00046
18	419	232	1.53	.09	3.97	9.9	3.47	9.9	.30	.31	40.9	41.7	VAR00018
16	428	232	1.46	.09	1.31	3.6	1.29	3.3	.29	.31	34.9	41.4	VAR00016
8	435	232	1.41	.09	.99	-.1	.97	-.4	.44	.32	44.8	41.4	VAR00008
25	456	232	1.25	.08	.93	-.9	.93	-.9	.38	.32	45.7	41.0	VAR00025
14	462	232	1.21	.08	1.17	2.1	1.15	1.8	.37	.32	46.6	41.1	VAR00014
13	481	232	1.08	.08	1.09	1.2	1.09	1.1	.27	.33	42.2	41.8	VAR00013
28	492	232	1.00	.08	6.20	9.9	6.11	9.9	.24	.33	46.1	41.9	VAR00028
9	495	232	.98	.08	1.02	.4	1.03	.5	.32	.33	50.4	42.0	VAR00009
39	534	232	.72	.08	.87	-1.8	.87	-1.8	.37	.33	49.6	42.8	VAR00039
30	544	232	.65	.08	1.01	.2	1.03	.3	.34	.33	40.1	43.1	VAR00030
51	546	232	.63	.08	1.14	1.7	1.15	1.8	.40	.33	45.7	43.4	VAR00051
34	563	232	.52	.08	1.18	2.2	1.19	2.2	.41	.33	37.9	43.9	VAR00034
52	580	232	.40	.08	.85	-1.9	.86	-1.8	.38	.33	45.3	44.9	VAR00052
43	603	232	.24	.08	.98	-.2	.99	-.1	.35	.32	44.4	47.0	VAR00043
47	608	232	.21	.08	.70	-4.0	.71	-3.8	.32	.32	53.0	47.5	VAR00047
31	668	232	-.24	.09	1.02	.3	1.02	.3	.14	.31	54.7	52.2	VAR00031
42	703	232	-.52	.09	.73	-3.2	.75	-2.9	.38	.30	59.1	52.8	VAR00042
40	711	232	-.59	.09	1.02	.3	1.09	.9	.18	.29	63.8	52.7	VAR00040
49	717	232	-.64	.09	1.18	1.9	1.17	1.8	.07	.29	57.3	52.5	VAR00049
32	721	232	-.68	.09	8.96	9.9	9.90	9.9	.15	.29	48.7	52.4	VAR00032
45	722	232	-.69	.09	.73	-3.1	.76	-2.7	.26	.29	68.1	52.3	VAR00045
1	730	232	-.76	.10	.73	-3.0	.75	-2.7	.37	.29	59.9	51.9	VAR00001
35	732	232	-.78	.10	8.71	9.9	9.90	9.9	.21	.28	67.7	52.0	VAR00035
36	735	232	-.81	.10	.93	-.6	.99	.0	.17	.28	56.9	52.1	VAR00036
21	738	232	-.83	.10	8.95	9.9	9.90	9.9	.18	.28	65.5	52.3	VAR00021
37	743	232	-.88	.10	.84	-1.4	.89	-.9	.20	.28	63.4	52.4	VAR00037
29	747	232	-.92	.10	.75	-1.9	.77	-1.5	.32	.28	61.2	52.4	VAR00029

Fig. 4. Item Measure

In the figure above shows some items that have been captured, it can be identified with the item norms of discrimination between 0,4 and 0,85 or 0,4 < *Pt Measure Corr* > 0,85. To find out whether an item is clear and does not create confusion as well as misconception for the students, Outfit MNS*Q* (0,5 < MNSQ > 1,5) and *Outfit ZSTD* (-2,,0 < ZSTD > 2,0) should be considered as well as norm on Pt. Measure Corr [10].

Based on that statement, it can be identified that item that can be used and did not cause misconceptions in measuring engineering student's self-concept is item number 34, 14, 23, 51, 08, 19, 25, 22, 39, and 52.

IV. DISCUSSION

Self-concept scale reliability has a moderate category of reliability (Fig. 1). This is due to external and internal factors. External factors emerge from used instrument, while internal factors stem from the readiness of the engineering students to work on the self-concept scale. The instrument used have quite a number of items, besides that the quality of the students who work on the self-concept scale doesn't have the same ability, so they will produce different self-concept score as well (Fig. 3).

Another factor that affects the lower reliability is the self-concept scale has a high level of difficulty items (Fig. 2), while items that can be mantained have a less decent quality of validity (Fig 4). Factor that affect self-concept come from within the individual. One of them is the interpersonal communication skills in expressing identity followed by constructing social contact in social environment [12]. Other than that, factor that influence student's self-concept can also come from experience, especially interpersonal experience, which emits positive feelings and feeling of worth, and competency in respected area by individuals and others [13]. This makes engineering students answers the self-concept scale in accordance with the showed engineering student's self-concept result, which is overall in positive category.

