Rasch analysis polytomy measuring levels emotional intelligence at Indonesian vocational high school students

A Alizamar1*, A Afdal2, Y Syahputra3, I Ifdil4, Z Ardi5

12345Universitas Negeri Padang, Padang, Indonesia.

*alizamar@konselor.org

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Abstract

During this time many people are found to achieve the required high learning achievement of intellectual intelligence (IQ) is also high. However, according to recent research in the field of psychology prove that IQ is not the only factor that affects one's learning achievement, but there are many other factors that affect one of them is emotional intelligence. So that the direction of this research is to measure the level of emotional intelligence vocational high school students. The study involved 101 students in vocational high schools in Indonesia, the data in this study a polytomy of data collected using the instrument of emotional intelligence in the form of Likert models scale and the data were analyzed using the Rasch model approach. These results indicate that most students are at a high level of emotional intelligence. Other than that, there are 10 students who are not appropriate in providing answers or outliers, indicated no trace of fraud or instrument by guessing the answer. The quality of instrument emotional intelligence given to a student's great to identify the condition of emotional intelligence, as seen from the value of the item reliability (.96).

Keywords: Emotional Intelligence, Rasch analysis polytomy, Vocational High School Students

INTRODUCTION

Emotional intelligence as a construct that has many researchers studied extensively in recent decades. This study takes an educational context as a regular venue adolescents coexist, many studies have been conducted and have shown that there is a relationship between a successful academic achievement and academic results on emotional intelligence, as well as the association with the mental health of students. By having the emotional intelligence skills will be more successful in school and in touch with peers and will be protected from risks such as drugs, juvenile delinquency. To better analyze how the concept evolved, we consider Capability Model, proposed by Mayer & Salovey (1997) emotional abilities as a set of cognitive skills which mainly acts to perceive, use, understand, and manage emotions.

Some research linking emotional intelligence and behavior of physical activity, leisure time activities and performance in education, to the psychological disorders or mental health problems that may be experienced by individuals. The linkage between emotional intelligence and stress and the relationship between emotional intelligence...
and general health. Based on the results of empirical states that emotional intelligence as a predictor of mental illness which shows how emotional intelligence relates negatively to depression and phobias in adults. Furthermore, Salakhatdinova & Palei (2018) states that emotionally intelligent people are more likely to use adaptive strategies and tend not to use maladaptive strategies to regulate their emotions. The research objective was to measure the level of emotional intelligence of students of vocational high schools, so that students have the skills of emotional intelligence is high tend to be more successful in school (such as learning outcomes and academic achievement are good) and relationships with peers and will be protected from risks such as drugs, delinquency, aggressive, avoid stress and depression.

**RESEARCH METHODS**

Participants:
The study involved 101 adolescents as respondents in Padang, West Sumatra. Adolescent respondents were teenagers who sit in high school vocational taken at random.

Procedures:
The respondents were given an instrument consisting of 38 statements in a paper-based format. Each respondent can choose one of five alternative answers is provided and 40 minutes of the time given to fill the emotional intelligence instrument.

Measuring:
Instrument compiled by Afdal et al. (2016) developed from Goleman's theory based on aspects of emotional intelligence, namely: (1) understanding and recognizing the emotions of self, (2) managing emotions, (3) motivating oneself, (4) recognizing the emotions of others, and (5) fostering relationships. Data in this research are politomy data collected using the instrument of emotional intelligence in the form of Likert model scale with five alternative answers, including answer choice: always, often, sometimes, rarely, and never

Data Analysis:
Data were analyzed using models Rasch using statistical analysis of suitability. Statistical analysis using parameter conformity outfit MNSQ with the ideal range (+0.5 s/d +1.5).

**RESULTS AND DISCUSSION**

For the purpose of this research, this report is pushed out in two stages: (1) assess the property and quality instruments emotional intelligence submitted by counselors to students, and (2) assess the ability of each student in conducting instrument emotional intelligence.

**Quality Test Instrument Emotional Intelligence for Students**

There are four aspects of the testing conducted to evaluate the instrument of emotional intelligence, namely (1) the index of reliability and separation, (2) test dimensions, (3) the item fit and misfit, and (4) the function of information instrument.
Table 1. Summary of quality instrument items (N item = 38).

<table>
<thead>
<tr>
<th>Estimation</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item Reliabilities</td>
<td>.96</td>
</tr>
<tr>
<td>Separation index of Item</td>
<td>4.76</td>
</tr>
<tr>
<td>Mean Item</td>
<td>0.00</td>
</tr>
<tr>
<td>Mean OUTFIT MNSQ</td>
<td>1.02</td>
</tr>
<tr>
<td>Raw Variance Explained by measures</td>
<td>26.8 %</td>
</tr>
<tr>
<td>Raw Variance Unexplained by measures</td>
<td>73.2 %</td>
</tr>
</tbody>
</table>

First, we review the reliability of the instrument of emotional intelligence. The estimation results in Table 1 show that emotional intelligence instrument reliability (.96) is at a very good rate. It is also supported by the value of the index separation can organize items into five sections, of which the highest, high, medium, low and lowest. Furthermore, the estimation unidimensional through principal component analysis (PCA) to identify the value of the variance of crude are described by the size of 26.8%, this means that the condition unidimensional instrument has been reached (> 20%) or, in other words, the item involved the instrument of emotional intelligence can be applied to measure emotionality.