The categorization of positive self-concept students as a whole becomes a component in the item analysis of the self-concept scale items used. Items are eliminated because the dominant difficulty level is too easy when applied to students of several faculties. Different ability of the constructed items seems to be not quite decent and makes the reliability at a moderate level. The quality of this scale can be said as not optimal yet, because this scale contains almost all items that have a low point measure correlation value. This is according to the opinion that explains, if the value of PT. Measure is greater than 0.4 and less than 0.85, this instrument is easy to understand and does not cause ambiguity in the subjects [10].

Engineering faculty student's dominant intelligence is on mechanical intelligence, while self-concept is part of intrapersonal intelligence and social intelligence. This allows the results of the analysis per item discussed in figure number 2 which stated about the analysis of engineering students who can answer on the scale of self-concept. Another possibility that is the cause of the results is not balanced with the analysis of items that are considered as other factors or because the quality factor of the measuring instrument is not decent and has been proven in fig. 4.

Engineering students cannot answer with the standard set as described on the scalogram, because while working, there are some students who lack of concentration in answering, so that this becomes an external factor that afects the results of answers given by students. In addition, the results of these answers are some that are manipulated by students because they have no motivation to answer the scale with too many statements.

These external factors can be referred as lack of concentration and self-confidence in answering items in engineering students. This is in accordance with the results of the study which explains the self-concept of students who are in the low category on the personal dimension of self. In addition, the student's self-concept cannot be measured properly based on the "item map" which is reflected because the ratio of students' ability to answer with difficulty is not directly proportional or balanced.

This becomes the basis the scale of self-concept cannot be generalized because the results are less suitable if applied to engineering students at UNIPA, Surabaya. The self-concept scale needs to be tested on respondents from other faculties. This becomes an alternative to increase the reliability and validity of the scale of self-concept used. In addition, the scale of self-concept can be tested for external validity so that it can be applied to students in other faculties, because it has a high measure ability of student self-concept.

V. CONCLUSION

The conclusion of this study is that all respondents have a positive self-concept. This is indicated by the categorization in the scalogram which shows the respondent's self-concept score dominates in the high category. However, the measuring instruments used were identified as having reliability in the medium category, so the instruments in the form of self-concept scales need to be improved in further. The level of difficulty of the instrument can be seen in Figure 2 which shows items in difficult and easy categories have the same percentage. It can be concluded that the self-concept scale instrument is not suitable for measuring the self-concept of engineering faculty students. This is because the constructed self-concept scale shows that the quality of the items is inconsistent and the level of reliability is still in the moderate category. The recommendation for further study is that it is necessary to re-examine the respondents for improvement of the instrument and if necessary, testing external validity to the student groups in other faculties. So that the scale of self-concept instruments is accurate when applied.

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REFERENCES

[1] Findley, D. *Self-Concept Clarity and Self-Esteem in Adolescence: Associations with Psychological, Behavioral , and Academic Adjustment*, 2013 (January).

[2] Agustiani, H. *Psikologi Perkembangan (Pendekatan Ekologi Kaitannya dengan Konsep Diri)*. Bandung: Refika Aditama, 2006.

[3] Planning, E. *Relation of Technology, Science, Self- Concept, Interest , and Gender*, 1994 pg. 43–51.

[4] Bharathi, T. A., & Sreedevi, P. A *Study on the Self- Concept of Adolescents*, 2016, *5*(10), 512–516.

[5] Bharathi, T. A., & Sreedevi, P. *A Study on the Self- Concept of Adolescents*, 2018 (April).

[6] Sebastian, C., Burnett, S., & Blakemore, S. *Development of the self-concept during adolescence*, 2008 (October). https://doi.org/10.1016/j.tics.2008.07.008

[7] Ybrandt, H. Self-concept in adolescence. *A study of age. UMEA Psychology Reports*. Sweden. 2015

[8] Kearney, A. *Exclusion from and Within School*. Netherlands: Sense Publishers., 2011

[9] Assahhra, M. F. *Konsep Diri Remaja yang Tinggal di Panti Asuhan (Studi Kasus). Jurnal Skripsi*. Jakarta: Universitas Gunadarma, 2014.

[10] Sumintono, B & Widhiarso, W. *Aplikasi pemodelan RASCH pada assessment pendidikan*. Cimahi : Trim Komunikata. 2015

[11] Elisa, M. *Skala Konsep Diri*. 2012. [online]. Accessed on March 2016 in http://elisatjahayoe.blogspot.com/2012/06/skala-konsep-diri.html

[12] Sumintono, B & Widhiarso, W. (2013). *Aplikasi Model Rasch untuk Penelitian Ilmu-Ilmu Sosial*. Cimahi : Trimkom Publishing House.2013

[13] Fitts, W. H. *The Self Concept and Delinquency*. California: Western Psychological Services., 1971