Third, categorization of items fit and misfit instruments emotional intelligence can be demonstrated by comparing the value of each item OUTFIT MNSQ instrument with MNSQ OUTFIT value average of +1.02 logit. Facts of the 38 items were given to students of all items on the instrument emotional intelligence is no misfit, or in other words 38 items appropriate for measuring emotional intelligence in students. Estimated fourth is to identify the extent of the information that can be set by the instrument as shown in Figures 1 and 2.

![Figure 1. Instrument information function (TIF) of DASS](image-url)
Figure 2. Probability of student answers on each choice answer

Figure 1 is known that the output of the information collected by the instrument of emotional intelligence is at the maximum level for students with moderate ability. While instrument emotional intelligence to reveal specific information for students who are at a high level and low emotional intelligence are less efficient. It is also supported by Figure 2 where the probability of selecting the answer is always, often, sometimes, rarely, and never revolves around the constant. Figure 2 shows that trend students select answers often and be clear on the difference in mean person (1.19 logit) and items (0.00 logit), this means that the person is far above the item or the emotional intelligence of students answered the item of emotional intelligence is at a high level.

Realization of Student Performance on instrument Emotional Intelligence Based on Rasch Fit Statistics

Ability students to work on instruments emotional intelligence can be evaluated through (1) the size of the individual, and (2) the individual matches. Both are used as a basis to determine the students who have high emotional intelligence or low, and students who do not fit in providing answers or outliers. Table 2 recognized that in principle all students have experience in managing emotional intelligence, it declared of Mean values of Person Measures (1.19 logit > logit 0.00). Unfortunately, the stability of the answers given students at the time of filling instrument enough emotional intelligence (.71). Furthermore, the interaction between the individual items (α=0.72), it indicates the interaction of students with good items.

<table>
<thead>
<tr>
<th>Estimation</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person Reliabilities</td>
<td>.71</td>
</tr>
<tr>
<td>Separation Index of Person</td>
<td>1.56</td>
</tr>
<tr>
<td>Mean Person</td>
<td>1.19</td>
</tr>
<tr>
<td>Mean OUFIT MNSQ</td>
<td>1.02</td>
</tr>
<tr>
<td>Cronbach alpha (KR-20) person raw score &quot;instrument&quot; reliability</td>
<td>72.0 %</td>
</tr>
</tbody>
</table>
We are also exploring the students who respond not in accordance with the given instrument (Misfit), of the 101 students there are 10 students who have OUTFIT MNSQ > +1.48 logit. Ten students as shown in Table 3.

<table>
<thead>
<tr>
<th>Student</th>
<th>OUTFIT MNSQ</th>
<th>Student</th>
<th>OUTFIT MNSQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>045</td>
<td>1.65</td>
<td>073</td>
<td>1.48</td>
</tr>
<tr>
<td>021</td>
<td>1.66</td>
<td>016</td>
<td>1.51</td>
</tr>
<tr>
<td>125</td>
<td>1.55</td>
<td>031</td>
<td>1.58</td>
</tr>
<tr>
<td>005</td>
<td>1.64</td>
<td>080</td>
<td>1.58</td>
</tr>
<tr>
<td>070</td>
<td>1.63</td>
<td>028</td>
<td>1.55</td>
</tr>
</tbody>
</table>

Based on Table 3 results show that students with code 045 (+1.65 logit) is a student who has the highest capability in the charging instrument emotional intelligence among 100 other students. By contradiction, code 042 (+.63 logit) are students with low ability in charging instrument emotional intelligence among 100 other students, it means the student code of 045 has the highest level of emotional intelligence are related in five dimensions, namely (1) understand and recognize emotions, (2) managing emotions, (3) motivate yourself, (4) recognize the emotions of others, and (5) fostering good relations with other people. Based on the results in Table 3 provides that the tendency of students to answer frequently in the charging instrument emotional intelligence. Reveals the average level of emotional intelligence of students is at a high level.

**CONCLUSION**

In principle, the quality of the intelligence instrument provided to the student counselor is very satisfactory. In terms of reliability, openness index, and fully unidimensional instruments. However, some aspects of intelligence instruments that need to be used include (1) on inappropriate or out-of-item items that are not suitable for performing accurate measurement functions; and (2) measurement information functions that only produce optimal for students who have moderate ability, and are less effective for students with low and high ability. Furthermore, in terms of measuring students' abilities in intelligence instruments will be seen 10 students who are not appropriate or outlier, which is students who present the response, is not in accordance with the instrument performed. Students who are dissatisfied or unlikely to be accurate, there are traces of cheating or answer by guessing. In addition, 91 students can be calculated for their ability to work on log intelligence instruments. Furthermore, the tendency of students to answer intelligence instruments at frequent and always conditions. This indicates that students of state 9 vocational school in the field of emotional intelligence are good or happen at a high level of emotional intelligence.

**REFERENCES**


P. Salovey, B. T. Bedell, J. B. Detweiler, and J. D. Mayer, “Coping intelligently,” Coping


